APPENDIX D

Future Do-Nothing Scenario Signal Warrants

Traffic Signal Warrant - Input Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2028	**Analyst:**	GC

Study Intersection Summary

Major Street:	Whitewood Ave	**Direction:**	East/West
Minor Street:	Golding St	**Direction:**	North/South

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	1
Number of Legs:	Three ("T" Intersection)	**Intersection Type:**	Existing

Notes: "Free Flow" is used when the operating speed is greater than or equal to 70km/h, "Restricted Flow" otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered "New" if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Whitewood Ave						Minor: Golding St						Pedestrians Crossing Major
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
AM	0	362	16	16	249	0	16	0	30	0	0	0	0
PM	0	360	30	16	396	0	15	0	28	0	0	0	0
AHV[1]	**0**	**181**	**12**	**8**	**161**	**0**	**8**	**0**	**15**	**0**	**0**	**0**	**0**

1. The AHV is determined by the availability of the peak hour estimates. If both the AM and PM Peak Hour Volume estimate is available then AHV = $(AM_{PHV} + PM_{PHV}) / 4$. In the case that only one estimate is available then AHV = $AM_{PHV} / 2$ **or** AHV = $PM_{PHV} / 2$.

Determination of Justification Volumes (Based on AHV)

Justification 1A: All Approach Lanes	385	Justification 2A: Major Street Both Approaches	362
Justification 1B: Minor Street Both Approaches	23	Justification 2B: Traffic Crossing Major Street	8

Note: The crossing volume is defined as the sum of:

(1) Left turns from both minor street approaches:			8
(2) The heaviest through volume from the minor street:			0
(3) 50% of the heavier left turn movement from major street when both of the following criteria are met:			0
(a) The left turn volume > 120 vph	8	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	189	FALSE	
(4) Pedestrians crossing the major street:			0
		Total	**8**

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Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2028	**Analyst:**	GC

Study Intersection Summary

Major Street:	Whitewood Ave	**Direction:**	East/West
Minor Street:	Golding St	**Direction:**	North/South

Summary of Base Justification Thresholds

Justification	1 Approach Lane		2 or More Approach Lanes	
	Free Flow	Restricted Flow	Free Flow	Restricted Flow
1A: All Approach Lanes	480	**720**	600	900
1B: Minor Street Both Approaches	120	**170**	120	170
2A: Major Street Both Approaches	480	**720**	600	900
2B: Traffic Crossing Major Street	50	**75**	50	75

The above values are taken from Table 12 and Table 13 from OTM Book 12 (March 2012).
The grey shaded values are provided for reference only, and are not applicable to the study intersection.

Adjusted Justification Thresholds for Study Intersection Conditions

Justification	Base Threshold	Existing Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	120%	-	**864**
1B: Minor Street Both Approaches	170	120%	150%	**306**
2A: Major Street Both Approaches	720	120%	-	**864**
2B: Traffic Crossing Major Street	75	120%	-	**90**

The above adjustments are taken from OTM Book 12 (March 2012) the "T" Intersection adjustment only applies to Justification 1B, and is a 50% increase on the threshold when the study intersection is a "T' intersection. Otherwise a value of 100% is used.

Warrant Calculation

Justification	Study Intersection Justification Volume	Justification Threshold	Percentage Warrant	Warrant Met?
1A: All Approach Lanes	385	**864**	45%	**No**
1B: Minor Street Both Approaches	23	**306**	8%	
2A: Major Street Both Approaches	362	**864**	42%	**No**
2B: Traffic Crossing Major Street	8	**90**	9%	

Notes: In the case of Justification 7 based on AHV both Warrant 1 and 2 must be met 100%, which requires both the A and B part of each warrant being equal to 100%.
When calculating the percentage, any value greater than 100% is expressed as 100%.

Based on OTM Book 12's Signal Warrant Justification 7 and the estimated AHV for the subject study intersection a signal is:

Not Warranted

Traffic Signal Warrant - Input Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2028	**Analyst:**	GC

Study Intersection Summary

Major Street:	Whitewood Ave	**Direction:**	East/West
Minor Street:	John	**Direction:**	North/South

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	1
Number of Legs:	Four	**Intersection Type:**	Existing

Notes: "Free Flow" is used when the operating speed is greater than or equal to 70km/h, "Restricted Flow" otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered "New" if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Whitewood Ave						Minor: John						Pedestrians Crossing Major
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
AM	15	288	4	4	256	8	4	0	5	11	4	15	7
PM	14	387	7	5	324	12	4	0	9	11	3	8	6
AHV[1]	**7**	**169**	**3**	**2**	**145**	**5**	**2**	**0**	**4**	**6**	**2**	**6**	**3**

1. The AHV is determined by the availability of the peak hour estimates. If both the AM and PM Peak Hour Volume estimate is available then AHV = $(AM_{PHV} + PM_{PHV}) / 4$. In the case that only one estimate is available then AHV = $AM_{PHV} / 2$ **or** AHV = $PM_{PHV} / 2$.

Determination of Justification Volumes (Based on AHV)

Justification 1A: All Approach Lanes	351	Justification 2A: Major Street Both Approaches	331
Justification 1B: Minor Street Both Approaches	20	Justification 2B: Traffic Crossing Major Street	13

Note: The crossing volume is defined as the sum of:

(1) Left turns from both minor street approaches:			8
(2) The heaviest through volume from the minor street:			2
(3) 50% of the heavier left turn movement from major street when both of the following criteria are met:			0
(a) The left turn volume > 120 vph	7	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	152	FALSE	
(4) Pedestrians crossing the major street:			3
		Total	**13**

Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2028	**Analyst:**	GC

Study Intersection Summary

Major Street:	Whitewood Ave	**Direction:**	East/West
Minor Street:	John	**Direction:**	North/South

Summary of Base Justification Thresholds

Justification	1 Approach Lane		2 or More Approach Lanes	
	Free Flow	Restricted Flow	Free Flow	Restricted Flow
1A: All Approach Lanes	480	**720**	600	900
1B: Minor Street Both Approaches	120	**170**	120	170
2A: Major Street Both Approaches	480	**720**	600	900
2B: Traffic Crossing Major Street	50	**75**	50	75

The above values are taken from Table 12 and Table 13 from OTM Book 12 (March 2012).
The grey shaded values are provided for reference only, and are not applicable to the study intersection.

Adjusted Justification Thresholds for Study Intersection Conditions

Justification	Base Threshold	Existing Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	120%	-	**864**
1B: Minor Street Both Approaches	170	120%	100%	**204**
2A: Major Street Both Approaches	720	120%	-	**864**
2B: Traffic Crossing Major Street	75	120%	-	**90**

The above adjustments are taken from OTM Book 12 (March 2012) the "T" Intersection adjustment only applies to Justification 1B, and is a 50% increase on the threshold when the study intersection is a "T' intersection. Otherwise a value of 100% is used.

Warrant Calculation

Justification	Study Intersection Justification Volume	Justification Threshold	Percentage Warrant	Warrant Met?
1A: All Approach Lanes	351	**864**	41%	**No**
1B: Minor Street Both Approaches	20	**204**	10%	
2A: Major Street Both Approaches	331	**864**	38%	**No**
2B: Traffic Crossing Major Street	13	**90**	14%	

Notes: In the case of Justification 7 based on AHV both Warrant 1 and 2 must be met 100%, which requires both the A and B part of each warrant being equal to 100%.
When calculating the percentage, any value greater than 100% is expressed as 100%.

Based on OTM Book 12's Signal Warrant Justification 7 and the estimated AHV for the subject study intersection a signal is:

Not Warranted

Traffic Signal Warrant - Input Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2028	**Analyst:**	GC

Study Intersection Summary

Major Street:	Whitewood Ave	**Direction:**	East/West
Minor Street:	Mary	**Direction:**	North/South

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	1
Number of Legs:	Four	**Intersection Type:**	Existing

Notes: "Free Flow" is used when the operating speed is greater than or equal to 70km/h, "Restricted Flow" otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered "New" if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Whitewood Ave						Minor: Mary						Pedestrians Crossing Major
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
AM	23	274	8	4	273	8	2	3	2	8	4	10	3
PM	22	375	9	7	333	6	1	4	5	8	2	12	5
AHV[1]	**11**	**162**	**4**	**3**	**152**	**4**	**1**	**2**	**2**	**4**	**2**	**6**	**2**

1. The AHV is determined by the availability of the peak hour estimates. If both the AM and PM Peak Hour Volume estimate is available then AHV = $(AM_{PHV} + PM_{PHV}) / 4$. In the case that only one estimate is available then AHV = $AM_{PHV} / 2$ **or** AHV = $PM_{PHV} / 2$.

Determination of Justification Volumes (Based on AHV)

Justification 1A: All Approach Lanes	353	Justification 2A: Major Street Both Approaches	336
Justification 1B: Minor Street Both Approaches	17	Justification 2B: Traffic Crossing Major Street	9

Note: The crossing volume is defined as the sum of:			
(1) Left turns from both minor street approaches:			5
(2) The heaviest through volume from the minor street:			2
(3) 50% of the heavier left turn movement from major street when both of the following criteria are met:			0
(a) The left turn volume > 120 vph	11	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	163	FALSE	
(4) Pedestrians crossing the major street:			2
		Total	**9**

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Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2028	**Analyst:**	GC

Study Intersection Summary

Major Street:	Whitewood Ave	**Direction:**	East/West
Minor Street:	Mary	**Direction:**	North/South

Summary of Base Justification Thresholds

Justification	1 Approach Lane		2 or More Approach Lanes	
	Free Flow	Restricted Flow	Free Flow	Restricted Flow
1A: All Approach Lanes	480	**720**	600	900
1B: Minor Street Both Approaches	120	**170**	120	170
2A: Major Street Both Approaches	480	**720**	600	900
2B: Traffic Crossing Major Street	50	**75**	50	75

The above values are taken from Table 12 and Table 13 from OTM Book 12 (March 2012).
The grey shaded values are provided for reference only, and are not applicable to the study intersection.

Adjusted Justification Thresholds for Study Intersection Conditions

Justification	Base Threshold	Existing Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	120%	-	**864**
1B: Minor Street Both Approaches	170	120%	100%	**204**
2A: Major Street Both Approaches	720	120%	-	**864**
2B: Traffic Crossing Major Street	75	120%	-	**90**

The above adjustments are taken from OTM Book 12 (March 2012) the "T" Intersection adjustment only applies to Justification 1B, and is a 50% increase on the threshold when the study intersection is a "T' intersection. Otherwise a value of 100% is used.

Warrant Calculation

Justification	Study Intersection Justification Volume	Justification Threshold	Percentage Warrant	Warrant Met?
1A: All Approach Lanes	353	**864**	41%	**No**
1B: Minor Street Both Approaches	17	**204**	8%	
2A: Major Street Both Approaches	336	**864**	39%	**No**
2B: Traffic Crossing Major Street	9	**90**	10%	

Notes: In the case of Justification 7 based on AHV both Warrant 1 and 2 must be met 100%, which requires both the A and B part of each warrant being equal to 100%.
When calculating the percentage, any value greater than 100% is expressed as 100%.

Based on OTM Book 12's Signal Warrant Justification 7 and the estimated AHV for the subject study intersection a signal is:

Not Warranted

Traffic Signal Warrant - Input Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2028	**Analyst:**	GC

Study Intersection Summary

Major Street:	Broadwood	**Direction:**	East/West
Minor Street:	Golding	**Direction:**	North/South

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	1
Number of Legs:	Three ("T" Intersection)	**Intersection Type:**	Existing

Notes: "Free Flow" is used when the operating speed is greater than or equal to 70km/h, "Restricted Flow" otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered "New" if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Broadwood						Minor: Golding						Pedestrians Crossing Major
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
AM	3	1	0	0	2	16	0	0	0	33	0	0	0
PM	0	0	0	0	4	41	0	0	0	2	0	34	0
AHV[1]	**1**	**0**	**0**	**0**	**2**	**14**	**0**	**0**	**0**	**9**	**0**	**9**	**0**

1. The AHV is determined by the availability of the peak hour estimates. If both the AM and PM Peak Hour Volume estimate is available then AHV = (AM_{PHV} + PM_{PHV}) / 4. In the case that only one estimate is available then AHV = AM_{PHV} / 2 **or** AHV = PM_{PHV} / 2.

Determination of Justification Volumes (Based on AHV)

Justification 1A: All Approach Lanes	35	Justification 2A: Major Street Both Approaches	17
Justification 1B: Minor Street Both Approaches	18	Justification 2B: Traffic Crossing Major Street	9

Note: The crossing volume is defined as the sum of:			
(1) Left turns from both minor street approaches:			9
(2) The heaviest through volume from the minor street:			0
(3) 50% of the heavier left turn movement from major street when both of the following criteria are met:			0
(a) The left turn volume > 120 vph	1	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	3	FALSE	
(4) Pedestrians crossing the major street:			0
		Total	**9**

Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2028	**Analyst:**	GC

Study Intersection Summary

Major Street:	Broadwood	**Direction:**	East/West
Minor Street:	Golding	**Direction:**	North/South

Summary of Base Justification Thresholds

Justification	1 Approach Lane		2 or More Approach Lanes	
	Free Flow	Restricted Flow	Free Flow	Restricted Flow
1A: All Approach Lanes	480	**720**	600	900
1B: Minor Street Both Approaches	120	**170**	120	170
2A: Major Street Both Approaches	480	**720**	600	900
2B: Traffic Crossing Major Street	50	**75**	50	75

The above values are taken from Table 12 and Table 13 from OTM Book 12 (March 2012).
The grey shaded values are provided for reference only, and are not applicable to the study intersection.

Adjusted Justification Thresholds for Study Intersection Conditions

Justification	Base Threshold	Existing Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	120%	-	**864**
1B: Minor Street Both Approaches	170	120%	150%	**306**
2A: Major Street Both Approaches	720	120%	-	**864**
2B: Traffic Crossing Major Street	75	120%	-	**90**

The above adjustments are taken from OTM Book 12 (March 2012) the "T" Intersection adjustment only applies to Justification 1B, and is a 50% increase on the threshold when the study intersection is a "T' intersection. Otherwise a value of 100% is used.

Warrant Calculation

Justification	Study Intersection Justification Volume	Justification Threshold	Percentage Warrant	Warrant Met?
1A: All Approach Lanes	35	**864**	4%	**No**
1B: Minor Street Both Approaches	18	**306**	6%	
2A: Major Street Both Approaches	17	**864**	2%	**No**
2B: Traffic Crossing Major Street	9	**90**	10%	

Notes: In the case of Justification 7 based on AHV both Warrant 1 and 2 must be met 100%, which requires both the A and B part of each warrant being equal to 100%.
When calculating the percentage, any value greater than 100% is expressed as 100%.

Based on OTM Book 12's Signal Warrant Justification 7 and the estimated AHV for the subject study intersection a signal is:

Not Warranted

Traffic Signal Warrant - Input Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2028	**Analyst:**	GC

Study Intersection Summary

Major Street:	Broadwood	**Direction:**	East/West
Minor Street:	Edith	**Direction:**	North/South

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	1
Number of Legs:	Three ("T" Intersection)	**Intersection Type:**	Existing

Notes: "Free Flow" is used when the operating speed is greater than or equal to 70km/h, "Restricted Flow" otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered "New" if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Broadwood						Minor: Edith						Pedestrians Crossing Major
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
AM	6	32	0	0	22	39	0	0	0	24	0	2	0
PM	8	47	0	0	41	25	0	0	0	71	0	5	0
AHV[1]	**4**	**20**	**0**	**0**	**16**	**16**	**0**	**0**	**0**	**24**	**0**	**2**	**0**

1. The AHV is determined by the availability of the peak hour estimates. If both the AM and PM Peak Hour Volume estimate is available then AHV = (AM_{PHV} + PM_{PHV}) / 4. In the case that only one estimate is available then AHV = AM_{PHV} / 2 **or** AHV = PM_{PHV} / 2.

Determination of Justification Volumes (Based on AHV)

Justification 1A: All Approach Lanes	82	Justification 2A: Major Street Both Approaches	56
Justification 1B: Minor Street Both Approaches	26	Justification 2B: Traffic Crossing Major Street	24

Note: The crossing volume is defined as the sum of:

(1) Left turns from both minor street approaches:			24
(2) The heaviest through volume from the minor street:			0
(3) 50% of the heavier left turn movement from major street when both of the following criteria are met:			0
(a) The left turn volume > 120 vph	4	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	20	FALSE	
(4) Pedestrians crossing the major street:			0
		Total	**24**

Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2028	**Analyst:**	GC

Study Intersection Summary

Major Street:	Broadwood	**Direction:**	East/West
Minor Street:	Edith	**Direction:**	North/South

Summary of Base Justification Thresholds

Justification	1 Approach Lane		2 or More Approach Lanes	
	Free Flow	Restricted Flow	Free Flow	Restricted Flow
1A: All Approach Lanes	480	**720**	600	900
1B: Minor Street Both Approaches	120	**170**	120	170
2A: Major Street Both Approaches	480	**720**	600	900
2B: Traffic Crossing Major Street	50	**75**	50	75

The above values are taken from Table 12 and Table 13 from OTM Book 12 (March 2012).
The grey shaded values are provided for reference only, and are not applicable to the study intersection.

Adjusted Justification Thresholds for Study Intersection Conditions

Justification	Base Threshold	Existing Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	120%	-	**864**
1B: Minor Street Both Approaches	170	120%	150%	**306**
2A: Major Street Both Approaches	720	120%	-	**864**
2B: Traffic Crossing Major Street	75	120%	-	**90**

The above adjustments are taken from OTM Book 12 (March 2012) the "T" Intersection adjustment only applies to Justification 1B, and is a 50% increase on the threshold when the study intersection is a "T' intersection. Otherwise a value of 100% is used.

Warrant Calculation

Justification	Study Intersection Justification Volume	Justification Threshold	Percentage Warrant	Warrant Met?
1A: All Approach Lanes	82	**864**	9%	**No**
1B: Minor Street Both Approaches	26	**306**	8%	
2A: Major Street Both Approaches	56	**864**	6%	**No**
2B: Traffic Crossing Major Street	24	**90**	27%	

Notes: In the case of Justification 7 based on AHV both Warrant 1 and 2 must be met 100%, which requires both the A and B part of each warrant being equal to 100%.
When calculating the percentage, any value greater than 100% is expressed as 100%.

Based on OTM Book 12's Signal Warrant Justification 7 and the estimated AHV for the subject study intersection a signal is:

Not Warranted

Traffic Signal Warrant - Input Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2028	**Analyst:**	GC

Study Intersection Summary

Major Street:	Lakeshore	**Direction:**	North/South
Minor Street:	Broadwood	**Direction:**	East/West

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	1
Number of Legs:	Four	**Intersection Type:**	Existing

Notes: "Free Flow" is used when the operating speed is greater than or equal to 70km/h, "Restricted Flow" otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered "New" if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Lakeshore						Minor: Broadwood						Pedestrians Crossing Major
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
AM	68	302	4	0	187	9	13	4	46	7	2	3	9
PM	50	288	2	2	332	18	20	4	98	2	0	7	6
AHV[1]	**30**	**148**	**2**	**1**	**130**	**7**	**8**	**2**	**36**	**2**	**1**	**3**	**4**

1. The AHV is determined by the availability of the peak hour estimates. If both the AM and PM Peak Hour Volume estimate is available then AHV = $(AM_{PHV} + PM_{PHV}) / 4$. In the case that only one estimate is available then AHV = $AM_{PHV} / 2$ **or** AHV = $PM_{PHV} / 2$.

Determination of Justification Volumes (Based on AHV)

Justification 1A: All Approach Lanes	370	Justification 2A: Major Street Both Approaches	318
Justification 1B: Minor Street Both Approaches	52	Justification 2B: Traffic Crossing Major Street	16

Note: The crossing volume is defined as the sum of:			
(1) Left turns from both minor street approaches:			10
(2) The heaviest through volume from the minor street:			2
(3) 50% of the heavier left turn movement from major street when both of the following criteria are met:			0
(a) The left turn volume > 120 vph	30	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	160	FALSE	
(4) Pedestrians crossing the major street:			4
		Total	**16**

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Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2028	**Analyst:**	GC

Study Intersection Summary

Major Street:	Lakeshore	**Direction:**	North/South
Minor Street:	Broadwood	**Direction:**	East/West

Summary of Base Justification Thresholds

Justification	1 Approach Lane		2 or More Approach Lanes	
	Free Flow	Restricted Flow	Free Flow	Restricted Flow
1A: All Approach Lanes	480	**720**	600	900
1B: Minor Street Both Approaches	120	**170**	120	170
2A: Major Street Both Approaches	480	**720**	600	900
2B: Traffic Crossing Major Street	50	**75**	50	75

The above values are taken from Table 12 and Table 13 from OTM Book 12 (March 2012).
The grey shaded values are provided for reference only, and are not applicable to the study intersection.

Adjusted Justification Thresholds for Study Intersection Conditions

Justification	Base Threshold	Existing Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	120%	-	**864**
1B: Minor Street Both Approaches	170	120%	100%	**204**
2A: Major Street Both Approaches	720	120%	-	**864**
2B: Traffic Crossing Major Street	75	120%	-	**90**

The above adjustments are taken from OTM Book 12 (March 2012) the "T" Intersection adjustment only applies to Justification 1B, and is a 50% increase on the threshold when the study intersection is a "T' intersection. Otherwise a value of 100% is used.

Warrant Calculation

Justification	Study Intersection Justification Volume	Justification Threshold	Percentage Warrant	Warrant Met?
1A: All Approach Lanes	370	**864**	43%	**No**
1B: Minor Street Both Approaches	52	**204**	25%	
2A: Major Street Both Approaches	318	**864**	37%	**No**
2B: Traffic Crossing Major Street	16	**90**	18%	

Notes: In the case of Justification 7 based on AHV both Warrant 1 and 2 must be met 100%, which requires both the A and B part of each warrant being equal to 100%.
When calculating the percentage, any value greater than 100% is expressed as 100%.

Based on OTM Book 12's Signal Warrant Justification 7 and the estimated AHV for the subject study intersection a signal is:

Not Warranted

Traffic Signal Warrant - Input Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2028	**Analyst:**	GC

Study Intersection Summary

Major Street:	Lakeshore	**Direction:**	North/South
Minor Street:	Farah	**Direction:**	East/West

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	1
Number of Legs:	Four	**Intersection Type:**	Existing

Notes: "Free Flow" is used when the operating speed is greater than or equal to 70km/h, "Restricted Flow" otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered "New" if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Lakeshore						Minor: Farah						Pedestrians Crossing Major
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
AM	6	232	83	34	133	6	8	12	15	41	15	15	10
PM	9	258	47	28	265	9	3	23	23	62	32	18	4
AHV[1]	**4**	**123**	**33**	**16**	**100**	**4**	**3**	**9**	**10**	**26**	**12**	**8**	**4**

1. The AHV is determined by the availability of the peak hour estimates. If both the AM and PM Peak Hour Volume estimate is available then AHV = $(AM_{PHV} + PM_{PHV}) / 4$. In the case that only one estimate is available then AHV = $AM_{PHV} / 2$ **or** AHV = $PM_{PHV} / 2$.

Determination of Justification Volumes (Based on AHV)

Justification 1A: All Approach Lanes	348	Justification 2A: Major Street Both Approaches	280
Justification 1B: Minor Street Both Approaches	68	Justification 2B: Traffic Crossing Major Street	45

Note: The crossing volume is defined as the sum of:			
(1) Left turns from both minor street approaches:			29
(2) The heaviest through volume from the minor street:			12
(3) 50% of the heavier left turn movement from major street when both of the following criteria are met:			0
(a) The left turn volume > 120 vph	16	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	139	FALSE	
(4) Pedestrians crossing the major street:			4
		Total	**45**

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Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2028	**Analyst:**	GC

Study Intersection Summary

Major Street:	Lakeshore	**Direction:**	North/South
Minor Street:	Farah	**Direction:**	East/West

Summary of Base Justification Thresholds

Justification	1 Approach Lane		2 or More Approach Lanes	
	Free Flow	Restricted Flow	Free Flow	Restricted Flow
1A: All Approach Lanes	480	**720**	600	900
1B: Minor Street Both Approaches	120	**170**	120	170
2A: Major Street Both Approaches	480	**720**	600	900
2B: Traffic Crossing Major Street	50	**75**	50	75

The above values are taken from Table 12 and Table 13 from OTM Book 12 (March 2012).
The grey shaded values are provided for reference only, and are not applicable to the study intersection.

Adjusted Justification Thresholds for Study Intersection Conditions

Justification	Base Threshold	Existing Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	120%	-	**864**
1B: Minor Street Both Approaches	170	120%	100%	**204**
2A: Major Street Both Approaches	720	120%	-	**864**
2B: Traffic Crossing Major Street	75	120%	-	**90**

The above adjustments are taken from OTM Book 12 (March 2012) the "T" Intersection adjustment only applies to Justification 1B, and is a 50% increase on the threshold when the study intersection is a "T' intersection. Otherwise a value of 100% is used.

Warrant Calculation

Justification	Study Intersection Justification Volume	Justification Threshold	Percentage Warrant	Warrant Met?
1A: All Approach Lanes	348	**864**	40%	**No**
1B: Minor Street Both Approaches	68	**204**	33%	
2A: Major Street Both Approaches	280	**864**	32%	**No**
2B: Traffic Crossing Major Street	45	**90**	50%	

Notes: In the case of Justification 7 based on AHV both Warrant 1 and 2 must be met 100%, which requires both the A and B part of each warrant being equal to 100%.
When calculating the percentage, any value greater than 100% is expressed as 100%.

Based on OTM Book 12's Signal Warrant Justification 7 and the estimated AHV for the subject study intersection a signal is:

Not Warranted

Traffic Signal Warrant - Input Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2028	**Analyst:**	GC

Study Intersection Summary

Major Street:	Armstrong	**Direction:**	North/South
Minor Street:	Church	**Direction:**	East/West

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	1
Number of Legs:	Three ("T" Intersection)	**Intersection Type:**	Existing

Notes: "Free Flow" is used when the operating speed is greater than or equal to 70km/h, "Restricted Flow" otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered "New" if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Armstrong						Minor: Church						Pedestrians Crossing Major
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
AM	5	321	0	0	377	90	0	0	0	0	0	0	5
PM	5	574	0	0	453	50	0	0	0	0	0	0	2
AHV[1]	**3**	**224**	**0**	**0**	**208**	**35**	**0**	**0**	**0**	**0**	**0**	**0**	**2**

1. The AHV is determined by the availability of the peak hour estimates. If both the AM and PM Peak Hour Volume estimate is available then AHV = $(AM_{PHV} + PM_{PHV}) / 4$. In the case that only one estimate is available then AHV = $AM_{PHV} / 2$ **or** AHV = $PM_{PHV} / 2$.

Determination of Justification Volumes (Based on AHV)

Justification 1A: All Approach Lanes	470
Justification 1B: Minor Street Both Approaches	0

Justification 2A: Major Street Both Approaches	470
Justification 2B: Traffic Crossing Major Street	2

Note: The crossing volume is defined as the sum of:

(1) Left turns from both minor street approaches:			0
(2) The heaviest through volume from the minor street:			0
(3) 50% of the heavier left turn movement from major street when both of the following criteria are met:			0
(a) The left turn volume > 120 vph	3	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	211	FALSE	
(4) Pedestrians crossing the major street:			2
		Total	**2**

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Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2028	**Analyst:**	GC

Study Intersection Summary

Major Street:	Armstrong	**Direction:**	North/South
Minor Street:	Church	**Direction:**	East/West

Summary of Base Justification Thresholds

Justification	1 Approach Lane		2 or More Approach Lanes	
	Free Flow	Restricted Flow	Free Flow	Restricted Flow
1A: All Approach Lanes	480	**720**	600	900
1B: Minor Street Both Approaches	120	**170**	120	170
2A: Major Street Both Approaches	480	**720**	600	900
2B: Traffic Crossing Major Street	50	**75**	50	75

The above values are taken from Table 12 and Table 13 from OTM Book 12 (March 2012).
The grey shaded values are provided for reference only, and are not applicable to the study intersection.

Adjusted Justification Thresholds for Study Intersection Conditions

Justification	Base Threshold	Existing Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	120%	-	**864**
1B: Minor Street Both Approaches	170	120%	150%	**306**
2A: Major Street Both Approaches	720	120%	-	**864**
2B: Traffic Crossing Major Street	75	120%	-	**90**

The above adjustments are taken from OTM Book 12 (March 2012) the "T" Intersection adjustment only applies to Justification 1B, and is a 50% increase on the threshold when the study intersection is a "T' intersection. Otherwise a value of 100% is used.

Warrant Calculation

Justification	Study Intersection Justification Volume	Justification Threshold	Percentage Warrant	Warrant Met?
1A: All Approach Lanes	470	**864**	54%	**No**
1B: Minor Street Both Approaches	0	**306**	0%	
2A: Major Street Both Approaches	470	**864**	54%	**No**
2B: Traffic Crossing Major Street	2	**90**	2%	

Notes: In the case of Justification 7 based on AHV both Warrant 1 and 2 must be met 100%, which requires both the A and B part of each warrant being equal to 100%.
When calculating the percentage, any value greater than 100% is expressed as 100%.

Based on OTM Book 12's Signal Warrant Justification 7 and the estimated AHV for the subject study intersection a signal is:

Not Warranted

TYLin

Traffic Signal Warrant - Input Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2028	**Analyst:**	GC

Study Intersection Summary

Major Street:	Armstrong	**Direction:**	North/South
Minor Street:	Sherpe	**Direction:**	East/West

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	1
Number of Legs:	Four	**Intersection Type:**	Existing

Notes: "Free Flow" is used when the operating speed is greater than or equal to 70km/h, "Restricted Flow" otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered "New" if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Armstrong						Minor: Sherpe						Pedestrians Crossing Major
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
AM	0	330	4	65	454	0	14	2	5	1	0	40	5
PM	0	544	14	37	477	0	36	0	10	0	0	93	2
AHV[1]	**0**	**219**	**5**	**26**	**233**	**0**	**13**	**1**	**4**	**0**	**0**	**33**	**2**

1. The AHV is determined by the availability of the peak hour estimates. If both the AM and PM Peak Hour Volume estimate is available then AHV = $(AM_{PHV} + PM_{PHV}) / 4$. In the case that only one estimate is available then AHV = $AM_{PHV} / 2$ **or** AHV = $PM_{PHV} / 2$.

Determination of Justification Volumes (Based on AHV)

Justification 1A: All Approach Lanes	534	Justification 2A: Major Street Both Approaches	483
Justification 1B: Minor Street Both Approaches	51	Justification 2B: Traffic Crossing Major Street	16

Note: The crossing volume is defined as the sum of:

(1) Left turns from both minor street approaches:			13
(2) The heaviest through volume from the minor street:			1
(3) 50% of the heavier left turn movement from major street when both of the following criteria are met:			0
(a) The left turn volume > 120 vph	26	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	245	FALSE	
(4) Pedestrians crossing the major street:			2
		Total	**16**

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Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2028	**Analyst:**	GC

Study Intersection Summary

Major Street:	Armstrong	**Direction:**	North/South
Minor Street:	Sherpe	**Direction:**	East/West

Summary of Base Justification Thresholds

Justification	1 Approach Lane		2 or More Approach Lanes	
	Free Flow	Restricted Flow	Free Flow	Restricted Flow
1A: All Approach Lanes	480	**720**	600	900
1B: Minor Street Both Approaches	120	**170**	120	170
2A: Major Street Both Approaches	480	**720**	600	900
2B: Traffic Crossing Major Street	50	**75**	50	75

The above values are taken from Table 12 and Table 13 from OTM Book 12 (March 2012).
The grey shaded values are provided for reference only, and are not applicable to the study intersection.

Adjusted Justification Thresholds for Study Intersection Conditions

Justification	Base Threshold	Existing Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	120%	-	**864**
1B: Minor Street Both Approaches	170	120%	100%	**204**
2A: Major Street Both Approaches	720	120%	-	**864**
2B: Traffic Crossing Major Street	75	120%	-	**90**

The above adjustments are taken from OTM Book 12 (March 2012) the "T" Intersection adjustment only applies to Justification 1B, and is a 50% increase on the threshold when the study intersection is a "T' intersection. Otherwise a value of 100% is used.

Warrant Calculation

Justification	Study Intersection Justification Volume	Justification Threshold	Percentage Warrant	Warrant Met?
1A: All Approach Lanes	534	**864**	62%	**No**
1B: Minor Street Both Approaches	51	**204**	25%	
2A: Major Street Both Approaches	483	**864**	56%	**No**
2B: Traffic Crossing Major Street	16	**90**	18%	

Notes: In the case of Justification 7 based on AHV both Warrant 1 and 2 must be met 100%, which requires both the A and B part of each warrant being equal to 100%.
When calculating the percentage, any value greater than 100% is expressed as 100%.

Based on OTM Book 12's Signal Warrant Justification 7 and the estimated AHV for the subject study intersection a signal is:

Not Warranted

Traffic Signal Warrant - Input Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2028	**Analyst:**	GC

Study Intersection Summary

Major Street:	Main	**Direction:**	East/West
Minor Street:	Rorke	**Direction:**	North/South

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	1
Number of Legs:	Four	**Intersection Type:**	Existing

Notes: "Free Flow" is used when the operating speed is greater than or equal to 70km/h, "Restricted Flow" otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered "New" if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Main						Minor: Rorke						Pedestrians Crossing Major
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
AM	10	39	38	82	50	9	61	19	192	5	21	14	1
PM	14	84	73	206	60	9	52	24	127	5	24	11	5
AHV[1]	**6**	**31**	**28**	**72**	**28**	**5**	**28**	**11**	**80**	**3**	**11**	**6**	**2**

1. The AHV is determined by the availability of the peak hour estimates. If both the AM and PM Peak Hour Volume estimate is available then AHV = $(AM_{PHV} + PM_{PHV}) / 4$. In the case that only one estimate is available then AHV = $AM_{PHV} / 2$ **or** AHV = $PM_{PHV} / 2$.

Determination of Justification Volumes (Based on AHV)

Justification 1A: All Approach Lanes	309	Justification 2A: Major Street Both Approaches	170
Justification 1B: Minor Street Both Approaches	139	Justification 2B: Traffic Crossing Major Street	44

Note: The crossing volume is defined as the sum of:			
(1) Left turns from both minor street approaches:			31
(2) The heaviest through volume from the minor street:			11
(3) 50% of the heavier left turn movement from major street when both of the following criteria are met:			0
(a) The left turn volume > 120 vph	72	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	103	FALSE	
(4) Pedestrians crossing the major street:			2
		Total	**44**

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Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2028	**Analyst:**	GC

Study Intersection Summary

Major Street:	Main	**Direction:**	East/West
Minor Street:	Rorke	**Direction:**	North/South

Summary of Base Justification Thresholds

Justification	1 Approach Lane		2 or More Approach Lanes	
	Free Flow	Restricted Flow	Free Flow	Restricted Flow
1A: All Approach Lanes	480	**720**	600	900
1B: Minor Street Both Approaches	120	**170**	120	170
2A: Major Street Both Approaches	480	**720**	600	900
2B: Traffic Crossing Major Street	50	**75**	50	75

The above values are taken from Table 12 and Table 13 from OTM Book 12 (March 2012).
The grey shaded values are provided for reference only, and are not applicable to the study intersection.

Adjusted Justification Thresholds for Study Intersection Conditions

Justification	Base Threshold	Existing Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	120%	-	**864**
1B: Minor Street Both Approaches	170	120%	100%	**204**
2A: Major Street Both Approaches	720	120%	-	**864**
2B: Traffic Crossing Major Street	75	120%	-	**90**

The above adjustments are taken from OTM Book 12 (March 2012) the "T" Intersection adjustment only applies to Justification 1B, and is a 50% increase on the threshold when the study intersection is a "T' intersection. Otherwise a value of 100% is used.

Warrant Calculation

Justification	Study Intersection Justification Volume	Justification Threshold	Percentage Warrant	Warrant Met?
1A: All Approach Lanes	309	**864**	36%	**No**
1B: Minor Street Both Approaches	139	**204**	68%	
2A: Major Street Both Approaches	170	**864**	20%	**No**
2B: Traffic Crossing Major Street	44	**90**	49%	

Notes: In the case of Justification 7 based on AHV both Warrant 1 and 2 must be met 100%, which requires both the A and B part of each warrant being equal to 100%.
When calculating the percentage, any value greater than 100% is expressed as 100%.

Based on OTM Book 12's Signal Warrant Justification 7 and the estimated AHV for the subject study intersection a signal is:

Not Warranted

TYLin

Traffic Signal Warrant - Input Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2028	**Analyst:**	GC

Study Intersection Summary

Major Street:	Main	**Direction:**	East/West
Minor Street:	Gorgina	**Direction:**	North/South

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	1
Number of Legs:	Four	**Intersection Type:**	Existing

Notes: "Free Flow" is used when the operating speed is greater than or equal to 70km/h, "Restricted Flow" otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered "New" if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Main						Minor: Gorgina						Pedestrians Crossing Major
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
AM	4	238	7	8	126	3	12	7	43	1	0	4	3
PM	4	192	7	32	280	7	12	3	30	4	4	5	11
AHV[1]	**2**	**108**	**4**	**10**	**102**	**3**	**6**	**3**	**18**	**1**	**1**	**2**	**4**

1. The AHV is determined by the availability of the peak hour estimates. If both the AM and PM Peak Hour Volume estimate is available then AHV = $(AM_{PHV} + PM_{PHV}) / 4$. In the case that only one estimate is available then AHV = $AM_{PHV} / 2$ **or** AHV = $PM_{PHV} / 2$.

Determination of Justification Volumes (Based on AHV)

Justification 1A: All Approach Lanes	260	Justification 2A: Major Street Both Approaches	229
Justification 1B: Minor Street Both Approaches	31	Justification 2B: Traffic Crossing Major Street	14

Note: The crossing volume is defined as the sum of:

(1) Left turns from both minor street approaches:			7
(2) The heaviest through volume from the minor street:			3
(3) 50% of the heavier left turn movement from major street when both of the following criteria are met:			0
(a) The left turn volume > 120 vph	10	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	118	FALSE	
(4) Pedestrians crossing the major street:			4
		Total	**14**

Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2028	**Analyst:**	GC

Study Intersection Summary

Major Street:	Main	**Direction:**	East/West
Minor Street:	Gorgina	**Direction:**	North/South

Summary of Base Justification Thresholds

Justification	1 Approach Lane		2 or More Approach Lanes	
	Free Flow	Restricted Flow	Free Flow	Restricted Flow
1A: All Approach Lanes	480	**720**	600	900
1B: Minor Street Both Approaches	120	**170**	120	170
2A: Major Street Both Approaches	480	**720**	600	900
2B: Traffic Crossing Major Street	50	**75**	50	75

The above values are taken from Table 12 and Table 13 from OTM Book 12 (March 2012).
The grey shaded values are provided for reference only, and are not applicable to the study intersection.

Adjusted Justification Thresholds for Study Intersection Conditions

Justification	Base Threshold	Existing Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	120%	-	**864**
1B: Minor Street Both Approaches	170	120%	100%	**204**
2A: Major Street Both Approaches	720	120%	-	**864**
2B: Traffic Crossing Major Street	75	120%	-	**90**

The above adjustments are taken from OTM Book 12 (March 2012) the "T" Intersection adjustment only applies to Justification 1B, and is a 50% increase on the threshold when the study intersection is a "T' intersection. Otherwise a value of 100% is used.

Warrant Calculation

Justification	Study Intersection Justification Volume	Justification Threshold	Percentage Warrant	Warrant Met?
1A: All Approach Lanes	260	**864**	30%	**No**
1B: Minor Street Both Approaches	31	**204**	15%	
2A: Major Street Both Approaches	229	**864**	27%	**No**
2B: Traffic Crossing Major Street	14	**90**	16%	

Notes: In the case of Justification 7 based on AHV both Warrant 1 and 2 must be met 100%, which requires both the A and B part of each warrant being equal to 100%.
When calculating the percentage, any value greater than 100% is expressed as 100%.

Based on OTM Book 12's Signal Warrant Justification 7 and the estimated AHV for the subject study intersection a signal is:

Not Warranted

Traffic Signal Warrant - Input Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2028	**Analyst:**	GC

Study Intersection Summary

Major Street:	Main	**Direction:**	East/West
Minor Street:	Ferguson	**Direction:**	North/South

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	1
Number of Legs:	Four	**Intersection Type:**	Existing

Notes: "Free Flow" is used when the operating speed is greater than or equal to 70km/h, "Restricted Flow" otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered "New" if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Main						Minor: Ferguson						Pedestrians Crossing Major
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
AM	243	19	6	1	13	44	6	11	0	29	21	106	7
PM	208	27	12	0	18	52	7	13	0	20	40	269	21
AHV[1]	**113**	**12**	**5**	**0**	**8**	**24**	**3**	**6**	**0**	**12**	**15**	**94**	**7**

1. The AHV is determined by the availability of the peak hour estimates. If both the AM and PM Peak Hour Volume estimate is available then AHV = $(AM_{PHV} + PM_{PHV}) / 4$. In the case that only one estimate is available then AHV = $AM_{PHV} / 2$ **or** AHV = $PM_{PHV} / 2$.

Determination of Justification Volumes (Based on AHV)

Justification 1A: All Approach Lanes	292
Justification 1B: Minor Street Both Approaches	130

Justification 2A: Major Street Both Approaches	162
Justification 2B: Traffic Crossing Major Street	37

Note: The crossing volume is defined as the sum of:

(1) Left turns from both minor street approaches:			15
(2) The heaviest through volume from the minor street:			15
(3) 50% of the heavier left turn movement from major street when both of the following criteria are met:			0
(a) The left turn volume > 120 vph	113	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	121	FALSE	
(4) Pedestrians crossing the major street:			7
		Total	**37**

TYLin

Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2028	**Analyst:**	GC

Study Intersection Summary

Major Street:	Main	**Direction:**	East/West
Minor Street:	Ferguson	**Direction:**	North/South

Summary of Base Justification Thresholds

Justification	1 Approach Lane		2 or More Approach Lanes	
	Free Flow	Restricted Flow	Free Flow	Restricted Flow
1A: All Approach Lanes	480	**720**	600	900
1B: Minor Street Both Approaches	120	**170**	120	170
2A: Major Street Both Approaches	480	**720**	600	900
2B: Traffic Crossing Major Street	50	**75**	50	75

The above values are taken from Table 12 and Table 13 from OTM Book 12 (March 2012).
The grey shaded values are provided for reference only, and are not applicable to the study intersection.

Adjusted Justification Thresholds for Study Intersection Conditions

Justification	Base Threshold	Existing Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	120%	-	**864**
1B: Minor Street Both Approaches	170	120%	100%	**204**
2A: Major Street Both Approaches	720	120%	-	**864**
2B: Traffic Crossing Major Street	75	120%	-	**90**

The above adjustments are taken from OTM Book 12 (March 2012) the "T" Intersection adjustment only applies to Justification 1B, and is a 50% increase on the threshold when the study intersection is a "T' intersection. Otherwise a value of 100% is used.

Warrant Calculation

Justification	Study Intersection Justification Volume	Justification Threshold	Percentage Warrant	Warrant Met?
1A: All Approach Lanes	292	**864**	34%	**No**
1B: Minor Street Both Approaches	130	**204**	64%	
2A: Major Street Both Approaches	162	**864**	19%	**No**
2B: Traffic Crossing Major Street	37	**90**	41%	

Notes: In the case of Justification 7 based on AHV both Warrant 1 and 2 must be met 100%, which requires both the A and B part of each warrant being equal to 100%.
When calculating the percentage, any value greater than 100% is expressed as 100%.

Based on OTM Book 12's Signal Warrant Justification 7 and the estimated AHV for the subject study intersection a signal is:

Not Warranted

TYLin

Traffic Signal Warrant - Input Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2028	**Analyst:**	GC

Study Intersection Summary

Major Street:	Ferguson	**Direction:**	North/South
Minor Street:	Broadway	**Direction:**	East/West

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	1
Number of Legs:	Four	**Intersection Type:**	Existing

Notes: "Free Flow" is used when the operating speed is greater than or equal to 70km/h, "Restricted Flow" otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered "New" if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Ferguson						Minor: Broadway						Pedestrians Crossing Major
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
AM	1	299	0	20	148	10	6	0	1	5	2	23	0
PM	1	248	26	27	307	27	5	4	0	19	3	32	2
AHV[1]	**1**	**137**	**7**	**12**	**114**	**9**	**3**	**1**	**0**	**6**	**1**	**14**	**1**

1. The AHV is determined by the availability of the peak hour estimates. If both the AM and PM Peak Hour Volume estimate is available then AHV = (AM_{PHV} + PM_{PHV}) / 4. In the case that only one estimate is available then AHV = AM_{PHV} / 2 **or** AHV = PM_{PHV} / 2.

Determination of Justification Volumes (Based on AHV)

Justification 1A: All Approach Lanes	305	Justification 2A: Major Street Both Approaches	280
Justification 1B: Minor Street Both Approaches	25	Justification 2B: Traffic Crossing Major Street	11

Note: The crossing volume is defined as the sum of:

(1) Left turns from both minor street approaches:			9
(2) The heaviest through volume from the minor street:			1
(3) 50% of the heavier left turn movement from major street when both of the following criteria are met:			0
(a) The left turn volume > 120 vph	12	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	149	FALSE	
(4) Pedestrians crossing the major street:			1
		Total	**11**

Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2028	**Analyst:**	GC

Study Intersection Summary

Major Street:	Ferguson	**Direction:**	North/South
Minor Street:	Broadway	**Direction:**	East/West

Summary of Base Justification Thresholds

Justification	1 Approach Lane		2 or More Approach Lanes	
	Free Flow	Restricted Flow	Free Flow	Restricted Flow
1A: All Approach Lanes	480	**720**	600	900
1B: Minor Street Both Approaches	120	**170**	120	170
2A: Major Street Both Approaches	480	**720**	600	900
2B: Traffic Crossing Major Street	50	**75**	50	75

The above values are taken from Table 12 and Table 13 from OTM Book 12 (March 2012).
The grey shaded values are provided for reference only, and are not applicable to the study intersection.

Adjusted Justification Thresholds for Study Intersection Conditions

Justification	Base Threshold	Existing Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	120%	-	**864**
1B: Minor Street Both Approaches	170	120%	100%	**204**
2A: Major Street Both Approaches	720	120%	-	**864**
2B: Traffic Crossing Major Street	75	120%	-	**90**

The above adjustments are taken from OTM Book 12 (March 2012) the "T" Intersection adjustment only applies to Justification 1B, and is a 50% increase on the threshold when the study intersection is a "T' intersection. Otherwise a value of 100% is used.

Warrant Calculation

Justification	Study Intersection Justification Volume	Justification Threshold	Percentage Warrant	Warrant Met?
1A: All Approach Lanes	305	**864**	35%	**No**
1B: Minor Street Both Approaches	25	**204**	12%	
2A: Major Street Both Approaches	280	**864**	32%	**No**
2B: Traffic Crossing Major Street	11	**90**	12%	

Notes: In the case of Justification 7 based on AHV both Warrant 1 and 2 must be met 100%, which requires both the A and B part of each warrant being equal to 100%.
When calculating the percentage, any value greater than 100% is expressed as 100%.

Based on OTM Book 12's Signal Warrant Justification 7 and the estimated AHV for the subject study intersection a signal is:

Not Warranted

Traffic Signal Warrant - Input Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2028	**Analyst:**	GC

Study Intersection Summary

Major Street:	Ferguson	**Direction:**	North/South
Minor Street:	Browning	**Direction:**	East/West

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	1
Number of Legs:	Four	**Intersection Type:**	Existing

Notes: "Free Flow" is used when the operating speed is greater than or equal to 70km/h, "Restricted Flow" otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered "New" if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Ferguson						Minor: Browning						Pedestrians Crossing Major
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
AM	0	313	1	3	190	5	9	2	0	5	0	1	2
PM	4	289	4	5	344	8	2	0	2	7	3	5	2
AHV[1]	**1**	**151**	**1**	**2**	**134**	**3**	**3**	**1**	**1**	**3**	**1**	**2**	**1**

1. The AHV is determined by the availability of the peak hour estimates. If both the AM and PM Peak Hour Volume estimate is available then AHV = $(AM_{PHV} + PM_{PHV}) / 4$. In the case that only one estimate is available then AHV = $AM_{PHV} / 2$ **or** AHV = $PM_{PHV} / 2$.

Determination of Justification Volumes (Based on AHV)

Justification 1A: All Approach Lanes	303	Justification 2A: Major Street Both Approaches	292
Justification 1B: Minor Street Both Approaches	11	Justification 2B: Traffic Crossing Major Street	8

Note: The crossing volume is defined as the sum of:

(1) Left turns from both minor street approaches:			6
(2) The heaviest through volume from the minor street:			1
(3) 50% of the heavier left turn movement from major street when both of the following criteria are met:			0
(a) The left turn volume > 120 vph	2	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	153	FALSE	
(4) Pedestrians crossing the major street:			1
		Total	**8**

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Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2028	**Analyst:**	GC

Study Intersection Summary

Major Street:	Ferguson	**Direction:**	North/South
Minor Street:	Browning	**Direction:**	East/West

Summary of Base Justification Thresholds

Justification	1 Approach Lane		2 or More Approach Lanes	
	Free Flow	Restricted Flow	Free Flow	Restricted Flow
1A: All Approach Lanes	480	**720**	600	900
1B: Minor Street Both Approaches	120	**170**	120	170
2A: Major Street Both Approaches	480	**720**	600	900
2B: Traffic Crossing Major Street	50	**75**	50	75

The above values are taken from Table 12 and Table 13 from OTM Book 12 (March 2012).
The grey shaded values are provided for reference only, and are not applicable to the study intersection.

Adjusted Justification Thresholds for Study Intersection Conditions

Justification	Base Threshold	Existing Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	120%	-	**864**
1B: Minor Street Both Approaches	170	120%	100%	**204**
2A: Major Street Both Approaches	720	120%	-	**864**
2B: Traffic Crossing Major Street	75	120%	-	**90**

The above adjustments are taken from OTM Book 12 (March 2012) the "T" Intersection adjustment only applies to Justification 1B, and is a 50% increase on the threshold when the study intersection is a "T' intersection. Otherwise a value of 100% is used.

Warrant Calculation

Justification	Study Intersection Justification Volume	Justification Threshold	Percentage Warrant	Warrant Met?
1A: All Approach Lanes	303	**864**	35%	**No**
1B: Minor Street Both Approaches	11	**204**	5%	
2A: Major Street Both Approaches	292	**864**	34%	**No**
2B: Traffic Crossing Major Street	8	**90**	9%	

Notes: In the case of Justification 7 based on AHV both Warrant 1 and 2 must be met 100%, which requires both the A and B part of each warrant being equal to 100%.
When calculating the percentage, any value greater than 100% is expressed as 100%.

Based on OTM Book 12's Signal Warrant Justification 7 and the estimated AHV for the subject study intersection a signal is:

Not Warranted

Traffic Signal Warrant - Input Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2043	**Analyst:**	GC

Study Intersection Summary

Major Street:	Whitewood Ave	**Direction:**	East/West
Minor Street:	Golding St	**Direction:**	North/South

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	1
Number of Legs:	Three ("T" Intersection)	**Intersection Type:**	Existing

Notes: "Free Flow" is used when the operating speed is greater than or equal to 70km/h, "Restricted Flow" otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered "New" if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Whitewood Ave						Minor: Golding St						Pedestrians Crossing Major
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
AM	0	486	16	16	335	0	16	0	30	0	0	0	0
PM	0	485	30	16	532	0	15	0	28	0	0	0	0
AHV[1]	**0**	**243**	**12**	**8**	**217**	**0**	**8**	**0**	**15**	**0**	**0**	**0**	**0**

1. The AHV is determined by the availability of the peak hour estimates. If both the AM and PM Peak Hour Volume estimate is available then AHV = $(AM_{PHV} + PM_{PHV}) / 4$. In the case that only one estimate is available then AHV = $AM_{PHV} / 2$ **or** AHV = $PM_{PHV} / 2$.

Determination of Justification Volumes (Based on AHV)

Justification 1A: All Approach Lanes	503	Justification 2A: Major Street Both Approaches	480
Justification 1B: Minor Street Both Approaches	23	Justification 2B: Traffic Crossing Major Street	8

Note: The crossing volume is defined as the sum of:

(1) Left turns from both minor street approaches:			8
(2) The heaviest through volume from the minor street:			0
(3) 50% of the heavier left turn movement from major street when both of the following criteria are met:			0
(a) The left turn volume > 120 vph	8	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	251	FALSE	
(4) Pedestrians crossing the major street:			0
		Total	**8**

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Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2043	**Analyst:**	GC

Study Intersection Summary

Major Street:	Whitewood Ave	**Direction:**	East/West
Minor Street:	Golding St	**Direction:**	North/South

Summary of Base Justification Thresholds

Justification	1 Approach Lane		2 or More Approach Lanes	
	Free Flow	Restricted Flow	Free Flow	Restricted Flow
1A: All Approach Lanes	480	**720**	600	900
1B: Minor Street Both Approaches	120	**170**	120	170
2A: Major Street Both Approaches	480	**720**	600	900
2B: Traffic Crossing Major Street	50	**75**	50	75

The above values are taken from Table 12 and Table 13 from OTM Book 12 (March 2012).
The grey shaded values are provided for reference only, and are not applicable to the study intersection.

Adjusted Justification Thresholds for Study Intersection Conditions

Justification	Base Threshold	Existing Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	120%	-	**864**
1B: Minor Street Both Approaches	170	120%	150%	**306**
2A: Major Street Both Approaches	720	120%	-	**864**
2B: Traffic Crossing Major Street	75	120%	-	**90**

The above adjustments are taken from OTM Book 12 (March 2012) the "T" Intersection adjustment only applies to Justification 1B, and is a 50% increase on the threshold when the study intersection is a "T' intersection. Otherwise a value of 100% is used.

Warrant Calculation

Justification	Study Intersection Justification Volume	Justification Threshold	Percentage Warrant	Warrant Met?
1A: All Approach Lanes	503	**864**	58%	**No**
1B: Minor Street Both Approaches	23	**306**	8%	
2A: Major Street Both Approaches	480	**864**	56%	**No**
2B: Traffic Crossing Major Street	8	**90**	9%	

Notes: In the case of Justification 7 based on AHV both Warrant 1 and 2 must be met 100%, which requires both the A and B part of each warrant being equal to 100%.
When calculating the percentage, any value greater than 100% is expressed as 100%.

Based on OTM Book 12's Signal Warrant Justification 7 and the estimated AHV for the subject study intersection a signal is:

Not Warranted

Traffic Signal Warrant - Input Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2043	**Analyst:**	GC

Study Intersection Summary

Major Street:	Whitewood Ave	**Direction:**	East/West
Minor Street:	John	**Direction:**	North/South

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	1
Number of Legs:	Four	**Intersection Type:**	Existing

Notes: "Free Flow" is used when the operating speed is greater than or equal to 70km/h, "Restricted Flow" otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered "New" if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Whitewood Ave						Minor: John						Pedestrians Crossing Major
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
AM	15	387	4	4	344	8	4	0	5	11	4	15	7
PM	14	521	7	5	436	12	4	0	9	11	3	8	6
AHV[1]	**7**	**227**	**3**	**2**	**195**	**5**	**2**	**0**	**4**	**6**	**2**	**6**	**3**

1. The AHV is determined by the availability of the peak hour estimates. If both the AM and PM Peak Hour Volume estimate is available then AHV = (AM_{PHV} + PM_{PHV}) / 4. In the case that only one estimate is available then AHV = AM_{PHV} / 2 **or** AHV = PM_{PHV} / 2.

Determination of Justification Volumes (Based on AHV)

Justification 1A: All Approach Lanes	459	Justification 2A: Major Street Both Approaches	439
Justification 1B: Minor Street Both Approaches	20	Justification 2B: Traffic Crossing Major Street	13

Note: The crossing volume is defined as the sum of:			
(1) Left turns from both minor street approaches:			8
(2) The heaviest through volume from the minor street:			2
(3) 50% of the heavier left turn movement from major street when both of the following criteria are met:			0
(a) The left turn volume > 120 vph	7	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	202	FALSE	
(4) Pedestrians crossing the major street:			3
		Total	**13**

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Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2043	**Analyst:**	GC

Study Intersection Summary

Major Street:	Whitewood Ave	**Direction:**	East/West
Minor Street:	John	**Direction:**	North/South

Summary of Base Justification Thresholds

Justification	1 Approach Lane		2 or More Approach Lanes	
	Free Flow	Restricted Flow	Free Flow	Restricted Flow
1A: All Approach Lanes	480	**720**	600	900
1B: Minor Street Both Approaches	120	**170**	120	170
2A: Major Street Both Approaches	480	**720**	600	900
2B: Traffic Crossing Major Street	50	**75**	50	75

The above values are taken from Table 12 and Table 13 from OTM Book 12 (March 2012).
The grey shaded values are provided for reference only, and are not applicable to the study intersection.

Adjusted Justification Thresholds for Study Intersection Conditions

Justification	Base Threshold	Existing Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	120%	-	**864**
1B: Minor Street Both Approaches	170	120%	100%	**204**
2A: Major Street Both Approaches	720	120%	-	**864**
2B: Traffic Crossing Major Street	75	120%	-	**90**

The above adjustments are taken from OTM Book 12 (March 2012) the "T" Intersection adjustment only applies to Justification 1B, and is a 50% increase on the threshold when the study intersection is a "T' intersection. Otherwise a value of 100% is used.

Warrant Calculation

Justification	Study Intersection Justification Volume	Justification Threshold	Percentage Warrant	Warrant Met?
1A: All Approach Lanes	459	**864**	53%	**No**
1B: Minor Street Both Approaches	20	**204**	10%	
2A: Major Street Both Approaches	439	**864**	51%	**No**
2B: Traffic Crossing Major Street	13	**90**	14%	

Notes: In the case of Justification 7 based on AHV both Warrant 1 and 2 must be met 100%, which requires both the A and B part of each warrant being equal to 100%.
When calculating the percentage, any value greater than 100% is expressed as 100%.

Based on OTM Book 12's Signal Warrant Justification 7 and the estimated AHV for the subject study intersection a signal is:

Not Warranted

Traffic Signal Warrant - Input Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2043	**Analyst:**	GC

Study Intersection Summary

Major Street:	Whitewood Ave	**Direction:**	East/West
Minor Street:	Mary	**Direction:**	North/South

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	1
Number of Legs:	Four	**Intersection Type:**	Existing

Notes: "Free Flow" is used when the operating speed is greater than or equal to 70km/h, "Restricted Flow" otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered "New" if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Whitewood Ave						Minor: Mary						Pedestrians Crossing Major
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
AM	23	369	8	4	368	8	2	3	2	8	4	10	3
PM	22	504	9	7	448	6	1	4	5	8	2	12	5
AHV[1]	**11**	**218**	**4**	**3**	**204**	**4**	**1**	**2**	**2**	**4**	**2**	**6**	**2**

1. The AHV is determined by the availability of the peak hour estimates. If both the AM and PM Peak Hour Volume estimate is available then AHV = $(AM_{PHV} + PM_{PHV}) / 4$. In the case that only one estimate is available then AHV = $AM_{PHV} / 2$ **or** AHV = $PM_{PHV} / 2$.

Determination of Justification Volumes (Based on AHV)

Justification 1A: All Approach Lanes	461	Justification 2A: Major Street Both Approaches	444
Justification 1B: Minor Street Both Approaches	17	Justification 2B: Traffic Crossing Major Street	9

Note: The crossing volume is defined as the sum of:			
(1) Left turns from both minor street approaches:			5
(2) The heaviest through volume from the minor street:			2
(3) 50% of the heavier left turn movement from major street when both of the following criteria are met:			0
(a) The left turn volume > 120 vph	11	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	215	FALSE	
(4) Pedestrians crossing the major street:			2
		Total	**9**

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Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2043	**Analyst:**	GC

Study Intersection Summary

Major Street:	Whitewood Ave	**Direction:**	East/West
Minor Street:	Mary	**Direction:**	North/South

Summary of Base Justification Thresholds

Justification	1 Approach Lane		2 or More Approach Lanes	
	Free Flow	Restricted Flow	Free Flow	Restricted Flow
1A: All Approach Lanes	480	**720**	600	900
1B: Minor Street Both Approaches	120	**170**	120	170
2A: Major Street Both Approaches	480	**720**	600	900
2B: Traffic Crossing Major Street	50	**75**	50	75

The above values are taken from Table 12 and Table 13 from OTM Book 12 (March 2012).
The grey shaded values are provided for reference only, and are not applicable to the study intersection.

Adjusted Justification Thresholds for Study Intersection Conditions

Justification	Base Threshold	Existing Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	120%	-	**864**
1B: Minor Street Both Approaches	170	120%	100%	**204**
2A: Major Street Both Approaches	720	120%	-	**864**
2B: Traffic Crossing Major Street	75	120%	-	**90**

The above adjustments are taken from OTM Book 12 (March 2012) the "T" Intersection adjustment only applies to Justification 1B, and is a 50% increase on the threshold when the study intersection is a "T' intersection. Otherwise a value of 100% is used.

Warrant Calculation

Justification	Study Intersection Justification Volume	Justification Threshold	Percentage Warrant	Warrant Met?
1A: All Approach Lanes	461	**864**	53%	**No**
1B: Minor Street Both Approaches	17	**204**	8%	
2A: Major Street Both Approaches	444	**864**	51%	**No**
2B: Traffic Crossing Major Street	9	**90**	10%	

Notes: In the case of Justification 7 based on AHV both Warrant 1 and 2 must be met 100%, which requires both the A and B part of each warrant being equal to 100%.
When calculating the percentage, any value greater than 100% is expressed as 100%.

Based on OTM Book 12's Signal Warrant Justification 7 and the estimated AHV for the subject study intersection a signal is:

Not Warranted

TYLin

Traffic Signal Warrant - Input Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2043	**Analyst:**	GC

Study Intersection Summary

Major Street:	Broadwood	**Direction:**	East/West
Minor Street:	Golding	**Direction:**	North/South

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	1
Number of Legs:	Three ("T" Intersection)	**Intersection Type:**	Existing

Notes: "Free Flow" is used when the operating speed is greater than or equal to 70km/h, "Restricted Flow" otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered "New" if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Broadwood						Minor: Golding						Pedestrians Crossing Major
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
AM	3	1	0	0	2	16	0	0	0	33	0	0	0
PM	0	0	0	0	4	41	0	0	0	2	0	34	0
AHV[1]	**1**	**0**	**0**	**0**	**2**	**14**	**0**	**0**	**0**	**9**	**0**	**9**	**0**

1. The AHV is determined by the availability of the peak hour estimates. If both the AM and PM Peak Hour Volume estimate is available then AHV = (AM_{PHV} + PM_{PHV}) / 4. In the case that only one estimate is available then AHV = AM_{PHV} / 2 **or** AHV = PM_{PHV} / 2.

Determination of Justification Volumes (Based on AHV)

Justification 1A: All Approach Lanes	35	Justification 2A: Major Street Both Approaches	17
Justification 1B: Minor Street Both Approaches	18	Justification 2B: Traffic Crossing Major Street	9

Note: The crossing volume is defined as the sum of:

(1) Left turns from both minor street approaches:			9
(2) The heaviest through volume from the minor street:			0
(3) 50% of the heavier left turn movement from major street when both of the following criteria are met:			0
(a) The left turn volume > 120 vph	1	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	3	FALSE	
(4) Pedestrians crossing the major street:			0
		Total	**9**

Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2043	**Analyst:**	GC

Study Intersection Summary

Major Street:	Broadwood	**Direction:**	East/West
Minor Street:	Golding	**Direction:**	North/South

Summary of Base Justification Thresholds

Justification	1 Approach Lane		2 or More Approach Lanes	
	Free Flow	Restricted Flow	Free Flow	Restricted Flow
1A: All Approach Lanes	480	**720**	600	900
1B: Minor Street Both Approaches	120	**170**	120	170
2A: Major Street Both Approaches	480	**720**	600	900
2B: Traffic Crossing Major Street	50	**75**	50	75

The above values are taken from Table 12 and Table 13 from OTM Book 12 (March 2012).
The grey shaded values are provided for reference only, and are not applicable to the study intersection.

Adjusted Justification Thresholds for Study Intersection Conditions

Justification	Base Threshold	Existing Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	120%	-	**864**
1B: Minor Street Both Approaches	170	120%	150%	**306**
2A: Major Street Both Approaches	720	120%	-	**864**
2B: Traffic Crossing Major Street	75	120%	-	**90**

The above adjustments are taken from OTM Book 12 (March 2012) the "T" Intersection adjustment only applies to Justification 1B, and is a 50% increase on the threshold when the study intersection is a "T' intersection. Otherwise a value of 100% is used.

Warrant Calculation

Justification	Study Intersection Justification Volume	Justification Threshold	Percentage Warrant	Warrant Met?
1A: All Approach Lanes	35	**864**	4%	**No**
1B: Minor Street Both Approaches	18	**306**	6%	
2A: Major Street Both Approaches	17	**864**	2%	**No**
2B: Traffic Crossing Major Street	9	**90**	10%	

Notes: In the case of Justification 7 based on AHV both Warrant 1 and 2 must be met 100%, which requires both the A and B part of each warrant being equal to 100%.
When calculating the percentage, any value greater than 100% is expressed as 100%.

Based on OTM Book 12's Signal Warrant Justification 7 and the estimated AHV for the subject study intersection a signal is:

Not Warranted

Traffic Signal Warrant - Input Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2043	**Analyst:**	GC

Study Intersection Summary

Major Street:	Broadwood	**Direction:**	East/West
Minor Street:	Edith	**Direction:**	North/South

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	1
Number of Legs:	Three ("T" Intersection)	**Intersection Type:**	Existing

Notes: "Free Flow" is used when the operating speed is greater than or equal to 70km/h, "Restricted Flow" otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered "New" if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Broadwood						Minor: Edith						Pedestrians Crossing Major
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
AM	6	32	0	0	22	39	0	0	0	24	0	2	0
PM	8	47	0	0	41	25	0	0	0	71	0	5	0
AHV[1]	**4**	**20**	**0**	**0**	**16**	**16**	**0**	**0**	**0**	**24**	**0**	**2**	**0**

1. The AHV is determined by the availability of the peak hour estimates. If both the AM and PM Peak Hour Volume estimate is available then AHV = (AM_{PHV} + PM_{PHV}) / 4. In the case that only one estimate is available then AHV = AM_{PHV} / 2 **or** AHV = PM_{PHV} / 2.

Determination of Justification Volumes (Based on AHV)

Justification 1A: All Approach Lanes	82	Justification 2A: Major Street Both Approaches	56
Justification 1B: Minor Street Both Approaches	26	Justification 2B: Traffic Crossing Major Street	24

Note: The crossing volume is defined as the sum of:			
(1) Left turns from both minor street approaches:			24
(2) The heaviest through volume from the minor street:			0
(3) 50% of the heavier left turn movement from major street when both of the following criteria are met:			0
(a) The left turn volume > 120 vph	4	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	20	FALSE	
(4) Pedestrians crossing the major street:			0
		Total	**24**

TYLin

Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2043	**Analyst:**	GC

Study Intersection Summary

Major Street:	Broadwood	**Direction:**	East/West
Minor Street:	Edith	**Direction:**	North/South

Summary of Base Justification Thresholds

Justification	1 Approach Lane		2 or More Approach Lanes	
	Free Flow	Restricted Flow	Free Flow	Restricted Flow
1A: All Approach Lanes	480	**720**	600	900
1B: Minor Street Both Approaches	120	**170**	120	170
2A: Major Street Both Approaches	480	**720**	600	900
2B: Traffic Crossing Major Street	50	**75**	50	75

The above values are taken from Table 12 and Table 13 from OTM Book 12 (March 2012).
The grey shaded values are provided for reference only, and are not applicable to the study intersection.

Adjusted Justification Thresholds for Study Intersection Conditions

Justification	Base Threshold	Existing Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	120%	-	**864**
1B: Minor Street Both Approaches	170	120%	150%	**306**
2A: Major Street Both Approaches	720	120%	-	**864**
2B: Traffic Crossing Major Street	75	120%	-	**90**

The above adjustments are taken from OTM Book 12 (March 2012) the "T" Intersection adjustment only applies to Justification 1B, and is a 50% increase on the threshold when the study intersection is a "T' intersection. Otherwise a value of 100% is used.

Warrant Calculation

Justification	Study Intersection Justification Volume	Justification Threshold	Percentage Warrant	Warrant Met?
1A: All Approach Lanes	82	**864**	9%	**No**
1B: Minor Street Both Approaches	26	**306**	8%	
2A: Major Street Both Approaches	56	**864**	6%	**No**
2B: Traffic Crossing Major Street	24	**90**	27%	

Notes: In the case of Justification 7 based on AHV both Warrant 1 and 2 must be met 100%, which requires both the A and B part of each warrant being equal to 100%.
When calculating the percentage, any value greater than 100% is expressed as 100%.

Based on OTM Book 12's Signal Warrant Justification 7 and the estimated AHV for the subject study intersection a signal is:

Not Warranted

TYLin

Traffic Signal Warrant - Input Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2043	**Analyst:**	GC

Study Intersection Summary

Major Street:	Lakeshore	**Direction:**	North/South
Minor Street:	Broadwood	**Direction:**	East/West

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	1
Number of Legs:	Four	**Intersection Type:**	Existing

Notes: "Free Flow" is used when the operating speed is greater than or equal to 70km/h, "Restricted Flow" otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered "New" if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Lakeshore						Minor: Broadwood						Pedestrians Crossing Major
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
AM	68	406	4	0	252	9	13	4	46	7	2	3	9
PM	50	387	2	2	446	18	20	4	98	2	0	7	6
AHV[1]	**30**	**198**	**2**	**1**	**175**	**7**	**8**	**2**	**36**	**2**	**1**	**3**	**4**

1. The AHV is determined by the availability of the peak hour estimates. If both the AM and PM Peak Hour Volume estimate is available then AHV = $(AM_{PHV} + PM_{PHV}) / 4$. In the case that only one estimate is available then AHV = $AM_{PHV} / 2$ **or** AHV = $PM_{PHV} / 2$.

Determination of Justification Volumes (Based on AHV)

Justification 1A: All Approach Lanes	465	Justification 2A: Major Street Both Approaches	413
Justification 1B: Minor Street Both Approaches	52	Justification 2B: Traffic Crossing Major Street	16

Note: The crossing volume is defined as the sum of:

(1) Left turns from both minor street approaches:			10
(2) The heaviest through volume from the minor street:			2
(3) 50% of the heavier left turn movement from major street when both of the following criteria are met:			0
(a) The left turn volume > 120 vph	30	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	205	FALSE	
(4) Pedestrians crossing the major street:			4
		Total	**16**

TYLin

Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2043	**Analyst:**	GC

Study Intersection Summary

Major Street:	Lakeshore	**Direction:**	North/South
Minor Street:	Broadwood	**Direction:**	East/West

Summary of Base Justification Thresholds

Justification	1 Approach Lane		2 or More Approach Lanes	
	Free Flow	Restricted Flow	Free Flow	Restricted Flow
1A: All Approach Lanes	480	**720**	600	900
1B: Minor Street Both Approaches	120	**170**	120	170
2A: Major Street Both Approaches	480	**720**	600	900
2B: Traffic Crossing Major Street	50	**75**	50	75

The above values are taken from Table 12 and Table 13 from OTM Book 12 (March 2012).
The grey shaded values are provided for reference only, and are not applicable to the study intersection.

Adjusted Justification Thresholds for Study Intersection Conditions

Justification	Base Threshold	Existing Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	120%	-	**864**
1B: Minor Street Both Approaches	170	120%	100%	**204**
2A: Major Street Both Approaches	720	120%	-	**864**
2B: Traffic Crossing Major Street	75	120%	-	**90**

The above adjustments are taken from OTM Book 12 (March 2012) the "T" Intersection adjustment only applies to Justification 1B, and is a 50% increase on the threshold when the study intersection is a "T' intersection. Otherwise a value of 100% is used.

Warrant Calculation

Justification	Study Intersection Justification Volume	Justification Threshold	Percentage Warrant	Warrant Met?
1A: All Approach Lanes	465	**864**	54%	**No**
1B: Minor Street Both Approaches	52	**204**	25%	
2A: Major Street Both Approaches	413	**864**	48%	**No**
2B: Traffic Crossing Major Street	16	**90**	18%	

Notes: In the case of Justification 7 based on AHV both Warrant 1 and 2 must be met 100%, which requires both the A and B part of each warrant being equal to 100%.
When calculating the percentage, any value greater than 100% is expressed as 100%.

Based on OTM Book 12's Signal Warrant Justification 7 and the estimated AHV for the subject study intersection a signal is:

Not Warranted

TYLin

Traffic Signal Warrant - Input Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2043	**Analyst:**	GC

Study Intersection Summary

Major Street:	Lakeshore	**Direction:**	North/South
Minor Street:	Farah	**Direction:**	East/West

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	1
Number of Legs:	Four	**Intersection Type:**	Existing

Notes: "Free Flow" is used when the operating speed is greater than or equal to 70km/h, "Restricted Flow" otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered "New" if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Lakeshore						Minor: Farah						Pedestrians Crossing Major
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
AM	6	313	83	34	179	6	8	12	15	41	15	15	10
PM	9	347	47	28	357	9	3	23	23	62	32	18	4
AHV[1]	**4**	**165**	**33**	**16**	**134**	**4**	**3**	**9**	**10**	**26**	**12**	**8**	**4**

1. The AHV is determined by the availability of the peak hour estimates. If both the AM and PM Peak Hour Volume estimate is available then AHV = $(AM_{PHV} + PM_{PHV}) / 4$. In the case that only one estimate is available then AHV = $AM_{PHV} / 2$ **or** AHV = $PM_{PHV} / 2$.

Determination of Justification Volumes (Based on AHV)

Justification 1A: All Approach Lanes	424	Justification 2A: Major Street Both Approaches	356
Justification 1B: Minor Street Both Approaches	68	Justification 2B: Traffic Crossing Major Street	45

Note: The crossing volume is defined as the sum of:			
(1) Left turns from both minor street approaches:			29
(2) The heaviest through volume from the minor street:			12
(3) 50% of the heavier left turn movement from major street when both of the following criteria are met:			0
(a) The left turn volume > 120 vph	16	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	181	FALSE	
(4) Pedestrians crossing the major street:			4
		Total	**45**

TYLin

Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2043	**Analyst:**	GC

Study Intersection Summary

Major Street:	Lakeshore	**Direction:**	North/South
Minor Street:	Farah	**Direction:**	East/West

Summary of Base Justification Thresholds

Justification	1 Approach Lane		2 or More Approach Lanes	
	Free Flow	Restricted Flow	Free Flow	Restricted Flow
1A: All Approach Lanes	480	**720**	600	900
1B: Minor Street Both Approaches	120	**170**	120	170
2A: Major Street Both Approaches	480	**720**	600	900
2B: Traffic Crossing Major Street	50	**75**	50	75

The above values are taken from Table 12 and Table 13 from OTM Book 12 (March 2012).
The grey shaded values are provided for reference only, and are not applicable to the study intersection.

Adjusted Justification Thresholds for Study Intersection Conditions

Justification	Base Threshold	Existing Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	120%	-	**864**
1B: Minor Street Both Approaches	170	120%	100%	**204**
2A: Major Street Both Approaches	720	120%	-	**864**
2B: Traffic Crossing Major Street	75	120%	-	**90**

The above adjustments are taken from OTM Book 12 (March 2012) the "T" Intersection adjustment only applies to Justification 1B, and is a 50% increase on the threshold when the study intersection is a "T' intersection. Otherwise a value of 100% is used.

Warrant Calculation

Justification	Study Intersection Justification Volume	Justification Threshold	Percentage Warrant	Warrant Met?
1A: All Approach Lanes	424	**864**	49%	**No**
1B: Minor Street Both Approaches	68	**204**	33%	
2A: Major Street Both Approaches	356	**864**	41%	**No**
2B: Traffic Crossing Major Street	45	**90**	50%	

Notes: In the case of Justification 7 based on AHV both Warrant 1 and 2 must be met 100%, which requires both the A and B part of each warrant being equal to 100%.
When calculating the percentage, any value greater than 100% is expressed as 100%.

Based on OTM Book 12's Signal Warrant Justification 7 and the estimated AHV for the subject study intersection a signal is:

Not Warranted

TYLin

Traffic Signal Warrant - Input Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2043	**Analyst:**	GC

Study Intersection Summary

Major Street:	Armstrong	**Direction:**	North/South
Minor Street:	Church	**Direction:**	East/West

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	1
Number of Legs:	Three ("T" Intersection)	**Intersection Type:**	Existing

Notes: "Free Flow" is used when the operating speed is greater than or equal to 70km/h, "Restricted Flow" otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered "New" if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Armstrong						Minor: Church						Pedestrians Crossing Major
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
AM	5	431	0	0	507	90	0	0	0	0	0	0	5
PM	5	772	0	0	610	50	0	0	0	0	0	0	2
AHV[1]	**3**	**301**	**0**	**0**	**279**	**35**	**0**	**0**	**0**	**0**	**0**	**0**	**2**

1. The AHV is determined by the availability of the peak hour estimates. If both the AM and PM Peak Hour Volume estimate is available then AHV = $(AM_{PHV} + PM_{PHV}) / 4$. In the case that only one estimate is available then AHV = $AM_{PHV} / 2$ **or** AHV = $PM_{PHV} / 2$.

Determination of Justification Volumes (Based on AHV)

Justification 1A: All Approach Lanes	618
Justification 1B: Minor Street Both Approaches	0

Justification 2A: Major Street Both Approaches	618
Justification 2B: Traffic Crossing Major Street	2

Note: The crossing volume is defined as the sum of:

(1) Left turns from both minor street approaches:			0
(2) The heaviest through volume from the minor street:			0
(3) 50% of the heavier left turn movement from major street when both of the following criteria are met:			0
(a) The left turn volume > 120 vph	3	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	282	FALSE	
(4) Pedestrians crossing the major street:			2
		Total	**2**

TYLin

Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2043	**Analyst:**	GC

Study Intersection Summary

Major Street:	Armstrong	**Direction:**	North/South
Minor Street:	Church	**Direction:**	East/West

Summary of Base Justification Thresholds

Justification	1 Approach Lane		2 or More Approach Lanes	
	Free Flow	Restricted Flow	Free Flow	Restricted Flow
1A: All Approach Lanes	480	**720**	600	900
1B: Minor Street Both Approaches	120	**170**	120	170
2A: Major Street Both Approaches	480	**720**	600	900
2B: Traffic Crossing Major Street	50	**75**	50	75

The above values are taken from Table 12 and Table 13 from OTM Book 12 (March 2012).
The grey shaded values are provided for reference only, and are not applicable to the study intersection.

Adjusted Justification Thresholds for Study Intersection Conditions

Justification	Base Threshold	Existing Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	120%	-	**864**
1B: Minor Street Both Approaches	170	120%	150%	**306**
2A: Major Street Both Approaches	720	120%	-	**864**
2B: Traffic Crossing Major Street	75	120%	-	**90**

The above adjustments are taken from OTM Book 12 (March 2012) the "T" Intersection adjustment only applies to Justification 1B, and is a 50% increase on the threshold when the study intersection is a "T' intersection. Otherwise a value of 100% is used.

Warrant Calculation

Justification	Study Intersection Justification Volume	Justification Threshold	Percentage Warrant	Warrant Met?
1A: All Approach Lanes	618	**864**	72%	**No**
1B: Minor Street Both Approaches	0	**306**	0%	
2A: Major Street Both Approaches	618	**864**	72%	**No**
2B: Traffic Crossing Major Street	2	**90**	2%	

Notes: In the case of Justification 7 based on AHV both Warrant 1 and 2 must be met 100%, which requires both the A and B part of each warrant being equal to 100%.
When calculating the percentage, any value greater than 100% is expressed as 100%.

Based on OTM Book 12's Signal Warrant Justification 7 and the estimated AHV for the subject study intersection a signal is:

Not Warranted

TYLin

Traffic Signal Warrant - Input Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2043	**Analyst:**	GC

Study Intersection Summary

Major Street:	Armstrong	**Direction:**	North/South
Minor Street:	Sherpe	**Direction:**	East/West

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	1
Number of Legs:	Four	**Intersection Type:**	Existing

Notes: "Free Flow" is used when the operating speed is greater than or equal to 70km/h, "Restricted Flow" otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered "New" if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Armstrong						Minor: Sherpe						Pedestrians Crossing Major
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
AM	0	443	4	65	611	0	14	2	5	1	0	40	5
PM	0	732	14	37	642	0	36	0	10	0	0	93	2
AHV[1]	**0**	**294**	**5**	**26**	**313**	**0**	**13**	**1**	**4**	**0**	**0**	**33**	**2**

1. The AHV is determined by the availability of the peak hour estimates. If both the AM and PM Peak Hour Volume estimate is available then AHV = $(AM_{PHV} + PM_{PHV}) / 4$. In the case that only one estimate is available then AHV = $AM_{PHV} / 2$ **or** AHV = $PM_{PHV} / 2$.

Determination of Justification Volumes (Based on AHV)

Justification 1A: All Approach Lanes	689	Justification 2A: Major Street Both Approaches	638
Justification 1B: Minor Street Both Approaches	51	Justification 2B: Traffic Crossing Major Street	16

Note: The crossing volume is defined as the sum of:

(1) Left turns from both minor street approaches:			13
(2) The heaviest through volume from the minor street:			1
(3) 50% of the heavier left turn movement from major street when both of the following criteria are met:			0
(a) The left turn volume > 120 vph	26	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	320	FALSE	
(4) Pedestrians crossing the major street:			2
		Total	**16**

TYLin

Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2043	**Analyst:**	GC

Study Intersection Summary

Major Street:	Armstrong	**Direction:**	North/South
Minor Street:	Sherpe	**Direction:**	East/West

Summary of Base Justification Thresholds

Justification	1 Approach Lane		2 or More Approach Lanes	
	Free Flow	Restricted Flow	Free Flow	Restricted Flow
1A: All Approach Lanes	480	**720**	600	900
1B: Minor Street Both Approaches	120	**170**	120	170
2A: Major Street Both Approaches	480	**720**	600	900
2B: Traffic Crossing Major Street	50	**75**	50	75

The above values are taken from Table 12 and Table 13 from OTM Book 12 (March 2012).
The grey shaded values are provided for reference only, and are not applicable to the study intersection.

Adjusted Justification Thresholds for Study Intersection Conditions

Justification	Base Threshold	Existing Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	120%	-	**864**
1B: Minor Street Both Approaches	170	120%	100%	**204**
2A: Major Street Both Approaches	720	120%	-	**864**
2B: Traffic Crossing Major Street	75	120%	-	**90**

The above adjustments are taken from OTM Book 12 (March 2012) the "T" Intersection adjustment only applies to Justification 1B, and is a 50% increase on the threshold when the study intersection is a "T' intersection. Otherwise a value of 100% is used.

Warrant Calculation

Justification	Study Intersection Justification Volume	Justification Threshold	Percentage Warrant	Warrant Met?
1A: All Approach Lanes	689	**864**	80%	**No**
1B: Minor Street Both Approaches	51	**204**	25%	
2A: Major Street Both Approaches	638	**864**	74%	**No**
2B: Traffic Crossing Major Street	16	**90**	18%	

Notes: In the case of Justification 7 based on AHV both Warrant 1 and 2 must be met 100%, which requires both the A and B part of each warrant being equal to 100%.
When calculating the percentage, any value greater than 100% is expressed as 100%.

Based on OTM Book 12's Signal Warrant Justification 7 and the estimated AHV for the subject study intersection a signal is:

Not Warranted

Traffic Signal Warrant - Input Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2043	**Analyst:**	GC

Study Intersection Summary

Major Street:	Main	**Direction:**	East/West
Minor Street:	Rorke	**Direction:**	North/South

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	1
Number of Legs:	Four	**Intersection Type:**	Existing

Notes: "Free Flow" is used when the operating speed is greater than or equal to 70km/h, "Restricted Flow" otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered "New" if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Main						Minor: Rorke						Pedestrians Crossing Major
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
AM	10	53	51	110	67	9	82	19	258	5	21	14	1
PM	14	113	99	277	81	9	70	24	171	5	24	11	5
AHV[1]	**6**	**42**	**38**	**97**	**37**	**5**	**38**	**11**	**107**	**3**	**11**	**6**	**2**

1. The AHV is determined by the availability of the peak hour estimates. If both the AM and PM Peak Hour Volume estimate is available then AHV = $(AM_{PHV} + PM_{PHV}) / 4$. In the case that only one estimate is available then AHV = $AM_{PHV} / 2$ **or** AHV = $PM_{PHV} / 2$.

Determination of Justification Volumes (Based on AHV)

Justification 1A: All Approach Lanes	401	Justification 2A: Major Street Both Approaches	225
Justification 1B: Minor Street Both Approaches	176	Justification 2B: Traffic Crossing Major Street	54

Note: The crossing volume is defined as the sum of:			
(1) Left turns from both minor street approaches:			41
(2) The heaviest through volume from the minor street:			11
(3) 50% of the heavier left turn movement from major street when both of the following criteria are met:			0
(a) The left turn volume > 120 vph	97	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	139	FALSE	
(4) Pedestrians crossing the major street:			2
		Total	**54**

TYLin

Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2043	**Analyst:**	GC

Study Intersection Summary

Major Street:	Main	**Direction:**	East/West
Minor Street:	Rorke	**Direction:**	North/South

Summary of Base Justification Thresholds

Justification	1 Approach Lane		2 or More Approach Lanes	
	Free Flow	Restricted Flow	Free Flow	Restricted Flow
1A: All Approach Lanes	480	**720**	600	900
1B: Minor Street Both Approaches	120	**170**	120	170
2A: Major Street Both Approaches	480	**720**	600	900
2B: Traffic Crossing Major Street	50	**75**	50	75

The above values are taken from Table 12 and Table 13 from OTM Book 12 (March 2012).
The grey shaded values are provided for reference only, and are not applicable to the study intersection.

Adjusted Justification Thresholds for Study Intersection Conditions

Justification	Base Threshold	Existing Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	120%	-	**864**
1B: Minor Street Both Approaches	170	120%	100%	**204**
2A: Major Street Both Approaches	720	120%	-	**864**
2B: Traffic Crossing Major Street	75	120%	-	**90**

The above adjustments are taken from OTM Book 12 (March 2012) the "T" Intersection adjustment only applies to Justification 1B, and is a 50% increase on the threshold when the study intersection is a "T' intersection. Otherwise a value of 100% is used.

Warrant Calculation

Justification	Study Intersection Justification Volume	Justification Threshold	Percentage Warrant	Warrant Met?
1A: All Approach Lanes	401	**864**	46%	**No**
1B: Minor Street Both Approaches	176	**204**	86%	
2A: Major Street Both Approaches	225	**864**	26%	**No**
2B: Traffic Crossing Major Street	54	**90**	60%	

Notes: In the case of Justification 7 based on AHV both Warrant 1 and 2 must be met 100%, which requires both the A and B part of each warrant being equal to 100%.
When calculating the percentage, any value greater than 100% is expressed as 100%.

Based on OTM Book 12's Signal Warrant Justification 7 and the estimated AHV for the subject study intersection a signal is:

Not Warranted

TYLin

Traffic Signal Warrant - Input Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2043	**Analyst:**	GC

Study Intersection Summary

Major Street:	Main	**Direction:**	East/West
Minor Street:	Gorgina	**Direction:**	North/South

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	1
Number of Legs:	Four	**Intersection Type:**	Existing

Notes: "Free Flow" is used when the operating speed is greater than or equal to 70km/h, "Restricted Flow" otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered "New" if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Main						Minor: Gorgina						Pedestrians Crossing Major
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
AM	4	320	7	8	170	3	12	7	43	1	0	4	3
PM	4	258	7	32	376	7	12	3	30	4	4	5	11
AHV[1]	**2**	**145**	**4**	**10**	**137**	**3**	**6**	**3**	**18**	**1**	**1**	**2**	**4**

1. The AHV is determined by the availability of the peak hour estimates. If both the AM and PM Peak Hour Volume estimate is available then AHV = $(AM_{PHV} + PM_{PHV}) / 4$. In the case that only one estimate is available then AHV = $AM_{PHV} / 2$ **or** AHV = $PM_{PHV} / 2$.

Determination of Justification Volumes (Based on AHV)

Justification 1A: All Approach Lanes	332
Justification 1B: Minor Street Both Approaches	31

Justification 2A: Major Street Both Approaches	301
Justification 2B: Traffic Crossing Major Street	14

Note: The crossing volume is defined as the sum of:

(1) Left turns from both minor street approaches:			7
(2) The heaviest through volume from the minor street:			3
(3) 50% of the heavier left turn movement from major street when both of the following criteria are met:			0
(a) The left turn volume > 120 vph	10	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	155	FALSE	
(4) Pedestrians crossing the major street:			4
		Total	**14**

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Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2043	**Analyst:**	GC

Study Intersection Summary

Major Street:	Main	**Direction:**	East/West
Minor Street:	Gorgina	**Direction:**	North/South

Summary of Base Justification Thresholds

Justification	1 Approach Lane		2 or More Approach Lanes	
	Free Flow	Restricted Flow	Free Flow	Restricted Flow
1A: All Approach Lanes	480	**720**	600	900
1B: Minor Street Both Approaches	120	**170**	120	170
2A: Major Street Both Approaches	480	**720**	600	900
2B: Traffic Crossing Major Street	50	**75**	50	75

The above values are taken from Table 12 and Table 13 from OTM Book 12 (March 2012).
The grey shaded values are provided for reference only, and are not applicable to the study intersection.

Adjusted Justification Thresholds for Study Intersection Conditions

Justification	Base Threshold	Existing Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	120%	-	**864**
1B: Minor Street Both Approaches	170	120%	100%	**204**
2A: Major Street Both Approaches	720	120%	-	**864**
2B: Traffic Crossing Major Street	75	120%	-	**90**

The above adjustments are taken from OTM Book 12 (March 2012) the "T" Intersection adjustment only applies to Justification 1B, and is a 50% increase on the threshold when the study intersection is a "T' intersection. Otherwise a value of 100% is used.

Warrant Calculation

Justification	Study Intersection Justification Volume	Justification Threshold	Percentage Warrant	Warrant Met?
1A: All Approach Lanes	332	**864**	38%	**No**
1B: Minor Street Both Approaches	31	**204**	15%	
2A: Major Street Both Approaches	301	**864**	35%	**No**
2B: Traffic Crossing Major Street	14	**90**	16%	

Notes: In the case of Justification 7 based on AHV both Warrant 1 and 2 must be met 100%, which requires both the A and B part of each warrant being equal to 100%.
When calculating the percentage, any value greater than 100% is expressed as 100%.

Based on OTM Book 12's Signal Warrant Justification 7 and the estimated AHV for the subject study intersection a signal is:

Not Warranted

TYLin

Traffic Signal Warrant - Input Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2043	**Analyst:**	GC

Study Intersection Summary

Major Street:	Main	**Direction:**	East/West
Minor Street:	Ferguson	**Direction:**	North/South

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	1
Number of Legs:	Four	**Intersection Type:**	Existing

Notes: "Free Flow" is used when the operating speed is greater than or equal to 70km/h, "Restricted Flow" otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered "New" if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Main						Minor: Ferguson						Pedestrians Crossing Major
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
AM	327	19	6	1	13	58	6	11	0	29	21	143	7
PM	280	27	12	0	18	70	7	13	0	20	40	362	21
AHV[1]	**152**	**12**	**5**	**0**	**8**	**32**	**3**	**6**	**0**	**12**	**15**	**126**	**7**

1. The AHV is determined by the availability of the peak hour estimates. If both the AM and PM Peak Hour Volume estimate is available then AHV = $(AM_{PHV} + PM_{PHV}) / 4$. In the case that only one estimate is available then AHV = $AM_{PHV} / 2$ **or** AHV = $PM_{PHV} / 2$.

Determination of Justification Volumes (Based on AHV)

Justification 1A: All Approach Lanes	371	Justification 2A: Major Street Both Approaches	209
Justification 1B: Minor Street Both Approaches	162	Justification 2B: Traffic Crossing Major Street	37

Note: The crossing volume is defined as the sum of:

(1) Left turns from both minor street approaches:			15
(2) The heaviest through volume from the minor street:			15
(3) 50% of the heavier left turn movement from major street when both of the following criteria are met:			0
(a) The left turn volume > 120 vph	152	TRUE	
(b) The left turn volume plus the opposing volume > 720 vph	160	FALSE	
(4) Pedestrians crossing the major street:			7
		Total	**37**

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Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2043	**Analyst:**	GC

Study Intersection Summary

Major Street:	Main	**Direction:**	East/West
Minor Street:	Ferguson	**Direction:**	North/South

Summary of Base Justification Thresholds

Justification	1 Approach Lane		2 or More Approach Lanes	
	Free Flow	Restricted Flow	Free Flow	Restricted Flow
1A: All Approach Lanes	480	**720**	600	900
1B: Minor Street Both Approaches	120	**170**	120	170
2A: Major Street Both Approaches	480	**720**	600	900
2B: Traffic Crossing Major Street	50	**75**	50	75

The above values are taken from Table 12 and Table 13 from OTM Book 12 (March 2012).
The grey shaded values are provided for reference only, and are not applicable to the study intersection.

Adjusted Justification Thresholds for Study Intersection Conditions

Justification	Base Threshold	Existing Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	120%	-	**864**
1B: Minor Street Both Approaches	170	120%	100%	**204**
2A: Major Street Both Approaches	720	120%	-	**864**
2B: Traffic Crossing Major Street	75	120%	-	**90**

The above adjustments are taken from OTM Book 12 (March 2012) the "T" Intersection adjustment only applies to Justification 1B, and is a 50% increase on the threshold when the study intersection is a "T' intersection. Otherwise a value of 100% is used.

Warrant Calculation

Justification	Study Intersection Justification Volume	Justification Threshold	Percentage Warrant	Warrant Met?
1A: All Approach Lanes	371	**864**	43%	**No**
1B: Minor Street Both Approaches	162	**204**	79%	
2A: Major Street Both Approaches	209	**864**	24%	**No**
2B: Traffic Crossing Major Street	37	**90**	41%	

Notes: In the case of Justification 7 based on AHV both Warrant 1 and 2 must be met 100%, which requires both the A and B part of each warrant being equal to 100%.
When calculating the percentage, any value greater than 100% is expressed as 100%.

Based on OTM Book 12's Signal Warrant Justification 7 and the estimated AHV for the subject study intersection a signal is:

Not Warranted

Traffic Signal Warrant - Input Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2043	**Analyst:**	GC

Study Intersection Summary

Major Street:	Ferguson	**Direction:**	North/South
Minor Street:	Broadway	**Direction:**	East/West

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	1
Number of Legs:	Four	**Intersection Type:**	Existing

Notes: "Free Flow" is used when the operating speed is greater than or equal to 70km/h, "Restricted Flow" otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered "New" if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Ferguson						Minor: Broadway						Pedestrians Crossing Major
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
AM	1	402	0	20	200	10	6	0	1	5	2	23	0
PM	1	333	26	27	414	27	5	4	0	19	3	32	2
AHV[1]	**1**	**184**	**7**	**12**	**154**	**9**	**3**	**1**	**0**	**6**	**1**	**14**	**1**

1. The AHV is determined by the availability of the peak hour estimates. If both the AM and PM Peak Hour Volume estimate is available then AHV = $(AM_{PHV} + PM_{PHV}) / 4$. In the case that only one estimate is available then AHV = $AM_{PHV} / 2$ **or** AHV = $PM_{PHV} / 2$.

Determination of Justification Volumes (Based on AHV)

Justification 1A: All Approach Lanes	392	Justification 2A: Major Street Both Approaches	367
Justification 1B: Minor Street Both Approaches	25	Justification 2B: Traffic Crossing Major Street	11

Note: The crossing volume is defined as the sum of:

(1) Left turns from both minor street approaches:			9
(2) The heaviest through volume from the minor street:			1
(3) 50% of the heavier left turn movement from major street when both of the following criteria are met:			0
(a) The left turn volume > 120 vph	12	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	196	FALSE	
(4) Pedestrians crossing the major street:			1
		Total	**11**

Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2043	**Analyst:**	GC

Study Intersection Summary

Major Street:	Ferguson	**Direction:**	North/South
Minor Street:	Broadway	**Direction:**	East/West

Summary of Base Justification Thresholds

Justification	1 Approach Lane		2 or More Approach Lanes	
	Free Flow	Restricted Flow	Free Flow	Restricted Flow
1A: All Approach Lanes	480	**720**	600	900
1B: Minor Street Both Approaches	120	**170**	120	170
2A: Major Street Both Approaches	480	**720**	600	900
2B: Traffic Crossing Major Street	50	**75**	50	75

The above values are taken from Table 12 and Table 13 from OTM Book 12 (March 2012).
The grey shaded values are provided for reference only, and are not applicable to the study intersection.

Adjusted Justification Thresholds for Study Intersection Conditions

Justification	Base Threshold	Existing Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	120%	-	**864**
1B: Minor Street Both Approaches	170	120%	100%	**204**
2A: Major Street Both Approaches	720	120%	-	**864**
2B: Traffic Crossing Major Street	75	120%	-	**90**

The above adjustments are taken from OTM Book 12 (March 2012) the "T" Intersection adjustment only applies to Justification 1B, and is a 50% increase on the threshold when the study intersection is a "T' intersection. Otherwise a value of 100% is used.

Warrant Calculation

Justification	Study Intersection Justification Volume	Justification Threshold	Percentage Warrant	Warrant Met?
1A: All Approach Lanes	392	**864**	45%	**No**
1B: Minor Street Both Approaches	25	**204**	12%	
2A: Major Street Both Approaches	367	**864**	42%	**No**
2B: Traffic Crossing Major Street	11	**90**	12%	

Notes: In the case of Justification 7 based on AHV both Warrant 1 and 2 must be met 100%, which requires both the A and B part of each warrant being equal to 100%.
When calculating the percentage, any value greater than 100% is expressed as 100%.

Based on OTM Book 12's Signal Warrant Justification 7 and the estimated AHV for the subject study intersection a signal is:

Not Warranted

Traffic Signal Warrant - Input Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2043	**Analyst:**	GC

Study Intersection Summary

Major Street:	Ferguson	**Direction:**	North/South
Minor Street:	Browning	**Direction:**	East/West

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	1
Number of Legs:	Four	**Intersection Type:**	Existing

Notes: "Free Flow" is used when the operating speed is greater than or equal to 70km/h, "Restricted Flow" otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered "New" if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Ferguson						Minor: Browning						Pedestrians Crossing Major
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
AM	0	421	1	3	256	5	9	2	0	5	0	1	2
PM	4	388	4	5	463	8	2	0	2	7	3	5	2
AHV[1]	**1**	**202**	**1**	**2**	**180**	**3**	**3**	**1**	**1**	**3**	**1**	**2**	**1**

1. The AHV is determined by the availability of the peak hour estimates. If both the AM and PM Peak Hour Volume estimate is available then AHV = (AM_{PHV} + PM_{PHV}) / 4. In the case that only one estimate is available then AHV = AM_{PHV} / 2 **or** AHV = PM_{PHV} / 2.

Determination of Justification Volumes (Based on AHV)

Justification 1A: All Approach Lanes	400	Justification 2A: Major Street Both Approaches	389
Justification 1B: Minor Street Both Approaches	11	Justification 2B: Traffic Crossing Major Street	8

Note: The crossing volume is defined as the sum of:

(1) Left turns from both minor street approaches:			6
(2) The heaviest through volume from the minor street:			1
(3) 50% of the heavier left turn movement from major street when both of the following criteria are met:			0
(a) The left turn volume > 120 vph	2	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	204	FALSE	
(4) Pedestrians crossing the major street:			1
		Total	**8**

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Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

Based Ontario Traffic Manual Book 12 - Traffic Signals (March 2012)

Project and Scenario Summary

Project:	Temiskaming Shores Downtown Cores Transportation Study			**Project No.:**	10777
				Date:	2023-08-22
Horizon:	Future Background	**Horizon Year:**	2043	**Analyst:**	GC

Study Intersection Summary

Major Street:	Ferguson	**Direction:**	North/South
Minor Street:	Browning	**Direction:**	East/West

Summary of Base Justification Thresholds

Justification	1 Approach Lane		2 or More Approach Lanes	
	Free Flow	Restricted Flow	Free Flow	Restricted Flow
1A: All Approach Lanes	480	**720**	600	900
1B: Minor Street Both Approaches	120	**170**	120	170
2A: Major Street Both Approaches	480	**720**	600	900
2B: Traffic Crossing Major Street	50	**75**	50	75

The above values are taken from Table 12 and Table 13 from OTM Book 12 (March 2012).
The grey shaded values are provided for reference only, and are not applicable to the study intersection.

Adjusted Justification Thresholds for Study Intersection Conditions

Justification	Base Threshold	Existing Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	120%	-	**864**
1B: Minor Street Both Approaches	170	120%	100%	**204**
2A: Major Street Both Approaches	720	120%	-	**864**
2B: Traffic Crossing Major Street	75	120%	-	**90**

The above adjustments are taken from OTM Book 12 (March 2012) the "T" Intersection adjustment only applies to Justification 1B, and is a 50% increase on the threshold when the study intersection is a "T' intersection. Otherwise a value of 100% is used.

Warrant Calculation

Justification	Study Intersection Justification Volume	Justification Threshold	Percentage Warrant	Warrant Met?
1A: All Approach Lanes	400	**864**	46%	**No**
1B: Minor Street Both Approaches	11	**204**	5%	
2A: Major Street Both Approaches	389	**864**	45%	**No**
2B: Traffic Crossing Major Street	8	**90**	9%	

Notes: In the case of Justification 7 based on AHV both Warrant 1 and 2 must be met 100%, which requires both the A and B part of each warrant being equal to 100%.
When calculating the percentage, any value greater than 100% is expressed as 100%.

Based on OTM Book 12's Signal Warrant Justification 7 and the estimated AHV for the subject study intersection a signal is:

Not Warranted