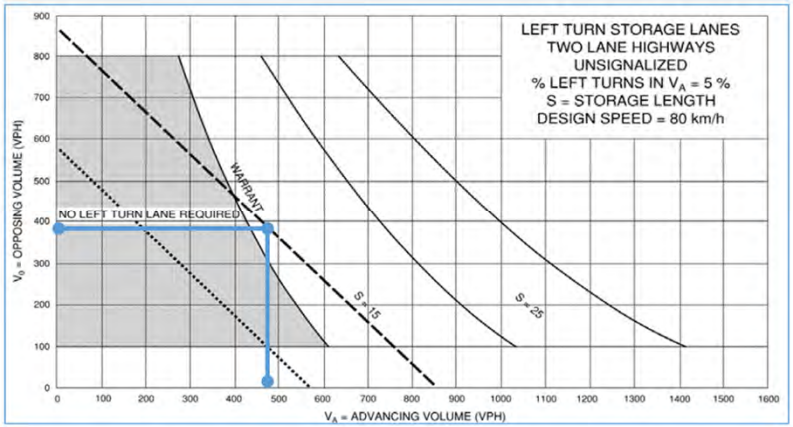
APPENDIX F

Warrants

2029 AM Peak- Intersection Street B and 10 Side Road

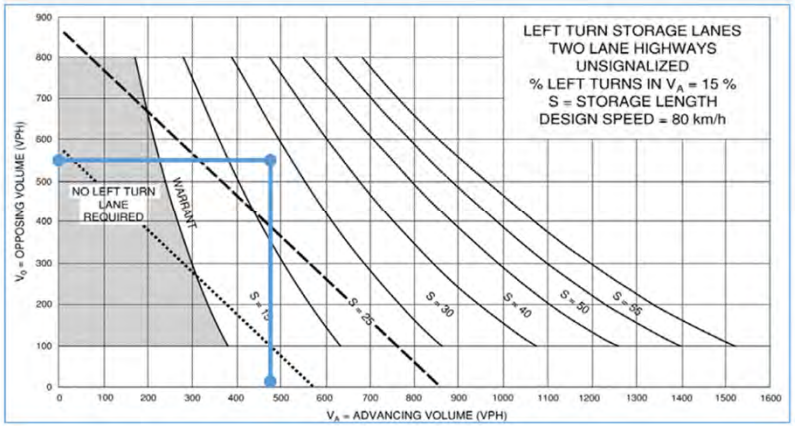
Future Total 2029 - Street B and 10 Side Road



AM	Peak Period
EB	Analysis Approach
5	%LT
80_5	Scenario
460	Advancing Volumes
374	Opposing Volumes

2029 PM Peak- Intersection Street B and 10 Side Road

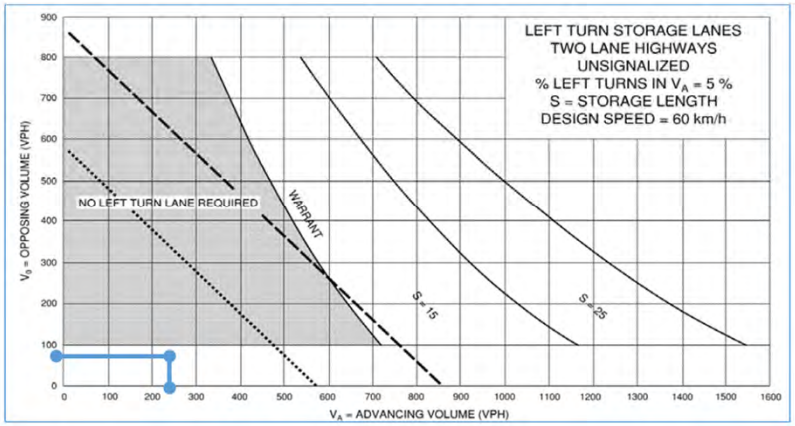
Future Total 2029 - Street B and 10 Side Road



PM	Peak Period
EB	Analysis Approach
15	%LT
80_15	Scenario
466	Advancing Volumes
543	Opposing Volumes

2029 AM Peak- Intersection Danby Road/Street A and 10th Line

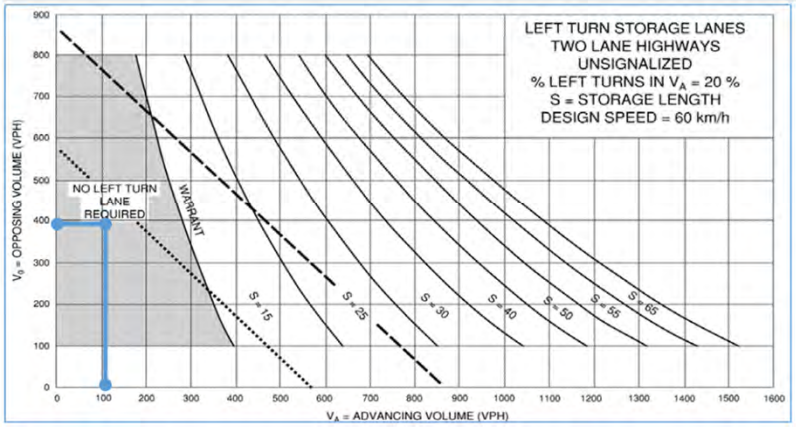
Future Total 2029 - Street A/Danby Road and 10th Line



AM	Peak Period
SB	Analysis Approach
5	%LT
60_5	Scenario
245	Advancing Volumes
77	Opposing Volumes

2029 PM Peak- Intersection Danby Road/Street A and 10th Line

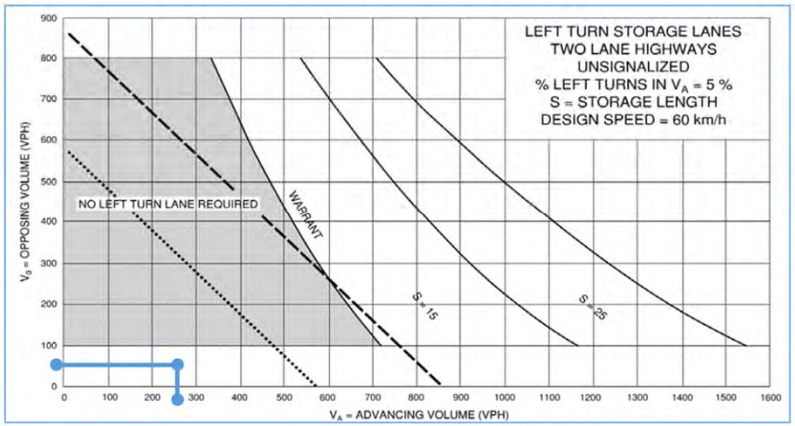
Future Total 2029 - Street A/Danby Road and 10th Line



PM	Peak Period
SB	Analysis Approach
20	%LT
60_20	Scenario
104	Advancing Volumes
390	Opposing Volumes

2031 AM Peak- Intersection Danby Road/Street A and 10th Line

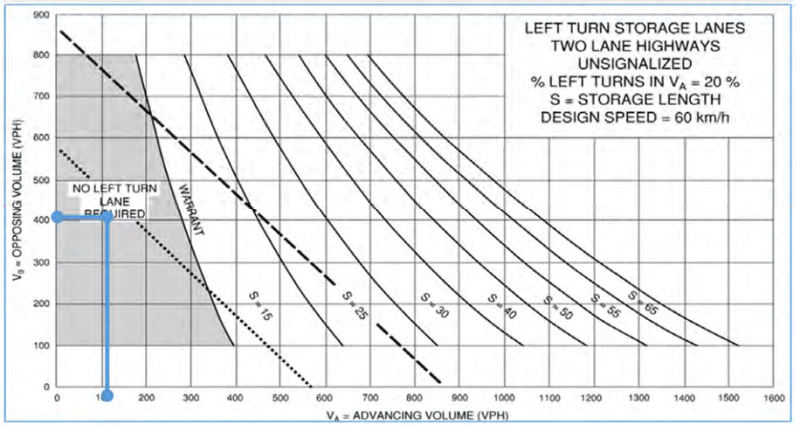
Future Total 2031- Street A/Danby Road and 10th Line



AM	Peak Period
SB	Analysis Approach
5	%LT
60_5	Scenario
262	Advancing Volumes
82	Opposing Volumes

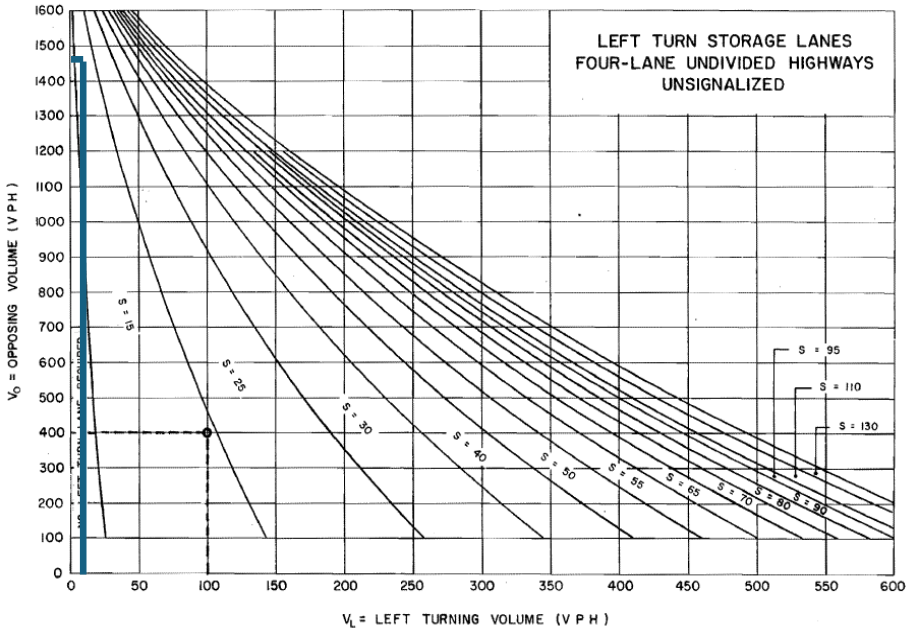
2031 PM Peak- Intersection Danby Road/Street A and 10th Line

Future Total 2031- Street A/Danby Road and 10th Line

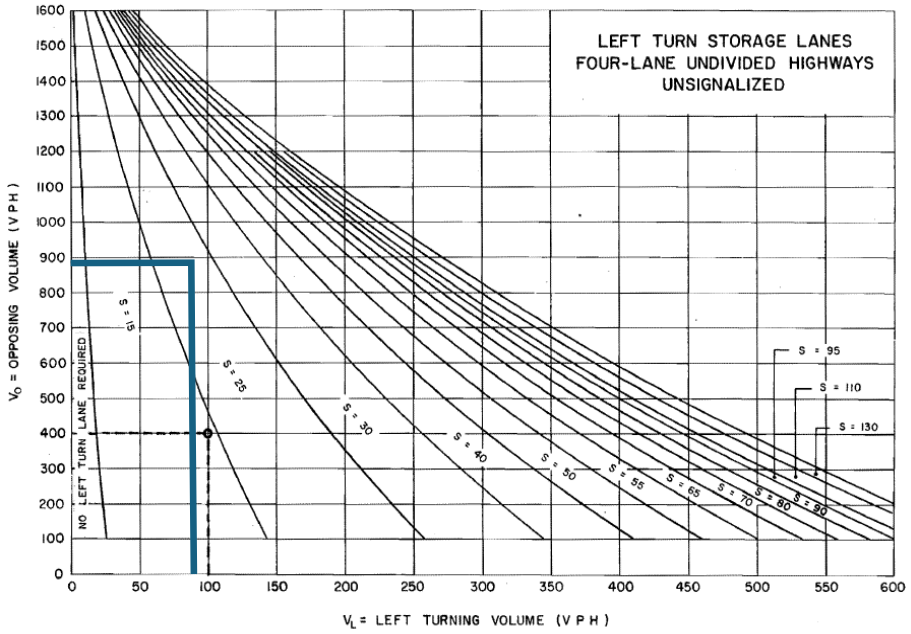


PM	Peak Period
SB	Analysis Approach
20	%LT
60_20	Scenario
108	Advancing Volumes
421	Opposing Volumes

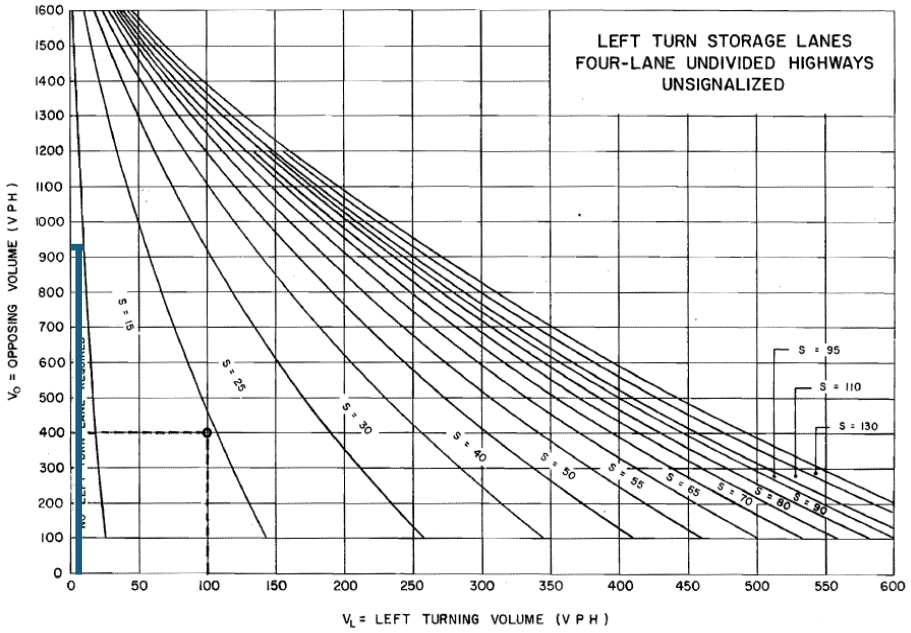
2031 AM Peak- Intersection Street B at 10 Side Road



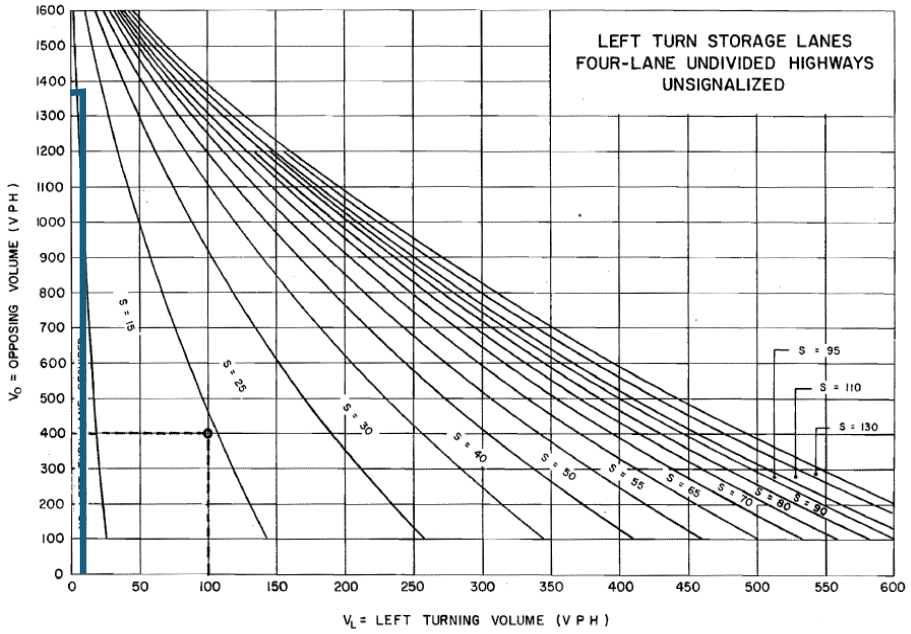
2031 PM Peak- Intersection Street B at 10 Side Road



2031 AM Peak- Intersection Street T at Norval Bypass



2031 PM Peak- Intersection Street T at Norval Bypass



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:	Norval By pass			**Project No.:**	100160
				Date:	2025-03-14
Horizon:	Future Total	**Horizon Year:**	2029	**Analyst:**	SP

Study Intersection Summary

Major Street:	10th Line	**Direction:**	North/South
Minor Street:	Street A/Danby Road	**Direction:**	East/West

Intersection Details for Warrant Parameters

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

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: 10th Line						Minor: Street A/Danby Road						Pedestrians Crossing Major
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
AM	38	31	6	6	236	3	2	16	183	24	39	14	0
PM	136	225	29	21	72	9	4	43	57	18	35	8	0
AHV[1]	**44**	**64**	**9**	**7**	**77**	**3**	**2**	**15**	**60**	**11**	**19**	**6**	**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	317	Justification 2A: Major Street Both Approaches	204
Justification 1B: Minor Street Both Approaches	113	Justification 2B: Traffic Crossing Major Street	32

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:			19
(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	44	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	121	FALSE	
(4) Pedestrians crossing the major street:			0
		Total	**32**

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:	Norval By pass			**Project No.:**	100160
				Date:	2025-03-14
Horizon:	Future Total	**Horizon Year:**	2029	**Analyst:**	SP

Study Intersection Summary

Major Street:	10th Line	**Direction:**	North/South
Minor Street:	Street A/Danby Road	**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	New Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	150%	-	**1080**
1B: Minor Street Both Approaches	170	150%	100%	**255**
2A: Major Street Both Approaches	720	150%	-	**1080**
2B: Traffic Crossing Major Street	75	150%	-	**113**

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	317	**1080**	29%	**No**
1B: Minor Street Both Approaches	113	**255**	44%	
2A: Major Street Both Approaches	204	**1080**	19%	**No**
2B: Traffic Crossing Major Street	32	**113**	28%	

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:	Norval By pass			**Project No.:**	100160
				Date:	2025-03-14
Horizon:	Future Total	**Horizon Year:**	2029	**Analyst:**	SP

Study Intersection Summary

Major Street:	Street B	**Direction:**	North/South
Minor Street:	Street A	**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:**	New

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: Street B						Minor: Street A						Pedestrians Crossing Major
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
AM	8	31	0	0	76	18	6	0	8	0	0	0	0
PM	16	122	0	0	52	11	27	0	24	0	0	0	0
AHV[1]	**6**	**38**	**0**	**0**	**32**	**7**	**8**	**0**	**8**	**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	99	Justification 2A: Major Street Both Approaches	83
Justification 1B: Minor Street Both Approaches	16	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	6	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	38	FALSE	
(4) Pedestrians crossing the major street:			0
		Total	**8**

Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

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

Project and Scenario Summary

Project:	Norval By pass			**Project No.:**	100160
				Date:	2025-03-14
Horizon:	Future Total	**Horizon Year:**	2029	**Analyst:**	SP

Study Intersection Summary

Major Street:	Street B	**Direction:**	North/South
Minor Street:	Street A	**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	New Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	150%	-	**1080**
1B: Minor Street Both Approaches	170	150%	150%	**382.5**
2A: Major Street Both Approaches	720	150%	-	**1080**
2B: Traffic Crossing Major Street	75	150%	-	**113**

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	99	**1080**	9%	**No**
1B: Minor Street Both Approaches	16	**383**	4%	
2A: Major Street Both Approaches	83	**1080**	8%	**No**
2B: Traffic Crossing Major Street	8	**113**	7%	

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:	Norval By pass			**Project No.:**	100160
				Date:	2025-03-14
Horizon:	Future Total	**Horizon Year:**	2029	**Analyst:**	SP

Study Intersection Summary

Major Street:	10 Side Road	**Direction:**	East/West
Minor Street:	Street B	**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:**	New

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: 10 Side Road						Minor: Street B						Pedestrians Crossing Major
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
AM	14	433	0	0	320	48	0	0	0	128	0	18	0
PM	67	395	0	0	400	143	0	0	0	100	0	22	0
AHV[1]	**20**	**207**	**0**	**0**	**180**	**48**	**0**	**0**	**0**	**57**	**0**	**10**	**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	522	Justification 2A: Major Street Both Approaches	455
Justification 1B: Minor Street Both Approaches	67	Justification 2B: Traffic Crossing Major Street	57

Note: The crossing volume is defined as the sum of:			
(1) Left turns from both minor street approaches:			57
(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	20	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	200	FALSE	
(4) Pedestrians crossing the major street:			0
		Total	**57**

Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

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

Project and Scenario Summary

Project:	Norval By pass			**Project No.:**	100160
				Date:	2025-03-14
Horizon:	Future Total	**Horizon Year:**	2029	**Analyst:**	SP

Study Intersection Summary

Major Street:	10 Side Road	**Direction:**	East/West
Minor Street:	Street B	**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	New Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	150%	-	**1080**
1B: Minor Street Both Approaches	170	150%	150%	**382.5**
2A: Major Street Both Approaches	720	150%	-	**1080**
2B: Traffic Crossing Major Street	75	150%	-	**113**

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	522	**1080**	48%	**No**
1B: Minor Street Both Approaches	67	**383**	18%	
2A: Major Street Both Approaches	455	**1080**	42%	**No**
2B: Traffic Crossing Major Street	57	**113**	51%	

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:	Norval By pass			**Project No.:**	100160
				Date:	2025-03-14
Horizon:	Future Total	**Horizon Year:**	2029	**Analyst:**	SP

Study Intersection Summary

Major Street:	10th Line	**Direction:**	North/South
Minor Street:	Argyll Road/Street E	**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:**	New

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: 10th Line						Minor: Argyll Road/Street E						Pedestrians Crossing Major
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
AM	36	0	11	0	0	0	0	9	217	27	26	0	0
PM	227	0	9	0	0	0	0	19	79	22	27	0	0
AHV[1]	**66**	**0**	**5**	**0**	**0**	**0**	**0**	**7**	**74**	**12**	**13**	**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	177	Justification 2A: Major Street Both Approaches	71
Justification 1B: Minor Street Both Approaches	106	Justification 2B: Traffic Crossing Major Street	25

Note: The crossing volume is defined as the sum of:			
(1) Left turns from both minor street approaches:			12
(2) The heaviest through volume from the minor street:			13
(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	66	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	66	FALSE	
(4) Pedestrians crossing the major street:			0
		Total	**25**

Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

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

Project and Scenario Summary

Project:	Norval By pass			**Project No.:**	100160
				Date:	2025-03-14
Horizon:	Future Total	**Horizon Year:**	2029	**Analyst:**	SP

Study Intersection Summary

Major Street:	10th Line	**Direction:**	North/South
Minor Street:	Argyll Road/Street E	**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	New Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	150%	-	**1080**
1B: Minor Street Both Approaches	170	150%	150%	**382.5**
2A: Major Street Both Approaches	720	150%	-	**1080**
2B: Traffic Crossing Major Street	75	150%	-	**113**

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	177	**1080**	16%	**No**
1B: Minor Street Both Approaches	106	**383**	28%	
2A: Major Street Both Approaches	71	**1080**	7%	**No**
2B: Traffic Crossing Major Street	25	**113**	22%	

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:	Norval By pass			**Project No.:**	100160
				Date:	2025-03-14
Horizon:	Future Total	**Horizon Year:**	2031	**Analyst:**	SP

Study Intersection Summary

Major Street:	10th Line	**Direction:**	North/South
Minor Street:	Street A/Danby Road	**Direction:**	East/West

Intersection Details for Warrant Parameters

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

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: 10th Line						Minor: Street A/Danby Road						Pedestrians Crossing Major
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
AM	41	33	6	6	253	3	2	16	198	24	39	14	0
PM	147	242	29	21	76	9	4	43	61	18	35	8	0
AHV[1]	**47**	**69**	**9**	**7**	**82**	**3**	**2**	**15**	**65**	**11**	**19**	**6**	**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	335	Justification 2A: Major Street Both Approaches	217
Justification 1B: Minor Street Both Approaches	118	Justification 2B: Traffic Crossing Major Street	32

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:			19
(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	47	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	129	FALSE	
(4) Pedestrians crossing the major street:			0
		Total	**32**

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:	Norval By pass			**Project No.:**	100160
				Date:	2025-03-14
Horizon:	Future Total	**Horizon Year:**	2031	**Analyst:**	SP

Study Intersection Summary

Major Street:	10th Line	**Direction:**	North/South
Minor Street:	Street A/Danby Road	**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	New Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	150%	-	**1080**
1B: Minor Street Both Approaches	170	150%	100%	**255**
2A: Major Street Both Approaches	720	150%	-	**1080**
2B: Traffic Crossing Major Street	75	150%	-	**113**

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	335	**1080**	31%	**No**
1B: Minor Street Both Approaches	118	**255**	46%	
2A: Major Street Both Approaches	217	**1080**	20%	**No**
2B: Traffic Crossing Major Street	32	**113**	28%	

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:	Norval By pass			**Project No.:**	100160
				Date:	2025-03-14
Horizon:	Future Total	**Horizon Year:**	2031	**Analyst:**	SP

Study Intersection Summary

Major Street:	Street B	**Direction:**	North/South
Minor Street:	Street A	**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:**	New

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: Street B						Minor: Street A						Pedestrians Crossing Major
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
AM	8	31	0	0	76	18	6	0	8	0	0	0	0
PM	16	122	0	0	52	11	27	0	24	0	0	0	0
AHV[1]	**6**	**38**	**0**	**0**	**32**	**7**	**8**	**0**	**8**	**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	99	Justification 2A: Major Street Both Approaches	83
Justification 1B: Minor Street Both Approaches	16	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	6	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	38	FALSE	
(4) Pedestrians crossing the major street:			0
		Total	**8**

Traffic Signal Warrant - Output Sheet
Justification 7 - Projected Volumes

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

Project and Scenario Summary

Project:	Norval By pass			**Project No.:**	100160
				Date:	2025-03-14
Horizon:	Future Total	**Horizon Year:**	2031	**Analyst:**	SP

Study Intersection Summary

Major Street:	Street B	**Direction:**	North/South
Minor Street:	Street A	**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	New Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	150%	-	**1080**
1B: Minor Street Both Approaches	170	150%	150%	**382.5**
2A: Major Street Both Approaches	720	150%	-	**1080**
2B: Traffic Crossing Major Street	75	150%	-	**113**

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	99	**1080**	9%	**No**
1B: Minor Street Both Approaches	16	**383**	4%	
2A: Major Street Both Approaches	83	**1080**	8%	**No**
2B: Traffic Crossing Major Street	8	**113**	7%	

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:	Norval By pass			**Project No.:**	100160
				Date:	2025-03-14
Horizon:	Future Total	**Horizon Year:**	2031	**Analyst:**	SP

Study Intersection Summary

Major Street:	10 Side Road	**Direction:**	East/West
Minor Street:	Street B	**Direction:**	North/South

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	2 or more
Number of Legs:	Three ("T" Intersection)	**Intersection Type:**	New

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: 10 Side Road						Minor: Street B						Pedestrians Crossing Major
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
AM	14	717	0	0	1403	49	0	0	0	129	0	18	0
PM	67	1402	0	0	721	145	0	0	0	101	0	22	0
AHV[1]	**20**	**530**	**0**	**0**	**531**	**49**	**0**	**0**	**0**	**58**	**0**	**10**	**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	1198	Justification 2A: Major Street Both Approaches	1130
Justification 1B: Minor Street Both Approaches	68	Justification 2B: Traffic Crossing Major Street	58

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

(1) Left turns from both minor street approaches:			58
(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	20	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	551	FALSE	
(4) Pedestrians crossing the major street:			0
		Total	**58**

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:	Norval By pass			**Project No.:**	100160
				Date:	2025-03-14
Horizon:	Future Total	**Horizon Year:**	2031	**Analyst:**	SP

Study Intersection Summary

Major Street:	10 Side Road	**Direction:**	East/West
Minor Street:	Street B	**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	New Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	900	150%	-	**1350**
1B: Minor Street Both Approaches	170	150%	150%	**382.5**
2A: Major Street Both Approaches	900	150%	-	**1350**
2B: Traffic Crossing Major Street	75	150%	-	**113**

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	1198	**1350**	89%	**No**
1B: Minor Street Both Approaches	68	**383**	18%	
2A: Major Street Both Approaches	1130	**1350**	84%	**No**
2B: Traffic Crossing Major Street	58	**113**	52%	

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:	Norval By pass			**Project No.:**	100160
				Date:	2025-03-14
Horizon:	Future Total	**Horizon Year:**	2031	**Analyst:**	SP

Study Intersection Summary

Major Street:	10th Line	**Direction:**	North/South
Minor Street:	Argyll Road/Street E	**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:**	New

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: 10th Line						Minor: Argyll Road/Street E						Pedestrians Crossing Major
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
AM	37	0	11	0	0	0	0	9	234	27	26	0	0
PM	245	0	9	0	0	0	0	19	84	22	27	0	0
AHV[1]	**71**	**0**	**5**	**0**	**0**	**0**	**0**	**7**	**80**	**12**	**13**	**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	188	Justification 2A: Major Street Both Approaches	76
Justification 1B: Minor Street Both Approaches	112	Justification 2B: Traffic Crossing Major Street	25

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

(1) Left turns from both minor street approaches:			12
(2) The heaviest through volume from the minor street:			13
(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	71	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	71	FALSE	
(4) Pedestrians crossing the major street:			0
		Total	**25**

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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:	Norval By pass			**Project No.:**	100160
				Date:	2025-03-14
Horizon:	Future Total	**Horizon Year:**	2031	**Analyst:**	SP

Study Intersection Summary

Major Street:	10th Line	**Direction:**	North/South
Minor Street:	Argyll Road/Street E	**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	New Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	720	150%	-	**1080**
1B: Minor Street Both Approaches	170	150%	150%	**382.5**
2A: Major Street Both Approaches	720	150%	-	**1080**
2B: Traffic Crossing Major Street	75	150%	-	**113**

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	188	**1080**	17%	**No**
1B: Minor Street Both Approaches	112	**383**	29%	
2A: Major Street Both Approaches	76	**1080**	7%	**No**
2B: Traffic Crossing Major Street	25	**113**	22%	

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:	Norval By pass			**Project No.:**	100160
				Date:	2025-03-14
Horizon:	Future Total	**Horizon Year:**	2031	**Analyst:**	SP

Study Intersection Summary

Major Street:	Norval Bypass	**Direction:**	North/South
Minor Street:	Street T	**Direction:**	East/West

Intersection Details for Warrant Parameters

Flow Conditions:	Restricted Flow (Urban)	**Number of Lanes:**	2 or more
Number of Legs:	Three ("T" Intersection)	**Intersection Type:**	New

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: Norval Bypass						Minor: Street T						Pedestrians Crossing Major
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
AM	0	900	12	1	1350	0	0	0	0	32	0	7	0
PM	0	1350	32	5	900	0	0	0	0	20	0	5	0
AHV[1]	**0**	**563**	**11**	**2**	**563**	**0**	**0**	**0**	**0**	**13**	**0**	**3**	**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	1155	Justification 2A: Major Street Both Approaches	1139
Justification 1B: Minor Street Both Approaches	16	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:			13
(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	2	FALSE	
(b) The left turn volume plus the opposing volume > 720 vph	565	FALSE	
(4) Pedestrians crossing the major street:			0
		Total	**13**

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:	Norval By pass			**Project No.:**	100160
				Date:	2025-03-14
Horizon:	Future Total	**Horizon Year:**	2031	**Analyst:**	SP

Study Intersection Summary

Major Street:	Norval Bypass	**Direction:**	North/South
Minor Street:	Street T	**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	New Intersection	"T" Intersection	Final Threshold
1A: All Approach Lanes	900	150%	-	**1350**
1B: Minor Street Both Approaches	170	150%	150%	**382.5**
2A: Major Street Both Approaches	900	150%	-	**1350**
2B: Traffic Crossing Major Street	75	150%	-	**113**

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	1155	**1350**	86%	**No**
1B: Minor Street Both Approaches	16	**383**	4%	
2A: Major Street Both Approaches	1139	**1350**	84%	**No**
2B: Traffic Crossing Major Street	13	**113**	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

Fieldgate - Russel Farms - All-way Stop Minimum Volume Warrant (Collector Road)

Street A & Street B/Street C **Future Total 2029**

AWSC Warrant

Not Warranted

8 Hours		Northbound			Westbound			Southbound			Eastbound			Minor St.	Total	Splits	
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total		Major St.	Minor St.
1	0.95	8	29	0	0	0	0	0	72	17	6	0	8	13	153	83%	9%
AM	Pk Hr	8	31	0	0	0	0	0	76	18	6	0	8	14	147	90%	10%
3	0.55	9	67	0	0	0	0	0	29	6	15	0	13	28	139	80%	20%
4	0.65	10	79	0	0	0	0	0	34	7	18	0	16	33	164	80%	20%
5	0.75	12	92	0	0	0	0	0	39	8	20	0	18	38	189	80%	20%
6	0.85	14	104	0	0	0	0	0	44	9	23	0	20	43	214	80%	20%
7	0.95	15	116	0	0	0	0	0	49	10	26	0	23	48	239	80%	20%
PM	Pk Hr	16	122	0	0	0	0	0	52	11	27	0	24	51	252	80%	20%

All-way Stop Minimum Warrant - Collector Road:

Volume exceeds 375 on all approaches (highest 8 hours a day)

Split does not exceed 75%/25% (i.e., Minor Street must not be less than 30%)

Volume exceeds 150 on Minor Street

Warranted:

Both total volume, Minor St. volume and splits must be satisfied.

Fieldgate - Russel Farms - All-way Stop Minimum Volume Warrant (Urban Arterial Road)

Street A & 10th Line **Future Total 2029**

AWSC Warrant

Not Warranted

8 Hours		Northbound			Westbound			Southbound			Eastbound			Minor St.	Total	Splits	
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total		Major St.	Minor St.
1	0.95	36	29	6	23	37	13	6	224	3	2	15	174	264	832	37%	32%
AM	Pk Hr	38	31	6	24	39	14	6	236	3	2	16	183	278	598	54%	46%
3	0.55	75	124	16	10	19	4	12	40	5	2	24	31	91	361	75%	25%
4	0.65	88	146	19	12	23	5	14	47	6	3	28	37	107	427	75%	25%
5	0.75	102	169	22	14	26	6	16	54	7	3	32	43	124	493	75%	25%
6	0.85	116	191	25	15	30	7	18	61	8	3	37	48	140	558	75%	25%
7	0.95	129	214	28	17	33	8	20	68	9	4	41	54	157	624	75%	25%
PM	Pk Hr	136	225	29	18	35	8	21	72	9	4	43	57	165	657	75%	25%

All-way Stop Minimum Warrant - Urban Arterial Road:

- Volume exceeds 375 on all approaches (highest 8 hours a day)
- Split does not exceed 75%/25% (i.e., Minor Street must not be less than 30%)
- Volume exceeds 150 on Minor Street

Warranted:
Both total volume, Minor St. volume and splits must be satisfied.

Fieldgate - Russel Farms - All-way Stop Minimum Volume Warrant (Urban Arterial Road)

Street B & 10 Side road **Future Total 2029**

AWSC Warrant

Not Warranted

8 Hours		Northbound			Westbound			Southbound			Eastbound			Minor St.	Total	Splits	
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total		Major St.	Minor St.
1	0.95	0	0	0	0	304	46	122	0	17	13	411	0	139	1052	74%	13%
AM	Pk Hr	0	0	0	0	320	48	128	0	18	14	433	0	146	961	85%	15%
3	0.55	0	0	0	0	220	79	55	0	12	37	217	0	67	620	89%	11%
4	0.65	0	0	0	0	260	93	65	0	14	44	257	0	79	733	89%	11%
5	0.75	0	0	0	0	300	107	75	0	17	50	296	0	92	845	89%	11%
6	0.85	0	0	0	0	340	122	85	0	19	57	336	0	104	958	89%	11%
7	0.95	0	0	0	0	380	136	95	0	21	64	375	0	116	1071	89%	11%
PM	Pk Hr	0	0	0	0	400	143	100	0	22	67	395	0	122	1127	89%	11%

All-way Stop Minimum Warrant - Urban Arterial Road:

Volume exceeds 500 on all approaches (highest 8 hours a day)

Split does not exceed 75%/25% (i.e., Minor Street must not be less than 30%)

Volume exceeds 200 on Minor Street

Warranted:

Both total volume, Minor St. volume and splits must be satisfied.

Fieldgate - Russel Farms - All-way Stop Minimum Volume Warrant (Collector Road)

Street B & Street P/Street R **Future Total 2029**

AWSC Warrant

Not Warranted

8 Hours		Northbound			Westbound			Southbound			Eastbound			Minor St.	Total	Splits	
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total		Major St.	Minor St.
1	0.95	20	31	6	17	0	6	2	78	0	0	0	49	72	281	49%	26%
AM	Pk Hr	21	33	6	18	0	6	2	82	0	0	0	52	76	220	65%	35%
3	0.55	32	74	10	7	0	2	3	39	0	0	0	20	29	186	85%	15%
4	0.65	38	87	12	8	0	3	3	46	0	0	0	23	34	220	85%	15%
5	0.75	44	101	14	9	0	3	4	53	0	0	0	27	39	254	85%	15%
6	0.85	49	114	15	10	0	3	4	60	0	0	0	31	44	287	85%	15%
7	0.95	55	127	17	11	0	4	5	67	0	0	0	34	49	321	85%	15%
PM	Pk Hr	58	134	18	12	0	4	5	71	0	0	0	36	52	338	85%	15%

All-way Stop Minimum Warrant - Collector Road:

Volume exceeds 375 on all approaches (highest 8 hours a day)

Split does not exceed 70%/30% (i.e., Minor Street must not be less than 30%)

Volume exceeds 150 on Minor Street

Warranted:

Both total volume, Minor St. volume and splits must be satisfied.

Fieldgate - Russel Farms - All-way Stop Minimum Volume Warrant (Collector Road)

Street E & Street C/Street D **Future Total 2029**

AWSC Warrant

Not Warranted

8 Hours		Northbound			Westbound			Southbound			Eastbound			Minor St.	Total	Splits	
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total		Major St.	Minor St.
1	0.95	45	0	0	0	0	0	0	1	7	2	0	11	13	79	66%	17%
AM	Pk Hr	47	0	0	0	0	0	0	1	7	2	0	12	14	69	80%	20%
3	0.55	25	0	0	0	0	0	0	1	3	2	0	13	15	43	65%	35%
4	0.65	29	0	0	0	0	0	0	1	3	3	0	16	18	51	65%	35%
5	0.75	34	0	0	0	0	0	0	1	4	3	0	18	21	59	65%	35%
6	0.85	38	0	0	0	0	0	0	1	4	3	0	20	24	67	65%	35%
7	0.95	43	0	0	0	0	0	0	1	5	4	0	23	27	75	65%	35%
PM	Pk Hr	45	0	0	0	0	0	0	1	5	4	0	24	28	79	65%	35%

All-way Stop Minimum Warrant - Collector Road:

Volume exceeds 375 on all approaches (highest 8 hours a day)

Split does not exceed 75%/25% (i.e., Minor Street must not be less than 30%)

Volume exceeds 150 on Minor Street

Warranted:

Both total volume, Minor St. volume and splits must be satisfied.

Fieldgate - Russel Farms - All-way Stop Minimum Volume Warrant (Urban Arterial Road)

Street E & 10th Line/Argyll Road **Future Total 2029**

AWSC Warrant

Not Warranted

8 Hours		Northbound			Westbound			Southbound			Eastbound			Minor St.	Total	Splits	
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total		Major St.	Minor St.
1	0.95	0	34	10	26	0	25	9	206	0	0	0	0	50	360	72%	14%
AM	Pk Hr	0	36	11	27	0	26	9	217	0	0	0	0	53	326	84%	16%
3	0.55	0	125	5	12	0	15	10	43	0	0	0	0	27	211	87%	13%
4	0.65	0	148	6	14	0	18	12	51	0	0	0	0	32	249	87%	13%
5	0.75	0	170	7	17	0	20	14	59	0	0	0	0	37	287	87%	13%
6	0.85	0	193	8	19	0	23	16	67	0	0	0	0	42	326	87%	13%
7	0.95	0	216	9	21	0	26	18	75	0	0	0	0	47	364	87%	13%
PM	Pk Hr	0	227	9	22	0	27	19	79	0	0	0	0	49	383	87%	13%

All-way Stop Minimum Warrant - Urban Arterial Road:

Volume exceeds 375 on all approaches (highest 8 hours a day)

Split does not exceed 75%/25% (i.e., Minor Street must not be less than 30%)

Volume exceeds 150 on Minor Street

Warranted:

Both total volume, Minor St. volume and splits must be satisfied.

Fieldgate - Russel Farms - All-way Stop Minimum Volume Warrant (Collector Road)

Street A & Street B/Street C

Future Total 2031

AWSC Warrant

Not Warranted

8 Hours		Northbound			Westbound			Southbound			Eastbound			Minor St.	Total	Splits	
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total		Major St.	Minor St.
1	0.95	8	29	0	0	0	0	0	72	17	6	0	8	13	153	83%	9%
AM	Pk Hr	8	31	0	0	0	0	0	76	18	6	0	8	14	147	90%	10%
3	0.55	9	67	0	0	0	0	0	29	6	15	0	13	28	139	80%	20%
4	0.65	10	79	0	0	0	0	0	34	7	18	0	16	33	164	80%	20%
5	0.75	12	92	0	0	0	0	0	39	8	20	0	18	38	189	80%	20%
6	0.85	14	104	0	0	0	0	0	44	9	23	0	20	43	214	80%	20%
7	0.95	15	116	0	0	0	0	0	49	10	26	0	23	48	239	80%	20%
PM	Pk Hr	16	122	0	0	0	0	0	52	11	27	0	24	51	252	80%	20%

All-way Stop Minimum Warrant - Collector Road:

Volume exceeds 375 on all approaches (highest 8 hours a day)

Split does not exceed 75%/25% (i.e., Minor Street must not be less than 30%)

Volume exceeds 150 on Minor Street

Warranted:

Both total volume, Minor St. volume and splits must be satisfied.

Fieldgate - Russel Farms - All-way Stop Minimum Volume Warrant (Collector Road)

Street A & 10th Line **Future Total 2031**

AWSC Warrant

Not Warranted

8 Hours		Northbound			Westbound			Southbound			Eastbound			Minor St.	Total	Splits	
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total		Major St.	Minor St.
1	0.95	39	31	6	23	37	13	6	240	3	2	15	188	278	603	54%	46%
AM	Pk Hr	41	33	6	24	39	14	6	253	3	2	16	198	293	635	54%	46%
3	0.55	81	133	16	10	19	4	12	42	5	2	24	34	93	381	76%	24%
4	0.65	96	157	19	12	23	5	14	49	6	3	28	40	110	450	76%	24%
5	0.75	110	182	22	14	26	6	16	57	7	3	32	46	127	520	76%	24%
6	0.85	125	206	25	15	30	7	18	65	8	3	37	52	144	589	76%	24%
7	0.95	140	230	28	17	33	8	20	72	9	4	41	58	161	658	76%	24%
PM	Pk Hr	147	242	29	18	35	8	21	76	9	4	43	61	169	693	76%	24%

All-way Stop Minimum Warrant - Collector Road:

Volume exceeds 375 on all approaches (highest 8 hours a day)

Split does not exceed 70%/30% (i.e., Minor Street must not be less than 30%)

Volume exceeds 150 on Minor Street

Warranted:

Both total volume, Minor St. volume and splits must be satisfied.

Fieldgate - Russel Farms - All-way Stop Minimum Volume Warrant (Urban Arterial Road)

Street B & 10 Side road **Future Total 2031**

AWSC Warrant

Not Warranted

8 Hours		Northbound			Westbound			Southbound			Eastbound			Minor St.	Total	Splits	
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total		Major St.	Minor St.
1	0.95	0	0	0	0	1333	47	123	0	77	13	681	0	200	2273	91%	9%
AM	Pk Hr	0	0	0	0	1403	49	129	0	81	14	717	0	210	2393	91%	9%
3	0.55	0	0	0	0	397	80	56	0	12	37	771	0	68	1352	95%	5%
4	0.65	0	0	0	0	469	94	66	0	14	44	911	0	80	1598	95%	5%
5	0.75	0	0	0	0	541	109	76	0	17	50	1052	0	92	1844	95%	5%
6	0.85	0	0	0	0	613	123	86	0	19	57	1192	0	105	2089	95%	5%
7	0.95	0	0	0	0	685	138	96	0	21	64	1332	0	117	2335	95%	5%
PM	Pk Hr	0	0	0	0	721	145	101	0	22	67	1402	0	123	2458	95%	5%

All-way Stop Minimum Warrant - Urban Arterial Road:

Volume exceeds 500 on all approaches (highest 8 hours a day)

Split does not exceed 75%/25% (i.e., Minor Street must not be less than 30%)

Volume exceeds 200 on Minor Street

Warranted:

Both total volume, Minor St. volume and splits must be satisfied.

Fieldgate - Russel Farms - All-way Stop Minimum Volume Warrant (Collector Road)

Street B & Street P/Street R **Future Total 2031**

AWSC Warrant

Not Warranted

8 Hours		Northbound			Westbound			Southbound			Eastbound			Minor St.	Total	Splits	
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total		Major St.	Minor St.
1	0.95	20	31	6	17	0	6	2	78	0	0	0	49	72	281	49%	26%
AM	Pk Hr	21	33	6	18	0	6	2	82	0	0	0	52	76	220	65%	35%
3	0.55	32	74	10	7	0	2	3	39	0	0	0	20	29	186	85%	15%
4	0.65	38	87	12	8	0	3	3	46	0	0	0	23	34	220	85%	15%
5	0.75	44	101	14	9	0	3	4	53	0	0	0	27	39	254	85%	15%
6	0.85	49	114	15	10	0	3	4	60	0	0	0	31	44	287	85%	15%
7	0.95	55	127	17	11	0	4	5	67	0	0	0	34	49	321	85%	15%
PM	Pk Hr	58	134	18	12	0	4	5	71	0	0	0	36	52	338	85%	15%

All-way Stop Minimum Warrant - Collector Road:

Volume exceeds 375 on all approaches (highest 8 hours a day)

Split does not exceed 70%/30% (i.e., Minor Street must not be less than 30%)

Volume exceeds 150 on Minor Street

Warranted:

Both total volume, Minor St. volume and splits must be satisfied.

Fieldgate - Russel Farms - All-way Stop Minimum Volume Warrant (Collector Road)

Street E & Street C/Street D **Future Total 2031**

AWSC Warrant

Not Warranted

8 Hours		Northbound			Westbound			Southbound			Eastbound			Minor St.	Total	Splits	
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total		Major St.	Minor St.
1	0.95	45	0	0	0	0	0	0	1	7	2	0	11	13	66	80%	20%
AM	Pk Hr	47	0	0	0	0	0	0	1	7	2	0	12	14	69	80%	20%
3	0.55	25	0	0	0	0	0	0	1	3	2	0	13	15	43	65%	35%
4	0.65	29	0	0	0	0	0	0	1	3	3	0	16	18	51	65%	35%
5	0.75	34	0	0	0	0	0	0	1	4	3	0	18	21	59	65%	35%
6	0.85	38	0	0	0	0	0	0	1	4	3	0	20	24	67	65%	35%
7	0.95	43	0	0	0	0	0	0	1	5	4	0	23	27	75	65%	35%
PM	Pk Hr	45	0	0	0	0	0	0	1	5	4	0	24	28	79	65%	35%

All-way Stop Minimum Warrant - Collector Road:

Volume exceeds 375 on all approaches (highest 8 hours a day)

Split does not exceed 75%/25% (i.e., Minor Street must not be less than 30%)

Volume exceeds 150 on Minor Street

Warranted:

Both total volume, Minor St. volume and splits must be satisfied.

Fieldgate - Russel Farms - All-way Stop Minimum Volume Warrant (Collector Road)

Street E & 10th Line/Argyll Road **Future Total 2031**

AWSC Warrant

Not Warranted

8 Hours		Northbound			Westbound			Southbound			Eastbound			Minor St.	Total	Splits	
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total		Major St.	Minor St.
1	0.95	0	35	10	26	0	25	9	222	0	0	0	0	50	327	85%	15%
AM	Pk Hr	0	37	11	27	0	26	9	234	0	0	0	0	53	344	85%	15%
3	0.55	0	135	5	12	0	15	10	46	0	0	0	0	27	223	88%	12%
4	0.65	0	159	6	14	0	18	12	55	0	0	0	0	32	264	88%	12%
5	0.75	0	184	7	17	0	20	14	63	0	0	0	0	37	305	88%	12%
6	0.85	0	208	8	19	0	23	16	71	0	0	0	0	42	345	88%	12%
7	0.95	0	233	9	21	0	26	18	80	0	0	0	0	47	386	88%	12%
PM	Pk Hr	0	245	9	22	0	27	19	84	0	0	0	0	49	406	88%	12%

All-way Stop Minimum Warrant - Urban Arterial Road:

Volume exceeds 375 on all approaches (highest 8 hours a day)

Split does not exceed 75%/25% (i.e., Minor Street must not be less than 30%)

Volume exceeds 150 on Minor Street

Warranted:

Both total volume, Minor St. volume and splits must be satisfied.

Fieldgate - Russel Farms - All-way Stop Minimum Volume Warrant (Urban Arterial Road)

Street T & Norval West Bypass **Future Total 2031**

AWSC Warrant

Not Warranted

8 Hours		Northbound			Westbound			Southbound			Eastbound			Minor St.	Total	Splits	
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total		Major St.	Minor St.
1	0.95	0	855	11	30	0	7	1	1283	0	0	0	0	37	2187	98%	2%
AM	Pk Hr	0	900	12	32	0	7	1	1350	0	0	0	0	39	2302	98%	2%
3	0.55	0	743	18	11	0	3	3	495	0	0	0	0	14	1272	99%	1%
4	0.65	0	878	21	13	0	3	3	585	0	0	0	0	16	1503	99%	1%
5	0.75	0	1013	24	15	0	4	4	675	0	0	0	0	19	1734	99%	1%
6	0.85	0	1148	27	17	0	4	4	765	0	0	0	0	21	1965	99%	1%
7	0.95	0	1283	30	19	0	5	5	855	0	0	0	0	24	2196	99%	1%
PM	Pk Hr	0	1350	32	20	0	5	5	900	0	0	0	0	25	2312	99%	1%

All-way Stop Minimum Warrant - Urban Arterial Road:

Volume exceeds 500 on all approaches (highest 8 hours a day)

Split does not exceed 75%/25% (i.e., Minor Street must not be less than 30%)

Volume exceeds 200 on Minor Street

Warranted:

Both total volume, Minor St. volume and splits must be satisfied.