

JEDDORE GROCERY STORE: TRAFFIC IMPACT STUDY FINAL REPORT



PREPARED FOR:
METLINK INVESTMENTS LIMITED

JULY 2023

Project No. 231-02368



TABLE OF CONTENTS

1	INTRODUCTION.....	1
2	STUDY AREA DESCRIPTIONS.....	3
3	BACKGROUND TRAFFIC & DEVELOPMENT TRIPS.....	4
4	INTERSECTION OPERATIONAL ANALYSIS.....	7
4.1	Analysis Scenarios	9
4.2	Nova Scotia Trunk 7 at Site Access #1	10
4.3	Nova Scotia Trunk 7 at Site Access #2.....	11
5	SUMMARY & RECOMMENDATIONS	12
5.1	Summary	12
5.2	Recommendations	13
5.3	Conclusion.....	13

APPENDICES

- A TRAFFIC VOLUME DATA
- B WARRANT ANALYSIS
- C INTERSECTION PERFORMANCE ANALYSIS

PREPARED BY: ABHINAV NINAWA
PATRICK HATTON, P.ENG.



1 INTRODUCTION

Background

WSP is preparing plans for a new supermarket (see Figure 2) in the Head of Jeddore area on the presently vacant lands to the east of the site. It is expected that once the new store is complete, the existing grocery store will be redeveloped as a new commercial site. The development includes two existing connections from the site to Trunk 7 (See Figure 1). The proposed development is an approximately 15,780 square foot Supermarket and is expected to be operational by 2025. This study uses a 2030 horizon year, 5 years beyond site buildout, per NSPW requirements.

WSP Canada Inc. has been retained to complete this Traffic Impact Study (TIS) to investigate the transportation implications associated with the Head of Jeddore – supermarket development and determine upgrades to the local roadway network that are anticipated to be required to facilitate added growth in the area. The site plan is shown in Figure 2 and study intersections are shown in Figure 1.



Figure 1 – Study Intersections

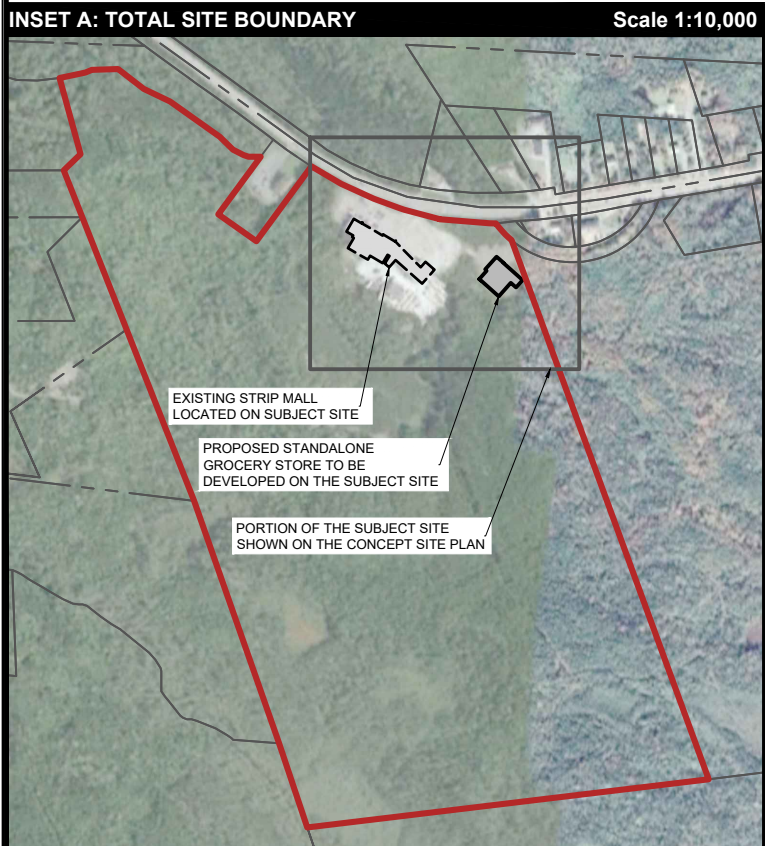
A Traffic Impact Study Usually Considers Four Questions

A TIS usually consists of determining answers for the following questions:

1. **What is the existing transportation situation** adjacent to the study site? How have volumes changed historically?
2. **What transportation changes are expected** at key Study Area locations? How many vehicle and active mode trips are expected to be generated by the proposed development during weekday peak hours? What routes are the trips expected to use to travel within and through the Study Area?
3. **What transportation impacts will occur** on Study Area roads, sidewalks, and intersections?
4. **What transportation improvements are required** to mitigate project impacts on Study Area travel? Are there transportation modifications that should be made to improve the travel experience for all users?

Study Objectives

1. Develop projected 2030 background weekday AM and PM peak hourly volumes for Study Intersections.
2. Estimate the number of weekdays AM and PM peak hour trips that will be generated by the proposed development.
3. Distribute and assign site generated trips to Study Intersections to project 2030 peak hourly volumes that include site generated trips.
4. Evaluate impacts of site generated traffic on the performance of Study Intersections.
5. Complete warrant analyses, as necessary, for Study Intersections and recommend improvements that may be needed at Study Intersections to mitigate the impacts of site development.



LEGEND

- Site Boundary
- - - Adjacent Property Boundary
- Existing Strip Mall Building
- Proposed Stand Alone Grocery Store

SITE SUMMARY:

- PID: 00609149 - 8990 Highway 7
- Total Land Area - 106.0 acres
- Total Lot Coverage - approx. 1.1%
- Existing Zone - MU (Mixed Use)

NOTES:

- Property lines are approximate only. Site subject to survey.
- Site subject to HRM Eastern Shore (West) Plan Area by-laws.

SOURCES:

- Property lines from Provincial mapping.
- Existing building footprint and site features taken from plans completed by HGE Engineering Inc., Site Plan, dated February 11, 2022 and GoogleEarth Imagery.
- GoogleEarth Imagery is approximate.

Designer: JHARPER	VERSION
Planner: AWINTERS	100

CONCEPT SITE PLAN
8990 Highway 7, Head of Jeddore
HALIFAX, NOVA SCOTIA

METLINK INVESTMENTS LIMITED
MAY 11, 2023 231-02368-100

SCALE

1 : 1,000

1 SPECTACLE LAKE DRIVE, DARTMOUTH, NS, CANADA B3B 1X7
PHONE: 902 835-9955 WSP.COM

FILE: K:\DARTMOUTH\2023\231-02368-00_HEAD_JEDDORE.DA_APPLICATION\SITE PLAN\231-02368-100.DWG Sheet:Standard 11x17 L

2 STUDY AREA DESCRIPTIONS

Existing Study Road Descriptions

Nova Scotia Trunk Highway 7 is a two-lane highway that travels in the East-West direction from Dartmouth in the west to Antigonish in the East. Within the study area the posted speed limit is 70 km/h. There are no sidewalks or bicycle lanes within the study area Trunk 7.

Existing Study Intersection Descriptions

Trips from various the new development will access the existing street network via the 2 driveways (identified in Figure 1). These connections are the existing site access connections to Trunk 7 at Access Point 1 and Access Point 2.

1. Trunk 7 at Access Point 1 is a 3-leg unsignalized driveway intersection (See Photos 1 and 2). The driveway is STOP controlled with free flow along Trunk 7. Trunk 7 has two through lanes in this area in the eastbound direction and a single lane in the westbound direction. There are no auxiliary turn lanes at this intersection. Stopping sight distance (SSD) in each direction exceeds 140m, which is greater than the minimum SSD of 130m for a vehicle traveling 80km/h.

2. Trunk 7 at Access Point 2 is a 3-leg unsignalized driveway intersection (See Photos 3 and 4). The driveway is STOP controlled with free flow along Trunk 7. Trunk 7 has two through lanes in this area in the eastbound direction and a single lane in the westbound direction. There are no auxiliary turn lanes at this intersection. Stopping sight distance (SSD) in each direction exceeds 140m, which is greater than the minimum SSD of 130m for a vehicle traveling 80km/h.



Photo 1: Looking left along Trunk 7 from Access 1



Photo 2: Looking right along Trunk 7 from Access 1



Photo 3: Looking left along Trunk 7 from Access 2



Photo 4: Looking right along Trunk 7 from Access 2

Active Transportation & Transit

There is no public transit in the area surrounding the development site and Head of Jeddore, there are no nearby bus stops for accessing public transport from the new development. The closest bus stop to the site is 18.4km away at Lakeview Shopping Centre in Porters Lake. The primary mode of transportation to and from the site are personal vehicles.

Description of Proposed Development

The proposed development is a supermarket at the east end of the site located at 8990 Trunk 7 in Head of Jeddore, NS as shown in Figure 2. The concept for the development includes building the supermarket in a total area of 15,780 square feet with about 91 parking stalls.

Once the new store is constructed and open, the existing grocery store on the site will be redeveloped.



3 BACKGROUND TRAFFIC & DEVELOPMENT TRIPS

**Turning
Movement
Counts &
Background
Growth**

Intersection background volumes used in this study were collected by WSP on Wednesday, April 19, 2023 at the study intersections (below).

1. Nova Scotia Trunk 7 – Site Access #1
2. Nova Scotia Trunk 7 – Site Access #2

The 2023 counted traffic volumes are tabulated in Table A-1 and A-2, Appendix A and shown in Figure A-1, Boxes A and B, Appendix A.

The historic traffic data for Trunk 7 Section 040: RTE 357 (MUSQUODOBOIT HBR) TO WEST JEDDORE ROAD has been obtained from NSPW and the AADT has been plotted in Figure 3 to represent the trends in annual traffic rate the from 2011 to 2022. These data show an historic annual growth rate of 1%.

A Seasonal Adjustment Factor of 1.06 has been applied to the counted traffic to account for seasonal adjustment and a 1.5% annual growth rate has been applied to account for the growth in background traffic along Trunk 7.

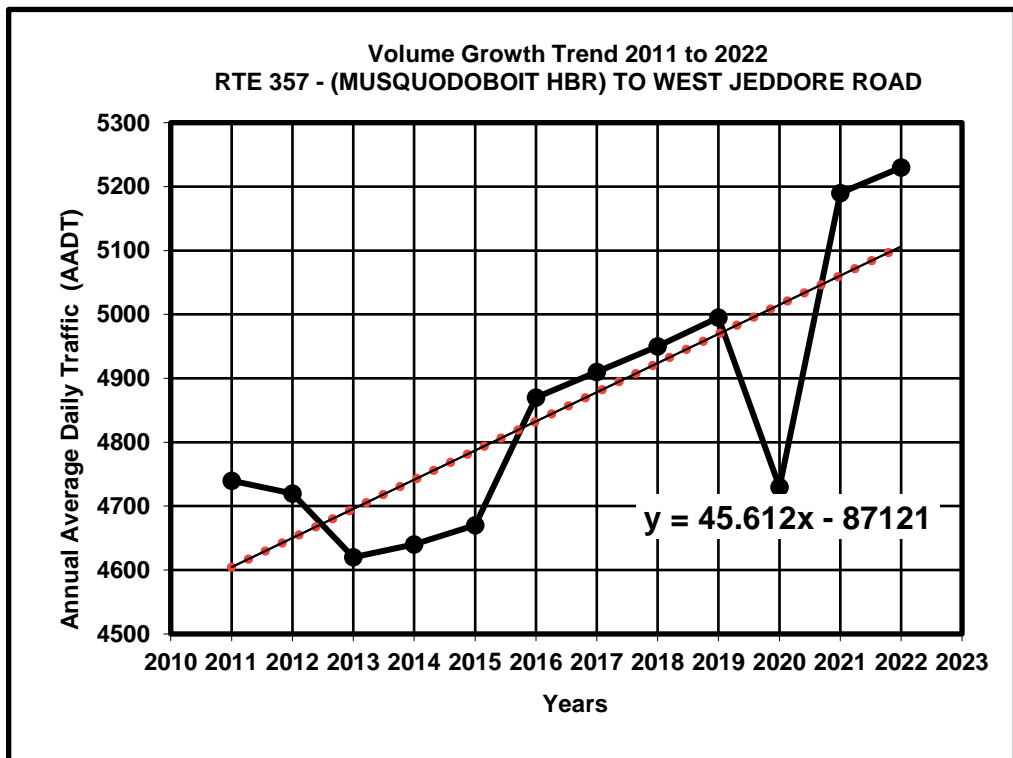


Figure 3 – Volume Growth Trend on (MUSQUODOBOIT HBR) To West Jeddore Road (2011 to 2021)

The 2030 weekday AM, and PM peak hour future background traffic volumes have been projected at the study intersections by applying a 1.06 seasonal adjustment factor and a 1.5% annual growth to the April 2023 counted volumes. These resulting 2030 future background volumes are illustrated diagrammatically in Figure A-1, Boxes C and D, Appendix A.



Anticipated Land Uses for the Proposed Development

The proposed development is expected to be an approximately 15,780 square foot supermarket. The existing site includes an approximately 13,440 square foot supermarket that will be redeveloped following construction of the new store. The future land use of the existing store site following redevelopment is unknown but it is expected to be a retail land use. No reduction of existing trips has been applied to the trips to and from the existing site to account for the redevelopment of the existing store as a future retail use.

Estimation of Trips Generated by the Proposed Development

Two types of trips are included in the external trips that will be generated by the proposed development - *Pass-by* and *Primary Trips*.

Pass-by trips are those which are made as ‘intervening opportunity’ stops to commercial and retail land uses by vehicle trips already passing by the site. Although these trips will be included in the driveway volumes to the site, they will not increase the overall traffic volumes on Study Area roads. A significant percentage of peak hour trips generated by this site can be expected to come from traffic passing the site on Trunk 7. While there may be pass-by trips to/from the site during the AM peak hour, a 30% pass-by rate has been used for retail trips during the PM peak hour only. No pass-by trip reduction was applied to retail trips during the AM peak hour.

Primary trips for this Study include all external site generated trips that are not considered pass-by trips.

Trip generation estimates for the proposed development were prepared using published rates from *Trip Generation Manual, 11th Edition* (Institute of Transportation Engineers, Washington, 2021). Trip generation estimates for the AM and PM peak hours of adjacent streets have been prepared for this development using land use plans prepared in May 2023 (See Figure 2) and is based on leasable square footage for the commercial development.

Trip generation rates as well as the entering / exiting distribution of site trips from the *Trip Generation 11th Edition* are summarized in Table 1.

Table 1 – Estimated Site Generated Trips

Land Use ¹	Unit ²	Trip Generation Rates ³				Trip Generation Estimates ³			
		AM Peak		PM Peak		AM Peak		PM Peak	
		In	Out	In	Out	In	Out	In	Out
Supermarket (GFA) (ITE Land Use 850)	15.78 kGFA	1.69	1.17	4.48	4.48	27	19	71	71
Primary Trips (70%)								50	50
Pass-by Trips (30%)								21	21
NOTES: 1. Rates are from <i>Trip Generation, 11th Edition</i> (Institute of Transportation Engineers, Washington, 2021). 2. Units are '1,000 sq ft of GFA', or kGFA. 3. Rates are 'vehicles per hour per unit'; trips generated are 'vehicles per hour for peak hours'.									

During the AM peak hour, it is estimated that the development will generate:

- 46 two-way primary vehicle trips (27 entering and 19 exiting); and,
- 0 pass-by vehicle trips.

During the PM peak hour, it is estimated that the development will generate:

- 100 two-way primary vehicle trips (50 entering and 50 exiting); and,
- 42 two-way pass-by vehicle trips (21 entering and 21 exiting).



Primary Trip Distribution

Primary trips to and from the site have been distributed based on the below distribution.

Direction	Distribution	
	AM Peak Hour	PM Peak Hour
East	50% (AM)	40% (PM)
West	50% (AM)	60% (PM)

Pass-by Trip Distribution

Pass-by site generated trips were assigned to the roadway network based on directional distribution of counted volumes along Trunk 7.

Trip Assignment

Site generated trips have been assigned to the road network with all of the traffic to and from the east and 90% of the traffic to and from the west using the easternmost connection to Trunk 7 (Access #2), based on the location of the proposed store within the footprint of the site. Assigned AM and PM peak hourly site generated trips are illustrated diagrammatically in Figure A-2, Boxes A and B, Appendix A.

Projected 2030 Traffic Volumes with the Proposed Development

Peak hourly estimated site generated vehicle volumes were distributed and assigned to the Trunk 7 access points using the above assumptions. Assigned site development trips (Figure A-2, Boxes A and B, Appendix A) were added to 2030 background volumes (Figure A-1, Boxes C and D, Appendix A) to provide estimates of the AM and PM peak hour volumes at study area intersections with build-out of the development (See Figure A-2, Boxes C and D, Appendix A).

4 INTERSECTION OPERATIONAL ANALYSIS

Intersection capacity analysis was completed to estimate how intersections may be expected to operate into the future without and with site generated trips. This section of the report addresses how left-turn lane warrants and traffic signal warrants were conducted and how each intersection was evaluated. The following subsections identify each study intersection and summarize the results of the operational analysis.

Left-Turn Lane Warrant Analysis

Left-turn movements on a two-lane street may cause both operational and safety problems. Operational problems result as a vehicle stopped waiting for an opportunity to turn across ‘heavy’ opposing traffic causes a queue of stopped vehicles to form. Safety problems result from rear end collisions when a stopped left-turning vehicle is struck by an advancing vehicle, or from head-on or right-angle collisions when a left-turning vehicle is struck by an opposing vehicle.

The *Geometric Design Standards for Ontario Highways Manual* contains nomographs for left-turn lane analysis for two lane streets at unsignalized intersections. The analysis method, which is normally used by WSP Atlantic to evaluate the warrant for left-turn lanes, uses a series of nomographs that consider speed, advancing volumes, left-turns as a percentage of advancing volumes, and opposing volumes. A point, based on ‘opposing’ and ‘advancing’ volumes, plotted to the right of the ‘warrant line’ of the appropriate ‘% left-turns’ and ‘approach speed’ nomograph, indicates that a left-turn lane is warranted for the conditions used in the analysis. Similarly, a point that is plotted to the left of the warrant line indicates that a left-turn lane is not warranted.

Left-turn lane analyses have been completed for site access intersections using projected 2030 peak hourly volumes without and with site generated trips and are illustrated in Figure B-1, Appendix B. Warrant results indicate that:

- A left-turn lane is not warranted in 2030 at the west access (Access 1) in 2030 without and with site generated trips; and,
- A left-turn lane is warranted at the east access (Access 2) in 2030 without and with site generated trips.

Right-Turn Lane Warrant Analysis

Operational problems may result at an intersection where a ‘high’ number of vehicles slow to make a right turn into a site. The *Ohio Department of Transportation State Highway Access Management Manual* contains nomographs for evaluating right turn lane warrants on two lane roads. The analysis is based on right turning and advancing volumes.

The right turn lane warrant evaluation included in Figure B-2, Appendix B, indicates:

- A right-turn lane is warranted on Trunk 7 at the west access (Access 1) in 2030 with site generated trips; and,
- A right-turn lane is not warranted on Trunk 7 at the east access (Access 2) in 2030 without and with site generated trips.

The volumes in this area should be reviewed periodically to determine when a right turn lane is warranted at the west access. These 2030 total traffic trip projections assume that the new supermarket is open and operating and that the existing grocery store is fully redeveloped.

Turn Lane Concept Sketch

A westbound left turn lane at the east access (Access 2) and an eastbound right turn lane at the west access (Access 1) could be provided by modifying the pavement markings along Trunk 7 similar to the concept sketch Shown in Figure 4.

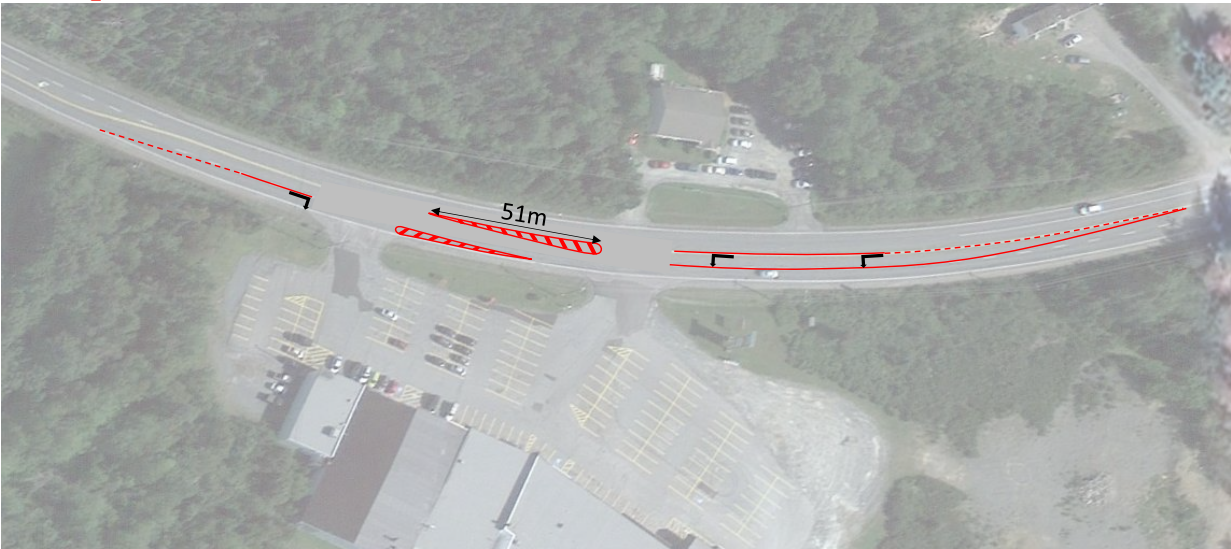


Figure 4 – Concept for Added Left Turn and Right Turn Lanes

Traffic Signal Warrant Analysis

A signal warrant analysis is completed to determine if the installation of traffic signals at an intersection will provide a positive impact on total intersection operation. That is, the benefits in time saved and improved safety that will accrue to vehicles entering from a side street will exceed the impact that signals will have in time lost and potential additional collisions for vehicles approaching the intersection on the main street.

The *Canadian Traffic Signal Warrant Matrix Analysis (Transportation Association of Canada (TAC), 2005)* considers 100 warrant points as an indication that traffic signals will provide a positive impact. Signal warrant analysis uses vehicular and pedestrian volumes, and intersection, roadway and study area characteristics to calculate a warrant point value.

Evaluation of traffic signal warrants were completed for appropriate intersections using 2030 background volumes with site generated trips. Signal warrant analysis sheets are included in Tables B-1 and B-2, Appendix B and indicate that traffic signals are not warranted at either site access intersection without or with the addition of site generated trips.

Intersection Capacity Analysis Results

Synchro 11 software has been used for performance evaluation of the Study Intersections under STOP or signal control. *Sidra Intersection 6.1* has been used for performance evaluation of the Study Intersections that have been analyzed as roundabouts. Summaries of the results are provided in the following sub-sections and detailed results of the analyses are included in Appendix C.

Intersection Level of Service Analysis

The level or quality of performance of an intersection in terms of traffic movement is determined by a level of service (LOS) analysis. LOS for intersections is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and increased travel time.

LOS criteria, as shown in Table 2, are stated in terms of average control delay per vehicle which includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.



Table 2 – Level of Service Criteria

LOS Description	Roundabouts and Two Way Stop Controlled (TWSC) Intersections Control Delay (Seconds per Vehicle)
Very low delay; most vehicles do not stop (Excellent)	Less than 10.0
Higher delay; most vehicles stop (Very Good)	Between 10.0 and 15.0
Higher level of congestion; number of vehicles stopping is significant, although many still pass through intersection without stopping (Good)	Between 15.0 and 25.0
Congestion becomes noticeable; vehicles must sometimes wait through more than one red light; many vehicles stop (Satisfactory)	Between 25.0 and 35.0
Vehicles must often wait through more than one red light; considered by many agencies to be the limit of acceptable delay	Between 35.0 and 50.0
This level is considered to be unacceptable to most drivers; occurs when arrival flow rates exceed the capacity of the intersection (Unacceptable)	Greater than 50.0

4.1 ANALYSIS SCENARIOS

**Summary
Analysis
Scenarios
Considered**

Scenario 1 – 2030 Background trips without proposed development: Represents 2030 weekday AM and PM peak hourly background traffic volumes (Figure A-1, Boxes C and D, Appendix A). The analysis uses the existing traffic control and lane configurations at the Study Intersections with the exception of the warranted westbound left-turn lane on Trunk 7 at Access #2.

Scenario 2 – 2030 Total Traffic with proposed development: Represents 2030 weekday AM and PM peak hourly volumes with the addition of trips generated by the proposed development (Figure A-2, Boxes A and B, Appendix A). The analysis uses the existing traffic control and lane configurations at the Study Intersections with the exception of the warranted westbound left-turn lane on Trunk 7 at Access #2.

4.2 NOVA SCOTIA TRUNK 7 AT SITE ACCESS #1

Operational performance results for this intersection are provided in Table 3 for both the AM and PM peak hours.

All movements during the AM and PM peak periods are expected to operate within NSPW Guidelines in 2030 without and with site development.

Table 3 - Intersection Capacity Analysis: Nova Scotia Trunk 7 – Site Access #1

LOS Criteria	Control Delay (sec/veh), Level of Service (LOS), Volume to Capacity (v/c, 95% Queue (m) by Intersection Movement			Overall Intersection	
	NS Trunk Highway 7		Site Access #1		
	EB-TTR	WB-LT	NB-LR	Delay	LOS
Scenario 1 - 2030 AM Peak Hour Background Trips Without Site Development (Page C-1)					
Control Delay	0.0	0.0	11.5	0.3	A
LOS	A	A	B		
V/C	0.04	0.19	0.02		
95% Queue	0.0	0.0	0.5		
Scenario 2 - 2030 AM Peak Hour Total Traffic with Site Generated Trips (Page C-5)					
Control Delay	0.0	0.0	11.8	0.3	A
LOS	A	A	B		
V/C	0.05	0.20	0.02		
95% Queue	0.0	0.0	0.5		
Scenario 1 - 2030 PM Peak Hour Background Trips Without Site Development (Page C-3)					
Control Delay	0.0	0.0	13.8	1.1	A
LOS	A	A	B		
V/C	0.15	0.20	0.13		
95% Queue	0.0	0.0	3.5		
Scenario 2 - 2030 PM Peak Hour Total Traffic with Site Generated Trips (Page C-7)					
Control Delay	0.0	0.0	14.9	1.1	A
LOS	A	A	B		
V/C	0.16	0.23	0.15		
95% Queue	0.0	0.0	4.1		

4.3 NOVA SCOTIA TRUNK 7 AT SITE ACCESS #2

Operational performance results for this intersection are provided in Table 4 for both the AM and PM peak hours.

All movements during the AM and PM peak periods are expected to operate within NSPW Guidelines in 2030 without and with site development.

Table 4 - Intersection Capacity Analysis: Nova Scotia Trunk 7 – Site Access #2

LOS Criteria	Control Delay (sec/veh), Level of Service (LOS), Volume to Capacity (v/c, 95% Queue (m) by Intersection Movement				Overall Intersection	
	NS Trunk Highway 7			Site Access #1	Delay	LOS
	EB-TTR	WB-L	WB-T	NB-LR		
Scenario 1 - 2030 AM Peak Hour Background Trips Without Site Development (Page C-2)						
Control Delay	0.0	7.5	0.0	9.8	0.8	A
LOS	A	A	A	A		
V/C	0.04	0.02	0.16	0.02		
95% Queue	0.0	0.5	0.0	0.5		
Scenario 2 - 2030 AM Peak Hour Total Traffic with Site Generated Trips (Page C-6)						
Control Delay	0.0	7.6	0.0	10.6	1.4	A
LOS	A	A	A	B		
V/C	0.04	0.03	0.16	0.05		
95% Queue	0.0	0.7	0.0	1.3		
Scenario 1 - 2030 PM Peak Hour Background Trips Without Site Development (Page C-4)						
Control Delay	0.0	8.5	0.0	13.0	2.7	A
LOS	A	A	A	B		
V/C	0.13	0.06	0.10	0.22		
95% Queue	0.0	1.5	0.0	6.6		
Scenario 2 - 2030 PM Peak Hour Total Traffic with Site Generated Trips (Page C-8)						
Control Delay	0.0	8.7	0.0	17.3	4.5	A
LOS	A	A	A	C		
V/C	0.14	0.09	0.10	0.41		
95% Queue	0.0	2.3	0.0	15.6		



5 SUMMARY & RECOMMENDATIONS

5.1 SUMMARY

Background	1. WSP is preparing plans for a new supermarket in the Head of Jeddore area. The construction and opening of the new store is expected by 2025.
Description of the Proposed Development	2. The concept for the development includes a total of 15,780 square feet of commercial development (supermarket).
Proposed Site Access	3. The new development will access Nova Scotia Trunk Highway 7 via the two existing driveway connections. Both connections are currently STOP controlled.
Turning Movement Counts	4. Weekday AM and PM peak hour turning movement counts were collected by WSP at both site access intersections on April 19, 2023.
Background Traffic Volumes	5. The 2023 traffic volumes have been increased by a 1.06 seasonal adjustment factor and a 1.5% annual growth rate to forecast the 2030 AM and PM peak hourly future background traffic volumes.
Estimation of Proposed Development Trips	6. Trip generation estimates for the proposed development were prepared using rates published in <i>Trip Generation, 11th Edition</i> (Institute of Transportation Engineers, Washington, 2021). 7. During the AM peak hour, it is estimated that the development will generate: <ul style="list-style-type: none">• 46 two-way primary vehicle trips (27 entering and 19 exiting); and,• 0 pass-by vehicle trips. 8. During the PM peak hour, it is estimated that the development will generate: <ul style="list-style-type: none">• 100 two-way primary vehicle trips (50 entering and 50 exiting); and,• 42 two-way pass-by vehicle trips (21 entering and 21 exiting).
Trip Distribution and Assignment	9. Primary vehicle trips generated by the development were assigned to the Study Intersections based on counted volumes and local knowledge of the area considering major trip origins and destinations in the region. Trips generated during the AM peak hour were distributed to the east (50%) and west (50%). Trips generated during the PM peak hour were distributed to the east (40%) and west (60%). 10. Pass-by vehicle trips generated by the development have been assigned to study area intersections based on existing traffic flow along Trunk 7.
Warrant Analysis Summary	11. Warrant reviews were completed for left-turn and right-turn lanes and traffic signals with the projected traffic volumes. 12. It was determined that a left-turn lane is warranted along Trunk 7 at the eastmost access (Access #2) without and with site development. A left turn lane is not expected to be warranted at Access #1. 13. It was determined that a right-turn lane is slightly warranted along Trunk 7 at the westmost access (Access #1) with site development. A right turn lane is not expected to be warranted at Access #2.

Warrant Analysis Summary (Cont)	14. Traffic signalization is not expected to be warranted at either of the site access intersections with Trunk 7 without or with site development.
Analysis Scenarios Considered	<p>15. Scenario 1 – 2030 Background trips without proposed development: Represents the 2030 weekday AM and PM peak hourly future background volumes at the existing site accesses.</p> <p>16. Scenario 2 – 2030 with proposed development: Represent a future 2030 weekday AM and PM peak hourly volumes with the addition of site generated trips.</p>
Summary – Intersection Capacity Analysis	<p>17. Intersection performance analysis was completed using <i>Synchro 11</i> at the Study Intersections.</p> <p>18. The Site Access #1 intersection with Trunk 7 is expected to operate within NSPW Guidelines during the 2030 weekday AM and PM peak periods without and with the development of the new Supermarket.</p> <p>19. The Site Access #2 intersection with Trunk 7 is expected to operate within NSPW Guidelines during the 2030 weekday AM and PM peak periods without and with the development of the new Supermarket.</p>

5.2 RECOMMENDATIONS

Recommendations	<p>20. Install a westbound left turn lane along Trunk 7 at the east site access (Access 2) which was found to be warranted in 2030 without site generated trips.</p> <p>21. Monitor the volumes in this area to determine when an eastbound right turn lane is warranted on Trunk 7 at the west site access (Access 1) which was found to be warranted in 2030 with site generated trips. These trip projections assume that the new supermarket is open and operating and that the existing supermarket is fully redeveloped.</p>
------------------------	--

5.3 CONCLUSION

Conclusion	22. With implementation of recommended upgrades, site generated trips are not expected to have a significant impact to traffic performance in the study area.
-------------------	---

APPENDIX

A

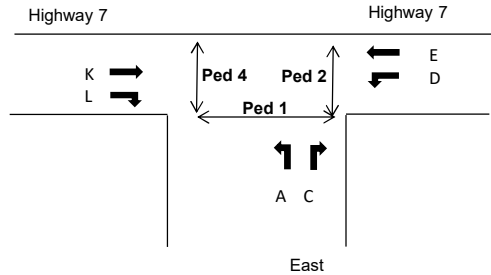
TRAFFIC VOLUME DATA

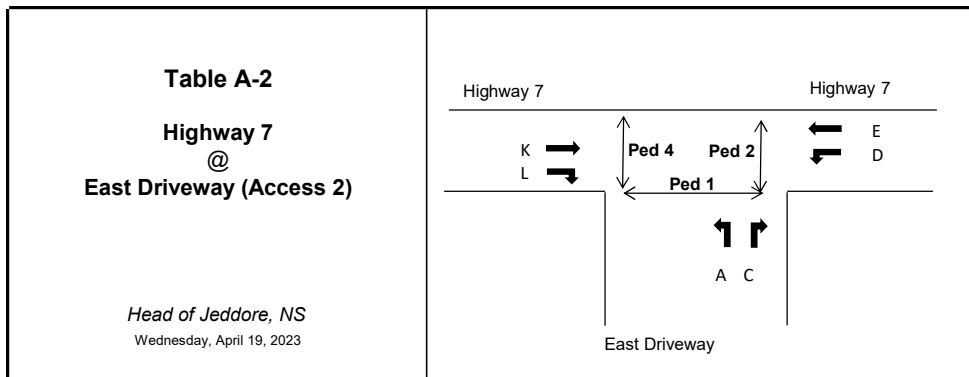


Time		West Driveway (Access 1) Northbound Approach		Highway 7 Westbound Approach		Highway 7 Eastbound Approach		Total Vehicles
		A	C	D	E	K	L	
07:00	07:15	0	0	0	64	18	0	82
07:15	07:30	0	0	0	50	32	3	85
07:30	07:45	1	0	0	56	27	1	85
07:45	08:00	1	0	1	56	27	3	88
08:00	08:15	3	1	0	44	30	4	82
08:15	08:30	2	0	0	57	22	4	85
08:30	08:45	4	0	0	45	29	2	80
08:45	09:00	0	0	0	49	37	3	89
AM Peak Hour		7	1	1	213	106	12	340
07:00	08:00	2	0	1	226	104	7	340
08:00	09:00	9	1	0	195	118	13	336
		Ped 1		Ped 2		Ped 4		Total Peds
07:00	08:00	0		0		0		0
08:00	09:00	0		0		0		0
Midday Peak Period Volume Data								
Time		West Driveway (Access 1) Northbound Approach		Highway 7 Westbound Approach		Highway 7 Eastbound Approach		Total Vehicles
		A	C	D	E	K	L	
11:30	11:45	4	1	1	29	44	6	85
11:45	12:00	7	2	1	45	38	11	104
12:00	12:15	4	0	0	36	51	11	102
12:15	12:30	9	0	1	42	50	20	122
12:30	12:45	6	4	0	25	49	13	97
12:45	13:00	4	2	0	36	41	13	96
13:00	13:15	8	1	0	34	39	9	91
13:15	13:30	4	0	0	45	24	7	80
Midday Peak Hour		26	6	2	148	188	55	425
11:30	12:30	24	3	3	152	183	48	413
12:30	13:30	22	7	0	140	153	42	364
		Ped 1		Ped 2		Ped 4		Total Peds
11:30	12:30	0		0		0		0
12:30	13:30	0		0		0		0
PM Peak Period Volume Data								
Time		West Driveway (Access 1) Northbound Approach		Highway 7 Westbound Approach		Highway 7 Eastbound Approach		Total Vehicles
		A	C	D	E	K	L	
16:00	16:15	7	4	0	45	84	16	156
16:15	16:30	4	3	0	43	72	13	135
16:30	16:45	7	5	0	47	99	15	173
16:45	17:00	10	3	1	27	85	20	146
17:00	17:15	6	1	0	48	71	11	137
17:15	17:30	4	1	0	40	81	13	139
17:30	17:45	1	4	1	35	54	13	108
17:45	18:00	0	1	0	43	78	17	139
PM Peak Hour		28	15	1	162	340	64	610
16:00	17:00	28	15	1	162	340	64	610
17:00	18:00	11	7	1	166	284	54	523
		Ped 1		Ped 2		Ped 4		Total Peds
16:00	17:00	0		0		0		0
17:00	18:00	0		0		0		0

Table A-1
Highway 7
@
West Driveway (Access 1)

Head of Jeddore, NS
Wednesday, April 19, 2023





AM Peak Period Volume Data

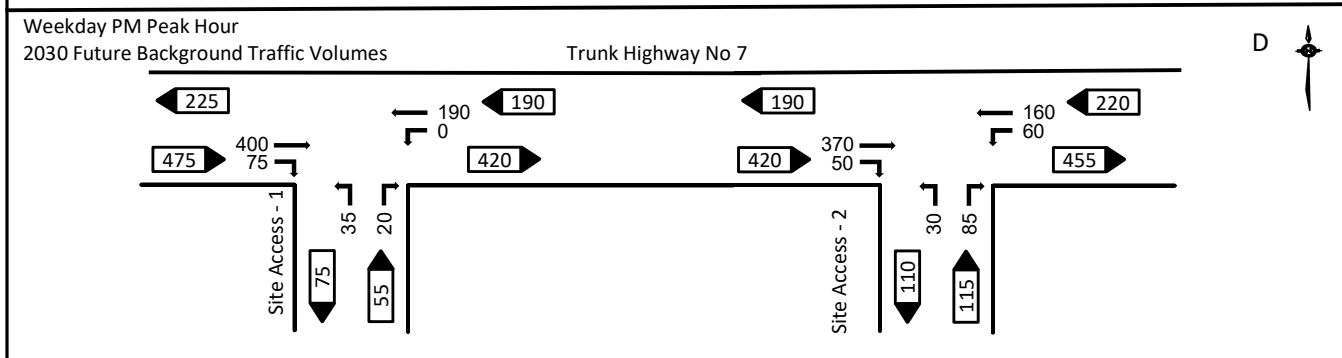
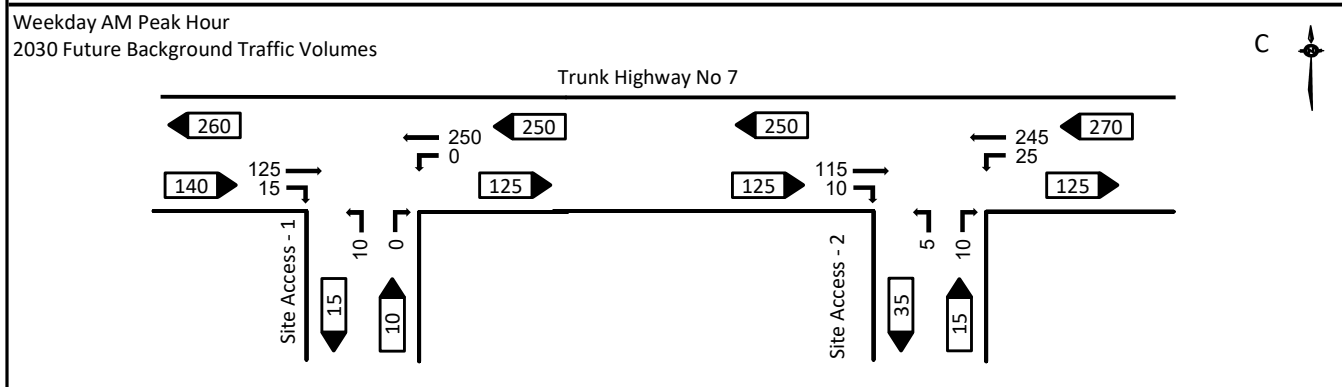
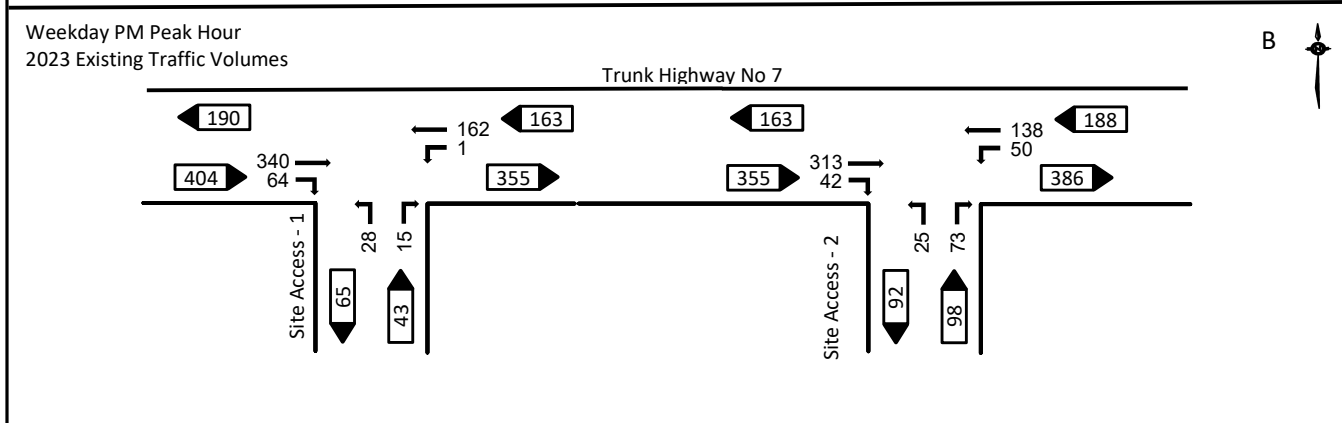
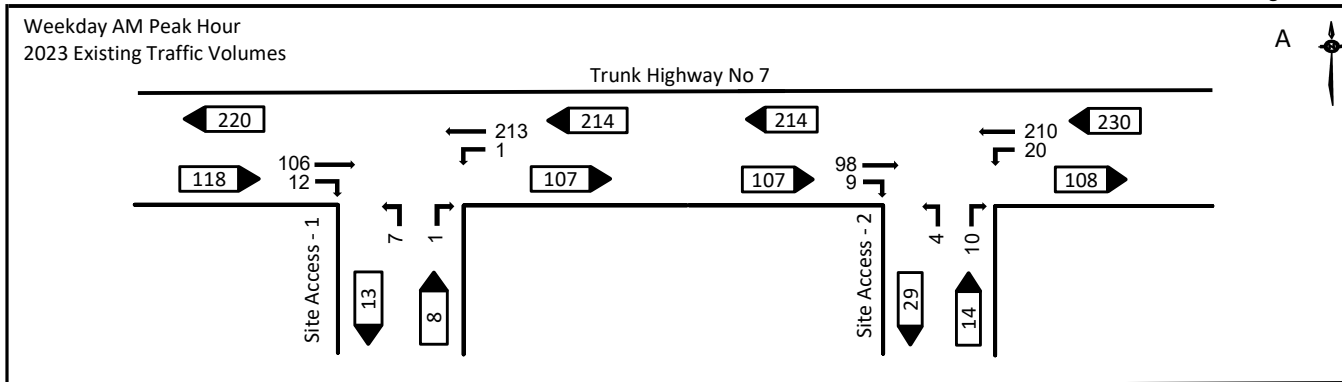
Time	East Driveway (Access 2)		Highway 7		Highway 7		Total Vehicles
	Northbound Approach		Westbound Approach		Eastbound Approach		
	A	C	D	E	K	L	
07:00 - 07:15	0	0	3	64	18	0	85
07:15 - 07:30	0	0	4	50	29	3	86
07:30 - 07:45	2	3	4	54	26	1	90
07:45 - 08:00	1	0	5	56	27	0	89
08:00 - 08:15	0	2	4	44	25	6	81
08:15 - 08:30	1	5	7	56	20	2	91
08:30 - 08:45	2	7	3	43	29	0	84
08:45 - 09:00	2	3	5	47	33	4	94
AM Peak Hour	4	10	20	210	98	9	351
07:00 - 08:00	3	3	16	224	100	4	350
08:00 - 09:00	5	17	19	190	107	12	350
	Ped 1		Ped 2		Ped 4		Total Peds
07:00 - 08:00	0		0		0		0
08:00 - 09:00	0		0		0		0


Midday Peak Period Volume Data

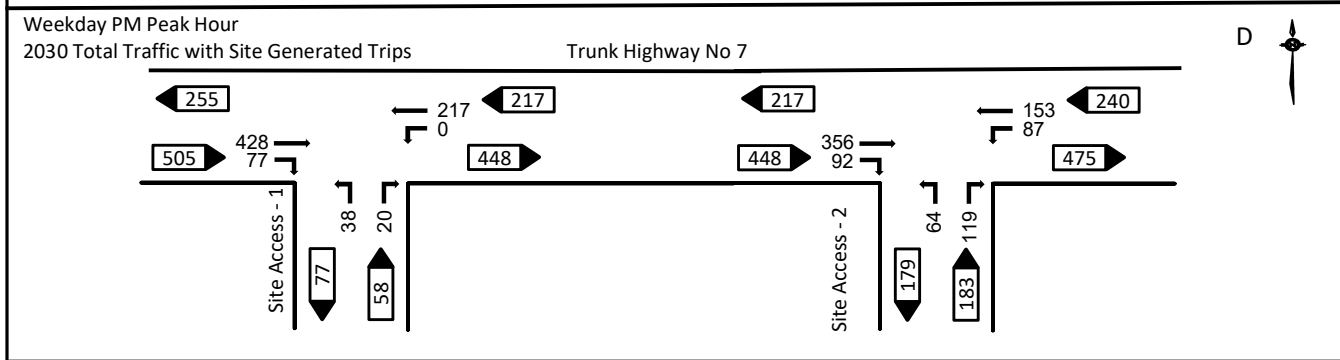
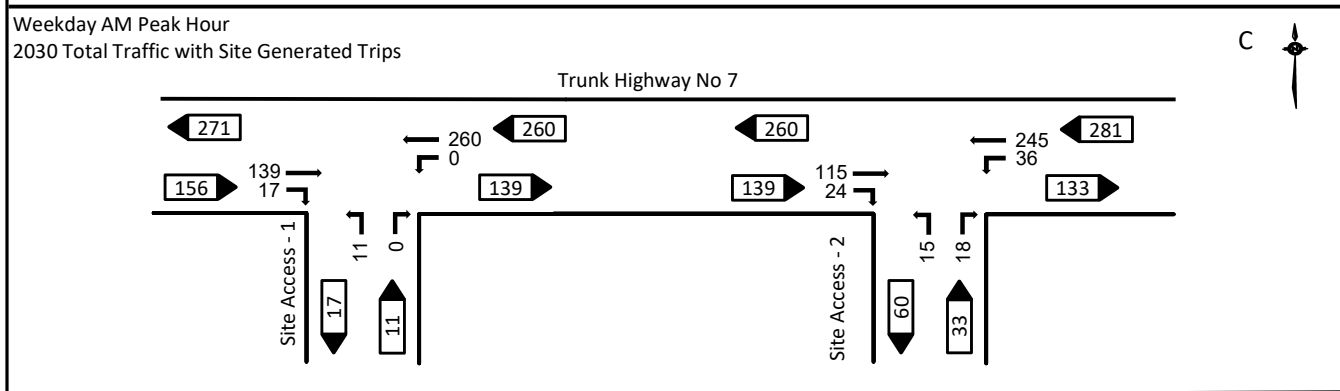
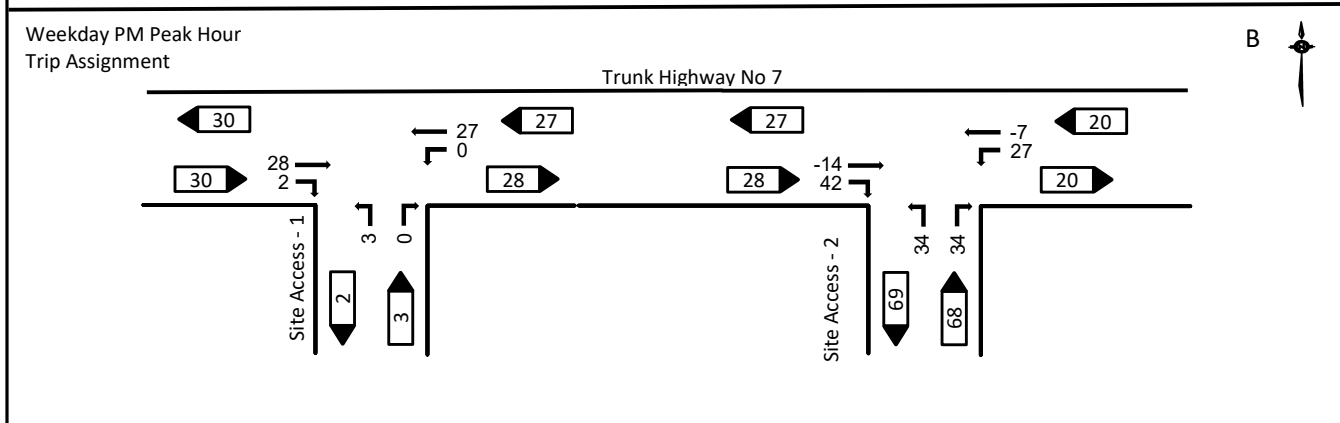
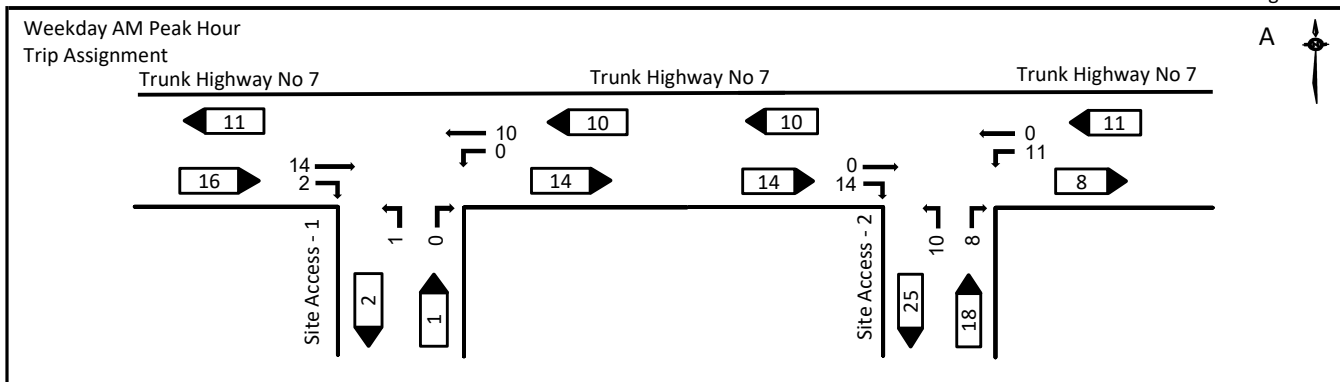
Time	East Driveway (Access 2)		Highway 7		Highway 7		Total Vehicles
	Northbound Approach		Westbound Approach		Eastbound Approach		
	A	C	D	E	K	L	
11:30 - 11:45	5	8	11	25	38	7	94
11:45 - 12:00	6	9	9	40	37	3	104
12:00 - 12:15	6	8	10	30	49	2	105
12:15 - 12:30	4	14	11	39	44	6	118
12:30 - 12:45	3	15	7	22	47	6	100
12:45 - 13:00	7	19	12	29	42	1	110
13:00 - 13:15	5	14	6	29	39	1	94
13:15 - 13:30	13	7	11	32	19	5	87
Midday Peak Hour	20	56	40	120	182	15	433
11:30 - 12:30	21	39	41	134	168	18	421
12:30 - 13:30	28	55	36	112	147	13	391
	Ped 1		Ped 2		Ped 4		Total Peds
11:30 - 12:30	0		0		0		0
12:30 - 13:30	0		0		0		0


PM Peak Period Volume Data

Time	East Driveway (Access 2)		Highway 7		Highway 7		Total Vehicles
	Northbound Approach		Westbound Approach		Eastbound Approach		
	A	C	D	E	K	L	
16:00 - 16:15	9	16	15	36	76	12	164
16:15 - 16:30	6	17	7	37	66	9	142
16:30 - 16:45	4	20	18	43	93	11	189
16:45 - 17:00	6	20	10	22	78	10	146
17:00 - 17:15	12	16	12	36	66	6	148
17:15 - 17:30	10	20	4	30	74	8	146
17:30 - 17:45	5	14	7	31	56	2	115
17:45 - 18:00	10	18	14	33	72	7	154
PM Peak Hour	25	73	50	138	313	42	641
16:00 - 17:00	25	73	50	138	313	42	641
17:00 - 18:00	37	68	37	130	268	23	563
	Ped 1		Ped 2		Ped 4		Total Peds
16:00 - 17:00	0		2		0		2
17:00 - 18:00	0		0		0		0



	Jeddore Supermarket - 8990 Highway 7 in Head of Jeddore, NS Head of Jeddore, NS	Figure A-1
	2023 Existing Traffic Volumes and 2030 Future Background Traffic Volumes	May 2023



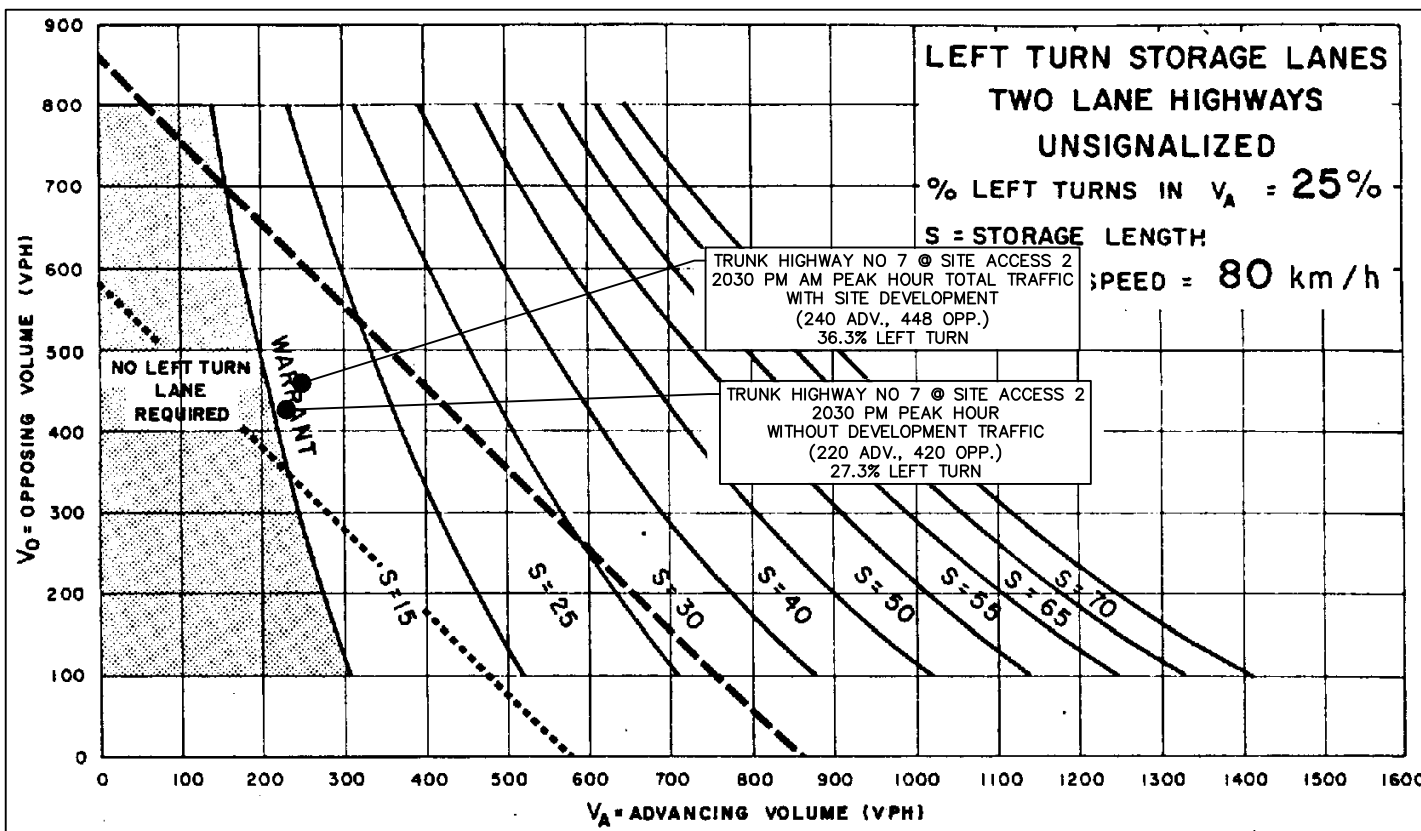
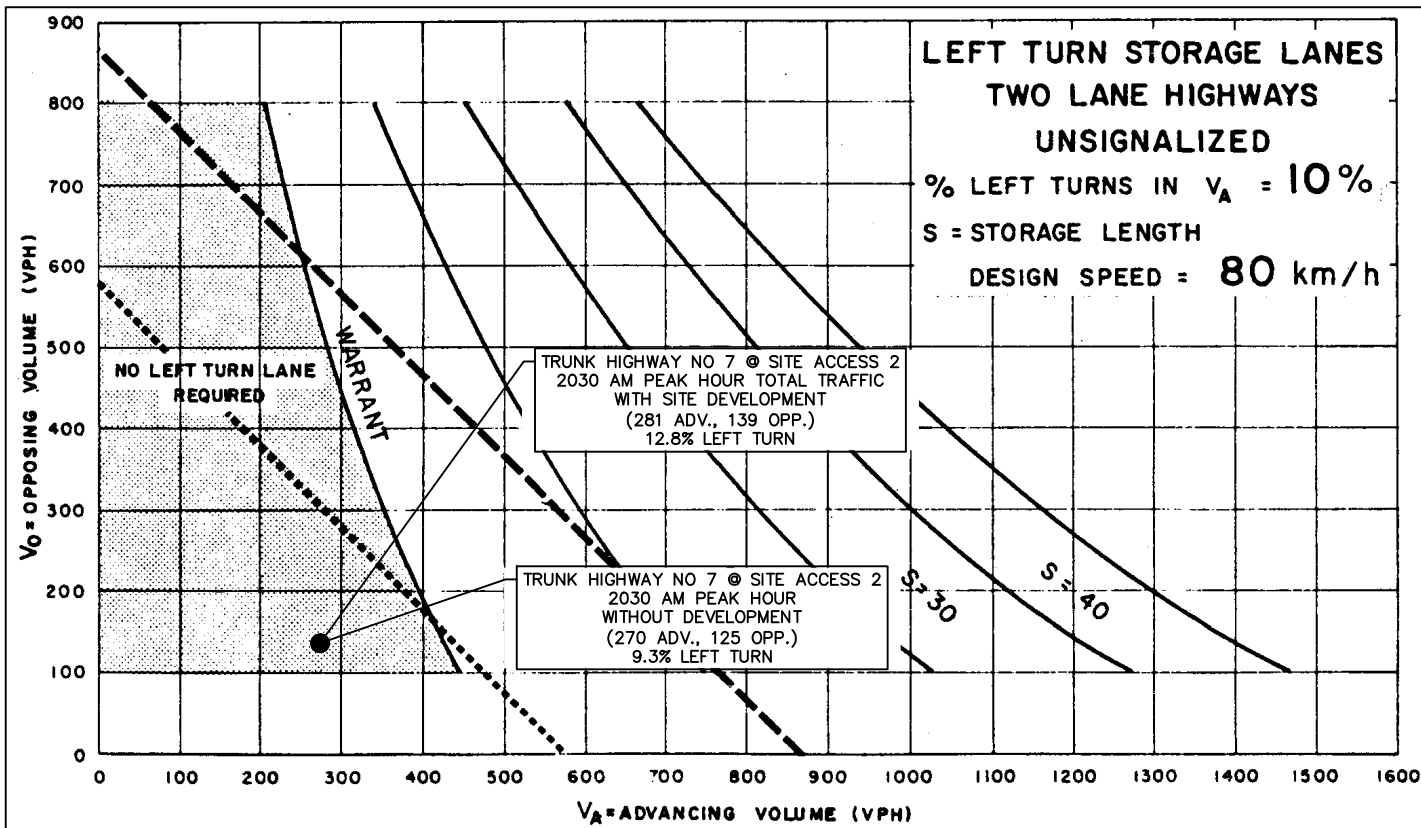
	Jeddore Supermarket - 8990 Highway 7 in Head of Jeddore, NS. Head of Jeddore, NS	Figure A-2
	Trip Assignment and 2030 Total Traffic Volumes with Site Generated Trips	May 2023

APPENDIX

B

WARRANT ANALYSIS





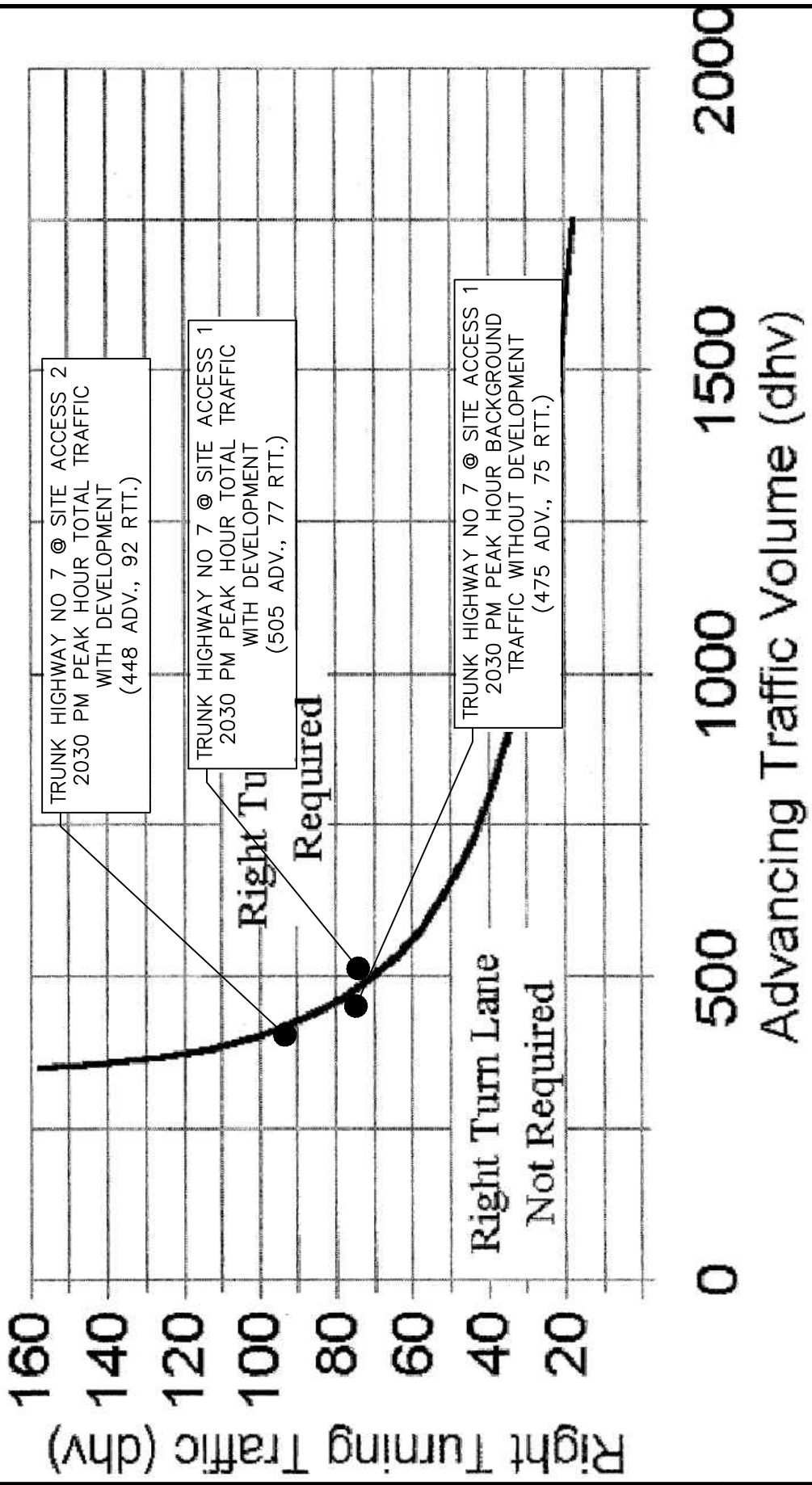
Jeddore - Supermarket TIS
Head of Jeddore, NS

Figure B-1

Left Turn Lane Warrants - Jeddore Sobseys Site Access Connections

May 2023

4 Lane Highway Right Turn Lane Warrant (>40 mph or 70 kph Posted Speed)



Jeddore - Supermarket TIS
Head of Jeddore, NS

Figure B-2

Right Turn Lane Warrants - Jeddore Sobeyes Site Access Connections

May 2023

2005 Canadian Traffic Signal Warrant Matrix Analysis

Table B-1 - Trunk 7 at Access #1
2030 Total Traffic with Site Generated Trips

Main Street (name)	Trunk 7	Direction (EW or NS)	EW	Date:	May 2023
Side Street (name)	Access #1	Direction (EW or NS)	NS	City:	Head of Jeddore

Lane Configuration		Excl LT	Th & LT	Through or Th+RT+LT	Th & RT	Excl RT	Upstream Signal (m)	# of Thru Lanes
Trunk 7	WB		1					1
Trunk 7	EB			1	1			
Access #1	NB			1				
N/A	SB							

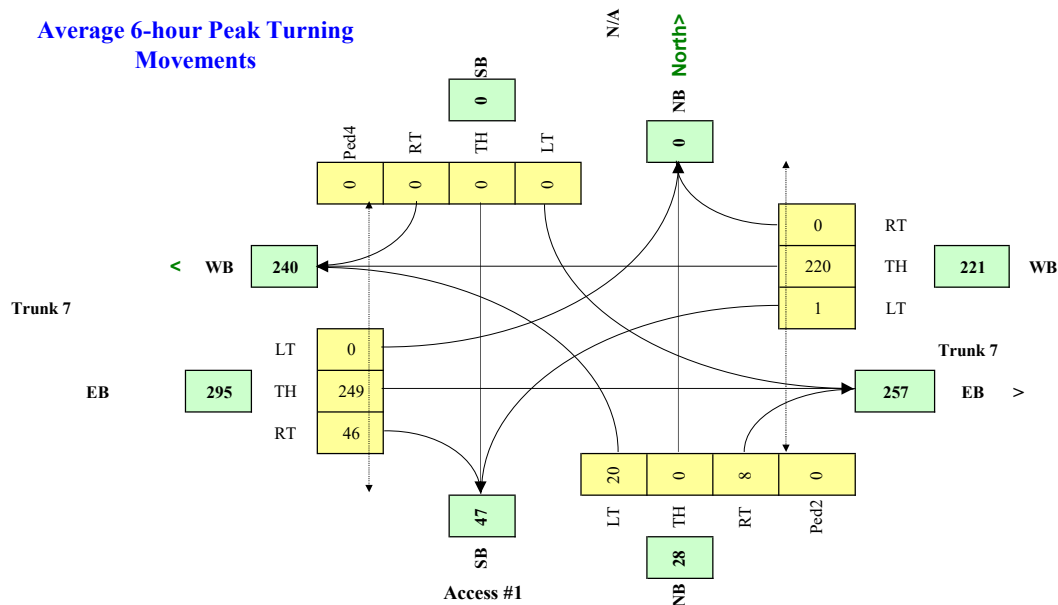
Other input		Speed (Km/h)	Trucks % (y/n)	Bus Rt (y/n)	Median (m)
Trunk 7	EW	70	2.0%	n	0.0
Access #1	NS	50	2.0%	n	

	Ped4 NS W Side	Ped2 NS E Side	Ped3 EW N Side	Ped1 EW S side
7:00 - 8:00				
8:00 - 9:00				
11:00 - 12:00				
12:00 - 13:00				
15:00 - 16:00				
16:00 - 17:00				
Total (6-hour peak)	0	0	0	0
Average (6-hour peak)	0	0	0	0

Demographics		
Elementary School	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	450,000
Central Business District	(y/n)	n

Traffic Input	NB			SB			WB			EB		
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT
7:00 - 8:00	5	0	0	0	0	0	0	275	0	0	135	10
8:00 - 9:00	10	0	0	0	0	0	0	235	0	0	150	15
11:00 - 12:00	30	0	5	0	0	0	5	195	0	0	230	60
12:00 - 13:00	25	0	10	0	0	0	0	180	0	0	195	50
15:00 - 16:00	35	0	20	0	0	0	0	215	0	0	425	75
16:00 - 17:00	15	0	10	0	0	0	0	220	0	0	360	65
Total (6-hour peak)	120	0	45	0	0	0	5	1,320	0	0	1,495	275
Average (6-hour peak)	20	0	8	0	0	0	1	220	0	0	249	46

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v-v}) / K_1 + (F(X_{v-p})L) / K_2] \times C_i$$

W =	6	6	0
		Veh	Ped
Not Warranted - Vs < 75			

2005 Canadian Traffic Signal Warrant Matrix Analysis

Table B-2 - Trunk 7 at Access #2
2030 Total Traffic with Site Generated Trips

Main Street (name)	Trunk 7	Direction (EW or NS)	EW	Date:	May 2023
Side Street (name)	Access #2	Direction (EW or NS)	NS	City:	Head of Jeddore

Lane Configuration		Excl LT	Th & LT	Through or Th+RT+LT	Th & RT	Excl RT	Upstream Signal (m)	# of Thru Lanes
Trunk 7	WB	1		1				1
Trunk 7	EB			1	1			
Access #2	NB			1				
N/A	SB							

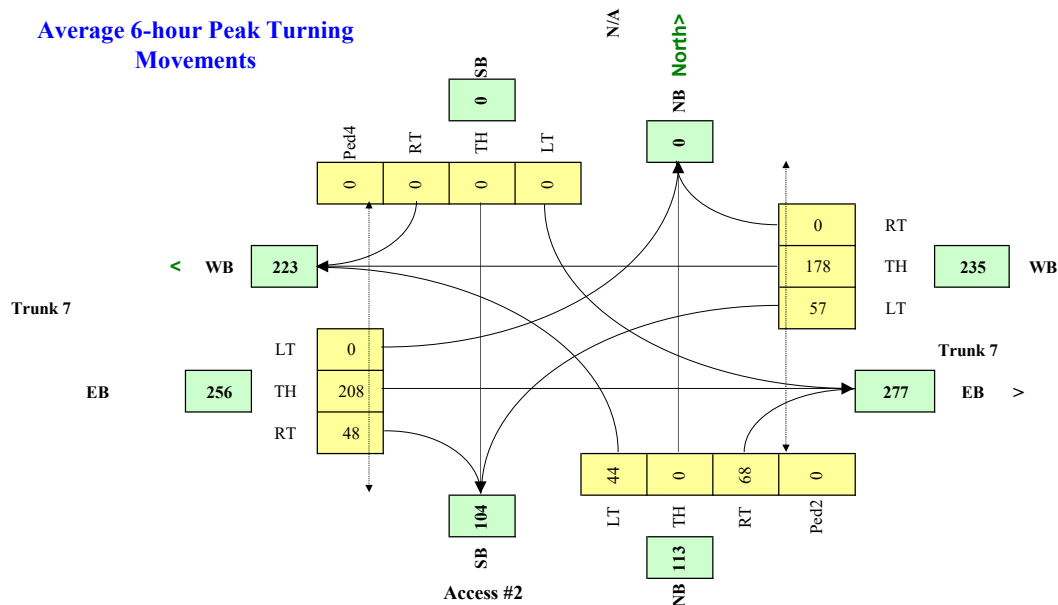
Other input		Speed (Km/h)	Trucks %	Bus Rt (y/n)	Median (m)
Trunk 7	EW	70	2.0%	n	0.0
Access #2	NS	50	2.0%	n	

	Ped4 NS W Side	Ped2 NS E Side	Ped3 EW N Side	Ped1 EW S side
7:00 - 8:00	0	0	0	0
8:00 - 9:00	0	0	0	0
11:00 - 12:00	0	0	0	0
12:00 - 13:00	0	0	0	0
15:00 - 16:00	0	2	0	0
16:00 - 17:00	0	0	0	0
Total (6-hour peak)	0	2	0	0
Average (6-hour peak)	0	0	0	0

Demographics		
Elementary School	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	450,000
Central Business District	(y/n)	n

Traffic Input	NB			SB			WB			EB		
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT
7:00 - 8:00	15	0	10	0	0	0	30	260	0	0	115	20
8:00 - 9:00	15	0	25	0	0	0	30	225	0	0	125	25
11:00 - 12:00	45	0	65	0	0	0	65	155	0	0	190	45
12:00 - 13:00	50	0	80	0	0	0	60	130	0	0	165	40
15:00 - 16:00	65	0	120	0	0	0	85	155	0	0	355	90
16:00 - 17:00	75	0	110	0	0	0	70	145	0	0	300	65
Total (6-hour peak)	265	0	410	0	0	0	340	1,070	0	0	1,250	285
Average (6-hour peak)	44	0	68	0	0	0	57	178	0	0	208	48

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v-v}) / K_1 + (F(X_{v-p})L) / K_2] \times C_i$$

W =	21	20	1
		Veh	Ped
NOT Warranted			

APPENDIX

C

INTERSECTION PERFORMANCE ANALYSIS





Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑	↑↑	
Traffic Volume (veh/h)	125	15	0	250	10	0
Future Volume (Veh/h)	125	15	0	250	10	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	136	16	0	272	11	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			152		416	76
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			152		416	76
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	100
cM capacity (veh/h)			1426		565	970
Direction, Lane #	EB 1	EB 2	WB 1	NB 1		
Volume Total	91	61	272	11		
Volume Left	0	0	0	11		
Volume Right	0	16	0	0		
cSH	1700	1700	1426	565		
Volume to Capacity	0.05	0.04	0.00	0.02		
Queue Length 95th (m)	0.0	0.0	0.0	0.5		
Control Delay (s)	0.0	0.0	0.0	11.5		
Lane LOS					B	
Approach Delay (s)	0.0		0.0	11.5		
Approach LOS					B	
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			23.2%	ICU Level of Service	A	
Analysis Period (min)			15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑	↘	
Traffic Volume (veh/h)	115	10	25	245	5	10
Future Volume (Veh/h)	115	10	25	245	5	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	125	11	27	266	5	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			136		450	68
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			136		450	68
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		99	99
cM capacity (veh/h)			1446		527	981
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	83	53	27	266	16	
Volume Left	0	0	27	0	5	
Volume Right	0	11	0	0	11	
cSH	1700	1700	1446	1700	773	
Volume to Capacity	0.05	0.03	0.02	0.16	0.02	
Queue Length 95th (m)	0.0	0.0	0.5	0.0	0.5	
Control Delay (s)	0.0	0.0	7.5	0.0	9.8	
Lane LOS			A			A
Approach Delay (s)	0.0	0.7		9.8		
Approach LOS					A	
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			22.9%	ICU Level of Service	A	
Analysis Period (min)			15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑	↑↑	
Traffic Volume (veh/h)	400	70	0	190	35	20
Future Volume (Veh/h)	400	70	0	190	35	20
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	435	76	0	207	38	22
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			511		680	256
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			511		680	256
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		90	97
cM capacity (veh/h)			1050		385	744
Direction, Lane #	EB 1	EB 2	WB 1	NB 1		
Volume Total	290	221	207	60		
Volume Left	0	0	0	38		
Volume Right	0	76	0	22		
cSH	1700	1700	1050	467		
Volume to Capacity	0.17	0.13	0.00	0.13		
Queue Length 95th (m)	0.0	0.0	0.0	3.5		
Control Delay (s)	0.0	0.0	0.0	13.8		
Lane LOS					B	
Approach Delay (s)	0.0		0.0	13.8		
Approach LOS					B	
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			23.3%	ICU Level of Service	A	
Analysis Period (min)			15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑	↘	
Traffic Volume (veh/h)	370	50	60	160	30	85
Future Volume (Veh/h)	370	50	60	160	30	85
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	402	54	65	174	33	92
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			456		733	228
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			456		733	228
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		90	88
cM capacity (veh/h)			1101		335	775
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	268	188	65	174	125	
Volume Left	0	0	65	0	33	
Volume Right	0	54	0	0	92	
cSH	1700	1700	1101	1700	575	
Volume to Capacity	0.16	0.11	0.06	0.10	0.22	
Queue Length 95th (m)	0.0	0.0	1.5	0.0	6.6	
Control Delay (s)	0.0	0.0	8.5	0.0	13.0	
Lane LOS			A	B		
Approach Delay (s)	0.0		2.3		13.0	
Approach LOS					B	
Intersection Summary						
Average Delay			2.7			
Intersection Capacity Utilization			32.1%	ICU Level of Service	A	
Analysis Period (min)			15			

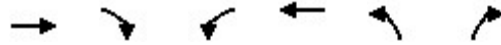


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑	↑↑	
Traffic Volume (veh/h)	139	17	0	260	11	0
Future Volume (Veh/h)	139	17	0	260	11	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	151	18	0	283	12	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			169		443	84
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			169		443	84
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	100
cM capacity (veh/h)			1406		543	958
Direction, Lane #	EB 1	EB 2	WB 1	NB 1		
Volume Total	101	68	283	12		
Volume Left	0	0	0	12		
Volume Right	0	18	0	0		
cSH	1700	1700	1406	543		
Volume to Capacity	0.06	0.04	0.00	0.02		
Queue Length 95th (m)	0.0	0.0	0.0	0.5		
Control Delay (s)	0.0	0.0	0.0	11.8		
Lane LOS				B		
Approach Delay (s)	0.0		0.0	11.8		
Approach LOS				B		
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			23.7%	ICU Level of Service	A	
Analysis Period (min)			15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑	↘	
Traffic Volume (veh/h)	115	24	36	245	15	18
Future Volume (Veh/h)	115	24	36	245	15	18
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	125	26	39	266	16	20
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			151		482	76
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			151		482	76
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		97	98
cM capacity (veh/h)			1428		499	970
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	83	68	39	266	36	
Volume Left	0	0	39	0	16	
Volume Right	0	26	0	0	20	
cSH	1700	1700	1428	1700	684	
Volume to Capacity	0.05	0.04	0.03	0.16	0.05	
Queue Length 95th (m)	0.0	0.0	0.7	0.0	1.3	
Control Delay (s)	0.0	0.0	7.6	0.0	10.6	
Lane LOS			A			B
Approach Delay (s)	0.0	1.0		10.6		
Approach LOS					B	
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization			22.9%	ICU Level of Service	A	
Analysis Period (min)			15			

Appendix C - Synchro Analysis
 1: Site Access #1 & Trunk Highway 7



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑	↑↑	
Traffic Volume (veh/h)	428	77	0	217	38	20
Future Volume (Veh/h)	428	77	0	217	38	20
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	465	84	0	236	41	22
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			549		743	274
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			549		743	274
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		88	97
cM capacity (veh/h)			1017		351	723
Direction, Lane #	EB 1	EB 2	WB 1	NB 1		
Volume Total	310	239	236	63		
Volume Left	0	0	0	41		
Volume Right	0	84	0	22		
cSH	1700	1700	1017	428		
Volume to Capacity	0.18	0.14	0.00	0.15		
Queue Length 95th (m)	0.0	0.0	0.0	4.1		
Control Delay (s)	0.0	0.0	0.0	14.9		
Lane LOS					B	
Approach Delay (s)	0.0		0.0	14.9		
Approach LOS					B	
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			24.3%	ICU Level of Service	A	
Analysis Period (min)			15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑	↘	
Traffic Volume (veh/h)	356	92	87	153	64	119
Future Volume (Veh/h)	356	92	87	153	64	119
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	387	100	95	166	70	129
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			487		793	244
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			487		793	244
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			91		76	83
cM capacity (veh/h)			1072		297	757
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	258	229	95	166	199	
Volume Left	0	0	95	0	70	
Volume Right	0	100	0	0	129	
cSH	1700	1700	1072	1700	490	
Volume to Capacity	0.15	0.13	0.09	0.10	0.41	
Queue Length 95th (m)	0.0	0.0	2.3	0.0	15.6	
Control Delay (s)	0.0	0.0	8.7	0.0	17.3	
Lane LOS			A	C		
Approach Delay (s)	0.0	3.2		17.3		
Approach LOS			C			
Intersection Summary						
Average Delay			4.5			
Intersection Capacity Utilization			38.5%	ICU Level of Service	A	
Analysis Period (min)			15			