Traffic Impact Brief for a Long Term Care Facility, Canadore Collene, North Bay, ON

Canadore College, North Bay, ON

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1 Introduction

Exp was retained by Canadore College, North Bay, ON to complete a Traffic Impact Brief (TIB) for the proposed Long Term Care facility on the Canadore College campus, The City of North Bay has requested a traffic brief to evaluate traffic impacts associated with the development.

The development will be a 160 bed long-term care facility. The long term care facility is to be located just south of Cedar Heights Road and north of the existing campus parking lots # 8A and #8B.

The proposed site plan is shown in **Figure 1**. A larger site plan is also provided in **Appendix 1**.

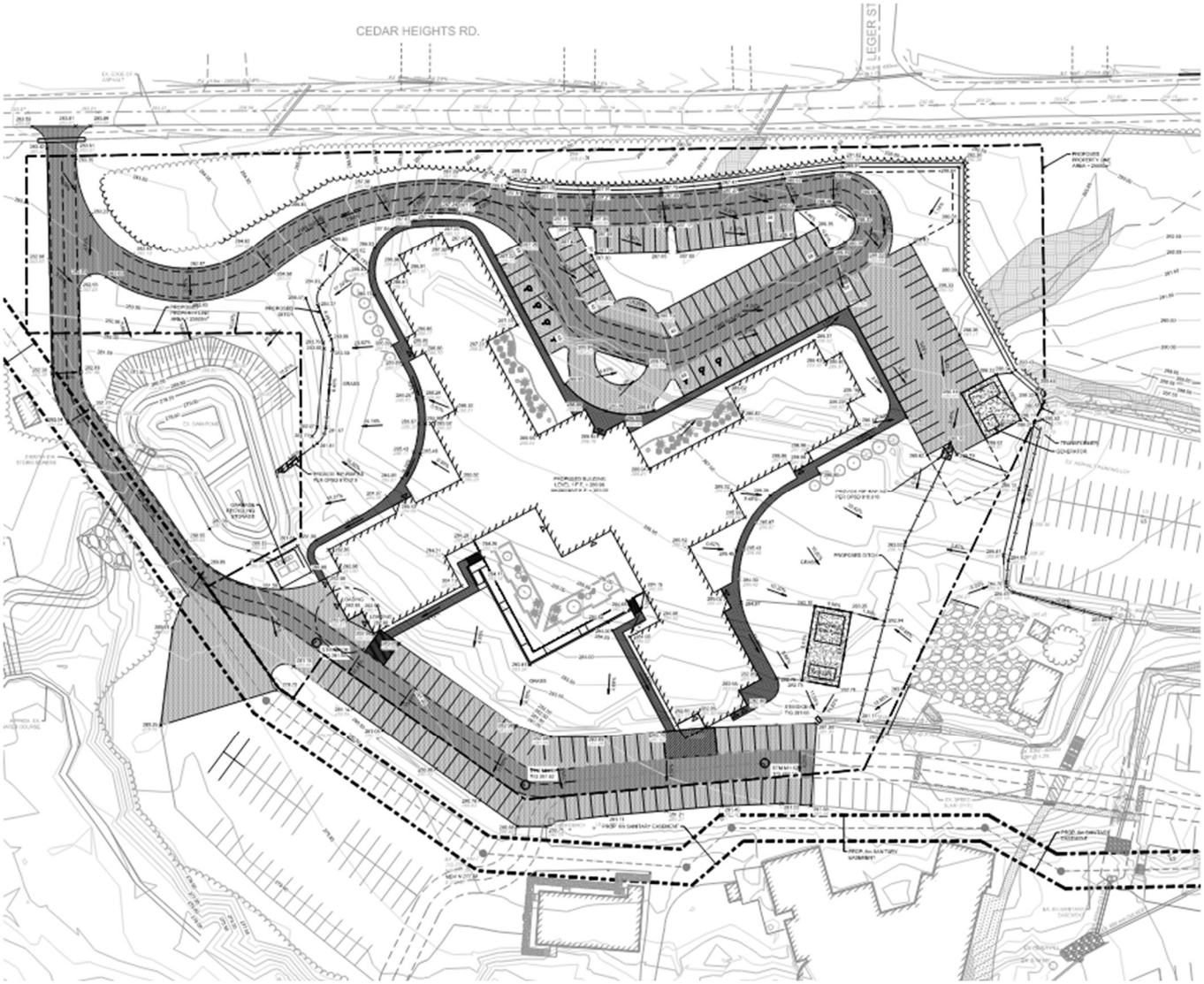

Figure 1: Proposed Development Site Plan

1.1 Approach

In order to assess the traffic impacts that the proposed development will have on the roadway network, the following work activities were completed:

- A traffic turning movement count at the Cedar Heights Road/Larocque Road/College Drive intersection between the hours of 0700 and 0900 and 1600 and 1800 on a weekday was obtained on April 18, 2024 with classes in place.
- A level of service analysis of existing traffic conditions (without development) at the Cedar Heights Road/Larocque Road all way stop sign controlled intersection for the AM and PM peak hour travel periods was undertaken. Any required deficiencies and improvements were identified.
- The trips that will be generated by the proposed LTC facility for the AM and PM peak hour travel periods using the appropriate Institute of Transportation trip rates for a LTC facility was estimated.
- These trips were assigned to the Cedar Heights Road/Larocque Road/College Drive intersection approaches based on existing trip distribution patterns.
- A level of service analysis was completed at the Cedar Heights Road/Larocque Road/College Drive intersection for the AM and PM peak hour travel periods with the development in place. Any deficiencies and required improvements attributable to the proposed development were identified.
- A review of the proposed site plan was undertaken with respect to access and site circulation.
- A draft report documenting the study findings was prepared and submitted for review.
- After any comments/edits are received, a final report will be prepared and submitted.

1.2 Study Area

The study area includes the Cedar Heights Road and the Cedar Heights Road/Larocque Road/College Drive intersection.

The Study Area is shown in **Figure 2**.

Figure 2: Study Area
The Study Area streets are two lanes wide, while the approaches to the Cedar Heights Road/Larocque Road/College Drive intersection are a combined left, through and right turn single lane. The intersection is an all way stop sign controlled.

1.3 Traffic Analyses Methodology

Key measures used in the analysis of intersection operations generally include average vehicle delays, level of service (LOS), 95th percentile queues and volume to capacity (v/c) ratios. The standard LOS criteria for stop sign-controlled intersections is provided in **Table 1** below. The methodology from the HCM 6th edition was used in the evaluation of the unsignalized intersection.

Table 1: Level of Service Criteria for Intersections

LOS	LOS Description	Stop Controlled Intersections Control Delay (sec/veh)
A	Very low delay; most vehicles do not stop **(Excellent)**	less than 10.0
B	Higher delay; more vehicles stop **(Very Good)**	between 10.0 and 15.0
C	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
D	Congestion becomes noticeable; vehicles must sometimes wait through more than one red light; many vehicles stop **(Satisfactory)**	between 25.0 and 35.0
E	Vehicles must often wait through more than one red light; considered by many agencies to be the limit of acceptable delay **(Acceptable)**	between 35.0 and 50.0
F	Considered to be unacceptable to most drivers; occurs when arrival flow rates exceed the capacity of the intersection **(Poor)**	greater than 50.0

2 Traffic Conditions without the Development

2.1 Traffic Volumes

EXP staff collected turning count movements for the study intersection on Thursday, April 18, 2024 for the AM (7 am to 9 am), noon (11:00 am to 1:00 pm), and PM (4 pm to 6 pm) peak periods. The peak counts between the two data collection days were utilized in this Study. The existing 2024 AM and PM peak hour volumes are provided in **Figure 3 and 4** below.

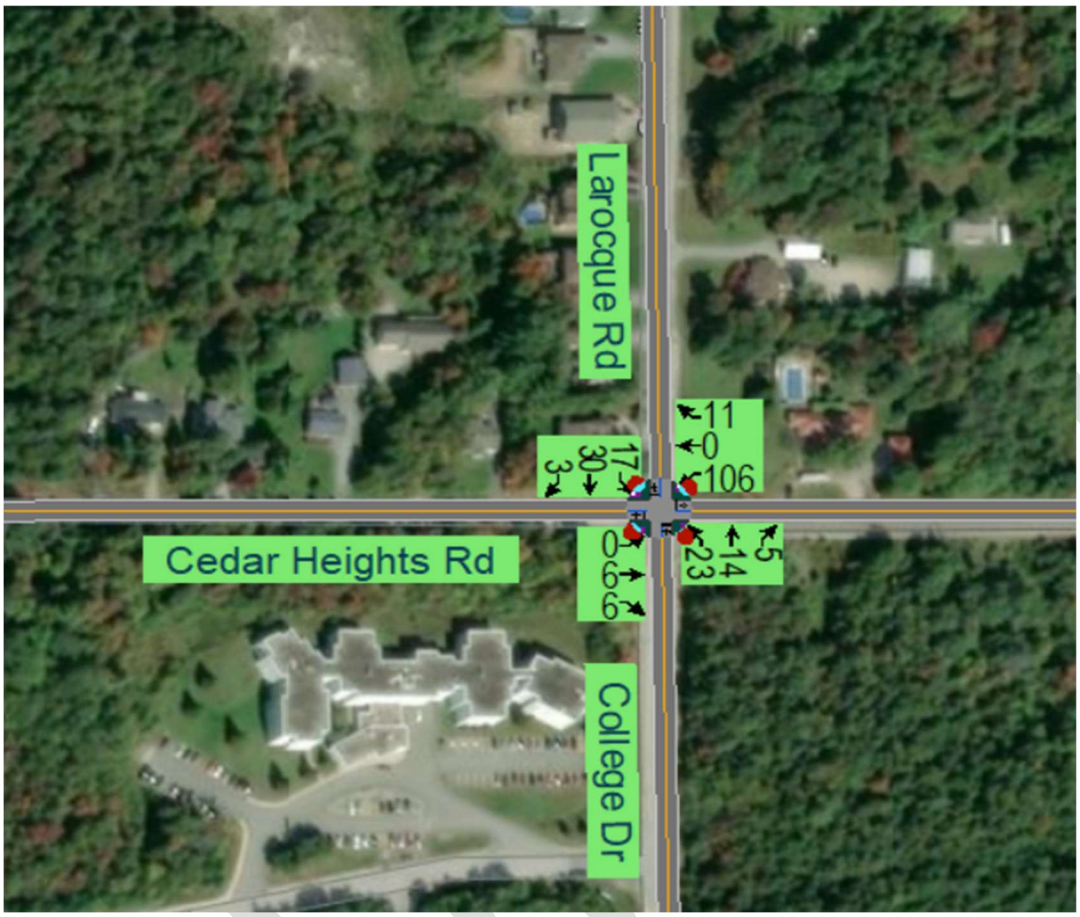

Figure 3: 2024 AM Peak Hour Volumes

Figure 4: 2024 PM Peak Hour Volumes

2.2 Existing Traffic Operations

Table 2 summaries the existing (2024) traffic operations at the Cedar Heights Road/Larocque Road/College Drive intersection. The detailed Synchro reports are provided in **Appendix 2** for reference.

The intersection is operating at an excellent overall LOS A during both peak periods. Individual turn movements are also operating at LOS A with no significant delays or queuing on the approaches.

Table 2: Existing Traffic Operations

Year	Traffic Control	Peak Hour	Overall LOS & Delay (sec/veh)	Criteria	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Cedar Heights Rd/College Dr																
					Cedar Heights Rd			Cedar Heights Rd			College Dr			Larocque Rd		
Existing 2024	STOP	AM	A 7.8	V/C		0.06			0.01			0.15			0.07	
				Delays (s/veh)	shared	7.6		shared	7.1	shared	shared	8.1	*shared*	shared	7.6	*shared*
				LOS		A			A			A			A	
				Queue		6m			0m			6 m			6 m	
		PM	A 7.8	V/C		0.15			0.01			0.09			0.04	
				Delays (s/veh)	shared	8	*shared*	shared	7.2	*shared*	shared	7.7	*shared*	shared	7.5	*shared*
				LOS		A			A			A			A	
				Queue		6m			0m			6 m			6 m	

3 Traffic Conditions with Proposed Development

3.1 Trip Generation

An estimate of the vehicle trips that are expected to be generated by the proposed development was calculated using the Institute of Transportation Engineers (ITE) "Trip Generation" rates. The 11th edition was utilized to provide estimates of vehicle trips to and from the long term care facility development.

For the proposed development, the ITE Nursing Home land use #620 was selected, and the rates are based on the number of beds The proposed development will have 160 beds

All trips are assumed to be new trips added to the Study Area. A breakdown of these trips, in terms of entering and exiting vehicles at the development site, is presented in **Table 3**.

Table 3: Estimated Trips of the Proposed Development

Development	Size	ITE Land Use Code	Land Use Description	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Lon Term Care Facility	160 beds	620	Nursing Home	16	6	22	7	15	22

3.2 Trip Distribution and Trip Assignment

A review of existing vehicle traffic patterns on the study intersection approaches was conducted for the AM and PM peak hours. Traffic generated to and from the proposed development were assigned to the study intersection approaches based on the existing distribution. The AM and PM peak hour generated volumes are shown in **Figures 5 and 6**.

Figure 5: AM Peak Hour Trip Assignment

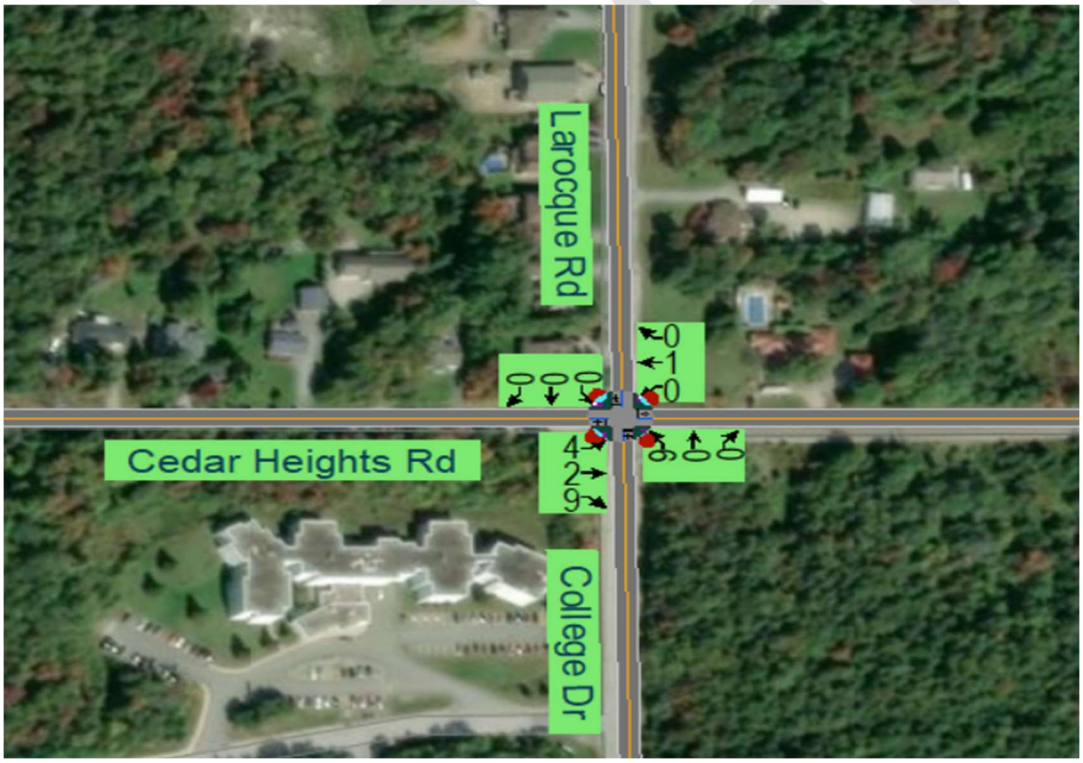

Figure 6: **PM Peak Hour Trip Distribution**

3.3 Traffic Volumes with Development in Place

The proposed development generated trips (**Figures 5 and 6**) were added to the existing volumes **(Figures 3 and 4)** traffic to represent traffic conditions with the development in place. These are provided in **Figure 7 and Figure 8** for the AM and PM peak periods.

Figure 7: AM Peak Hour Volumes with Development

Figure 8: PM Peak Hour Volumes with Development

3.4 Future Traffic Operations with the Proposed Development

Based on the projected traffic volumes for the proposed development, operational analyses were conducted for the study intersection. The traffic operations results are presented in **Table 4**. The detailed Synchro reports are provided in **Appendix 3** for reference.

Table 4: Traffic Operations With Development

Year	Traffic Control	Peak Hour	Overall LOS & Delay (sec/veh)	Criteria	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Cedar Heights Rd/College Dr																
					Cedar Heights Rd			Cedar Heights Rd			College Dr			Larocque Rd		
With Develop-ment	STOP	AM	A 7.9	V/C		0.07			0.02			0.15			0.07	
				Delays (s/veh)	shared	7.8		shared	7.1	shared	shared	8.1	*shared*	shared	7.7	*shared*
				LOS		A			A			A			A	
				Queue		6m			6m			6 m			6 m	
		PM	A 7.9	V/C		0.15			0.02			0.1			0.04	
				Delays (s/veh)	shared	8.1	*shared*	shared	7.2	*shared*	shared	7.8	*shared*	shared	7.5	*shared*
				LOS		A			A			A			A	
				Queue		6m			6m			6 m			6 m	

With the development in place the Cedar Heights Road/Larocque Road/College Drive intersection will continue to operate with excellent LOS A and no significant increase in delays or queuing on the approaches.

Generally, in a traffic brief a 5 or 10 year horizon period with a development in place, is not included, especially with a low traffic generator such as a LTC. However, I did look at traffic operations for both AM and PM peak periods over a 10 year time frame with a per annum growth of 1 percent. The College Drive/Laroque Road/Cedar Heights Road intersection would continue to operate at an excellent Level of Service A, with all turn movements operating efficiently. The volumes at the intersection are quite low and there is sufficient capacity to handle future growth.

4 Site Plan Review

4.1 Site Access

The proposed site plan (see **Figure 1** or **Appendix 1**) shows access to the development and the associated parking will be provided off the new road that will connect Cedar Heights Road with the campus parking lots #8A and #8B. No access to the proposed development will be directly from Cedar Heights Road.

The access to the 87 parking spaces should operate efficiently, providing direct access to the individual parking spaces. The design vehicle, a fire truck, can navigate through the parking area with direct access to the building.

Currently, students use the North or South Access Road to access campus parking. Canadore is planning on expanding the parking near the main entrance and will likely be a more desirable parking location for students. Therefore, it is not anticipated that there would be a large increase in traffic on Cedar Heights Road to access campus parking via the new street.

4.2 Sight Lines

A review was also undertaken of the new intersection at the long term care facility parking access with the new street. As part of the access road work, the sight triangles will be cleared to provide sufficient sight distances. There should be an unobstructed view to the east for approximately 130m (from centre of approach travel lane to vehicle at the stop bar). Cedar Heights Road ends just to the west of the proposed access road, so the end of the Cedar Heights Road is clearly visible from the proposed access road.

The proposed new street will be perpendicular to Cedar Heights Road. Currently the students that use Cedar Heights Road park along the shoulder of the road to avoid paying for parking at the College This may impact the sight lines, however the city frequently issues parking tickets for these vehicles parked on Cedar Heights Road. It is recommended “No Parking” signs be installed near the intersection to maintain the appropriate sight lines.

5 Summary of Findings

5.1 Introduction

Exp was retained by Canadore College, North Bay, ON to complete a Traffic Impact Brief (TIB) for the proposed Long Term Care facility on the Canadore College campus, The City of North Bay has requested a traffic brief to evaluate traffic impacts associated with the development, including traffic operations at the Cedar Heights Road/Larocque Road/College Drive intersection.

The development will be a 160 bed long-term care facility. The long term care facility is to be located just south of Cedar Heights Road and north of the existing campus parking lots # 8A and #8B.

5.2 Existing Traffic Operations

The Cedar Heights Road/Larocque Road/College Drive intersection is operating at an excellent overall LOS A during both peak travel periods. Individual turn movements are also operating at LOS A with no significant delays or queuing on the approaches.

5.3 Trip Generation

The long term facility is projected to generate 22 trips in the AM peak travel period and 22 trips in the PM peak.

5.4 Future Traffic Operations with the Proposed Development

With the development in place the Cedar Heights Road/Larocque Road/College Drive intersection will continue to operate with excellent LOS A and no significant increase in delays or queuing on the approaches.

Generally, in a traffic brief a 5 or 10 year horizon period with a development in place, is not included, especially with a low traffic generator such as a LTC. However, I did look at traffic operations for both AM and PM peak periods over a 10 year time frame with a per annum growth of 1 percent. The College Drive/Laroque Road/Cedar Heights Road intersection would continue to operate at an excellent Level of Service A, with all turn movements operating efficiently. The volumes at the intersection are quite low and there is sufficient capacity to handle future growth.

5.5 Site Access

The access to the 87 parking spaces should operate efficiently, providing direct access to the individual parking spaces. The design vehicle, a fire truck, can navigate through the parking area with direct access to the building.

Currently, students use the North or South Access Road to access campus parking. Canadore is planning on expanding the parking near the main entrance and will likely be a more desirable parking location for students. Therefore, it is not anticipated that there would be a large increase in traffic on Cedar Heights Road to access campus parking via the new street.

5.6 Sight Lines

As part of the access road work, the sight triangles will be cleared at the intersection of the parking access road with the new street to provide sufficient sight distances. There should be an unobstructed view to the east for approximately 130m (from centre of approach travel lane to vehicle at the stop bar). Cedar Heights Road ends just to the west of the proposed access road, so the end of the Cedar Heights Road is clearly visible from the proposed access road.

It is recommended “No Parking” signs be installed near the intersection of the new street with Cedar Heights Road to maintain the appropriate sight lines.

Appendix 1 –
Proposed Site Plan

LEGEND

- EXISTING EXPOSED BEDROCK TO REMAIN
- EXISTING BUILDING EDGES
- EXISTING GRAVEL AREAS TO REMAIN
- PROPOSED INTERLOCK STONE SIDEWALK
- PROPOSED HEAVY DUTY ASPHALT
- PROPOSED LIGHT DUTY ASPHALT
- PROPOSED LINE PAINTING
- EXISTING STORM PIPE/CULVERT
- PROPOSED STORM PIPE
- PROPOSED STORM CULVERT
- EXISTING SANITARY PIPE
- EXISTING DITCH TO REMAIN
- PROPOSED DITCH
- EXISTING BUSH LINE
- PROPOSED BUSH LINE
- PROPOSED CHAIN LINK FENCE
- PROPOSED WOOD FENCE
- LS — EXISTING LIGHT STANDARD
- EX. SAN MH — EXISTING SANITARY MANHOLE
- 11.03% — PROPOSED GRADING
- 284.87 / ×286.39 — ELEVATIONS - PROPOSED / - EXISTING

No.	REVISIONS	Date	By	App.
4	ISSUED FOR TENDER	SEPT 27, 2024	CM	CM
3	ISSUED FOR SITE PLAN AGREEMENT	JUL 12, 2024	BM	CM
2	ISSUED FOR WORKING DRAWING SUBMISSION	JUN 21, 2024	BM	CM
1	ISSUED FOR CLIENT REVIEW	FEB 8, 2024	RJ	CM

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Owner/Client: VILLAGES community care NORTH BAY

Location: CANADORE COLLEGE LONG TERM CARE FACILITY NORTH BAY, ONTARIO

Title: SITE SERVICING

Designed By: CM	Drawn By: EB	Checked By: CLC
Scale: 1:400	Date: SEPT 27, 2024	Drawing No.: C105
Project No.: NTB - 23012663		

DRAWING No. C105

FILE:E:\NTB\NTB-23012663-00\60 Execution\65 Drawings\Civil\NTB-23012663 CIVIL.dwg

Appendix 2 –
Synchro Detailed Reports – Without Proposed Development

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	6	6	106	0	11	23	14	5	17	30	3
Future Vol, veh/h	0	6	6	106	0	11	23	14	5	17	30	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	7	7	115	0	12	25	15	5	18	33	3
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.1	8.1	7.6	7.6
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	55%	0%	91%	34%
Vol Thru, %	33%	50%	0%	60%
Vol Right, %	12%	50%	9%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	42	12	117	50
LT Vol	23	0	106	17
Through Vol	14	6	0	30
RT Vol	5	6	11	3
Lane Flow Rate	46	13	127	54
Geometry Grp	1	1	1	1
Degree of Util (X)	0.054	0.014	0.15	0.064
Departure Headway (Hd)	4.259	3.905	4.243	4.247
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	828	901	839	832
Service Time	2.35	1.995	2.3	2.335
HCM Lane V/C Ratio	0.056	0.014	0.151	0.065
HCM Control Delay	7.6	7.1	8.1	7.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0	0.5	0.2

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	1	3	55	1	17	75	32	6	11	17	0
Future Vol, veh/h	2	1	3	55	1	17	75	32	6	11	17	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	1	3	60	1	18	82	35	7	12	18	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.2	7.7	8	7.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	66%	33%	75%	39%
Vol Thru, %	28%	17%	1%	61%
Vol Right, %	5%	50%	23%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	113	6	73	28
LT Vol	75	2	55	11
Through Vol	32	1	1	17
RT Vol	6	3	17	0
Lane Flow Rate	123	7	79	30
Geometry Grp	1	1	1	1
Degree of Util (X)	0.144	0.007	0.093	0.036
Departure Headway (Hd)	4.209	4.134	4.215	4.258
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	846	871	838	831
Service Time	2.262	2.134	2.301	2.335
HCM Lane V/C Ratio	0.145	0.008	0.094	0.036
HCM Control Delay	8	7.2	7.7	7.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.5	0	0.3	0.1

Appendix 3 –
Synchro Detailed Reports – With Proposed Development

Intersection	
Intersection Delay, s/veh	7.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	9	9	106	1	11	36	14	5	17	30	2
Future Vol, veh/h	0	9	9	106	1	11	36	14	5	17	30	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	10	10	115	1	12	39	15	5	18	33	2
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.1	8.1	7.8	7.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	65%	0%	90%	35%
Vol Thru, %	25%	50%	1%	61%
Vol Right, %	9%	50%	9%	4%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	55	18	118	49
LT Vol	36	0	106	17
Through Vol	14	9	1	30
RT Vol	5	9	11	2
Lane Flow Rate	60	20	128	53
Geometry Grp	1	1	1	1
Degree of Util (X)	0.072	0.022	0.152	0.065
Departure Headway (Hd)	4.409	4.031	4.267	4.384
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	817	893	831	822
Service Time	2.409	2.035	2.343	2.384
HCM Lane V/C Ratio	0.073	0.022	0.154	0.064
HCM Control Delay	7.8	7.1	8.1	7.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.1	0.5	0.2

Intersection	
Intersection Delay, s/veh	7.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	1	12	55	2	17	81	32	6	11	17	0
Future Vol, veh/h	6	1	12	55	2	17	81	32	6	11	17	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	1	13	60	2	18	88	35	7	12	18	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.2	7.8	8.1	7.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	68%	32%	74%	39%
Vol Thru, %	27%	5%	3%	61%
Vol Right, %	5%	63%	23%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	119	19	74	28
LT Vol	81	6	55	11
Through Vol	32	1	2	17
RT Vol	6	12	17	0
Lane Flow Rate	129	21	80	30
Geometry Grp	1	1	1	1
Degree of Util (X)	0.152	0.023	0.095	0.036
Departure Headway (Hd)	4.237	4.069	4.237	4.287
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	838	885	833	823
Service Time	2.302	2.069	2.331	2.377
HCM Lane V/C Ratio	0.154	0.024	0.096	0.036
HCM Control Delay	8.1	7.2	7.8	7.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.5	0.1	0.3	0.1