TECHNICAL MEMO

To	From
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Re	**Date**
Traffic Impact Assessment – Lantzville Long-Term Care Facility Development – Revision 2	August 26, 2025

1. Introduction

McElhanney Ltd. (McElhanney) completed a traffic impact assessment (TIA) for the proposed Vancouver Island Health Authority (Island Health) Long-Term Care (LTC) facility located at 6910 and 6930 Lantzville Road, in the District of Lantzville, B.C. This technical memorandum is a revision to the TIA dated August 1, 2024, and reflects an updated site plan.

The TIA analyzes the proposed development's impact on the surrounding roadway network and recommends mitigation measures, as warranted. This study assesses traffic operations for the weekday AM and PM peak development-hour conditions for current traffic (2023), the anticipated opening day (2028), and a 10-year horizon (2038). The following presents our assumptions, analysis, findings, and recommendations.

1.1. PROJECT DESCRIPTION

An updated site plan of the proposed development can be found in *Appendix A*. The proposed site serves as a "high quality, state of the art facility that meets the functional and operational requirements of Island Health." It consists of 306 long-term care beds and includes a separate daycare for employee use. The LTC facility is expected to open in the fall of 2028.

1.2. STUDY AREA

Seven study intersections were identified and analyzed for this study to determine the possible impacts associated with the proposed development:

- Schook Road / Site Access #1 (unsignalized, side-street stop controlled)
- Lantzville Road / Site Access #2 (unsignalized, side-street stop controlled)
- Lantzville Road / Dover Road / Schook Road (unsignalized, side-street stop controlled)
- Dover Road / Marry Ellen Drive (unsignalized, side-street stop controlled)
- Island Highway North / Mary Ellen Drive (signalized)
- Dover Road / Dickinson Road (signalized)

The existing road network is described below and shown in *Figure 1*.

1.3. ROAD NETWORK

Lantzville Road

Lantzville Road is a two-lane east-west road with painted shoulders on both sides. It is classified as a major journeyway road per the District of Lantzville's Official Community Plan (OCP). The road starts in the east at Schook Road, passes through commercial, institutional, and residential areas in Lantzville, and terminates at Island Highway North in the west. Within the study area, it has a speed limit of 50 km/h.

Schook Road

Schook Road is a two-lane north-south road with a gravel portion on the east side of the road used for parking. The road starts in the south at Lantzville Road / Dover Road, forms the east boundary of the proposed development, and terminates at a dead end just north of Dickinson Road. It is classified as an urban local road per the Regional District of Nanaimo's OCP. Within the study area, it has a speed limit of 50 km/h, except when the 30 km/h park zone is in effect.

Dover Road

Dover Road is a two-lane east-west road with turning lanes, a marked bike lane, and painted shoulder on both sides of the road. It has a sidewalk on the south side of the road with on-street parking along the north gravel portion and the south side of the road between Mary Ellen Drive and Dickinson Road. The road starts in the east at McGirr Road, passes through residential areas in the City of Nanaimo, and terminates at Schook Road or the Lantzville / Nanaimo boundary in the west. It is classified as a mobility collector road as per the Regional District of Nanaimo's OCP. Within the study area, it has a speed limit of 50 km/h, except when the 30 km/h park zone is in effect similar to Schook Road.

Mary Ellen Drive

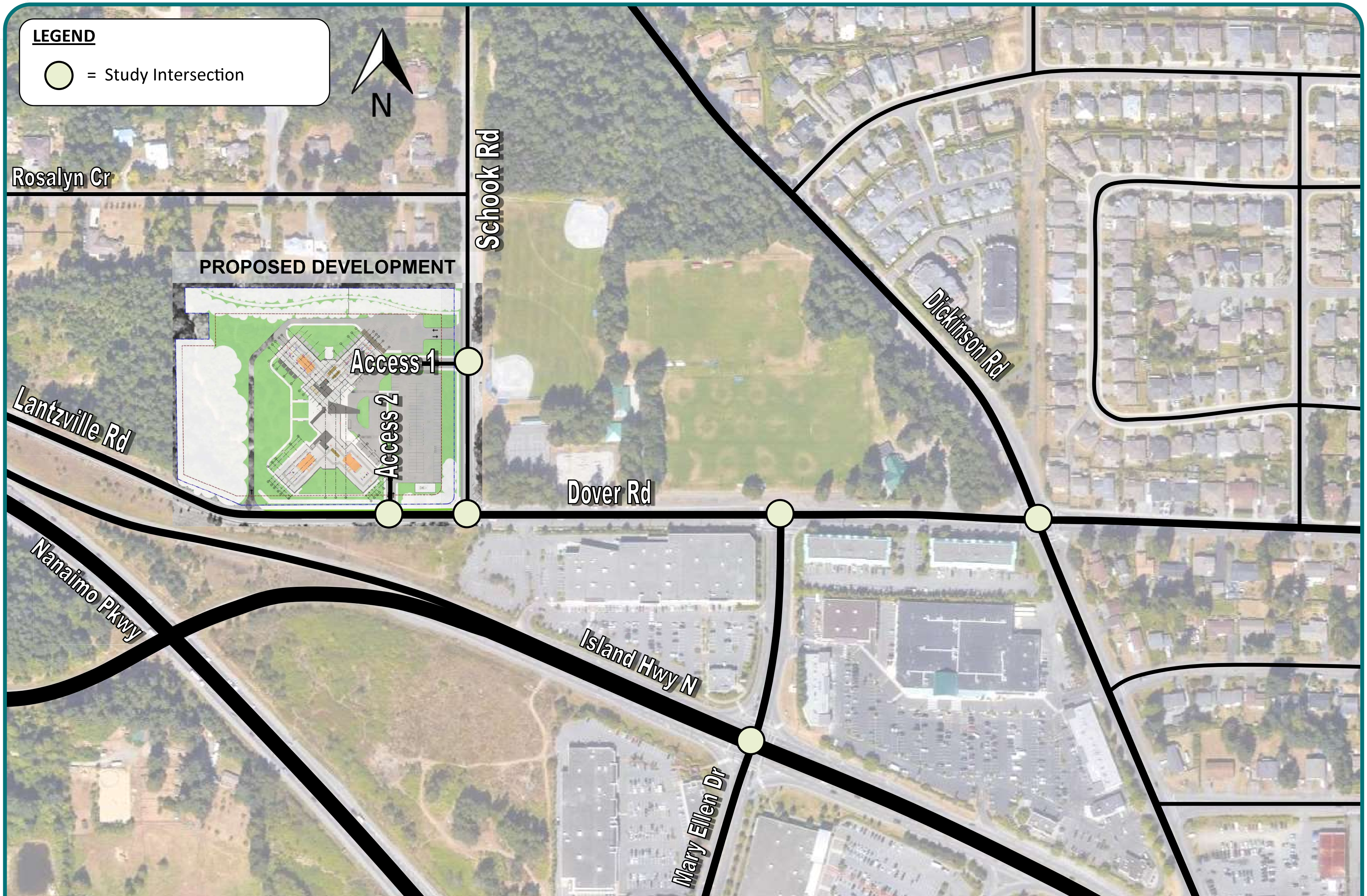
Mary Ellen Drive is a four-lane north-south road with turning lanes and a sidewalk on both sides of the road. The road starts in the south at Nanaimo Parkway, passes through a commercial area in Nanaimo, and terminates in the north at Island Highway North. It is classified as a mobility collector local road as per the Regional District of Nanaimo's OCP. Within the study area, it has a speed limit of 50 km/h.

Island Highway North

Island Highway North is a four-lane north-south highway with turning lanes and a painted shoulder on both sides of the road. The highway starts in the south in Nanaimo, passes through several communities including Lantzville, Parksville, and Courtenay, and terminates in the north in Campbell River. Within the study area, it has a speed limit of 70 km/h.

Dickinson Road

Dickinson Road is a three-lane north-south road with turning lanes and a sidewalk on both sides of the road, except north of Dover Road, where there is only a sidewalk on the east side of the road. Two lanes are dedicated for the heavier southbound traffic flow heading towards Island Highway North. The roadway starts south at Island Highway North, passes through residential areas in Nanaimo and Lantzville, and terminates in the north at Lantzville Road. It is classified as an urban collector road north of Dover Road and a mobility arterial road south of Dover Road per the District of Nanaimo's OCP. Within the study area, it has a speed limit of 50 km/h.



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Study Area

FIGURE 1

Not to Scale

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2. Multimodal Review

2.1. PEDESTRIANS

Existing Conditions:

NanaimoMap, the City's GIS application, was used to determine existing pedestrian facilities in the study area. The *Nanaimo Transportation Master Plan* (2014) and various plans and strategies on the District of Lantzville's website were referenced to determine short- and long-term improvements. A summary of the existing pedestrian network in the study area is provided below:

- **Lantzville Road, Schook Road, and Island Highway North**: Currently, there are no sidewalks provided on either side of these roads.

- **Dover Road:** There is a raised concrete sidewalk on the south side of the road. A zebra crosswalk and painted crosswalk is available at the intersection with Marry Ellen Drive. A signalized crossing with zebra crosswalks at the right turn channels are present at the intersection with Dickinson Road.

- **Mary Ellen Drive:** There is a raised asphalt multi-use path (MUP) on the west side of the road and a raised concrete sidewalk on the east side of the road.

- **Dickinson Road:** There is a raised concrete sidewalk on the east side of the road north of Dover Road. South of Dover Road, there is a raised concrete sidewalk on the west side of the road and a raised asphalt sidewalk on the east side of the road.

Proposed Conditions:

The District of Lantzville's *Transportation Review* (2013) recommends the development of a three-metre multi-use path on one side of major roadways/journeyways such as Lantzville Road. According to the District of Lantzville's *Economic Development Strategy* (2018), this improvement will take place after pedestrian realm improvements in the village core.

The *Nanaimo Transportation Master Plan* (2014) recommends sidewalks on both sides of all streets within the mobility hub core, within 600 metres of mobility hubs for all major and commercial roads, or where pedestrian generators (commercial use, transit stops, school, senior facilities) are present. The roads with missing sidewalks mentioned above fall within the Woodgrove mobility hub and are expected to receive improvements. The timeline of these improvements is not specified.

Discontinuities:

There is a lack of connectivity between the proposed development and the parks east of Schook Road and the commercial spaces south of Dover Road. Dedicated crossings at the west and north leg of the Lantzville Road / Dover Road / Schook Road intersection and sidewalks along the east side of Schook Road and north side of Dover Road could improve connectivity.

2.2. CYCLISTS

Existing Conditions:

NanaimoMap, the City's GIS application, was used to determine existing cyclist facilities in the study area. The *Nanaimo Transportation Master Plan* (2014) and various plans and strategies on the District of Lantzville's website were referenced to determine short- and long-term improvements. A summary of the existing cycling network in the study area is provided below and in *Figure 2*:

- **Lantzville Road and Island Hwy North**: There are painted shoulders on both sides of these roads; however, these painted shoulders are not intended for use as a bike lane.
- **Schook Road:** There are no bike paths provided on either side of this road.
- **Dover Road:** There are dedicated painted bike lanes complete with pavement markings and signage specifying intended use on both sides of the road.
- **Mary Ellen Drive**: There is a raised asphalt MUP on the west side of the road between Dover Road and Island Highway North.
- **Dickinson Road:** There is a painted shoulder on the west side of the road north of Dover Road. South of Dover Road, there are no designated bike lanes

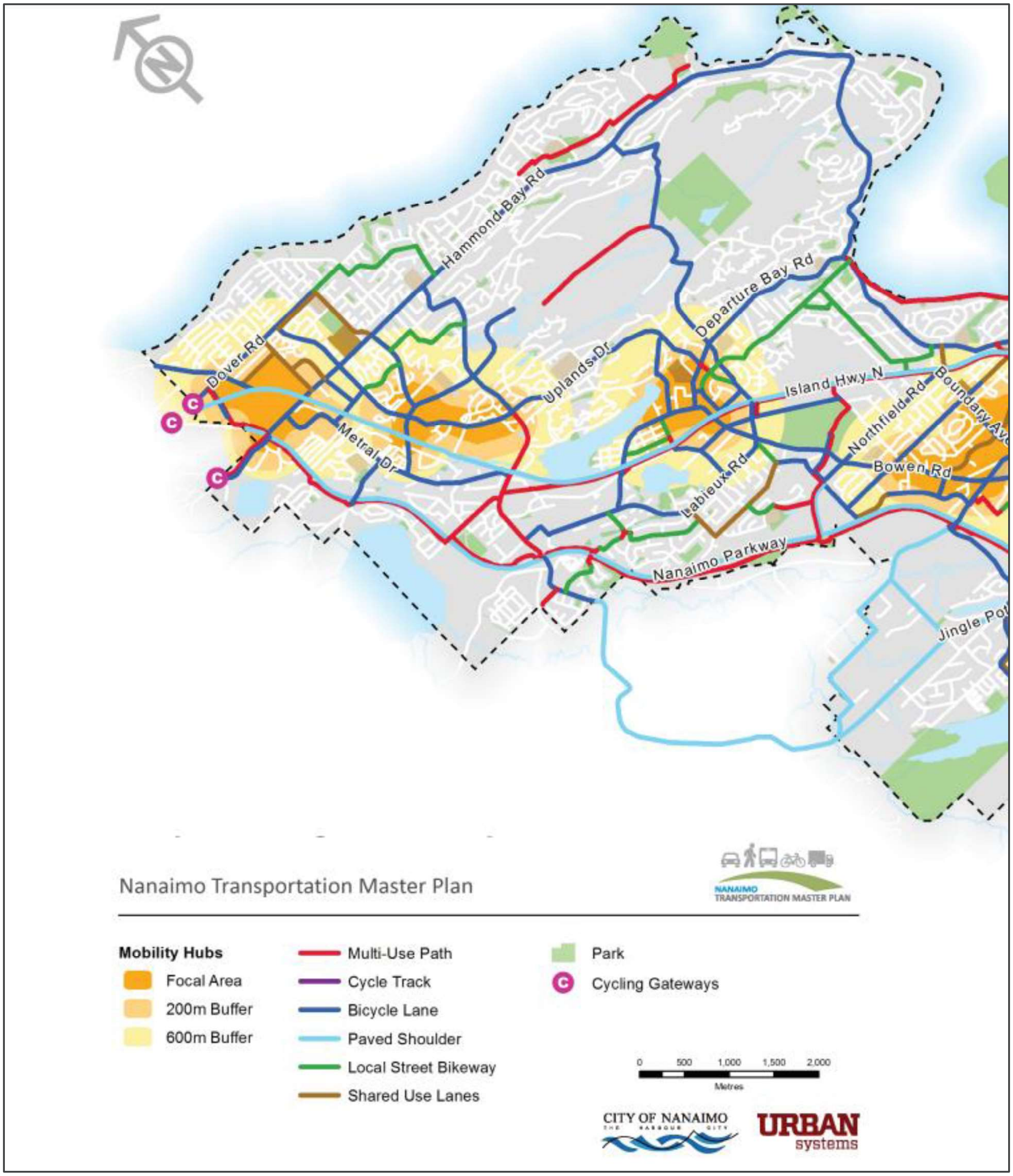
Proposed Conditions:

As shown in *Figure 2*, the *Nanaimo Transportation Master Plan* (2014) recommended several medium-long term improvements. Note that these improvements have already been implemented in existing conditions.

Discontinuities:

There is a lack of connectivity between the proposed development and the parks east of Schook Road and the commercial spaces south of Dover Road. Dedicated crossings at the west and north leg of the Lantzville Road / Dover Road / Schook Road intersection could improve connectivity. Bike lanes or MUPs along Schook Road could connect the proposed development to the bike route along Dover Road.

Figure 2: Medium-Long Term Bicycle Network Plan (Nanaimo Transportation Plan, 2014)



2.3. TRANSIT

An overview of the existing transit routes near the proposed development is provided in *Figure 3*. Woodgrove Exchange, which provides bus connection to several other routes and destinations, is within a 12-minute walking distance from the development site. The nearest bus routes to the development site are routes 20A, 40, and 31. Currently, bus routes 20A and 40 operate within a 5-minute walking distance between the nearest bus stops and the development site. Route 31 and its bus stop operates within a 10-minute walking distance from the development site. These routes are summarized below:

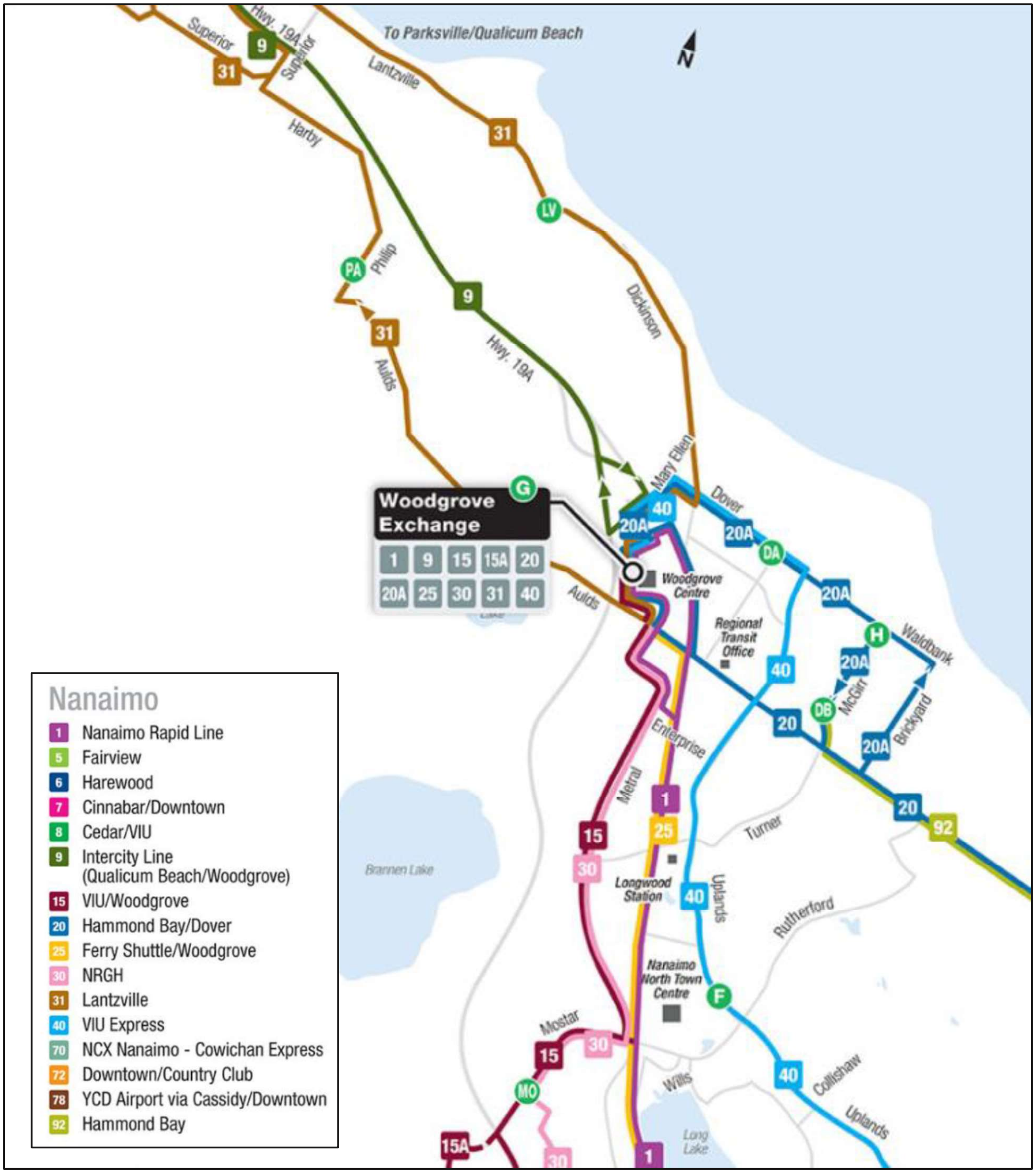
- **Route 20/20A – Hammond Bay/Dover:** This route connects Woodgrove Exchange to Hammond Bay, Country Club Exchange, Horseshoe Bay, and downtown Nanaimo. The nearest bus stops to the subject development are located just south and east of the Dover Road / Mary Ellen Drive intersection. Bus service at the nearest stop from the development is available for 16 hours on weekdays with an AM and PM peak hour wait time of approximately 20 and 35 minutes, respectively.

- **Route 40 – VIU Express:** This route connects Woodgrove Exchange to Vancouver Island University, Country Club Exchange, and downtown Nanaimo. The nearest bus stops to the subject development are located just south and east of the Dover Road / Mary Ellen Drive intersection. Bus service at the nearest stop from the development is available for 16 hours on weekdays with an AM and PM peak hour wait time of approximately 20 minutes.

  Route 31 – Lantzville: This route connects Woodgrove Exchange to Lantzville village core. The nearest bus stop to the subject development is located just north of the Dover Road / Dickinson Road intersection. Bus service at the nearest stop from the development is available for 12 hours on weekdays with an AM and PM peak hour wait time of approximately 35 and 55 minutes, respectively.

The District of Lantzville's *Economic Development Strategy* (2018) states that improvement of transit services is unlikely in Lantzville without increased density as the current population cannot sustain increased transit service. The *Nanaimo Transportation Master Plan* (2014) recommends integrating cycling and pedestrian facilities at the Woodgrove Transit Exchange to accommodate higher concentrations of medium to high residential developments.

Figure 3: Regional District of Nanaimo Transit Map (BC Transit, retrieved August 2025)

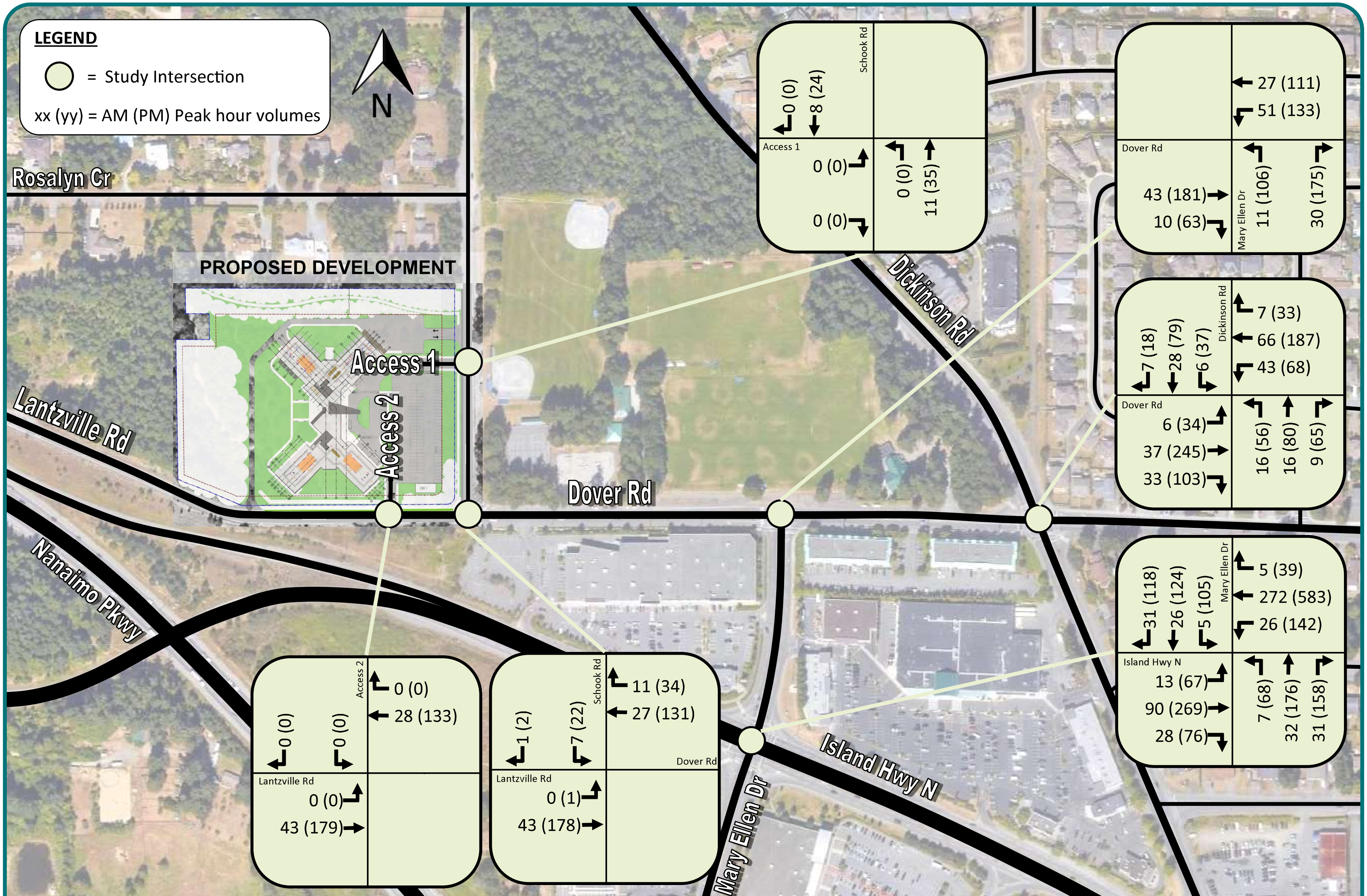


3. Traffic Volume Development

3.1. EXISTING TRAFFIC COUNTS

Turning movement counts were collected by McElhanney on Thursday, July 20, 2023, from 6:00 AM to 9:00 AM and 2:00 PM to 6:00 PM. Traffic was analyzed for the peak site-trip generating hour, which corresponds with employee shift turnover at 7:00 AM and 3:00 PM. Accordingly, the peak analysis periods were selected to be 6:30 AM to 7:30 AM and 2:30 PM to 3:30 PM.

The existing (2023) weekday AM and PM peak hour traffic volumes are shown in *Figure 4*. Detailed count sheets are included in *Appendix B*.



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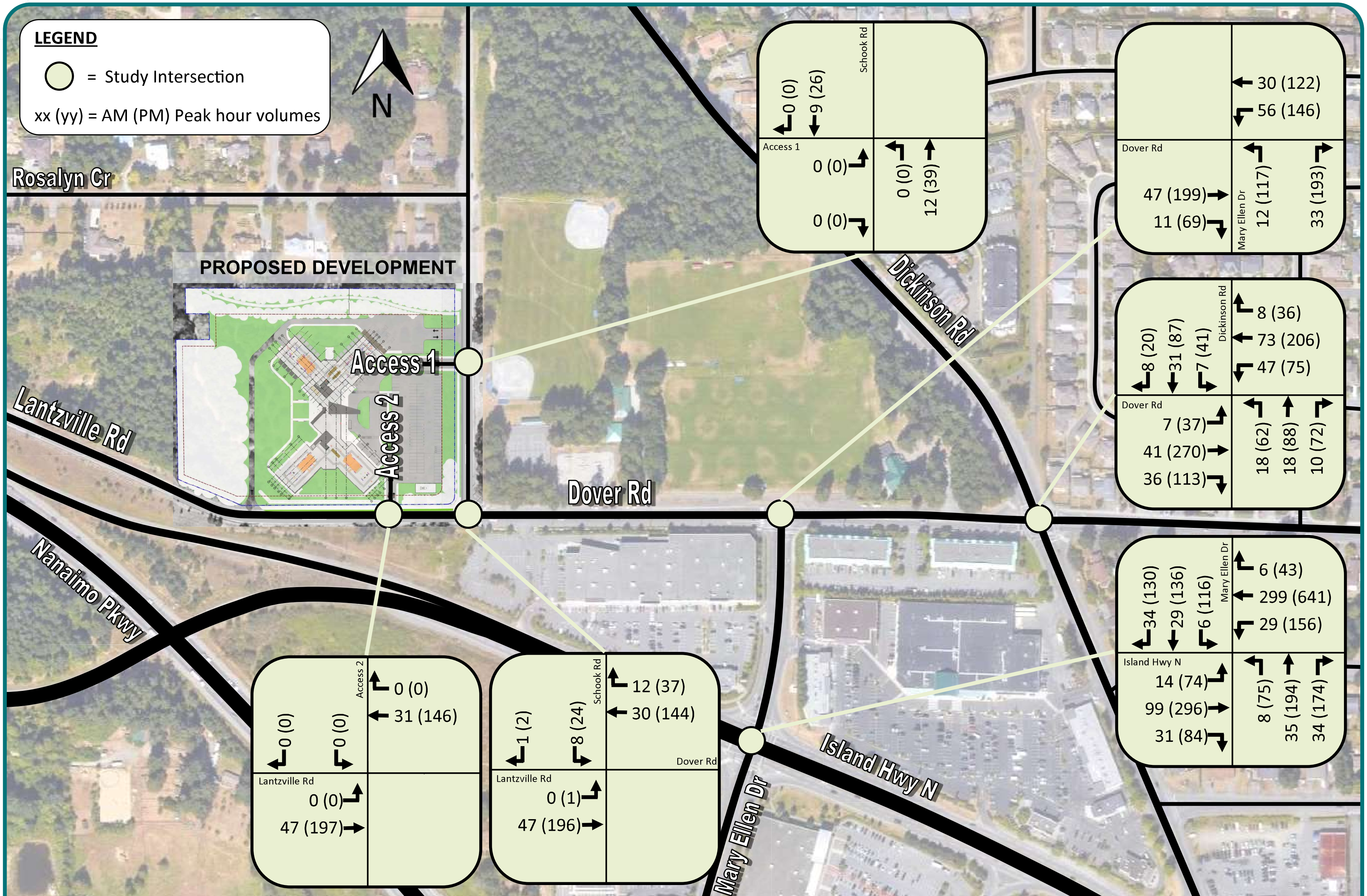
Existing Traffic Volumes

FIGURE 4

Not to Scale

3.2. FUTURE BACKGROUND TRAFFIC VOLUMES

Using existing (2023) weekday AM and PM peak hour volumes, traffic was developed for the opening-day (2028) and 10-year horizon (2038) scenarios. Future background volumes were grown from 2023 levels using a 2.0% annual linear growth rate. The resulting traffic volume profiles for peak analysis periods are shown in *Figure 5* and *Figure 6*.



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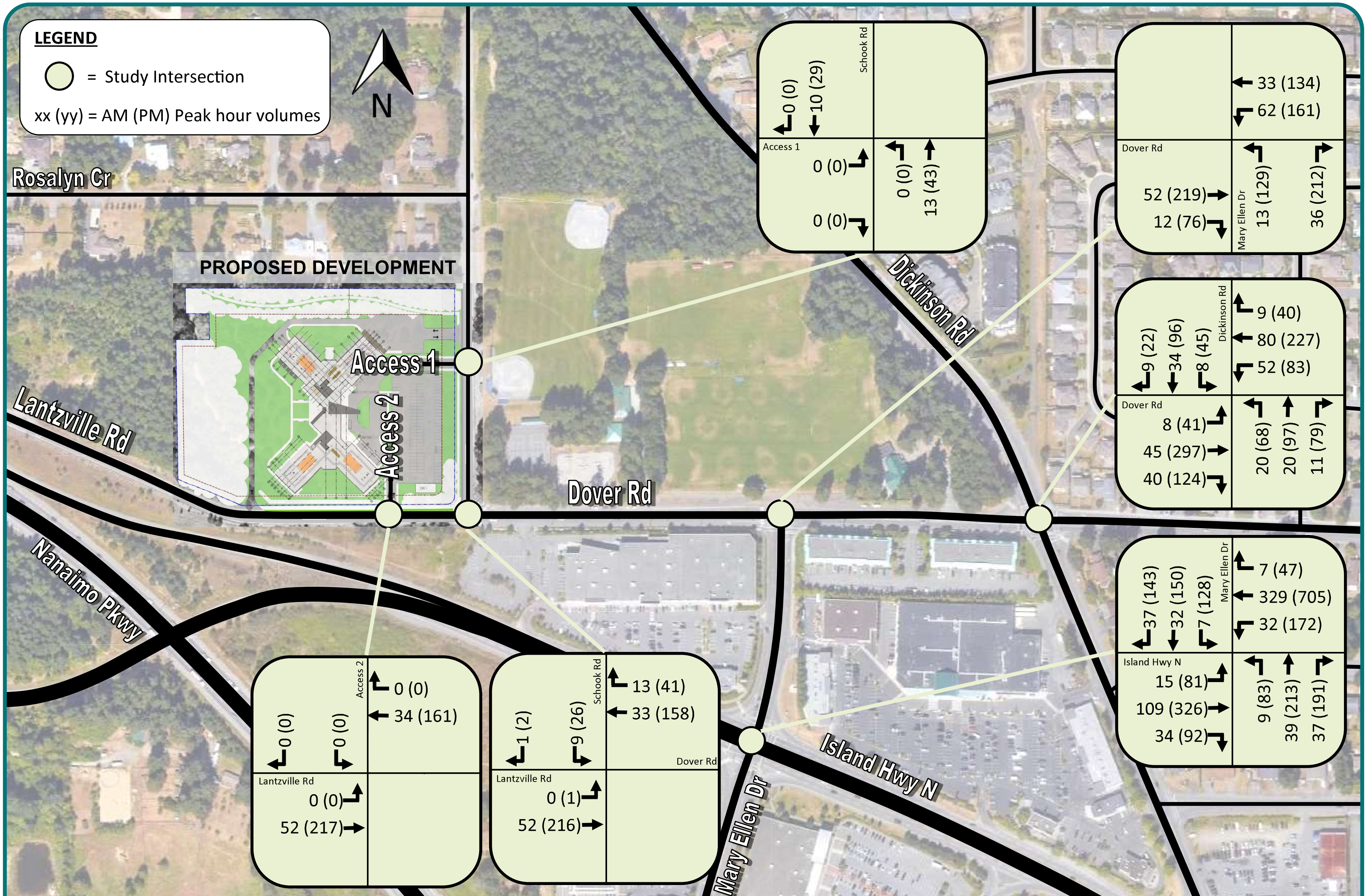
2028 Background Traffic Volumes

FIGURE 5

Not to Scale



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2038 Background Traffic Volumes

FIGURE 6

Not to Scale

3.3. TRIP GENERATION

Project trip generation refers to the process to estimate new vehicle traffic a proposed development will add to the surrounding road network. For this project, trips in and out of the long-term care facility were estimated based on employee shift information provided by Island Health, as shown in *Table 1*.

Table 1: Employee Shift Schedule and Expected Trips

Time Period	Employees Arriving	Employees Leaving	Total Employees
6:30 AM to 7:30 AM	130	15	145
2:30 PM to 3:30 PM	90	130	220

During the AM peak period, most site traffic is arriving for the 7:00 AM to 3:00 PM shift. For the evening shift traffic is more evenly split, with 90 employees arriving and the 130 morning shift employees leaving. Note that for the most conservative estimate, each employee is expected to arrive independent of one another with a vehicle occupancy rate of 1.0 employee per trip. It was also assumed that 5% and 10% of the residents will have visitors during the AM and PM peak hour, respectively.

Additionally, site trips for the proposed 37-student employee-use daycare were considered. Trip generation rates from the Institute of Transportation Engineers' (ITE) *Trip Generation Manual, 11th Edition* were used quantify daycare site trips. Although the daycare is intended for site staff, it may be available for public use should space be available. As such, it was conservatively assumed that half of the available daycare spots will be used by site staff, while the remaining slots will be accessible to the public. *Table 2* summarizes the resulting site-generated trips from the proposed development.

Table 2: Employee Shift Schedule and Expected Trips

Land Use	ITE Code	Qty	Units	Rate		AM Distribution		PM Distribution		AM Trip Gen			PM Trip Gen		
				AM	PM	In	Out	In	Out	In	Out	Total	In	Out	Total
Long Term Care Facility Staff	N/A	306	Beds	Provided by Client		90%	10%	41%	59%	130	15	**145**	90	130	**220**
Visitors	N/A	306	Beds	Assumed		60%	40%	40%	60%	9	6	**15**	13	18	**31**
Daycare Center	565	37	Students	0.78	0.79	53%	47%	47%	53%	15	14	**29**	14	15	**29**
Day Care Trip Reduction (50% of daycare spots will be used by staff)										8	7	**15**	7	8	**15**
Total Site-Generated Trips										146	28	**174**	110	155	**265**

As shown, the proposed development is expected to generate an additional 174 vehicle trips (146 inbound / 28 outbound) during the weekday AM peak period and 265 vehicle trips (110 inbound / 155 outbound) during the weekday PM peak period.

3.4. PEAK HOUR FACTORS

For a given hourly traffic volume, the arrival and departure of vehicles often varies. Peak hour factors (PHFs) are often used to describe the distribution of traffic volumes over a given 1-hour analysis period. The PHF can be calculated using *Equation 1* below:

$$\text{EQUATION 1:} \quad PHF = \frac{Total\ Hourly\ Volume\ (veh)}{4\ x\ Peak\ 15\ minute\ Volume\ within\ the\ Hour\ (veh)}$$

A PHF of 1.0 would mean that each 15-minute interval within an hour experiences the same level of traffic. Alternatively, a lower PHF of 0.5 would mean that the busiest 15-minute interval within the hour accounted for half of the hourly volume. Generally, PHFs trend towards 1.0 the busier an intersection becomes. These PHFs are used in the Highway Capacity Manual's (HCM) LOS methodology to help account for the variation in traffic arrival patterns over a given analysis period.

Generally, site-generated trips are expected to be distributed evenly throughout a given analysis period. However, given the nature of trips resulting from shift turnover, peak hour factors were adjusted for each intersection approach. Site trips outlined in *Table 1* were assumed to arrive within the half-hour period centred around 7:00 AM (for the morning shift) and 3:00 PM (for the evening shift). Site trips were layered onto evenly split background traffic to estimate new peak hour factors for each intersection approach in the future analysis periods. Generally, PHFs did not differ significantly from the observed 2023 traffic count data.

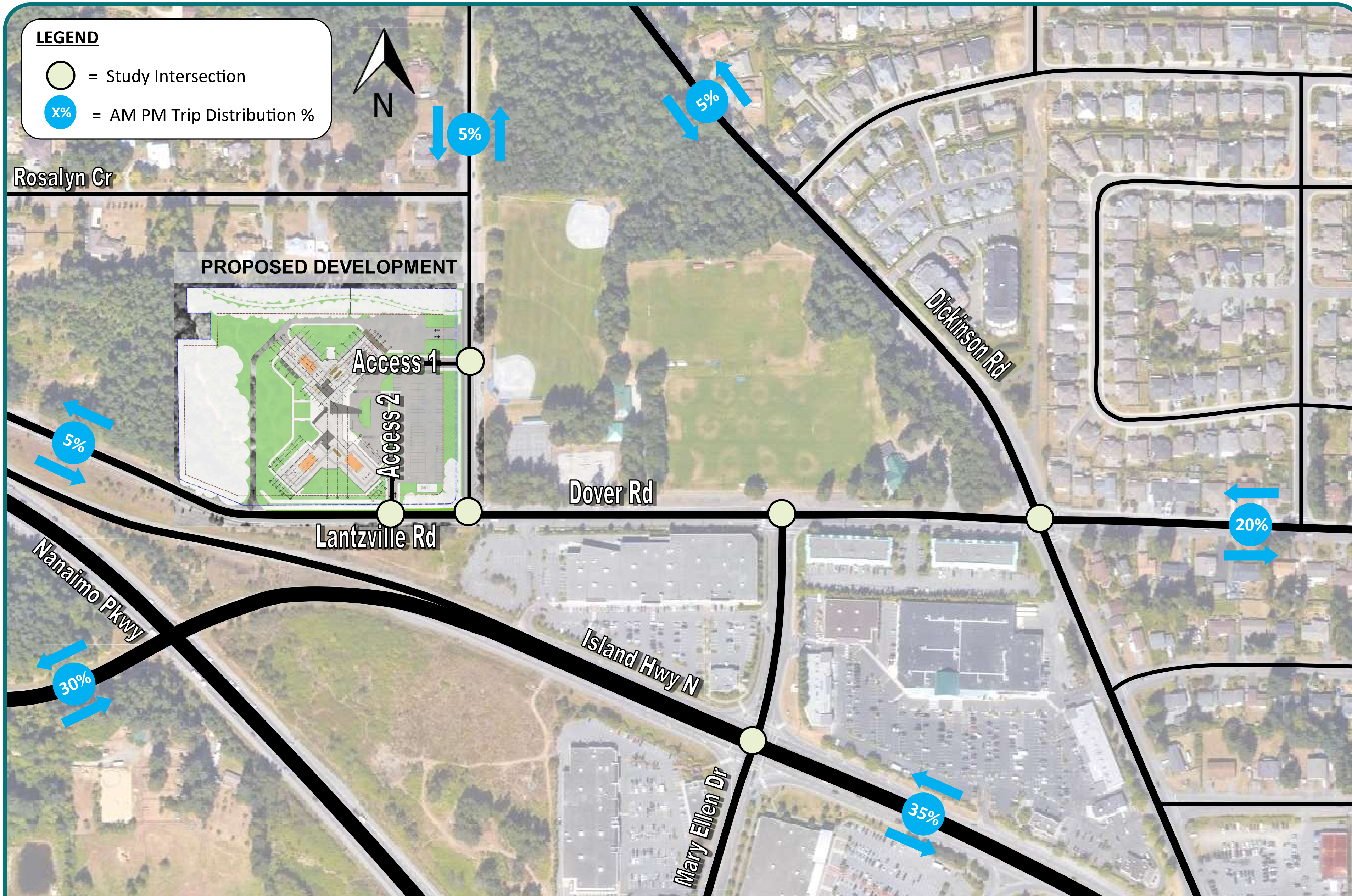
3.5. TRIP DISTRIBUTION

Traffic data collected in 2023 by McElhanney was reviewed to estimate the distribution of site-generated traffic. The following trip distribution was assumed for inbound and outbound AM and PM peak hour trips:

- East on Dover Road: 20%
- West on Dover Road: 5%
- East on Island Highway North: 35%
- West on Island Highway North: 30%
- North on Dickinson Road: 5%
- North on Schook Road: 5%

It was assumed that the generated trips would be equally distributed between Access 1 and Access 2.

The trip distribution assumptions are shown in *Figure 7*. The site generated trips after applying these distributions are presented in *Figure 8*.



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Trip Distribution

FIGURE 7

Not to Scale

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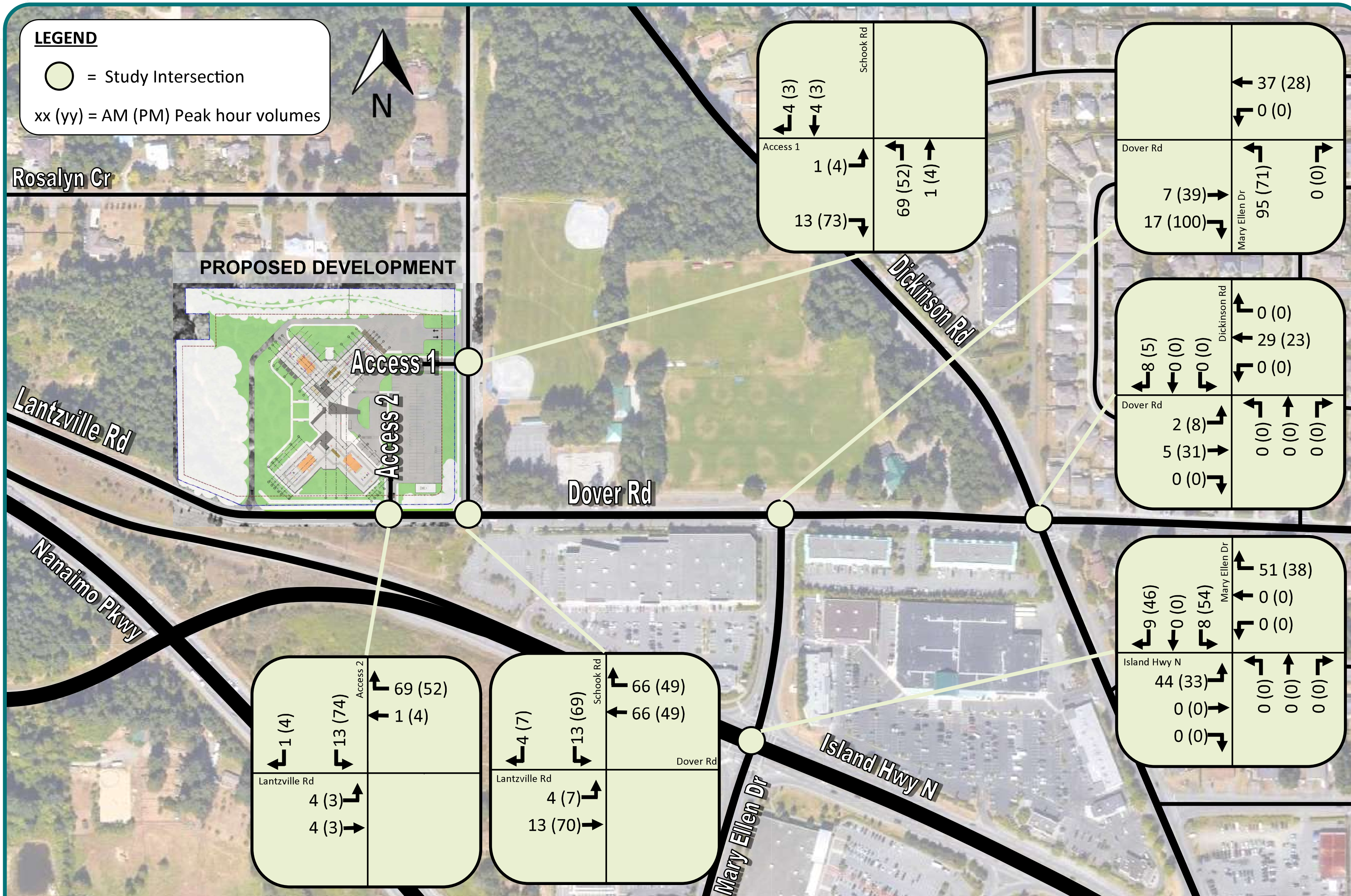

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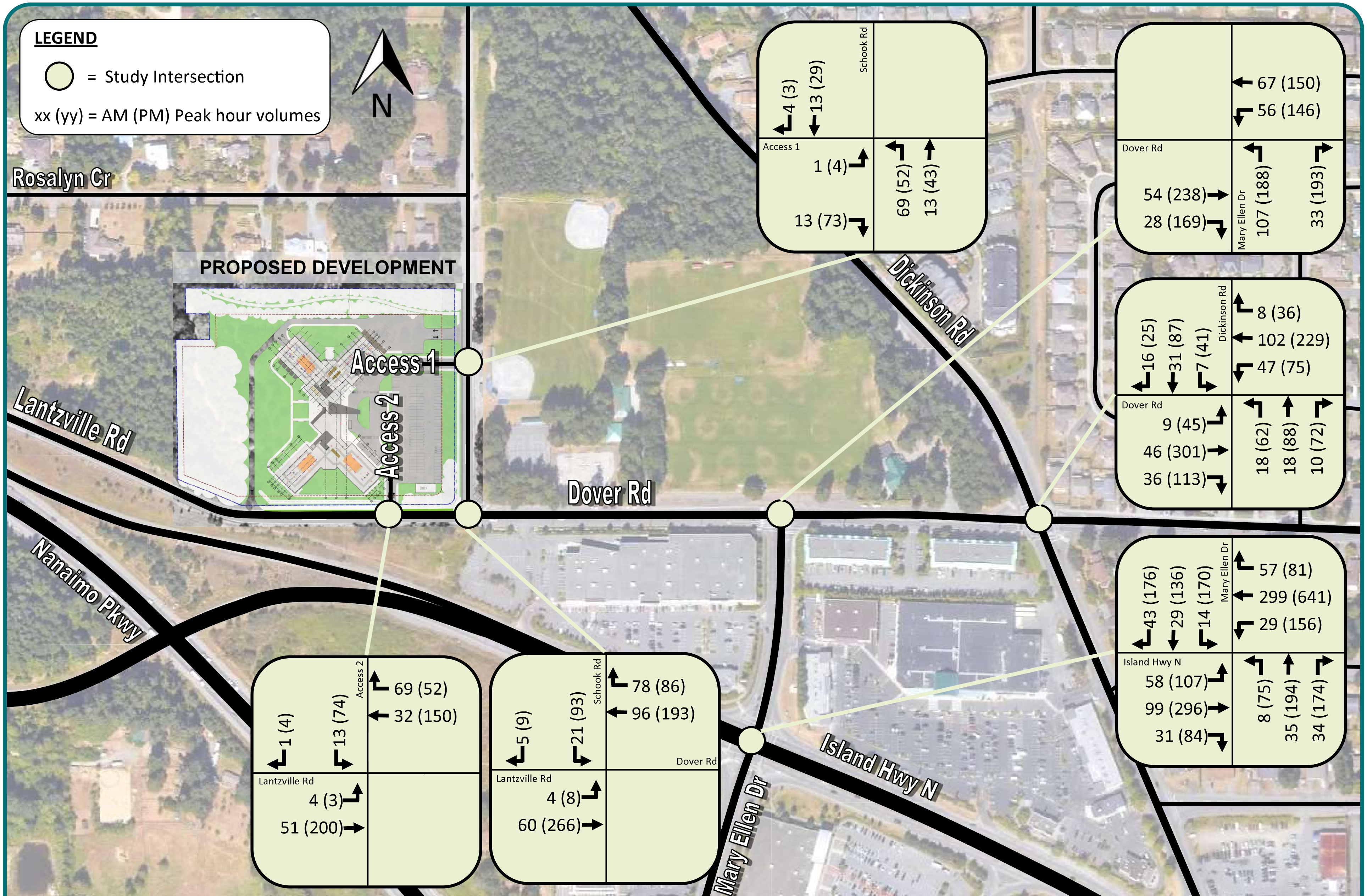
Site-Generated Trips

FIGURE 8

Not to Scale

3.6. FUTURE BACKGROUND TRAFFIC VOLUMES WITH DEVELOPMENT

To estimate future traffic volumes with development, site generated trips from *Figure 8* were superimposed onto Opening Day (2028) and 10-Year Horizon (2038) background traffic volumes. The future traffic volumes with the development for the weekday AM and PM peak hours are presented in *Figure 9* and *Figure 10* for the Opening Day (2028) and 10-Year Horizon (2038) scenarios, respectively.



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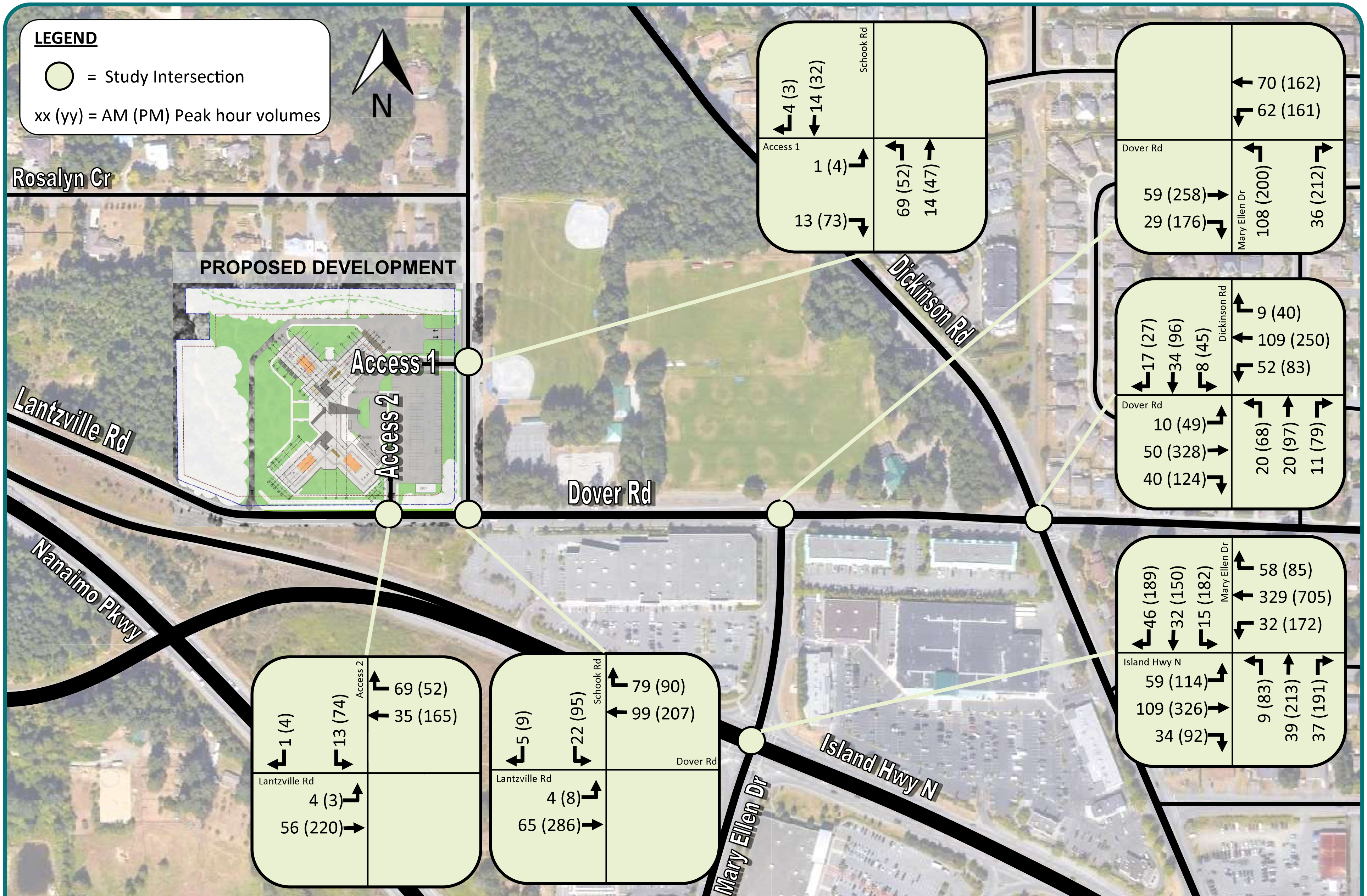
2028 Combined Traffic Volumes

FIGURE 9

Not to Scale



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2038 Combined Traffic Volumes

FIGURE 10

Not to Scale

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4. Traffic Operations Analysis

Traffic operations analysis was conducted for three scenarios:

- Existing (2023)
- Opening Day (2028)
- 10-Year Horizon (2038)

All scenarios were evaluated for weekday AM and PM peak hours. All future scenarios (2028 and 2038) were analyzed with and without the additional trips generated by the proposed development.

4.1. SYNCHRO ANALYSIS SOFTWARE

Synchro software, version 11, was used to report the volume-to capacity (v/c) ratio, average delay, level of service (LOS), and 95th percentile queue lengths for each movement at the study intersection. Synchro is a traffic software used to determine traffic conditions based on volumes, laning, and type of traffic control. Detailed Synchro analysis reports can be found in *Appendix C*.

4.2. LEVEL OF SERVICE CRITERIA

Intersection capacity analysis provides an indication of traffic operations based on calculations of volume-to capacity (v/c) ratio and delay for individual movements at an intersection. The v/c ratio, also referred to as degree of saturation, represents the sufficiency of an intersection to accommodate the vehicular demand. As the v/c ratio approaches 0.90, traffic flow may become unstable resulting in delay and queuing. Once the demand exceeds the capacity (i.e. a v/c ratio greater than 1.00), traffic flow is unstable and excessive delay and queuing is expected.

The level of service (LOS) for an intersection provides an indication of the quality of traffic operations and relates to the delay being experienced by vehicles. Intersection LOS denoted by letter grades ‘A’ through ‘D’ indicates a satisfactory level of operations, with ‘A’ being free flow and ‘D’ representing traffic that is approaching congestion. Levels designated ‘E’ and ‘F’ represent increasingly congested levels of traffic. LOS definitions for signalized and unsignalized intersections, as outlined in the Highway Capacity Manual, are included in *Table 3*.

Table 3: Level of Service Definitions

Level of Service	Delay Criteria		Description
	Signalized Intersections	Unsignalized Intersections	
A	≤ 10	≤ 10	Represents free flow. Individual users are virtually unaffected by others in the traffic stream. Usually no conflicting traffic.
B	> 10 to 20	> 10 to 15	Stable flow, but the presence of other users in the traffic stream begins to be noticeable. Occasionally some delay due to conflicting traffic.
C	> 20 to 35	> 15 to 25	Stable flow, but the operation of individual users becomes significantly affected by interactions with others in the traffic stream. Delay is noticeable, but not inconveniencing.
D	> 35 to 55	> 25 to 35	Represents high-density, but stable flow. Delay is noticeable and irritating; increased likelihood of risk taking.
E	**> 55 to 80**	**> 35 to 50**	**Represents operating conditions at or near the capacity level. Delay approaching tolerance levels; risk taking behaviour is likely.**
F	**> 80**	**> 50**	**Represents forced or breakdown flow. Delay exceeds tolerance level; high likelihood of risk taking.**

Notes: *Values shown are in seconds / vehicle.* ***BOLD*** *indicates unacceptable operation.*

It should be noted that although Synchro reports overall intersection LOS at side-street stop-controlled unsignalized intersections, the overall LOS is not a good indicator of the side street performance, as it is calculated from the average delay for all vehicles. As a result, the overall LOS is typically heavily skewed towards the LOS for the free flow major movement, particularly where the proportion of free flow volume on the major street is very high. To better acknowledge side street performance, only the individual movement LOS is presented for unsignalized side-street stop-controlled intersections.

4.3. TRAFFIC OPERATING CONDITIONS

Capacity analysis was completed for the existing (2023), opening day (2028), and 10-year horizon (2037) conditions for the weekday AM and PM peak hours. Future scenarios were analysed with and without development-generated traffic. Table values below marked in red highlight conditions near capacity (0.90 < v/c ratio < 1.00) and exceeding capacity (v/c ratio > 1.00) along with LOS E and F. Optimized signal timing plans were assumed for post-development conditions for all future scenarios.

Existing (2023) Conditions

The existing (2023) weekday operating conditions were analyzed at the study intersections described in *Section 1.2*. A summary of the results for the AM and PM peak hours – including volume to capacity (v/c) ratio, delay, LOS, and 95th percentile queue length – can be found in *Table 4*. The detailed results can be found in *Appendix C.* The existing intersection performance is described below:

- At Island Highway North / Mary Ellen Drive:
    - The southbound left (SBL) movement operates at LOS E during the PM peak.

- All individual movements operate below capacity.

- At all remaining intersections:
  - All individual movements operate below capacity with minimal delays and queues. Furthermore, results suggest that all movements operate at LOS C or better.

Table 4: Existing (2023) Operating Conditions

Existing (2023) Conditions															
Intersection	**Period**	**Attribute**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**Overall**
Lantzville Road / Dover Road / Schook Road *Unsignalized*	AM	Volume (vph)	0	43	-	-	27	11	-	-	-	7	-	1	-
		v/c Ratio	0.00	0.00	-	-	0.03	0.03	-	-	-	0.01	-	0.01	-
		Delay (s/veh)	0	0	-	-	0	0	-	-	-	9	-	9	-
		LOS	A	A	-	-	A	A	-	-	-	A	-	A	-
		95% Q (m)	0	0	-	-	0	0	-	-	-	0	-	0	-
	PM	Volume (vph)	1	178	-	-	131	34	-	-	-	22	-	2	-
		v/c Ratio	0.00	0.00	-	-	0.11	0.11	-	-	-	0.04	-	0.04	-
		Delay (s/veh)	0	0	-	-	0	0	-	-	-	11	-	11	-
		LOS	A	A	-	-	A	A	-	-	-	B	-	B	-
		95% Q (m)	0	0	-	-	0	0	-	-	-	1	-	1	-
Dover Road / Mary Ellen Drive *Unsignalized*	AM	Volume (vph)	-	43	10	51	27	-	11	-	30	-	-	-	-
		v/c Ratio	-	0.03	0.01	0.04	0.02	-	0.03	-	0.05	-	-	-	-
		Delay (s/veh)	-	0	0	8	0	-	10	-	9	-	-	-	-
		LOS	-	A	A	A	A	-	A	-	A	-	-	-	-
		95% Q (m)	-	0	0	1	0	-	1	-	1	-	-	-	-
	PM	Volume (vph)	-	181	63	133	111	-	106	-	175	-	-	-	-
		v/c Ratio	-	0.12	0.04	0.11	0.07	-	0.29	-	0.24	-	-	-	-
		Delay (s/veh)	-	0	0	8	0	-	17	-	11	-	-	-	-
		LOS	-	A	A	A	A	-	C	-	B	-	-	-	-
		95% Q (m)	-	0	0	3	0	-	9	-	7	-	-	-	-
Island Highway North / Mary Ellen Drive *Signalized*	AM	Volume (vph)	13	90	28	26	272	5	7	32	31	5	26	31	-
		v/c Ratio	0.03	0.06	0.04	0.04	0.14	0.01	0.03	0.14	0.14	0.02	0.09	0.11	-
		Delay (s/veh)	5	4	2	9	7	0	15	10	10	15	15	3	7
		LOS	A	A	A	A	A	A	B	A	A	B	B	A	A
		95% Q (m)	2	3	1	6	17	0	3	4	4	3	7	1	-
	PM	Volume (vph)	67	269	76	142	583	39	68	176	158	105	124	118	-
		v/c Ratio	0.14	0.12	0.08	0.26	0.32	0.05	0.36	0.52	0.52	0.81	0.40	0.33	-
		Delay (s/veh)	6	6	2	15	13	0	36	19	19	73	36	8	18
		LOS	A	A	A	B	B	A	D	B	B	**E**	D	A	B
		95% Q (m)	10	17	5	33	55	0	22	26	26	35	34	13	-
Dover Road / Dickinson Road *Signalized*	AM	Volume (vph)	6	37	33	43	66	7	16	16	9	6	28	7	-
		v/c Ratio	0.01	0.03	0.04	0.05	0.06	0.01	0.07	0.08	0.08	0.02	0.05	0.00	-
		Delay (s/veh)	8	7	3	7	7	0	9	7	7	10	8	0	7
		LOS	A	A	A	A	A	A	A	A	A	A	A	0	A
		95% Q (m)	2	7	3	8	10	0	4	4	4	2	3	0	-
	PM	Volume (vph)	34	245	103	68	187	33	56	80	65	37	79	18	-
		v/c Ratio	0.07	0.30	0.14	0.13	0.22	0.04	0.17	0.29	0.29	0.15	0.14	0.00	-
		Delay (s/veh)	9	10	3	9	9	3	11	8	8	11	9	0	8
		LOS	A	A	A	A	A	A	B	A	A	B	A	0	A
		95% Q (m)	7	34	7	11	25	3	10	15	15	7	6	0	-

***Note**: **RED** indicates exceeded capacity or poor performance at LOS E or F.*

Opening Day (2028) Conditions

The opening day (2028) weekday operating conditions were analyzed at the study intersections described in *Section 1.2*. A summary of the results for the AM and PM peak hours – including volume to capacity (v/c) ratio, delay, LOS, and 95th percentile queue length – without and with additional site generated traffic can be found in *Table 5* and *Table 6*, respectively. The detailed results can be found in *Appendix C.* The existing intersection performance is described below:

For the Opening Day (2028) **background** scenario:

- At Island Highway North / Mary Ellen Drive:
    - The SBL movement is expected to continue operating at LOS E during the PM peak.
    - All individual movements are expected to operate below capacity.
- At all remaining intersections:
    - All individual movements are expected to operate below capacity with minimal delays and queues. Furthermore, results suggest that all movements are expected to operate at LOS C or better.

With the addition of **development traffic** for the 2028 scenario:

- At Dover Road / Mary Ellen Drive:
    - The northbound left (NBL) movement is expected to deteriorate from LOS C in the background scenario to a LOS E during the PM peak.
    - All individual movements are expected to operate below capacity.
- At Island Highway North / Mary Ellen Drive:
    - The SBL movement is expected to continue operating at LOS E during the PM peak.
    - All individual movements are expected to operate below capacity.
- At all remaining intersections:
    - All individual movements are expected to operate below capacity with minimal delays and queues. Furthermore, results suggest that all movements operate at LOS C or better.

Table 5: Opening Day (2028) Operating Conditions – Background Only

Opening Day (2028) Conditions – Background Only															
Intersection	**Period**	**Attribute**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**Overall**
Lantzville Road / Dover Road / Schook Road *Unsignalized*	AM	Volume (vph)	0	47	-	-	30	12	-	-	-	8	-	1	-
		v/c Ratio	0.00	0.00	-	-	0.03	0.03	-	-	-	0.01	-	0.01	-
		Delay (s/veh)	0	0	-	-	0	0	-	-	-	9	-	9	-
		LOS	A	A	-	-	A	A	-	-	-	A	-	A	-
		95% Q (m)	0	0	-	-	0	0	-	-	-	0	-	0	-
	PM	Volume (vph)	1	196	-	-	144	37	-	-	-	24	-	2	-
		v/c Ratio	0.00	0.00	-	-	0.12	0.12	-	-	-	0.05	-	0.05	-
		Delay (s/veh)	0	0	-	-	0	0	-	-	-	11	-	11	-
		LOS	A	A	-	-	A	A	-	-	-	B	-	B	-
		95% Q (m)	0	0	-	-	0	0	-	-	-	1	-	1	-
Dover Road / Mary Ellen Drive *Unsignalized*	AM	Volume (vph)	-	47	11	56	30	-	12	-	33	-	-	-	-
		v/c Ratio	-	0.04	0.01	0.05	0.02	-	0.03	-	0.05	-	-	-	-
		Delay (s/veh)	-	0	0	8	0	-	10	-	9	-	-	-	-
		LOS	-	A	A	A	A	-	B	-	A	-	-	-	-
		95% Q (m)	-	0	0	1	0	-	1	-	1	-	-	-	-
	PM	Volume (vph)	-	199	69	146	122	-	117	-	193	-	-	-	-
		v/c Ratio	-	0.13	0.05	0.12	0.07	-	0.35	-	0.27	-	-	-	-
		Delay (s/veh)	-	0	0	8	0	-	19	-	11	-	-	-	-
		LOS	-	A	A	A	A	-	C	-	B	-	-	-	-
		95% Q (m)	-	0	0	3	0	-	12	-	8	-	-	-	-
Island Highway North / Mary Ellen Drive *Signalized*	AM	Volume (vph)	14	99	31	29	299	6	8	35	34	6	29	34	-
		v/c Ratio	0.03	0.06	0.04	0.04	0.15	0.01	0.03	0.14	0.14	0.02	0.10	0.11	-
		Delay (s/veh)	5	4	2	9	7	0	15	9	9	15	15	3	7
		LOS	A	A	A	A	A	A	B	A	A	B	B	A	A
		95% Q (m)	2	3	1	6	19	0	3	5	5	3	7	1	-
	PM	Volume (vph)	74	296	84	156	641	43	75	194	174	116	136	130	-
		v/c Ratio	0.17	0.14	0.09	0.31	0.37	0.05	0.36	0.51	0.51	0.83	0.39	0.33	-
		Delay (s/veh)	8	7	2	17	15	0	34	18	18	73	34	7	18
		LOS	A	A	A	B	B	A	C	B	B	**E**	C	A	B
		95% Q (m)	12	20	6	39	64	1	23	27	27	37	34	12	-
Dover Road / Dickinson Road *Signalized*	AM	Volume (vph)	7	41	36	47	73	8	18	18	10	7	31	8	-
		v/c Ratio	0.01	0.04	0.04	0.06	0.07	0.01	0.07	0.09	0.09	0.02	0.05	0.00	-
		Delay (s/veh)	8	7	4	7	7	0	9	7	7	9	8	0	7
		LOS	A	A	A	A	A	A	A	A	A	A	A	0	A
		95% Q (m)	2	7	4	8	11	0	4	4	4	2	3	0	-
	PM	Volume (vph)	37	270	113	75	206	36	62	88	72	41	87	20	-
		v/c Ratio	0.07	0.33	0.15	0.15	0.24	0.05	0.19	0.32	0.32	0.17	0.15	0.00	-
		Delay (s/veh)	9	10	3	9	9	3	11	8	8	11	9	0	8
		LOS	A	A	A	A	A	A	B	A	A	B	A	0	A
		95% Q (m)	7	37	7	12	27	4	11	16	16	8	7	0	-

***Note**: **RED** indicates exceeded capacity or poor performance at LOS E or F.*

Table 6: Opening Day (2028) Operating Conditions – with Development

Opening Day (2028) Conditions – with Development															
Intersection	**Period**	**Attribute**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**Overall**
Schook Road / Access 1 *Unsignalized*	AM	Volume (vph)	1	-	13	-	-	-	69	13	-	-	13	4	-
		v/c Ratio	0.03	-	0.03	-	-	-	0.08	0.08	-	-	0.01	0.01	-
		Delay (s/veh)	9	-	9	-	-	-	6	6	-	-	0	0	-
		LOS	A	-	A	-	-	-	A	A	-	-	A	A	-
		95% Q (m)	1	-	1	-	-	-	2	2	-	-	0	0	-
	PM	Volume (vph)	4	-	73	-	-	-	52	43	-	-	29	3	-
		v/c Ratio	0.15	-	0.15	-	-	-	0.06	0.06	-	-	0.02	0.02	-
		Delay (s/veh)	9	-	9	-	-	-	4	4	-	-	0	0	-
		LOS	A	-	A	-	-	-	A	A	-	-	A	A	-
		95% Q (m)	4	-	4	-	-	-	1	1	-	-	0	0	-
Lantzville Road / Access 2 *Unsignalized*	AM	Volume (vph)	4	-	73	-	-	-	52	43	-	-	29	3	-
		v/c Ratio	0.15	-	0.15	-	-	-	0.06	0.06	-	-	0.02	0.02	-
		Delay (s/veh)	9	-	9	-	-	-	4	4	-	-	0	0	-
		LOS	A	-	A	-	-	-	A	A	-	-	A	A	-
		95% Q (m)	4	-	4	-	-	-	1	1	-	-	0	0	-
	PM	Volume (vph)	4	51	-	-	32	69	-	-	-	13	-	1	-
		v/c Ratio	0.00	0.00	-	-	0.06	0.06	-	-	-	0.02	-	0.02	-
		Delay (s/veh)	1	1	-	-	0	0	-	-	-	9	-	9	-
		LOS	A	A	-	-	A	A	-	-	-	A	-	A	-
		95% Q (m)	0	0	-	-	0	0	-	-	-	0	-	0	-
Lantzville Road / Dover Road / Schook Road *Unsignalized*	AM	Volume (vph)	4	60	-	-	96	78	-	-	-	21	-	5	-
		v/c Ratio	0.00	0.00	-	-	0.18	0.18	-	-	-	0.06	-	0.06	-
		Delay (s/veh)	1	1	-	-	0	0	-	-	-	11	-	11	-
		LOS	A	A	-	-	A	A	-	-	-	B	-	B	-
		95% Q (m)	0	0	-	-	0	0	-	-	-	2	-	2	-
	PM	Volume (vph)	8	266	-	-	193	86	-	-	-	93	-	9	-
		v/c Ratio	0.01	0.01	-	-	0.22	0.22	-	-	-	0.41	-	0.41	-
		Delay (s/veh)	0	0	-	-	0	0	-	-	-	18	-	18	-
		LOS	A	A	-	-	A	A	-	-	-	C	-	C	-
		95% Q (m)	0	0	-	-	0	0	-	-	-	15	-	15	-
Dover Road / Mary Ellen Drive *Unsignalized*	AM	Volume (vph)	-	54	28	56	67	-	107	-	33	-	-	-	-
		v/c Ratio	-	0.04	0.02	0.05	0.05	-	0.29	-	0.06	-	-	-	-
		Delay (s/veh)	-	0	0	8	0	-	13	-	9	-	-	-	-
		LOS	-	A	A	A	A	-	B	-	A	-	-	-	-
		95% Q (m)	-	0	0	1	0	-	9	-	1	-	-	-	-
	PM	Volume (vph)	-	238	169	146	150	-	188	-	193	-	-	-	-
		v/c Ratio	-	0.18	0.13	0.15	0.09	-	0.72	-	0.31	-	-	-	-
		Delay (s/veh)	-	0	0	9	0	-	42	-	12	-	-	-	-
		LOS	-	A	A	A	A	-	**E**	-	B	-	-	-	-
		95% Q (m)	-	0	0	4	0	-	39	-	10	-	-	-	-

Table 6: Opening Day (2028) Operating Conditions – with Development (continued)

Opening Day (2028) Conditions – with Development *(continued)*															
Intersection	**Period**	**Attribute**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**Overall**
Island Highway North / Mary Ellen Drive *Signalized*	AM	Volume (vph)	58	99	31	29	299	57	8	35	34	14	29	43	-
		v/c Ratio	0.15	0.07	0.05	0.06	0.20	0.08	0.05	0.17	0.17	0.08	0.12	0.15	-
		Delay (s/veh)	5	4	2	11	10	1	17	11	11	17	17	2	8
		LOS	A	A	A	B	B	A	B	B	B	B	B	A	A
		95% Q (m)	4	3	1	6	18	2	3	4	4	4	7	1	-
	PM	Volume (vph)	107	296	84	156	641	81	75	194	174	170	136	176	-
		v/c Ratio	0.29	0.16	0.10	0.38	0.45	0.12	0.25	0.40	0.40	0.85	0.32	0.36	-
		Delay (s/veh)	11	9	3	21	19	3	23	12	12	57	23	5	18
		LOS	B	A	A	C	B	A	C	B	B	**E**	C	A	B
		95% Q (m)	17	21	7	38	61	6	19	22	22	45	29	10	-
Dover Road / Dickinson Road *Signalized*	AM	Volume (vph)	9	46	36	47	102	8	18	18	10	7	31	16	-
		v/c Ratio	0.01	0.04	0.04	0.06	0.09	0.01	0.07	0.09	0.09	0.02	0.06	0.06	-
		Delay (s/veh)	8	7	4	7	7	0	9	7	7	9	7	7	7
		LOS	A	A	A	A	A	A	A	A	A	A	A	A	A
		95% Q (m)	3	8	4	8	15	0	4	4	4	2	3	3	-
	PM	Volume (vph)	45	301	113	75	229	36	62	88	72	41	87	25	-
		v/c Ratio	0.09	0.37	0.15	0.16	0.27	0.05	0.20	0.32	0.32	0.17	0.16	0.16	-
		Delay (s/veh)	9	10	3	9	9	3	11	8	8	12	8	8	9
		LOS	A	B	A	A	A	A	B	A	A	B	A	A	A
		95% Q (m)	9	42	7	13	30	4	11	16	16	8	7	7	-

***Note**: **RED** indicates exceeded capacity or poor performance at LOS E or F.*

10-Year Horizon (2038) Conditions

The 10-Year Horizon (2038) weekday operating conditions were analyzed at the study intersections described in *Section 1.2*. A summary of the results for the AM and PM peak hours – including volume to capacity (v/c) ratio, delay, LOS, and 95th percentile queue length – without and with additional site generated traffic can be found in *Table 7* and *Table 8*, respectively. The detailed results can be found in *Appendix C.* The existing intersection performance is described below:

For the 10-Year Horizon (2038) **background** scenario:

- At Island Highway North / Mary Ellen Drive:
  - The SBL movement is expected to continue operating at LOS F during the PM peak.
  - All individual movements are expected to operate below capacity.
- At all remaining intersections:
  - All individual movements are expected to operate below capacity with minimal delays and queues. Furthermore, results suggest that all movements are expected to operate at LOS C or better.

With the addition of **development traffic** for the 2038 scenario:

- At Dover Road / Mary Ellen Drive:

- The NBL movement is expected to deteriorate from LOS C in the background scenario to LOS F during the PM peak.
- All individual movements are expected to operate below capacity.

- At Island Highway North / Mary Ellen Drive:
  - The SBL movement is expected to continue operating at LOS E during the PM peak.
  - All individual movements are expected to operate below capacity.
- At all remaining intersections:
  - All individual movements are expected to operate below capacity with minimal delays and queues. Furthermore, results suggest that all movements operate at LOS C or better.

Table 7: 10-Year Horizon (2038) Operating Conditions – Background Only

10-Year Horizon (2038) Conditions – Background Only															
Intersection	Period	Attribute	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Overall
Lantzville Road / Dover Road / Schook Road *Unsignalized*	AM	Volume (vph)	0	52	-	-	33	13	-	-	-	9	-	1	-
		v/c Ratio	0.00	0.00	-	-	0.04	0.04	-	-	-	0.02	-	0.02	-
		Delay (s/veh)	0	0	-	-	0	0	-	-	-	9	-	9	-
		LOS	A	A	-	-	A	A	-	-	-	A	-	A	-
		95% Q (m)	0	0	-	-	0	0	-	-	-	0	-	0	-
	PM	Volume (vph)	1	216	-	-	158	41	-	-	-	26	-	2	-
		v/c Ratio	0.00	0.00	-	-	0.13	0.13	-	-	-	0.06	-	0.06	-
		Delay (s/veh)	0	0	-	-	0	0	-	-	-	12	-	12	-
		LOS	A	A	-	-	A	A	-	-	-	B	-	B	-
		95% Q (m)	0	0	-	-	0	0	-	-	-	1	-	1	-
Dover Road / Mary Ellen Drive *Unsignalized*	AM	Volume (vph)	-	52	12	62	33	-	13	-	36	-	-	-	-
		v/c Ratio	-	0.04	0.01	0.05	0.02	-	0.03	-	0.06	-	-	-	-
		Delay (s/veh)	-	0	0	8	0	-	10	-	9	-	-	-	-
		LOS	-	A	A	A	A	-	B	-	A	-	-	-	-
		95% Q (m)	-	0	0	1	0	-	1	-	2	-	-	-	-
	PM	Volume (vph)	-	219	76	161	134	-	129	-	212	-	-	-	-
		v/c Ratio	-	0.14	0.05	0.13	0.08	-	0.43	-	0.30	-	-	-	-
		Delay (s/veh)	-	0	0	8	0	-	23	-	12	-	-	-	-
		LOS	-	A	A	A	A	-	C	-	B	-	-	-	-
		95% Q (m)	-	0	0	4	0	-	16	-	10	-	-	-	-
Island Highway North / Mary Ellen Drive *Signalized*	AM	Volume (vph)	15	109	34	32	329	7	9	39	37	7	32	37	-
		v/c Ratio	0.03	0.07	0.05	0.05	0.17	0.01	0.03	0.16	0.16	0.02	0.09	0.10	-
		Delay (s/veh)	5	4	2	9	7	0	15	10	10	15	15	2	7
		LOS	A	A	A	A	A	A	B	A	A	B	B	A	A
		95% Q (m)	2	4	1	7	21	0	3	5	5	3	9	2	-
	PM	Volume (vph)	81	326	92	172	705	47	83	213	191	128	150	143	-
		v/c Ratio	0.20	0.16	0.10	0.36	0.42	0.06	0.38	0.51	0.51	0.91	0.40	0.33	-
		Delay (s/veh)	8	7	2	19	17	1	34	18	18	87	32	6	19
		LOS	A	A	A	B	B	A	C	B	B	**F**	C	A	B
		95% Q (m)	13	22	6	43	70	2	25	29	29	48	38	13	-
Dover Road / Dickinson Road *Signalized*	AM	Volume (vph)	8	45	40	52	80	9	20	20	11	8	34	9	-
		v/c Ratio	0.01	0.04	0.04	0.06	0.07	0.01	0.08	0.10	0.10	0.02	0.06	0.00	-
		Delay (s/veh)	8	7	4	7	7	0	9	7	7	9	8	0	7
		LOS	A	A	A	A	A	A	A	A	A	A	A	0	A
		95% Q (m)	3	8	4	9	12	0	4	4	4	3	4	0	-
	PM	Volume (vph)	41	297	124	83	227	40	68	97	79	45	96	22	-
		v/c Ratio	0.08	0.37	0.16	0.17	0.26	0.05	0.22	0.35	0.35	0.19	0.16	0.00	-
		Delay (s/veh)	9	10	3	10	9	4	11	8	8	12	9	0	9
		LOS	A	B	A	A	A	A	B	A	A	B	A	0	A
		95% Q (m)	8	41	8	14	30	4	12	18	18	8	7	0	-

***Note**: **RED** indicates exceeded capacity or poor performance at LOS E or F.*

Table 8: 10-Year Horizon (2038) Operating Conditions – with Development

Opening Day (2028) Conditions – with Development															
Intersection	**Period**	**Attribute**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**Overall**
Schook Road / Access 1 *Unsignalized*	AM	Volume (vph)	1	-	13	-	-	-	69	14	-	-	14	4	-
		v/c Ratio	0.03	-	0.03	-	-	-	0.08	0.08	-	-	0.01	0.01	-
		Delay (s/veh)	9	-	9	-	-	-	6	6	-	-	0	0	-
		LOS	A	-	A	-	-	-	A	A	-	-	A	A	-
		95% Q (m)	1	-	1	-	-	-	2	2	-	-	0	0	-
	PM	Volume (vph)	4	-	73	-	-	-	52	47	-	-	32	3	-
		v/c Ratio	0.15	-	0.15	-	-	-	0.06	0.06	-	-	0.03	0.03	-
		Delay (s/veh)	9	-	9	-	-	-	4	4	-	-	0	0	-
		LOS	A	-	A	-	-	-	A	A	-	-	A	A	-
		95% Q (m)	4	-	4	-	-	-	1	1	-	-	0	0	-
Lantzville Road / Access 2 *Unsignalized*	AM	Volume (vph)	4	-	73	-	-	-	52	47	-	-	32	3	-
		v/c Ratio	0.15	-	0.15	-	-	-	0.06	0.06	-	-	0.03	0.03	-
		Delay (s/veh)	9	-	9	-	-	-	4	4	-	-	0	0	-
		LOS	A	-	A	-	-	-	A	A	-	-	A	A	-
		95% Q (m)	4	-	4	-	-	-	1	1	-	-	0	0	-
	PM	Volume (vph)	4	56	-	-	35	69	-	-	-	13	-	1	-
		v/c Ratio	0.00	0.00	-	-	0.07	0.07	-	-	-	0.02	-	0.02	-
		Delay (s/veh)	1	1	-	-	0	0	-	-	-	9	-	9	-
		LOS	A	A	-	-	A	A	-	-	-	A	-	A	-
		95% Q (m)	0	0	-	-	0	0	-	-	-	0	-	0	-
Lantzville Road / Dover Road / Schook Road *Unsignalized*	AM	Volume (vph)	4	65	-	-	99	79	-	-	-	22	-	5	-
		v/c Ratio	0.00	0.00	-	-	0.18	0.18	-	-	-	0.06	-	0.06	-
		Delay (s/veh)	1	1	-	-	0	0	-	-	-	11	-	11	-
		LOS	A	A	-	-	A	A	-	-	-	B	-	B	-
		95% Q (m)	0	0	-	-	0	0	-	-	-	2	-	2	-
	PM	Volume (vph)	8	286	-	-	207	90	-	-	-	95	-	9	-
		v/c Ratio	0.01	0.01	-	-	0.23	0.23	-	-	-	0.44	-	0.44	-
		Delay (s/veh)	0	0	-	-	0	0	-	-	-	20	-	20	-
		LOS	A	A	-	-	A	A	-	-	-	C	-	C	-
		95% Q (m)	0	0	-	-	0	0	-	-	-	17	-	17	-
Dover Road / Mary Ellen Drive *Unsignalized*	AM	Volume (vph)	-	59	29	62	70	-	108	-	36	-	-	-	-
		v/c Ratio	-	0.04	0.02	0.05	0.05	-	0.28	-	0.06	-	-	-	-
		Delay (s/veh)	-	0	0	8	0	-	13	-	9	-	-	-	-
		LOS	-	A	A	A	A	-	B	-	A	-	-	-	-
		95% Q (m)	-	0	0	1	0	-	9	-	2	-	-	-	-
	PM	Volume (vph)	-	258	176	161	162	-	200	-	212	-	-	-	-
		v/c Ratio	-	0.20	0.13	0.17	0.10	-	0.85	-	0.35	-	-	-	-
		Delay (s/veh)	-	0	0	9	0	-	62	-	13	-	-	-	-
		LOS	-	A	A	A	A	-	F	-	B	-	-	-	-
		95% Q (m)	-	0	0	5	0	-	54	-	12	-	-	-	-

Table 8: 10-Year Horizon (2038) Operating Conditions – with Development (continued)

Opening Day (2028) Conditions – with Development *(continued)*															
Intersection	**Period**	**Attribute**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**Overall**
Island Highway North / Mary Ellen Drive *Signalized*	AM	Volume (vph)	59	109	34	32	329	58	9	39	37	15	32	46	-
		v/c Ratio	0.16	0.08	0.05	0.06	0.22	0.08	0.06	0.18	0.18	0.08	0.11	0.14	-
		Delay (s/veh)	5	4	2	11	10	1	17	11	11	17	17	2	8
		LOS	A	A	A	B	B	A	B	B	B	B	B	A	A
		95% Q (m)	5	4	1	6	19	3	3	5	5	5	8	2	-
	PM	Volume (vph)	114	326	92	172	705	85	83	213	191	182	150	189	-
		v/c Ratio	0.34	0.18	0.11	0.44	0.51	0.12	0.27	0.41	0.41	0.87	0.32	0.35	-
		Delay (s/veh)	12	10	3	23	20	3	22	12	12	61	23	5	18
		LOS	B	A	A	C	C	A	C	B	B	**E**	C	A	B
		95% Q (m)	18	23	7	43	68	6	20	23	23	#58	32	13	-
Dover Road / Dickinson Road *Signalized*	AM	Volume (vph)	10	50	40	52	109	9	20	20	11	8	34	17	-
		v/c Ratio	0.01	0.05	0.04	0.06	0.10	0.01	0.08	0.10	0.10	0.02	0.07	0.07	-
		Delay (s/veh)	8	7	4	7	7	0	9	7	7	9	7	7	7
		LOS	A	A	A	A	A	A	A	A	A	A	A	A	A
		95% Q (m)	3	8	4	9	16	0	4	4	4	3	4	4	-
	PM	Volume (vph)	49	328	124	83	250	40	68	97	79	45	96	27	-
		v/c Ratio	0.10	0.40	0.16	0.17	0.29	0.05	0.22	0.36	0.36	0.19	0.17	0.17	-
		Delay (s/veh)	9	10	3	10	9	3	12	9	9	12	9	9	9
		LOS	A	B	A	A	A	A	B	A	A	B	A	A	A
		95% Q (m)	9	46	8	14	33	4	12	18	18	8	7	7	-

***Note**: **RED** indicates exceeded capacity or poor performance at LOS E or F.*

4.4. TRAFFIC OPERATING CONDITIONS – WITH POTENTIAL IMPROVEMENTS

As seen in *Table 8*, with the addition of development traffic for the 10-Year Horizon (2038) condition, the NBL movement at the unsignalized Dover Road / Mary Ellen Drive intersection operates at a LOS E during the PM peak hour. This movement deteriorates due to the additional development traffic in the 2028 condition. Note that this assumes no transportation demand management (TDM) strategies are implemented, and drivers continue to take the same routes to their destinations as the Existing (2023) condition.

Potential improvements for the Dover Road / Mary Ellen Drive intersection were tested using the Synchro software (version 11). A comparison of the results before and after improvements for the worst performing scenario (2038 PM – with development) is presented in *Table 9* below.

10-Year Horizon (2038) PM Conditions – with Development and Improvements

For the 2038 PM condition with development, the following improvements were made in the Synchro model for the unsignalized intersection at Dover Road / Mary Ellen Drive:

- Addition of a signal at this intersection, maintaining existing laning configurations
- Optimization of cycle length and split

As a result of these improvements, the NBL movement at Dover Road / Mary Ellen Drive improves from an LOS F to LOS B during the PM peak period. The eastbound through (EBT) and westbound left (WBL) conditions worsen slightly to LOS C and LOS B as a result of removing their right of way, though this is still considered an acceptable level of service.

Table 9: 10-Year Horizon (2038) Operating Conditions – with Development and Improvements

10-Year Horizon (2038) PM Conditions – with Development and Improvements															
Intersection	**Period**	**Attribute**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**Overall**
Dover Road / Mary Ellen Drive	**Unsignalized Intersection**														
	PM	Volume (vph)	-	258	176	161	162	-	200	-	212	-	-	-	-
		v/c Ratio	-	0.20	0.13	0.17	0.10	-	0.85	-	0.35	-	-	-	-
		Delay (s/veh)	-	0	0	9	0	-	62	-	13	-	-	-	-
		LOS	-	A	A	A	A	-	**F**	-	B	-	-	-	-
		95% Q (m)	-	0	0	5	0	-	54	-	12	-	-	-	-
	Signalized Intersection with Cycle & Split Optimization														
	PM	Volume (vph)	-	258	176	161	162	-	200	-	212	-	-	-	-
		v/c Ratio	-	0.69	0.39	0.46	0.22	-	0.39	-	0.36	-	-	-	-
		Delay (s/veh)	-	27	5	13	9	-	19	-	4	-	-	-	14
		LOS	-	C	A	B	A	-	B	-	A	-	-	-	B
		95% Q (m)	-	44	8	19	19	-	35	-	11	-	-	-	-

***Note**: **RED** indicates exceeded capacity or poor performance at LOS E or F.*

5. Site Access

5.1. DESCRIPTION

According to the site plan attached in *Appendix A*, the development site has three proposed accesses, all of which are to have two-way traffic flow and are summarized below:

- **Access 1** – located on the west side of Schook Road approximately 120 m north of Lantzville Road. This access leads to the surface lot and two-level parkade. It was assumed that 50% of trips to / from the development will use this access.

- **Access 2** – located on the north side of Lantzville Road approximately 60 m west of Schook Road. This access also leads to the surface lot and two-level parkade. It was assumed that the other 50% of trips to / from the development will use this access.

In addition to the above two site accesses, the proposed site plan includes dedicated access to the loading bay located north of Access 1 on Schook Road. The loading bay access is located approximately 140 m north of Lantzville Road.

5.2. SIGHT LINES

The sight lines for the abovementioned site accesses were reviewed based on guidance from the TAC's *Geometric Design Guide for Canadian Roads*. As indicated in the guide, roads such as Lantzville Road and Schook Road with a 50 km/h design speed should have at least a 65 m stopping sight distance. Stopping sight distance is the distance required for a vehicle to perceive a roadway obstacle and stop.

Sight lines are not anticipated to be a problem so long as the sight triangles shown in *Figure 11* are kept clear of any visual obstructions such as structures, fences, or vegetation. Tall landscaping which may obstruct vehicle sight lines should be avoided near the entrances. As more detailed versions of the site plan are developed, it is recommended to revaluate the sight lines at these accesses.

McElhanney
2211-47744-01

TIA – Lantzville Long-Term Care Facility Development – Rev 2
Site Access Sightline Assessment
FIGURE 11

Not to Scale

6. Conclusion and Recommendation

6.1. CONCLUSION

The purpose of this memorandum was to revise the TIA completed by McElhanney on August 1, 2024, to reflect an updated site plan. The TIA analyzes traffic operations for the proposed development located at 6910 and 6930 Lantzville Road, in the District of Lantzville, B.C. This study evaluated traffic for the existing (2023), opening day (2028), and 10-year horizon (2038) conditions across four study intersections and two site accesses.

Multimodal Review

The full Multimodal Review for the study area is outlined in *Section 2*.

The existing pedestrian network lacks sidewalks or MUPs on both sides along Lantzville Road, Schook Road, Island Highway North, and on one side along both Dover Road and Dickinson Road. The addition of dedicated crossings at the west and north leg of the Lantzville Road / Schook Road intersection and sidewalks along the east side of Schook Road and the north side of Dover Road could increase connectivity between the proposed development and parks and commercial spaces.

The cycling network lacks bike paths on both sides along Schook Road and on one side along some portions of Dover Road, Mary Ellen Drive, and Dickinson Road. New dedicated crossings at the west and north leg of the Lantzville Road / Dover Road / Schook Road intersection could improve cyclist connectivity between the proposed development, parks, and commercial spaces. A bike path could be considered along Schook Road to connect the proposed development to the bike route along Dover Road.

The transit network provides access to the proposed development through three bus routes within a 5- to 10-minute walking distance. Woodgrove Exchange is also accessible within a 12-minute walking distance from the development site. Bus service on weekdays is infrequent, with AM and PM peak hour wait times ranging between 20 and 55 minutes. Weekend service is reduced further.

Trip Generation

The proposed development is expected to generate an additional 174 vehicle trips (146 inbound / 28 outbound) during the weekday AM peak period and 265 vehicle trips (110 inbound / 155 outbound) during the weekday PM peak period. This includes LTC facility staff, visitors, and daycare users.

Traffic Analysis

Traffic was analyzed for the peak site-trip generating hour, which corresponds with employee shift turnover at 7:00 AM and 3:00 PM. Accordingly, the peak analysis periods were selected to be 6:30 AM to 7:30 AM and 2:30 PM to 3:30 PM. To project future volumes, a 2.0% annual linear growth rate growth rate was applied.

Existing (2023) Conditions

For the existing (2023) conditions, individual movements at all intersections operate below capacity. However, at the Island Highway North / Mary Ellen Drive intersection, the SBL movement operates at a LOS E during the PM peak.

Opening Day (2028) Conditions

Under opening day (2028) conditions, individual movements at all intersections are expected to continue operating below capacity. The SBL movement at Island Highway North / Mary Ellen Drive intersection is expected to further deteriorate but remain at a LOS E during the PM peak.

With the addition of development traffic:

- The NBL movement at Dover Road / Mary Ellen Drive is expected to deteriorate to a LOS E during the PM peak.
- The SBL movement at Island Highway North / Mary Ellen Drive intersection is expected to further deteriorate but remain at a LOS E during the PM peak.
- All individual movements are expected to continue operating below capacity.

15-Year Horizon (2038) Conditions

Under 10-year horizon (2038) conditions, individual movements at all intersections are expected to continue operating below capacity. The SBL movement at Island Highway North / Mary Ellen Drive intersection is expected to further deteriorate but remain at a LOS E during the PM peak.

With the addition of development traffic:

- The NBL movement at Dover Road / Mary Ellen Drive is expected to deteriorate to LOS F during the PM peak.
- The SBL movement at Island Highway North / Mary Ellen Drive intersection is expected to further deteriorate but remain at a LOS E during the PM peak.
- All individual movements are expected to continue operating below capacity.

Site Access

No safety or sight line issues were identified at the two site accesses proposed for the development at this time so long as the sight triangles shown in *Figure 11* are kept clear of any visual obstructions such as structures, fences or vegetation.

6.2. RECOMMENDATION

To improve pedestrian and cyclist connectivity, dedicated crossings at the west and north leg of the Lantzville Road / Dover Road / Schook Road intersection may be considered to connect the proposed development with nearby parks and commercial areas. Additionally, a bike path along Schook Road could be considered to connect the proposed development to the bike route along Dover Road.

Without the development traffic for the 2028 and 2038 conditions, the SBL movement at the signalized Island Highway North / Mary Ellen Drive intersection is expected to operate at a LOS E during the PM peak. After the addition of new site trips, the SBL movement is expected to remain at LOS E and operate under capacity, though delays approach tolerance levels. Note however, as delays continue to rise further it is expected that drivers may select alternate routes or trip patterns to their destinations to avoid excessive travel time delays.

With the addition of development traffic for the 10-year horizon (2038) condition, the NBL movement at the unsignalized Dover Road / Mary Ellen Drive intersection deteriorates to LOS E during the PM peak hour. The movement still operates under capacity, though improvements can be made to reduce heavy northbound-left trip delay. Signalizing the intersection improves the movement from LOS E to LOS C during the busier PM peak. Note that the introduction of a signal removes free-flow conditions for the east and west movements, which deteriorate from LOS A to LOS D at worst. As traffic continues to grow throughout the study area, monitoring the intersection may be considered and installing a traffic light as deemed necessary.

Lastly, it is recommended to maintain surrounding vegetation (trim and prune regularly) which may obstruct vehicle and pedestrian sight lines near the site access entrances. Continue to revaluate sight line requirements as updated site plans are provided.

7. Closing

If you have any questions or concerns regarding the information provided in this memo, please contact the undersigned.

Sincerely,
McElhanney Ltd.

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Appendices:
A – Site Plan
B – Raw Traffic Counts
C – Synchro Reports
D – Statement of Limitations