McElhanney

CANADA BEST MANAGED COMPANIES
Platinum member

2123 Hector Road, Comox

Traffic Impact Assessment

November 21, 2023

Submitted to Town of Comox
Prepared by McElhanney

Contact
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Our file: 2111-06197-00

Your Challenge.
Our Passion.

Our File: 2111-06197-00

November 21, 2023

Town of Comox
1809 Beaufort Avenue
Comox BC V9M 1R9

Attention: Marvin Kamenz, Director of Development Services

2123 Hector Road, Comox – Traffic Impact Assessment

Dear Marvin:

Please find attached the Traffic Impact Assessment (TIA) for the proposed development at 2123 Hector Road in Comox, BC. This TIA was requested by the Town of Comox for the development approval process.

The information within this report is true and accurate to the best of our knowledge. If you have any questions or concerns regarding this analysis, please contact the undersigned.

Sincerely,

McElhanney Ltd.

Prepared by:

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Reviewed by:

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA M.I. MERLO
2023-11-21

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PERMIT TO PRACTICE
McElhanney Ltd.
PERMIT NUMBER: 1003299
Engineers and Geoscientists of BC

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1. Introduction

McElhanney Ltd. (McElhanney) was retained by Broadstreet Properties Ltd. (the Client) to perform a Traffic Impact Assessment (TIA) for the proposed development located at 2123 Hector Road in the Town of Comox, British Columbia (BC). The scope of this TIA was established in a Development Approval Information Notice (DAI) dated March 6, 2023, from the Town of Comox attached in *Appendix A*.

The purpose of this TIA was to assess the impacts of the proposed development on the Town's and Comox Valley Regional District (CVRD) transportation networks and connectivity by evaluating two potential road network scenarios:

- ***Scenario 1***: Per concept site plans submitted by Broadstreet attached in *Appendix B*, properties at 2123 (the subject property) and 2077 Hector Road each provide individual access to public roads (Aspen Road and Hector Road, respectively) and no vehicular connection between these properties is constructed unless required for emergency access.

- ***Scenario 2***: A new east-west local road connecting Aspen Road to Anderton Road is constructed and provides access to 2123 and 2077 Hector Road properties, while a new greenway along Hector Road remains uninterrupted by vehicle traffic except for Town maintenance access to ponds and emergency vehicle access, if required.

In recent years, several traffic impact studies have been completed for neighbouring developments in close proximity of the subject development. McElhanney Ltd. completed a study for 2309 McDonald Road in 2018 and 695 Aspen Road in 2019. Bunt & Associates completed a study for 941 Aspen Road and 2077 Hector Road in 2023. Traffic counts and development traffic from these previous reports was considered in this study's analysis. Refer to *Section 3* for additional details on the incorporation of previous reports.

This study evaluates the Existing (2023), Opening Day (2025), and 20-Year Horizon (2043) conditions for the weekday AM and PM peak hours. Additionally, a site access review and high-level analysis considering future boundary extensions is provided. The following presents our assumptions, analysis, findings, and recommendations.

2. Background Information

2.1. PROJECT DESCRIPTION

The subject development is located at 2123 Hector Road in Comox BC, north of Guthrie Road and west of Anderton Road. The development is split into northern and southern halves. The current plans under Scenario 1 and Scenario 2 are shown in *Figure 1*, attached in *Appendix B*, and described below:

- **Scenario 1**
  - North: Four-storey apartment buildings with a total of 183 rental units (33 one-bedroom units, 118 two-bedroom units, and 32 three-bedroom units)
  - South: 69 three-storey townhomes (all three-bedroom units)

- **Scenario 2**
  - North: Four-storey apartment buildings with a total of 171 rental units (29 one-bedroom units, 118 two-bedroom units, and 24 three-bedroom units)
  - South: 65 three-storey townhomes (all three-bedroom units)

Under Scenario 1, access to both halves is proposed via two independent accesses on the east side of Aspen Road, fronting Grumman Place and Neptune Way. With the new east-west road under Scenario 2, access to the northern half is proposed for the new road. Access to the southern half is to remain on Aspen Road.

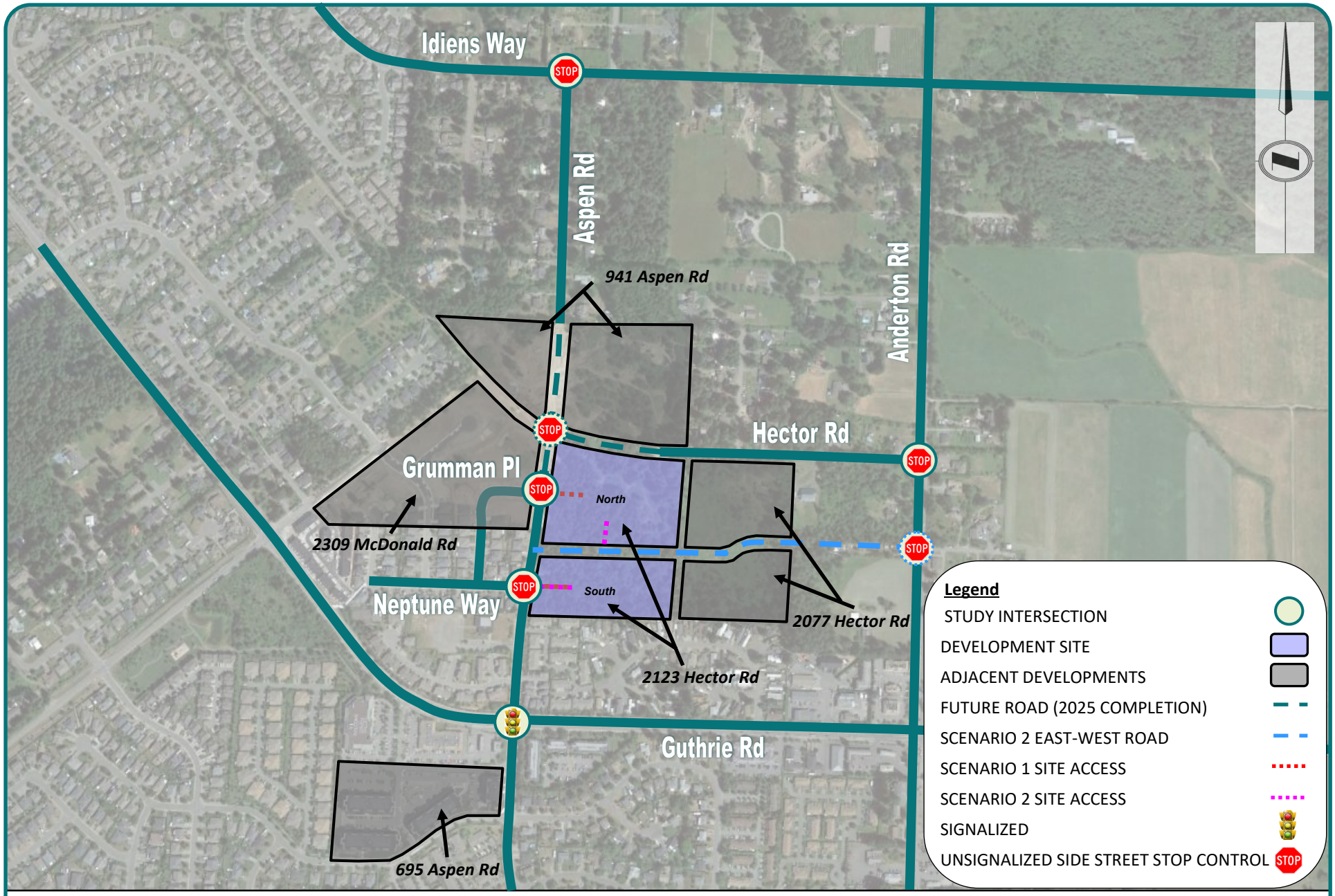
The nearby road network will change as the subject site is developed. By the Opening Day (2025), Aspen Road and Hector Road are expected to become continuous and connect with each other.

Figure 1: Site Plan (Above: Scenario 1, Below: Scenario 2)

2.2. STUDY AREA

The study area shown in *Figure 2* includes the area immediately surrounding the site including the site access points as well as the following intersections:

- Guthrie Road / Aspen Road (signalized),
- Aspen Road / Hector Road (future side-street stop controlled),
- Hector Road / Anderton Road (side-street stop controlled),
- Anderton Road / New east-west local road (scenario 2 future side street stop controlled),
- Aspen Road / Idiens Way (side-street stop controlled),
- Grumman Place / Aspen Road (side-street stop controlled), and
- Neptune Way / Aspen Road (side-street stop controlled).



2123 Hector Road - TIA
Study Area

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FIGURE 2

Not to Scale

2.3. EXISTING CONDITIONS

Existing conditions for the roads adjacent to the subject site are described in this section. All public road classifications and jurisdiction boundaries are based on the Town of Comox's *Official Community Plan Bylaw 1954 (February 2021)*. See *Figure 3*.

Guthrie Road

Guthrie Road is an east-west arterial road in Comox. Within the study area, it is a divided two-lane road with sidewalks and bike lanes on both sides in the study area. Guthrie Road connects to Lazo Road in the east and Highway 19A in the west as Lerwick Road. The posted speed limit within the study area is 50 km/h.

Aspen Road

The portion of Aspen Road in the Town of Comox is a north-south major collector road while the north portion outside of the Town is a Ministry of Transportation Infrastructure (MoTI) road. Aspen Road connects residential areas to arterial roads such as Guthrie Road and Anderton Road. It is an undivided two-lane road with sidewalks on both sides. At its north end there is no sidewalk on the east side. It will be extended north to Idiens Way. The posted speed limit within the study area is 50 km/h.

Hector Road

Hector Road is an east-west local road that connects to Anderton Road in the east and terminates to the west. Currently Hector Road is an MoTI road planned to be extended west to Aspen Road. Under Scenario 1, vehicles access from properties will be permitted on Hector Road. Under Scenario 2, the new Hector Greenway will remain uninterrupted by vehicles as access to 2123 and 2077 Hector Road will be via the new east-west local road connecting Aspen Road and Anderton Road.

Anderton Road

Anderton Road is a north-south arterial road that passes the Comox Valley Airport and connects to the BC Ferries Little River terminal to the north. It is a MoTI road north of the commercial areas by Guthrie Road. To the south, Anderton Road passes through several neighbourhoods and connects to downtown Comox area. Within the study area, it is a two-lane road with bike lanes on both sides south of Guthrie Road plus a short section north of Guthrie Road on the east side. The posted speed limit within the study area is 50 km/h increasing to 60 km/h further north.

Idiens Way

Idiens Way, not located in the Town of Comox, is an east-west local MoTI road connecting Lerwick Road in the west to Anderton Road in the east. The road has a speed limit of 50 km/h.

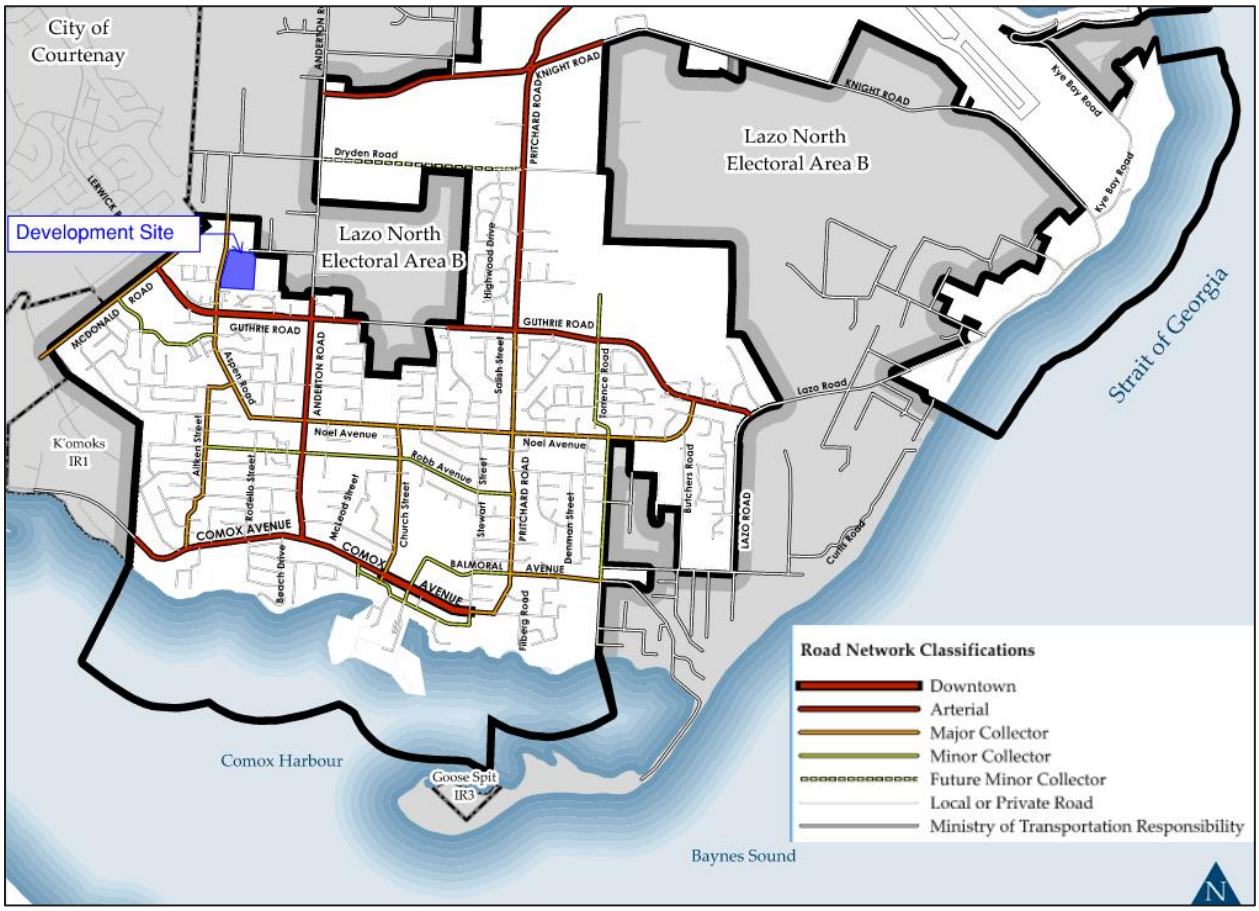
Grumman Place

Grumman Place is a local road which runs west from Aspen Road and curves south to connect to Neptune Way. Under Scenario 1, the access for the northern potion of the development lines up with Grumman Place. The road has a speed limit of 50 km/h.

Neptune Way

This local Road runs west from Aspen Road and terminates at a cul-de-sac to the west. Under both Scenario 1 and Scenario 2, the access for the southern portion of the development will line up with Neptune Way. The road has a speed limit of 50 km/h.

Figure 3: Road Classification (Figure Modified from Town of Comox OCP, Bylaw 1954, February 2021)



2.4. FUTURE ROAD NETWORK

In the future it is anticipated that Hector Road will be extended west, and Aspen Road extended north to connect with each other. Aspen Road will be extended further north to connect to the second portion of Aspen Road that runs south from Idiens Way but currently ends in a dead end. For analysis purposes, the extensions of Hector Road and Aspen Road are assumed to be complete by the subject development's opening day in 2025. For Scenario 2 analysis, it was assumed that the new east-west road connecting Aspen Road and Anderton Road will also be built out by 2025.

2.5. MULTIMODAL NETWORK

The existing and proposed multimodal network for this study area has been recently defined in the *Town of Comox 2020 Transportation Master Plan Update (2021)* and the *Bunt & Associates Transportation Impact Assessment for 941 Aspen Road and 2077 Hector Road (2023)*. Refer to *Appendix C* for related maps defining the pedestrian, cyclists, and transit network in the study area. An additional summary is provided below:

2.5.1. Pedestrians

A summary of the pedestrian network in the study area is provided below and summarized in *Figure 4*.

- **Guthrie Road:** There is an existing sidewalk on both sides of the road in the study area. There is a signalized crossing at Anderton Road, with only one other crossing opportunity until Pritchard Road.

- **Aspen Road:** Currently there are sidewalks along both sides in the study area except near the northern terminus of the road. A proposed sidewalk on the west side of Aspen Road from Noel Avenue to Murrelet Drive is expected to be complete by 2024. The proposed Comox Valley Regional District (CVRD) greenway trail north of Grumman Place will provide pedestrians connection to other greenway trails on Hector Road, McDonald Road, and in nearby parks. There is a signalized crossing at Guthrie Road.

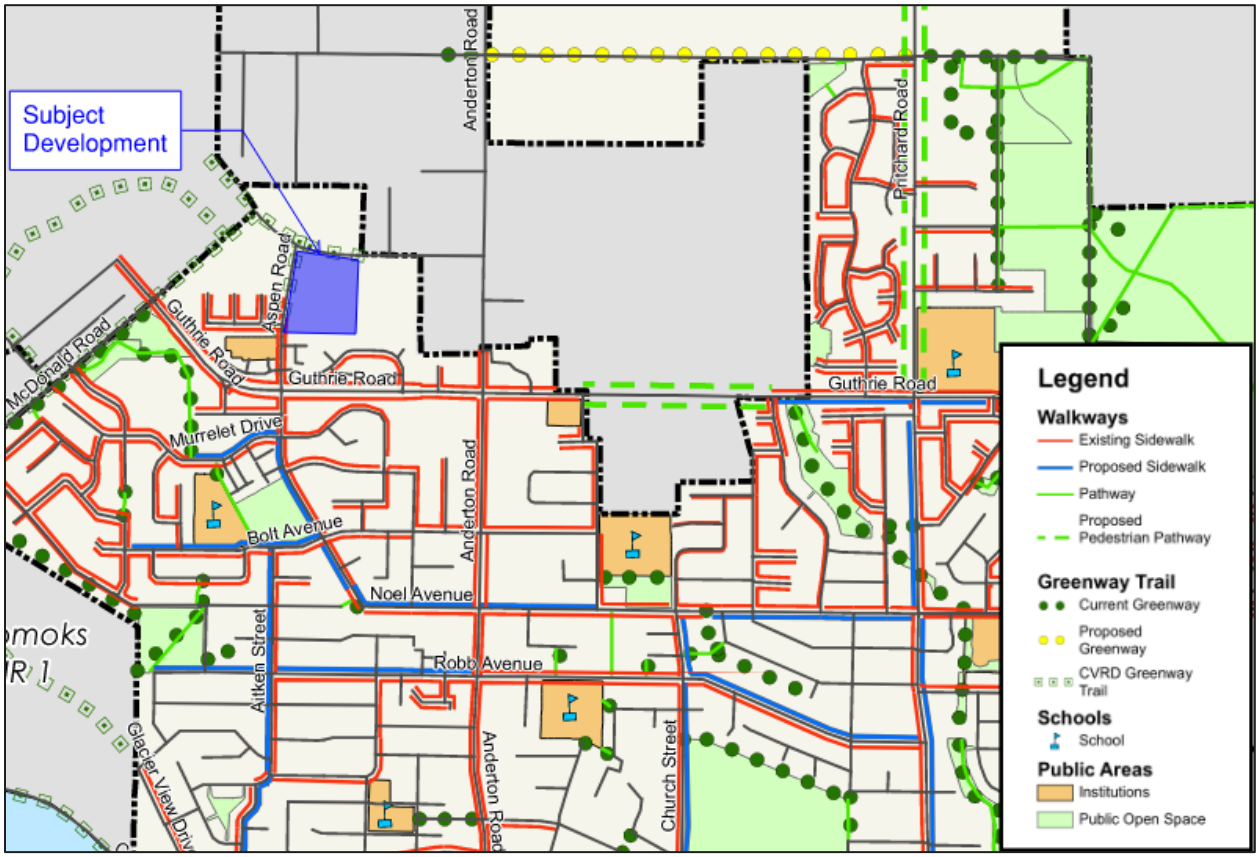
- **Hector Road:** Currently, no sidewalks are provided on either side of the road.

- **Anderton Road:** There are existing sidewalks on both sides of the road. The sidewalks terminate north of Guthrie Road, past the end of the Town's Boundary. There are no proposed upgrades north of the Town's boundary at this time.

- **Idiens Way:** Currently, no sidewalks are provided on either side of the road until just west of Sylvan Road. However, Idiens Way between Anderton Road and Pritchard Road is a proposed greenway trail which will provide pedestrians connection to greenways east of Pritchard Road.

- **Grumman Place and Neptune Way:** Existing sidewalks on both sides of the road. There are no proposed improvements at this time.

Figure 4: Existing and Proposed Pedestrian Network (Figure Modified from Town of Comox 2020 Transportation Master Plan Update)



2.5.2. Cyclists

A summary of the cycling network in the study area is provided below and summarized in *Figure 5*.

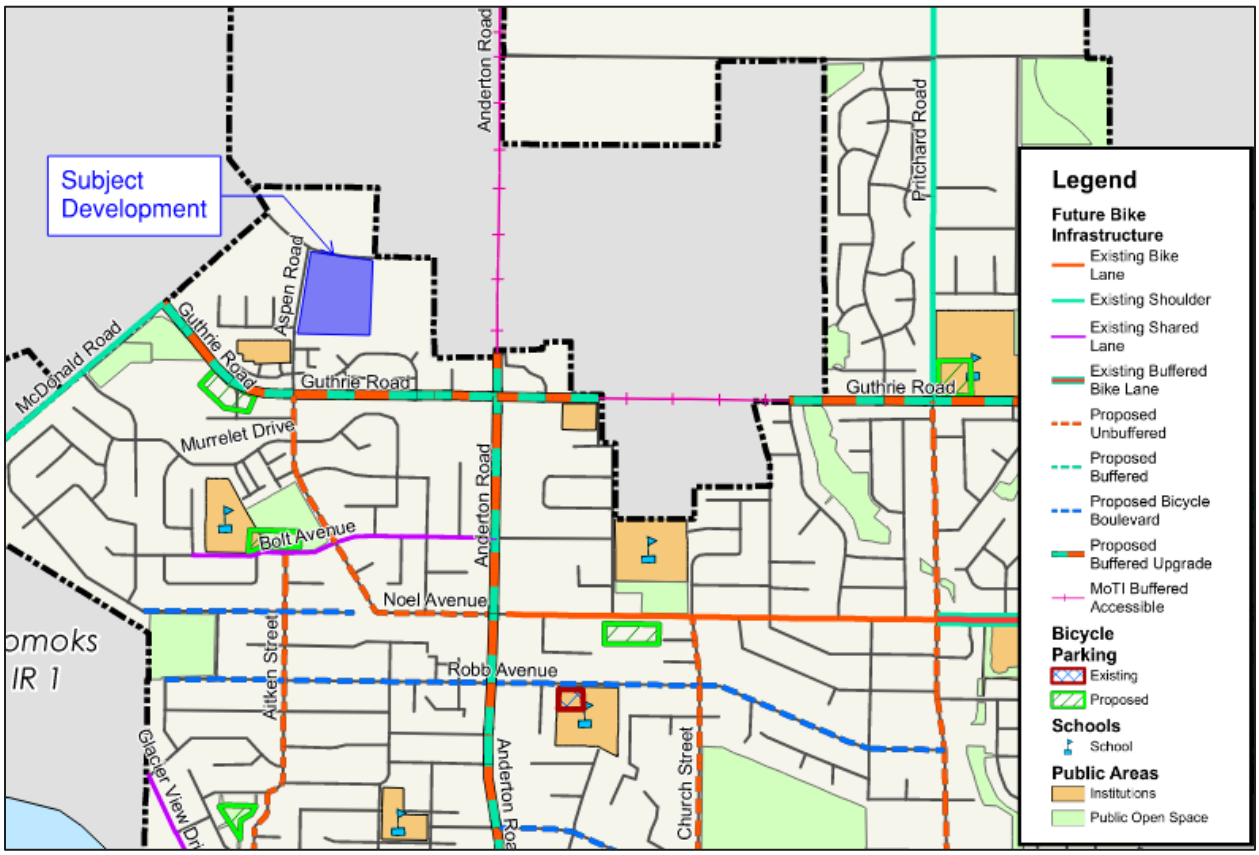
- **Guthrie Road:** There are dedicated bike lanes on both sides of the road complete with pavement markings. Buffered bicycle facilities are proposed along Guthrie Road from Nootka Street to Pritchard Road and McDonald Road to Linshart Road by 2024 and 2039, respectively. There is a signalized crossing at Anderton Road, with only one other crossing opportunity until Pritchard Road.

- **Aspen Road:** Currently, there are no bike paths provided along Aspen Road; however, unbuffered bicycle facilities are proposed from Guthrie Road to Noel Avenue by 2024. There is a signalized crossing at Guthrie Road.

- **Anderton Road:** Dedicated bike lanes on both sides of the road complete with pavement markings are provided south of Guthrie Road. Buffered bicycle facilities are proposed along Anderton Road from Comox Avenue to Guthrie Road by 2029. There is a signalized crossing at Guthrie Road and several crossing opportunities further south.

- **Hector Road, Idiens Way, Grumman Place, and Neptune Way:** Currently, there are no bike paths provided along these roads. There are no proposed improvements at this time.

Figure 5: Existing and Proposed Cycling Network (Figure Modified from Town of Comox 2020 Transportation Master Plan Update)



2.5.3. Transit

An overview of the existing transit routes and stops near the development site can be found in the *Bunt & Associates Transit Map (2023)* located in *Appendix C*. Additional route and bus timing information was retrieved from the *BC Transit* website. Currently, there are two transit routes that operate along Guthrie Road. There are nine bus stops within an 800 m radius or approximately 10-minute walk from the subject site. Four of these stops have sheltered benches while the other five have no amenities. The bus routes are summarized below:

- **Route #1 - Anfield Centre/Comox Mall:** This route connects Comox Mall to Ansfield Centre in Courtenay, BC with stops near destinations such as North Island College and Driftwood Mall in between. Bus service frequency varies based on time of day and day of week. Weekday AM and mid-day has service every 20 minutes while weekday PM, weekday evenings, and weekends have service between 30-40 minutes.

- **Route # 99 - VMP Connector:** This route connects Downtown Courtenay, BC to various destinations in Comox such as schools, North Island College, the Comox Valley Sports Centre, and Comox Airport. It only offers one trip in the morning and one trip in the afternoon during the school year. An additional trip lasting 15 minutes is offered in the Downton Courtenay direction for three stops in July and August only. No other transit frequency information was available for this route.

Additionally, the Comox Centre Exchange and North Island College/Comox Valley Aquatic Centre Exchange are located approximately 2.5 km southeast and 3.5km northeast, respectively, from the proposed development. These transit exchanges are serviced by eight BC transit bus routes. In addition to the routes listed above, other bus routes at the two mentioned exchanges are:

- Route 3: Comox Local
- Route 4: Driftwood Mall / Comox Mall
- Route 6: Uplands
- Route 11: Little River / Downtown
- Route 12: Oyster River / Downtown
- Route 13: Merville / Seal Bay

Although residents of the subject site have access to two transit routes through several stops within a 10-minute walking distance, the low bus service frequency may not be convenient for some. Additionally, residents may need to use multiple routes to get to certain desired destinations. The *Town of Comox 2020 Transportation Master Plan Update* recommended that the Town continue working with BC Transit to improve transit frequency, infrastructure, and encourage transit-oriented development in the region.

3. Traffic Volume Development

3.1. EXISTING TRAFFIC COUNTS

Existing turning movement volumes were collected by McElhanney at the following study intersection:

- Neptune Way / Aspen Road

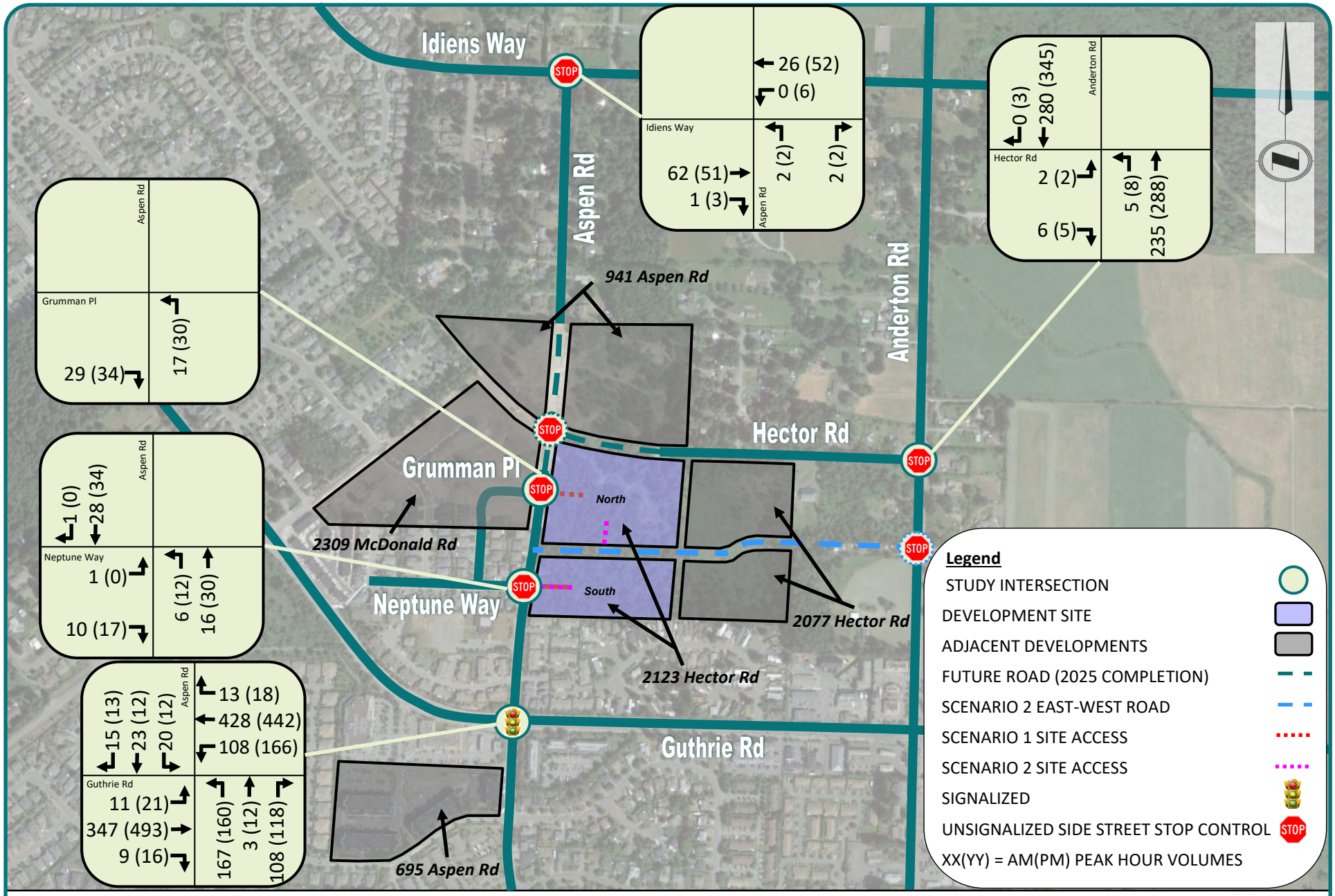
The remaining traffic volumes were obtained from other traffic studies within the study area and extrapolated using linear growth at a 1% annual rate up to existing 2023 conditions, if applicable. For study intersections where counts were unavailable, such as Grumman Place / Aspen Road where the road network currently ends and future intersection Aspen Road / Hector Road, volumes were balanced, and trip distribution assumptions were made to determine reasonable volumes. *Table 1* shows the traffic count dates, times, and source for each study intersection.

Table 1: Traffic Counts

Intersection	Survey Date & Time	Source
Neptune Way / Aspen Road	Thursday, 22 June 2023 7:00 AM to 9:00 AM 2:00 PM to 6:00 PM	McElhanney, 2023
Hector Road / Anderton Road	Thursday, 12 January 2023 8:00 AM to 9:00 AM 3:00 PM to 5:00 PM	Bunt & Associates, 2023
Idiens Way / Aspen Road	Thursday, 12 January 2023 7:00 AM to 8:00 AM 5:00 PM to 6:00 PM	Bunt & Associates, 2023
Guthrie Road / Aspen Road	Tuesday, 18 June 2019 6:00 AM to 9:00 AM 3:00 PM to 6:00 PM	McElhanney, 2019

The overall weekday AM and PM peak hours of the study area typically occur between 8:00 AM – 9:00 AM and 3:00 PM – 4:00 PM, respectively. As per the DAI letter, trip generation estimates from neighbouring developments at 695 Aspen Road and 2309 McDonald Road were also added to existing traffic volumes. See *Section 3* for peak hour trip generation at the subject and neighbouring developments.

Balanced existing (2023) weekday AM and PM peak hour traffic volumes are shown in *Figure 6.* Raw traffic count sheets are included in *Appendix D.*



2123 Hector Road - TIA

Existing (2023) Traffic Volumes

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FIGURE 6

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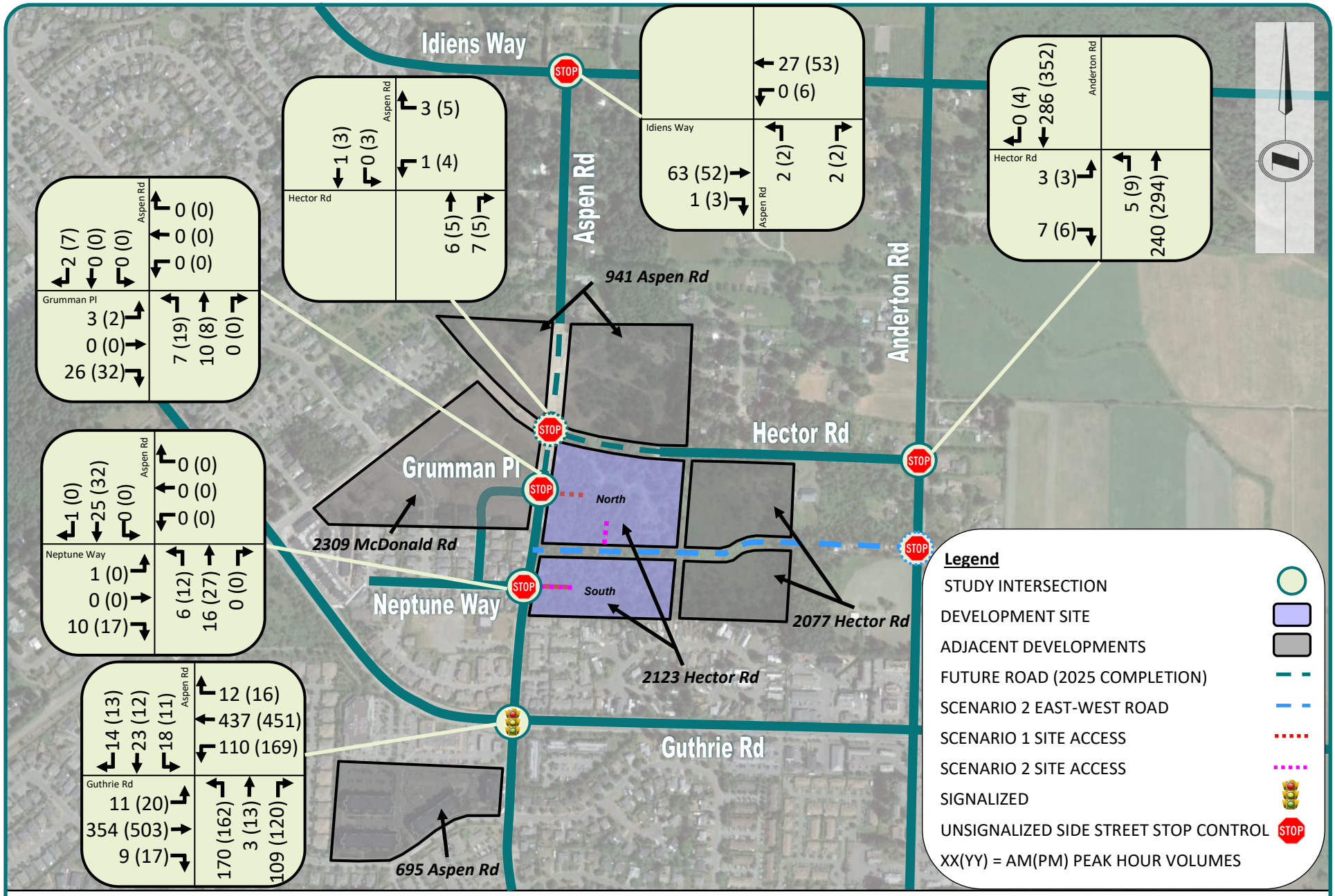
3.2. FUTURE BACKGROUND TRAFFIC VOLUMES

Future background traffic volumes were determined for the proposed development by factoring up existing traffic volumes using a 1% linear growth rate. Site generated traffic from 2309 McDonald Road and 695 Aspen Road at full build out was added to the 2025 opening year. Traffic from 941 Aspen Road and 2077 Hector Road is also included in the future 2043 horizon year as a further addition. The resulting background traffic volumes are shown in *Figure 7* for 2025 and *Figure 8* for 2043.



2123 Hector Road - TIA

Opening Day (2025) Traffic Volumes - Background Only

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FIGURE 7

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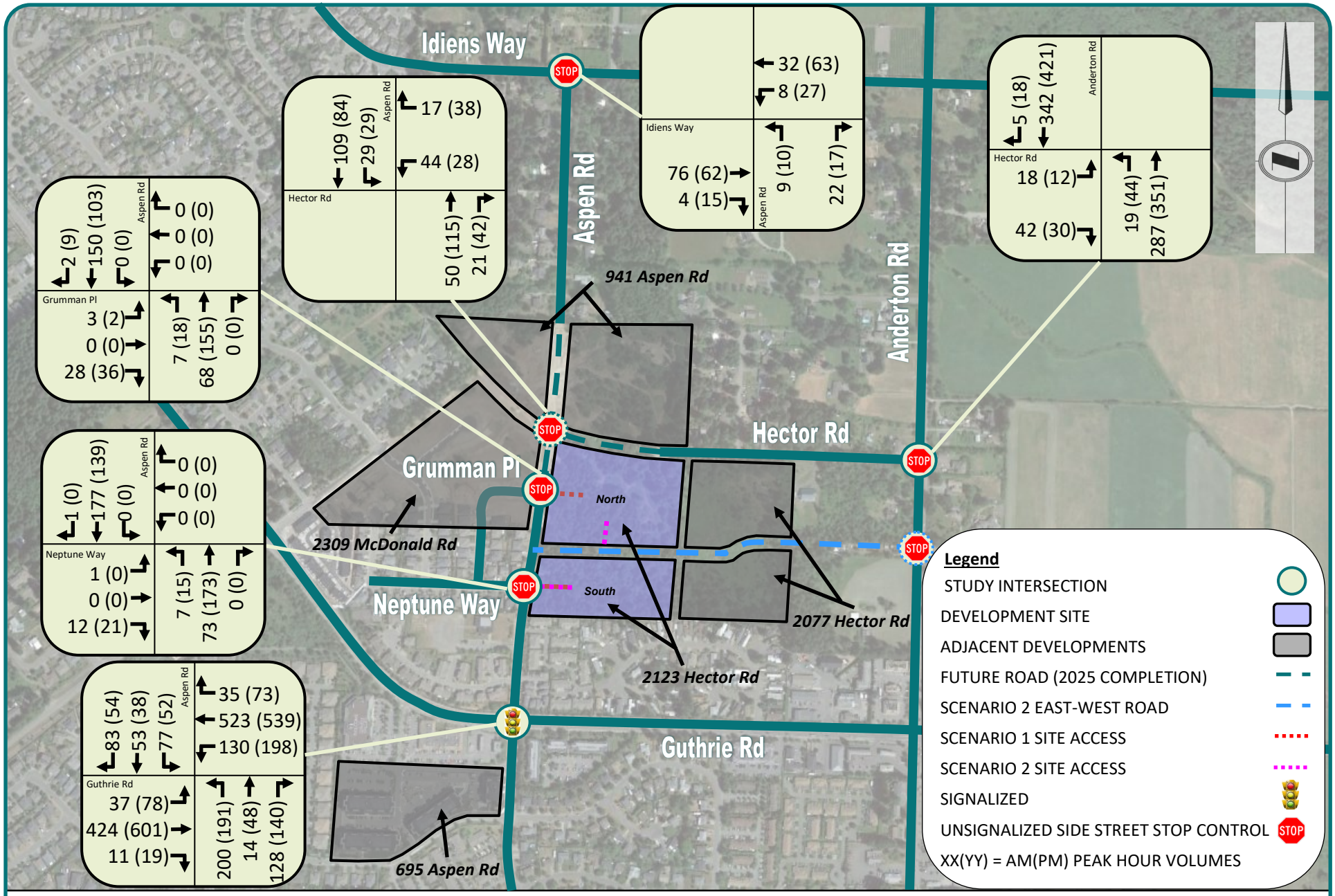

2123 Hector Road - TIA

20-Year Horizon (2043) Traffic Volumes - Background Only

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FIGURE 8

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3.3. TRIP GENERATION

Trip generation for the proposed development was determined for the weekday AM and PM peak hours using trip generation rates outlined in the Institute of Transportation Engineers' (ITE) *Trip Generation Manual, 11th Edition*. A summary of the vehicle trip generation rates, in/out distributions, and estimated trips generated by the proposed development is provided in *Table 2* and *Table 3*.

Table 2: ITE Vehicle Trip Generation Rates & In/Out Distributions for 2123 Hector Road

Scenario	Location	Land Use Description	Land Use Code	Total Size	Unit	Vehicle Trip Rate (Trips/Unit)		Distribution (%)			
								Weekday AM		Weekday PM	
						Weekday AM Peak	Weekday PM Peak	In	Out	In	Out
Scenario 1 *Without new east-west road*	North	Multifamily Housing (Mid-Rise)	221	183	Dwelling Units	0.37	0.39	23	77	61	39
	South	Single-Family Attached Housing	215	69	Dwelling Units	0.48	0.57	25	75	59	41
Scenario 2 *With new east-west road*	North	Multifamily Housing (Mid-Rise)	221	171	Dwelling Units	0.37	0.39	23	77	61	39
	South	Single-Family Attached Housing	215	65	Dwelling Units	0.48	0.57	25	75	59	41

Table 3: 2123 Hector Road Trip Generation

Scenario	Land Use Description	Weekday AM Peak Trip Gen			Weekday PM Peak Trip Gen		
		In	Out	Total	In	Out	Total
Scenario 1 *Without new east-west road*	Multifamily Housing (Mid-Rise)	16	52	**68**	44	28	**72**
	Single-Family Attached Housing	8	25	**33**	23	16	**39**
Total		24	77	**101**	67	44	**111**
Scenario 2 *With new east-west road*	Multifamily Housing (Mid-Rise)	14	49	**63**	41	26	**67**
	Single-Family Attached Housing	8	23	**31**	22	15	**37**
Total		22	72	**94**	63	41	**104**

Based on the trip rates and distributions summarized in *Table 2*, the proposed development under Scenario 1 is expected to generate an additional 101 vehicle trips (24 inbound / 77 outbound) during the weekday AM peak period and 111 vehicle trips (67 inbound / 44 outbound) during the PM peak period (see *Table 3*). Under Scenario 2, the development is expected to generate an additional 94 vehicle trips (22 inbound / 72 outbound) during the weekday AM peak period and 104 vehicle trips (63 inbound / 41 outbound) during the PM peak period.

3.3.1. Neighbouring Developments

As discussed in *Section 3.1* and *3.2*, site generated trips from the neighbouring developments were incorporated in either the existing and/or future conditions. The generated trips from the neighbouring developments used in this analysis were retrieved from McElhanney's 2018 study for 2309 McDonald Road, McElhanney's 2019 study for 695 Aspen Road, and Bunt & Associates' 2023 study for 941 Aspen

Road and 2077 Hector Road. The weekday AM and PM peak generated trips at each neighbouring development are presented in *Table 4*.

Table 4: Neighbouring Developments' Trip Generation

Site	Land Use Description	Land Use Code	Total Size	Unit	Weekday AM Trip Gen			Weekday PM Trip Gen		
					In	Out	Total	In	Out	Total
695 Aspen Rd	Mid-Rise Residential	221	232	Dwelling Units	20	55	75	55	35	90
	Shopping Centre	820	7.92	KSF	4	3	7	13	14	27
Total					24	58	**82**	68	49	**117**
2309 McDonald Rd	Single-Family Detached Housing	210	52	Dwelling Units	9	27	36	31	18	49
	Single-Family Attached Housing	215	30	Dwelling Units	4	11	14	10	7	17
Total					13	38	**50**	41	25	**66**
2077 Hector Rd	Single-Family Attached Housing	215	36	Dwelling Units	4	13	17	12	8	21
	Multifamily Housing (Mid-Rise)	221	180	Dwelling Units	15	51	67	43	27	70
Total					19	64	**84**	55	35	**91**
941 Aspen Rd	Multifamily Housing (Mid-Rise)	221	520	Dwelling Units	44	148	192	124	79	203
	Strip Retail Plaza (<40k)	822	21.5	1000 sq. ft GLA	20	12	32	44	44	88
Total					64	160	**224**	168	123	**291**

3.3.2. Trip Reductions

Trip reductions may be applied to ITE's base trip generation values to account for alternative modes of transportation, internal capture trips, and pass-by trips. For a more conservative analysis, no transit/walk/bike reductions were made for the subject development, 2123 Hector Road. Internal capture trips are trips from a land use within a development to another land use within that same development. Pass-by trips are additional stops at the study site by motorists on their way to a destination other than the subject development. Since the subject development is residential use only, no internal trip or pass-by reductions were made.

It should be noted that the studies at the neighbouring developments added some trip reductions, and these were retained for consistency with those studies:

- 695 Aspen Road (McElhanney, 2019): 2% reduction for transit and 10% for walk and bike.
- 2309 McDonald Road (McElhanney, 2018): 5% reduction for transit and 10% for walk and bike.
- 2077 Hector Road & 941 Aspen Road (Bunt & Associates, 2023): 15% reduction for internal trips.

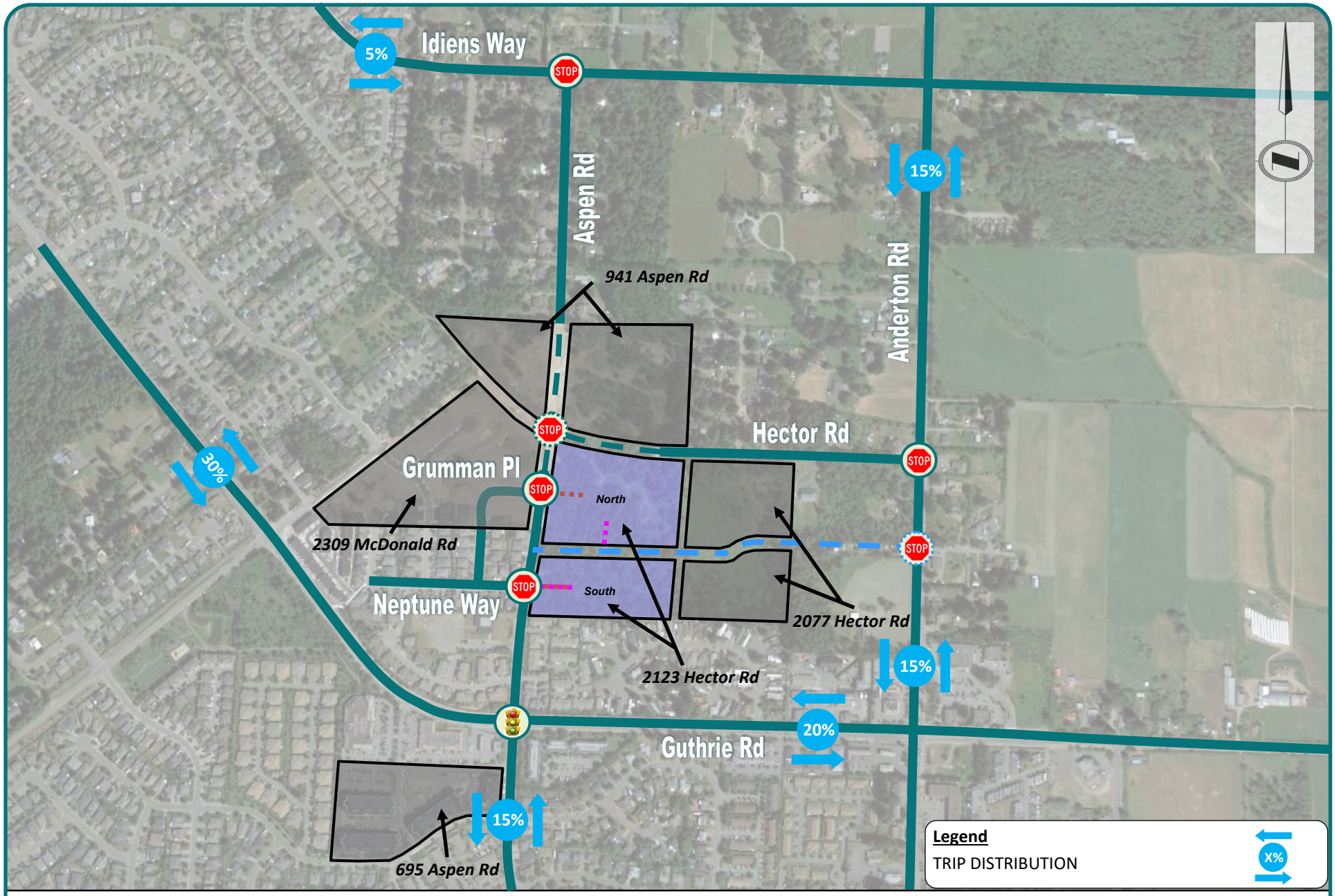
3.4. TRIP DISTRIBUTION AND ASSIGNMENT

It is anticipated that the majority of trips will travel south on Aspen Road to Guthrie Road and from there disburse to the east, west and south. The anticipated trip distribution was estimated using the results of previous studies and a review of land use in the Comox and Courtney area. The following trip distribution was used for inbound and outbound AM and PM peak hour trips:

- North on Anderton: 15%
- East on Guthrie: 20%
- South on Anderton: 15%
- South on Aspen: 15%
- West on Guthrie: 30%
- West in Idiens: 5%

Based on current site plans, it was assumed that all trips generated by the apartments will use the north access while those generated by the townhomes will use the south access. The north access is on Aspen Road fronting Grumman Place under Scenario 1 and on the new east-west road under Scenario 2. The south access is on Aspen Road fronting Neptune Way for both scenarios.

Based on the above noted trip generation and distribution, site trips were assigned to the road network. The trip distribution assumptions are shown in *Figure 9*. The site generated trips for the study area after applying these distributions are presented in *Figure 10*.

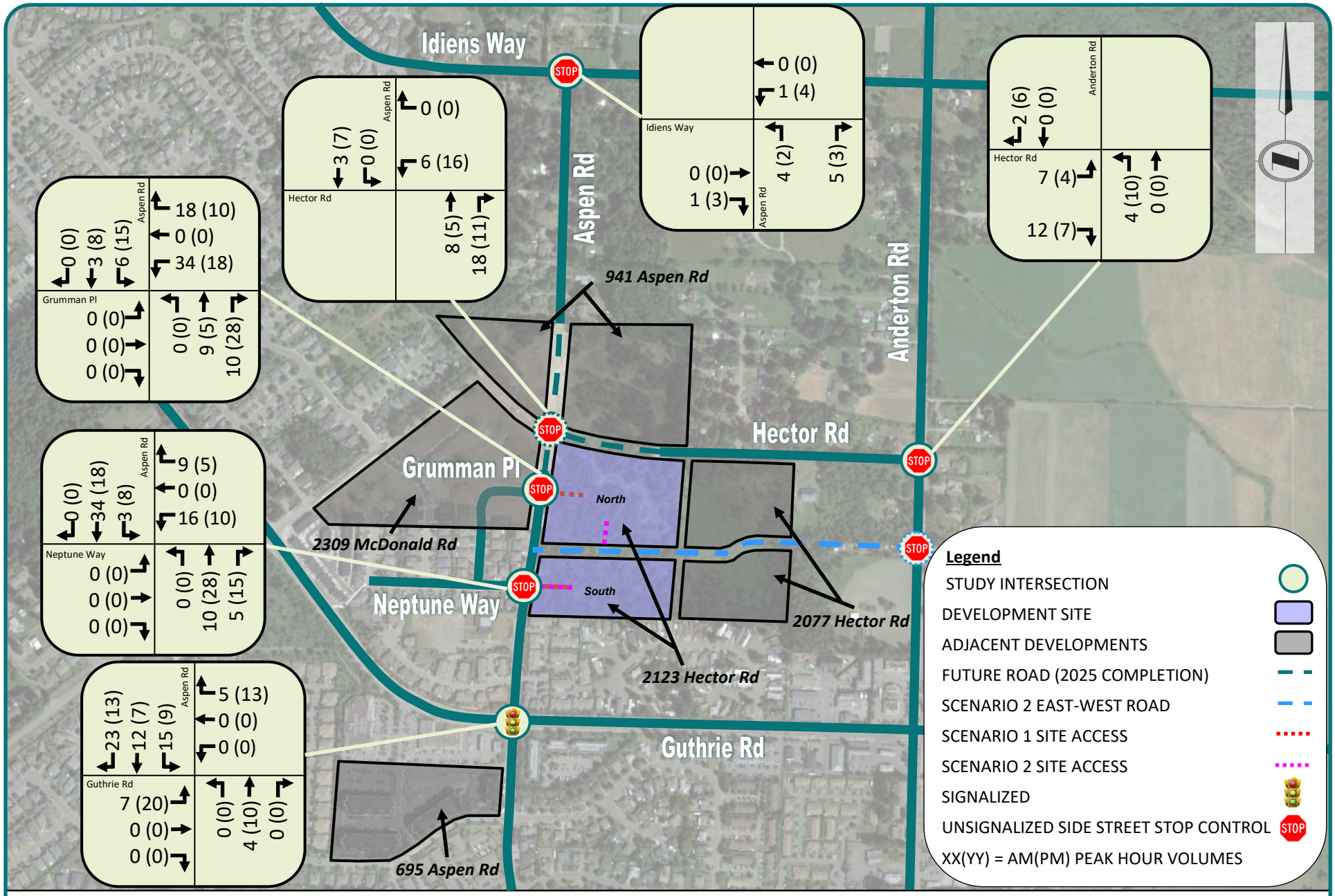


2123 Hector Road - TIA
Trip Distribution

McElhanney
2111-06197-00

FIGURE 9

Not to Scale



2123 Hector Road - TIA
Site Generated Trips

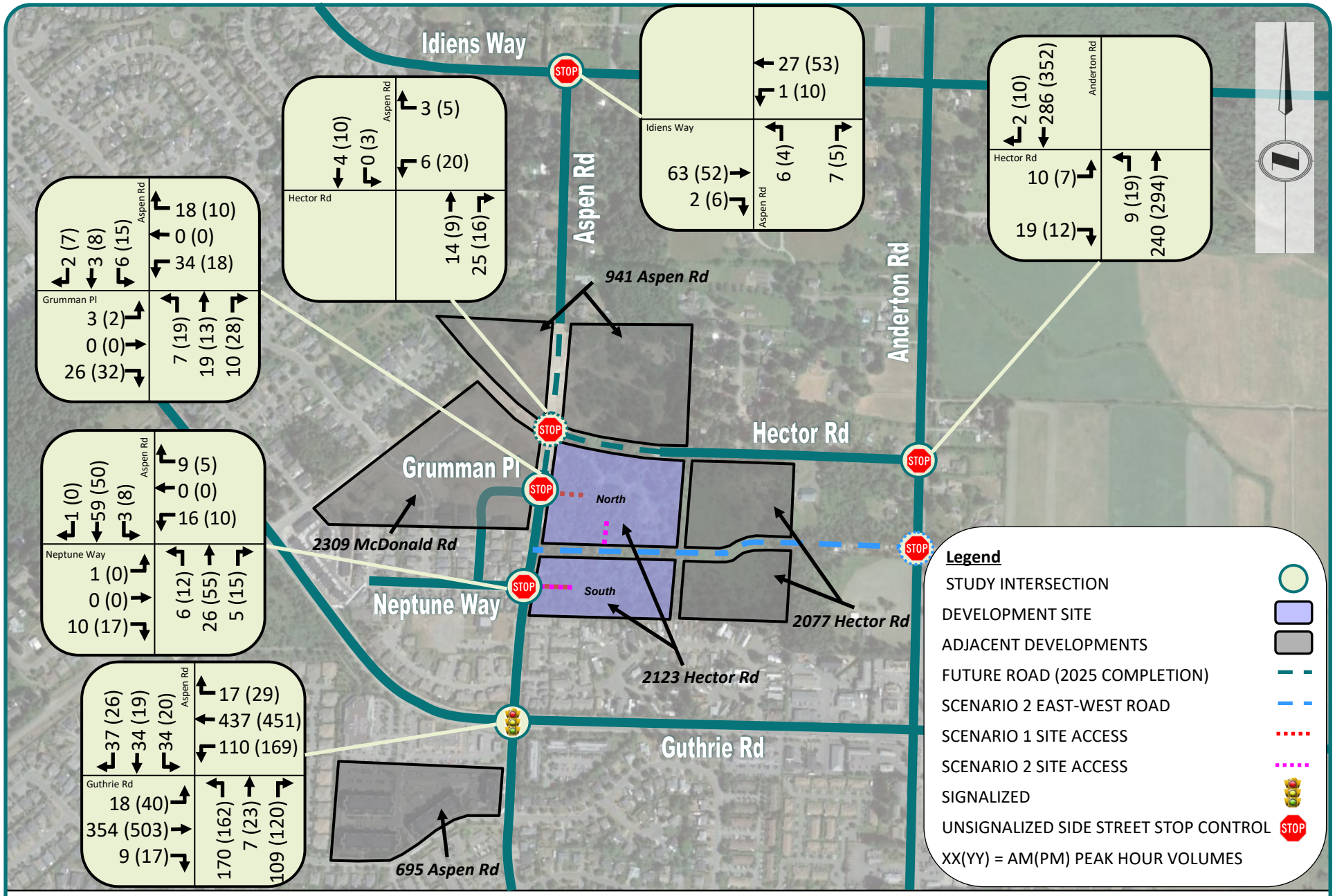
McElhanney
2111-06197-00

FIGURE 10

Not to Scale

3.5. FUTURE TRAFFIC VOLUMES WITH DEVELOPMENT

Future traffic volumes with the development were determined by adding the development traffic on top of the background traffic for the Opening Day (2025) and 20-Year Horizon (2043). The future traffic volumes with development traffic from the subject development, 2123 Hector Road, are presented in *Figure 11* for Opening Day (2025), *Figure 12* for 20-Year Horizon (2043), and *Figure 13* for 20-Year Horizon (2043) under Scenario 2.



2123 Hector Road - TIA

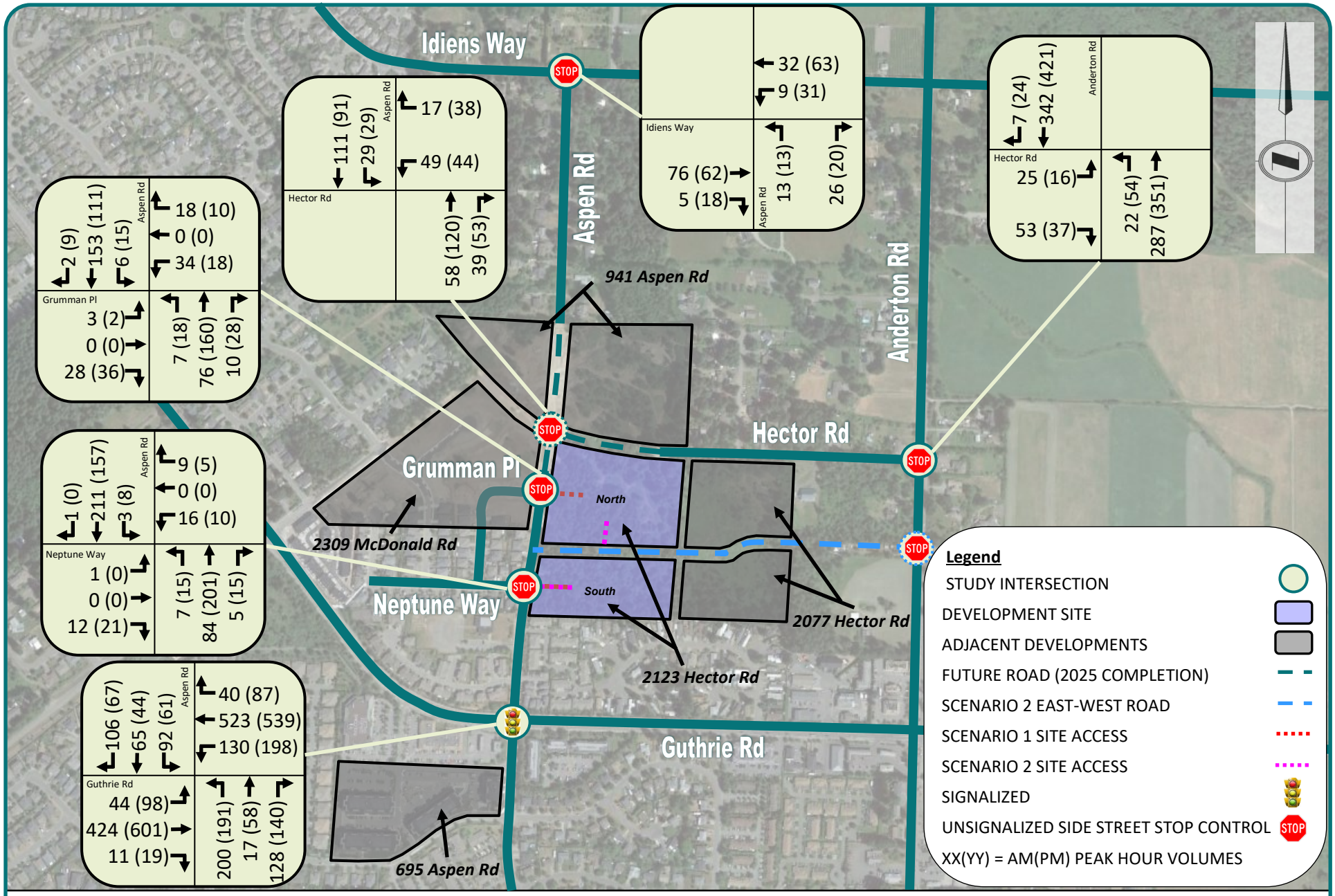
Opening Day (2025) Traffic Volumes - with Development

McElhanney

2111-06197-00

FIGURE 11

Not to Scale



2123 Hector Road - TIA

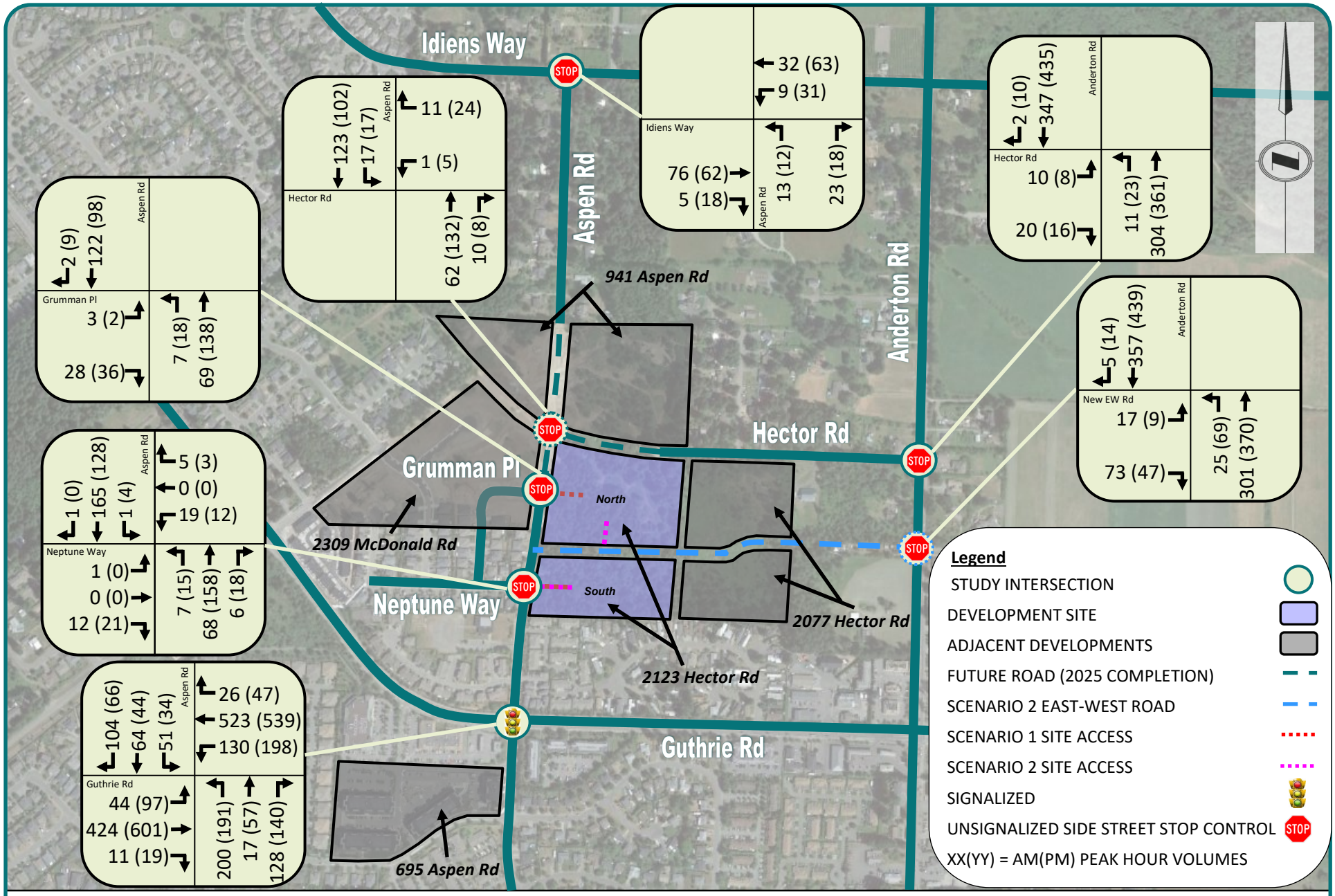
20-Year Horizon (2043) Traffic Volumes - with Development

McElhanney

2111-06197-00

FIGURE 12

Not to Scale



2123 Hector Road - TIA

Scenario 2: 20-Year Horizon (2043) Traffic Volumes - with Development

McElhanney

2111-06197-00

FIGURE 13

Not to Scale

4. Traffic Operations Analysis

Traffic operations analysis was conducted for three scenarios:

- Existing (2023)
- Opening Day (2025)
- 20-Year Horizon (2043)

All scenarios were evaluated for the weekday AM and PM peak hours. All future scenarios (2025 and 2043) 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 E*.

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 level ‘D’ representing conditions approaching congestion. Levels designated ‘E’ and ‘F’ represent increasingly congested traffic conditions.

LOS definitions for signalized and unsignalized intersections as outlined in the Highway Capacity Manual are included in *Table 5*.

Table 5: 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. MODEL ASSUMPTIONS

4.3.1. Signal Timing/Phasing

The existing timings as provided by the Town of Comox at the Aspen Road / Guthrie Road intersection, revised in 2022, were used for all models (see *Appendix F*). Pedestrian calls were set to 10.

4.3.2. Traffic Operations Analysis

Existing traffic volumes were adjusted to conservatively balance them between study intersections. To improve the accuracy of the traffic model, the following parameters in synchro were adjusted:

- A minimum volume of 10 vehicles was set for each turning movement at all intersections.
- Heavy Vehicle Percentage (%HV): Set to 2% for all intersections and movements.
- Peak Hour Factor (PHF): Set to 0.92 for all intersections in the Existing and Future conditions.
- Conflicting Pedestrians: Set to 10 for all intersections where pedestrian counts were unavailable.

4.4. SCENARIO 1: TRAFFIC OPERATING CONDITIONS

Capacity analysis was completed for the Existing (2023), Opening Day (2025), and 20-Year Horizon (2043) conditions for the weekday AM and PM peak hours. The 2025 and 2043 conditions were analyzed with and without the additional trips generated by the proposed development. If present, conditions near capacity (0.90 < v/c ratio < 1.00) and exceeding capacity (v/c ratio > 1.00) along with LOS E and F will be marked below in red.

4.4.1. Existing (2023) Conditions

The Existing (2023) weekday operating conditions were analyzed at the study intersections (except the future intersections) described in *Section 2.2*. 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 6*. The detailed results can be found in *Appendix E.*

Based on the analysis, all intersection movements perform at a LOS B or better with minimal queues and delays and sufficient capacity to accommodate demand.

Table 6: Scenario 1: Existing (2023) Conditions

SCENARIO 1: Existing (2023) Conditions															
Intersection	Period	Attribute	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Overall
Aspen Road / Guthrie Road *Signalized*	AM	Volume (veh/h)	11	347	9	108	428	13	167	3	108	20	23	15	-
		Volume to Capacity	0.04	0.52	0.02	0.31	0.66		0.43	0.21		0.06	0.07		-
		Control Delay (s)	8	12	1	11	15		16	4		12	9		13
		LOS	A	B	A	B	B		B	A		B	A		B
		95% Queue (m)	3	44	1	17	59		28	9		5	7		-
	PM	Volume (veh/h)	21	493	16	166	442	18	160	12	118	12	12	13	-
		Volume to Capacity	0.07	0.65	0.02	0.61	0.61		0.44	0.26		0.04	0.05		-
		Control Delay (s)	8	14	2	20	13		19	6		14	10		14
		LOS	A	B	A	B	B		B	A		B	B		B
		95% Queue (m)	4	67	2	32	61		30	11		4	6		-
Aspen Road / Idiens Way *Unsignalized*	AM	Volume (veh/h)	0	62	1	0	26	0	2	0	2	0	0	0	-
		Volume to Capacity	0.04			0			0			-			-
		Control Delay (s)	0			0			9			-			-
		LOS	A			A			A			-			-
		95% Queue (m)	0			0			0			-			-
	PM	Volume (veh/h)	0	51	3	6	52	0	2	0	2	0	0	0	-
		Volume to Capacity	0.03			0			0			-			-
		Control Delay (s)	0			1			9			-			-
		LOS	A			A			A			-			-
		95% Queue (m)	0			0			0			-			-
Aspen Road / Neptune Way *Unsignalized*	AM	Volume (veh/h)	1	0	10	0	0	0	6	16	0	0	28	1	-
		Volume to Capacity	0.01			-			0			0.02			-
		Control Delay (s)	9			-			2			0			-
		LOS	A			-			A			A			-
		95% Queue (m)	0			-			0			0			-
	PM	Volume (veh/h)	0	0	17	0	0	0	12	30	0	0	34	0	-
		Volume to Capacity	0.02			-			0.01			0.02			-
		Control Delay (s)	9			-			2			0			-
		LOS	A			-			A			A			-
		95% Queue (m)	0			-			0			0			-
Anderton Road / Hector Road *Unsignalized*	AM	Volume (veh/h)	2	0	6	0	0	0	5	235	0	0	280	0	-
		Volume to Capacity	0.01			-			0			0.18			-
		Control Delay (s)	11			-			0			0			-
		LOS	B			-			A			A			-
		95% Queue (m)	0			-			0			0			-

	PM	Volume (veh/h)	2	0	5	0	0	0	8	288	0	0	345	3	-
		Volume to Capacity	0.01			-			0.01			0.22			-
		Control Delay (s)	12			-			0			0			-
		LOS	B			-			A			A			-
		95% Queue (m)	0			-			0			0			-
Aspen Road / Grumman Place *Unsignalized*	AM	Volume (veh/h)	0	0	29	0	0	0	17	0	0	0	0	0	-
		Volume to Capacity	0.03			-			0.01			0			-
		Control Delay (s)	9			-			7			0			-
		LOS	A			-			A			A			-
		95% Queue (m)	1			-			0			0			-
	PM	Volume (veh/h)	0	0	34	0	0	0	30	0	0	0	0	0	-
		Volume to Capacity	0.04			-			0.02			0			-
		Control Delay (s)	9			-			7			0			-
		LOS	A			-			A			A			-
		95% Queue (m)	1			-			1			0			-
Hector Road / Aspen Road *Unsignalized*	AM	Volume (veh/h)	INTERSECTION DOES NOT EXIST AT THIS TIME												
		Volume to Capacity													
		Control Delay (s)													
		LOS													
		95% Queue (m)													
	PM	Volume (veh/h)													
		Volume to Capacity													
		Control Delay (s)													
		LOS													
		95% Queue (m)													
New E/W Road / Anderton Road *Unsignalized*	AM	Volume (veh/h)	INTERSECTION EXISTS IN SCENARIO 2 ONLY												
		Volume to Capacity													
		Control Delay (s)													
		LOS													
		95% Queue (m)													
	PM	Volume (veh/h)													
		Volume to Capacity													
		Control Delay (s)													
		LOS													
		95% Queue (m)													

4.4.2. Opening Day (2025) Conditions

The Opening Day (2025) weekday operating conditions were analyzed at the study intersections (except the scenario 2 future intersection) described in *Section 2.2*. 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 E.*

Based on the analysis, all intersection movements perform at a LOS B or better without development traffic and LOS C or better with development traffic with minimal queues and delays and sufficient capacity to accommodate demand.

Table 7: Scenario 1: Opening Day (2025) Conditions

SCENARIO 1: Opening Day (2025) Conditions															
Intersection	Period	Attribute	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Overall
Aspen Road / Guthrie Road *Signalized*	AM	Volume (veh/h)	11	354	10	110	437	12	170	10	109	18	23	14	-
		Volume to Capacity	0.04	0.53	0.02	0.32	0.67		0.43	0.23		0.05	0.07		-
		Control Delay (s)	8	12	1	11	15		16	5		12	9		13
		LOS	A	B	A	B	B		B	A		B	A		B
		95% Queue (m)	3	45	1	17	60		29	10		5	7		-
	PM	Volume (veh/h)	20	503	17	169	451	16	162	13	120	11	12	13	-
		Volume to Capacity	0.07	0.64	0.03	0.61	0.60		0.45	0.27		0.03	0.05		-
		Control Delay (s)	8	13	3	20	12		20	6		15	11		14
		LOS	A	B	A	B	B		B	A		B	B		B
		95% Queue (m)	4	69	2	33	62		31	11		4	6		-
Aspen Road / Idiens Way *Unsignalized*	AM	Volume (veh/h)	0	63	10	10	27	0	10	0	10	0	0	0	-
		Volume to Capacity	0.05			0.01			0.02			-			-
		Control Delay (s)	0			2			9			-			-
		LOS	A			A			A			-			-
		95% Queue (m)	0			0			1			-			-
	PM	Volume (veh/h)	0	52	10	10	53	0	10	0	10	0	0	0	-
		Volume to Capacity	0.04			0.01			0.03			-			-
		Control Delay (s)	0			1			9			-			-
		LOS	A			A			A			-			-
		95% Queue (m)	0			0			1			-			-
Aspen Road / Neptune Way *Unsignalized*	AM	Volume (veh/h)	10	0	10	0	0	0	10	16	0	0	25	10	-
		Volume to Capacity	0.02			-			0.01			0.02			-
		Control Delay (s)	9			-			3			0			-
		LOS	A			-			A			A			-
		95% Queue (m)	1			-			0			0			-
	PM	Volume (veh/h)	10	0	17	0	0	0	12	27	0	0	32	10	-
		Volume to Capacity	0.03			-			0.01			0.03			-
		Control Delay (s)	9			-			2			0			-
		LOS	A			-			A			A			-
		95% Queue (m)	1			-			0			0			-
Anderton Road / Hector Road *Unsignalized*	AM	Volume (veh/h)	10	0	10	0	0	0	10	240	0	0	286	10	-
		Volume to Capacity	0.04			-			0.01			0.19			-
		Control Delay (s)	12			-			0			0			-
		LOS	B			-			A			A			-
		95% Queue (m)	1			-			0			0			-

	PM	Volume (veh/h)	10	0	10	0	0	0	10	294	0	0	352	10	-
		Volume to Capacity	0.05			-			0.01			0.23			-
		Control Delay (s)	13			-			0			0			-
		LOS	B			-			A			A			-
		95% Queue (m)	1			-			0			0			-
Aspen Road / Grumman Place *Unsignalized*	AM	Volume (veh/h)	10	0	26	0	0	0	10	10	0	0	10	10	-
		Volume to Capacity	0.04			-			0.01			0.01			-
		Control Delay (s)	9			-			4			0			-
		LOS	A			-			A			A			-
		95% Queue (m)	1			-			0			0			-
	PM	Volume (veh/h)	10	0	32	0	0	0	19	10	0	0	10	10	-
		Volume to Capacity	0.05			-			0.01			0.01			-
		Control Delay (s)	9			-			5			0			-
		LOS	A			-			A			A			-
		95% Queue (m)	1			-			0			0			-
Hector Road / Aspen Road *Unsignalized*	AM	Volume (veh/h)	0	0	0	10	0	10	0	10	10	10	10	0	-
		Volume to Capacity	-			0.02			0.01			0.01			-
		Control Delay (s)	-			9			0			4			-
		LOS	-			A			A			A			-
		95% Queue (m)	-			1			0			0			-
	PM	Volume (veh/h)	0	0	0	10	0	10	0	10	10	10	10	0	-
		Volume to Capacity	-			0.02			0.01			0.01			-
		Control Delay (s)	-			9			0			4			-
		LOS	-			A			A			A			-
		95% Queue (m)	-			1			0			0			-
New E/W Road / Anderton Road *Unsignalized*	AM	Volume (veh/h)	INTERSECTION EXISTS IN SCENARIO 2 ONLY												
		Volume to Capacity													
		Control Delay (s)													
		LOS													
		95% Queue (m)													
	PM	Volume (veh/h)													
		Volume to Capacity													
		Control Delay (s)													
		LOS													
		95% Queue (m)													

Table 8: Scenario 1: Opening Day (2025) Conditions – With Development

SCENARIO 1: Opening Day (2025) Conditions - With Development															
Intersection	Period	Attribute	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Overall
Aspen Road / Guthrie Road *Signalized*	AM	Volume (veh/h)	18	354	10	110	437	17	170	10	109	34	34	37	-
		Volume to Capacity	0.07	0.53	0.02	0.33	0.68		0.45	0.22		0.09	0.14		-
		Control Delay (s)	9	12	1	11	15		16	5		12	8		13
		LOS	A	B	A	B	B		B	A		B	A		B
		95% Queue (m)	4	45	1	17	61		29	9		8	10		-
	PM	Volume (veh/h)	40	503	17	169	451	29	162	23	120	20	19	26	-
		Volume to Capacity	0.14	0.64	0.03	0.62	0.62		0.46	0.28		0.06	0.10		-
		Control Delay (s)	9	14	3	20	13		20	7		15	10		14
		LOS	A	B	A	B	B		C	A		B	A		B
		95% Queue (m)	7	69	2	34	64		31	13		6	8		-
Aspen Road / Idiens Way *Unsignalized*	AM	Volume (veh/h)	0	63	10	10	27	0	10	0	10	0	0	0	-
		Volume to Capacity	0.05			0.01			0.02			-			-
		Control Delay (s)	0			2			9			-			-
		LOS	A			A			A			-			-
		95% Queue (m)	0			0			1			-			-
	PM	Volume (veh/h)	0	52	10	10	53	0	10	0	10	0	0	0	-
		Volume to Capacity	0.04			0.01			0.03			-			-
		Control Delay (s)	0			1			9			-			-
		LOS	A			A			A			-			-
		95% Queue (m)	0			0			1			-			-
Aspen Road / Neptune Way *Unsignalized*	AM	Volume (veh/h)	10	0	10	16	0	9	10	26	5	3	59	10	-
		Volume to Capacity	0.03			0.03			0.01			0.00			-
		Control Delay (s)	9			9			2			0			-
		LOS	A			A			A			A			-
		95% Queue (m)	1			1			0			0			-
	PM	Volume (veh/h)	10	0	17	10	0	5	12	55	15	8	50	10	-
		Volume to Capacity	0.03			0.02			0.01			0.01			-
		Control Delay (s)	9			10			1			1			-
		LOS	A			A			A			A			-
		95% Queue (m)	1			1			0			0			-
Anderton Road / Hector Road *Unsignalized*	AM	Volume (veh/h)	10	0	19	0	0	0	10	240	0	0	286	10	-
		Volume to Capacity	0.06			-			0.01			0.19			-
		Control Delay (s)	12			-			0			0			-
		LOS	B			-			A			A			-
		95% Queue (m)	1			-			0			0			-

	PM	Volume (veh/h)	10	0	12	0	0	0	19	294	0	0	352	10	-
		Volume to Capacity	0.05			-			0.02			0.23			-
		Control Delay (s)	13			-			1			0			-
		LOS	B			-			A			A			-
		95% Queue (m)	1			-			0			0			-
Aspen Road / Grumman Place *Unsignalized*	AM	Volume (veh/h)	10	0	26	34	0	18	10	19	10	6	10	10	-
		Volume to Capacity	0.04			0.06			0.01			0.00			-
		Control Delay (s)	9			9			2			2			-
		LOS	A			A			A			A			-
		95% Queue (m)	1			2			0			0			-
	PM	Volume (veh/h)	10	0	32	18	0	10	19	13	28	15	10	10	-
		Volume to Capacity	0.05			0.04			0.01			0.01			-
		Control Delay (s)	9			10			2			3			-
		LOS	A			A			A			A			-
		95% Queue (m)	1			1			0			0			-
Hector Road / Aspen Road *Unsignalized*	AM	Volume (veh/h)	0	0	0	10	0	10	0	14	25	10	10	0	-
		Volume to Capacity	-			0.02			0.02			0.01			-
		Control Delay (s)	-			9			0			4			-
		LOS	-			A			A			A			-
		95% Queue (m)	-			1			0			4			-
	PM	Volume (veh/h)	0	0	0	20	0	10	0	10	16	10	10	0	-
		Volume to Capacity	-			0.04			0.02			0.01			-
		Control Delay (s)	-			9			0			4			-
		LOS	-			A			A			A			-
		95% Queue (m)	-			1			0			0			-
New E/W Road / Anderton Road *Unsignalized*	AM	Volume (veh/h)	INTERSECTION EXISTS IN SCENARIO 2 ONLY												
		Volume to Capacity													
		Control Delay (s)													
		LOS													
		95% Queue (m)													
	PM	Volume (veh/h)													
		Volume to Capacity													
		Control Delay (s)													
		LOS													
		95% Queue (m)													

4.4.3. 20-Year Horizon (2043) Conditions

The 20-Year Horizon (2043) weekday operating conditions were analyzed at the study intersections (except the scenario 2 future intersection) described in *Section 2.2*. 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 9* and *Table 10*, respectively. The detailed results can be found in *Appendix E.*

Based on the analysis, all intersection movements perform at a LOS C or better with minimal queues and delays and sufficient capacity to accommodate demand both without and with development traffic.

Table 9: Scenario 1: 20-Year Horizon (2043) Conditions

SCENARIO 1: 20-Year Horizon (2043) Conditions															
Intersection	Period	Attribute	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Overall
Aspen Road / Guthrie Road *Signalized*	AM	Volume (veh/h)	37	424	11	130	523	35	200	14	128	77	53	83	-
		Volume to Capacity	0.18	0.58	0.02	0.42	0.77		0.57	0.26		0.22	0.25		-
		Control Delay (s)	11	14	1	14	19		21	5		14	7		15
		LOS	B	B	A	B	B		C	A		B	A		B
		95% Queue (m)	8	58	1	23	#85		35	11		14	14		-
	PM	Volume (veh/h)	78	601	19	198	539	73	191	48	140	52	38	54	-
		Volume to Capacity	0.29	0.64	0.02	0.70	0.66		0.64	0.39		0.20	0.21		-
		Control Delay (s)	12	14	3	28	14		29	8		18	9		16
		LOS	B	B	A	C	B		C	A		B	A		B
		95% Queue (m)	15	94	2	#56	97		37	17		12	12		-
Aspen Road / Idiens Way *Unsignalized*	AM	Volume (veh/h)	0	76	10	10	32	0	10	0	22	0	0	0	-
		Volume to Capacity	0.06			0.01			0.04			-			-
		Control Delay (s)	0			2			9			-			-
		LOS	A			A			A			-			-
		95% Queue (m)	0			0			1			-			-
	PM	Volume (veh/h)	0	62	15	27	63	0	10	0	17	0	0	0	-
		Volume to Capacity	0.05			0.02			0.03			-			-
		Control Delay (s)	0			2			9			-			-
		LOS	A			A			A			-			-
		95% Queue (m)	0			1			1			-			-
Aspen Road / Neptune Way *Unsignalized*	AM	Volume (veh/h)	10	0	12	0	0	0	10	73	0	0	177	10	-
		Volume to Capacity	0.03			-			0.01			0.12			-
		Control Delay (s)	10			-			1			0			-
		LOS	A			-			A			A			-
		95% Queue (m)	1			-			0			0			-
	PM	Volume (veh/h)	10	0	21	0	0	0	15	173	0	0	139	10	-
		Volume to Capacity	0.05			-			0.01			0.1			-
		Control Delay (s)	10			-			1			0			-
		LOS	A			-			A			A			-
		95% Queue (m)	1			-			0			0			-
Anderton Road / Hector Road *Unsignalized*	AM	Volume (veh/h)	18	0	42	0	0	0	19	287	0	0	342	10	-
		Volume to Capacity	0.13			-			0.02			0.23			-
		Control Delay (s)	13			-			1			0			-
		LOS	B			-			A			A			-
		95% Queue (m)	3			-			0			0			-

	PM	Volume (veh/h)	12	0	30	0	0	0	44	351	0	0	421	18	-
		Volume to Capacity	0.11			-			0.05			0.28			-
		Control Delay (s)	14			-			1			0			-
		LOS	B			-			A			A			-
		95% Queue (m)	3			-			1			0			-
Aspen Road / Grumman Place *Unsignalized*	AM	Volume (veh/h)	10	0	28	0	0	0	10	68	0	0	150	10	-
		Volume to Capacity	0.05			-			0.01			0.10			-
		Control Delay (s)	10			-			1			0			-
		LOS	A			-			A			A			-
		95% Queue (m)	1			-			0			0			-
	PM	Volume (veh/h)	10	0	36	0	0	0	18	155	0	0	103	10	-
		Volume to Capacity	0.06			-			0.01			0.07			-
		Control Delay (s)	10			-			1			0			-
		LOS	A			-			A			A			-
		95% Queue (m)	2			-			0			0			-
Hector Road / Aspen Road *Unsignalized*	AM	Volume (veh/h)	0	0	0	44	0	17	0	50	21	29	109	0	-
		Volume to Capacity	-			0.09			0.05			0.02			-
		Control Delay (s)	-			10			0			2			-
		LOS	-			B			A			A			-
		95% Queue (m)	-			2			0			1			-
	PM	Volume (veh/h)	0	0	0	28	0	38	0	115	42	29	84	0	-
		Volume to Capacity	-			0.09			0.1			0.02			-
		Control Delay (s)	-			10			0			2			-
		LOS	-			B			A			A			-
		95% Queue (m)	-			2			0			1			-
New E/W Road / Anderton Road *Unsignalized*	AM	Volume (veh/h)	INTERSECTION EXISTS IN SCENARIO 2 ONLY												
		Volume to Capacity													
		Control Delay (s)													
		LOS													
		95% Queue (m)													
	PM	Volume (veh/h)													
		Volume to Capacity													
		Control Delay (s)													
		LOS													
		95% Queue (m)													

Table 10: Scenario 1: 20-Year Horizon (2043) Conditions – With Development

SCENARIO 1: 20-Year Horizon (2043) Conditions - With Development															
Intersection	Period	Attribute	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Overall
Aspen Road / Guthrie Road *Signalized*	AM	Volume (veh/h)	44	424	11	130	523	40	200	17	128	92	65	106	-
		Volume to Capacity	0.22	0.58	0.02	0.42	0.77		0.58	0.27		0.26	0.31		-
		Control Delay (s)	12	14	1	14	19		22	5		15	7		15
		LOS	B	B	A	B	B		C	A		B	A		B
		95% Queue (m)	9	58	1	23	#88		35	11		17	16		-
	PM	Volume (veh/h)	98	601	19	198	539	87	191	58	140	61	44	67	-
		Volume to Capacity	0.38	0.64	0.02	0.70	0.68		0.65	0.41		0.24	0.25		-
		Control Delay (s)	14	14	3	28	15		29	8		18	9		16
		LOS	B	B	A	C	B		C	A		B	A		B
		95% Queue (m)	21	95	2	#57	#106		37	18		13	13		-
Aspen Road / Idiens Way *Unsignalized*	AM	Volume (veh/h)	0	76	10	10	32	0	13	0	26	0	0	0	-
		Volume to Capacity	0.06			0.01			0.05			-			-
		Control Delay (s)	0			2			9			-			-
		LOS	A			A			A			-			-
		95% Queue (m)	0			0			1			-			-
	PM	Volume (veh/h)	0	62	18	31	63	0	13	0	20	0	0	0	-
		Volume to Capacity	0.05			0.02			0.04			-			-
		Control Delay (s)	0			3			10			-			-
		LOS	A			A			A			-			-
		95% Queue (m)	0			1			1			-			-
Aspen Road / Neptune Way *Unsignalized*	AM	Volume (veh/h)	10	0	12	16	0	9	10	84	5	3	211	10	-
		Volume to Capacity	0.04			0.04			0.01			0.00			-
		Control Delay (s)	11			11			1			0			-
		LOS	B			B			A			A			-
		95% Queue (m)	1			1			0			0			-
	PM	Volume (veh/h)	10	0	21	10	0	5	15	201	15	8	157	10	-
		Volume to Capacity	0.05			0.03			0.01			0.01			-
		Control Delay (s)	11			12			1			0			-
		LOS	B			B			A			A			-
		95% Queue (m)	1			1			0			0			-
Anderton Road / Hector Road *Unsignalized*	AM	Volume (veh/h)	25	0	53	0	0	0	22	287	0	0	342	10	-
		Volume to Capacity	0.17			-			0.02			0.23			-
		Control Delay (s)	13			-			1			0			-
		LOS	B			-			A			A			-
		95% Queue (m)	5			-			1			0			-

	PM	Volume (veh/h)	16	0	37	0	0	0	54	351	0	0	421	24	-
		Volume to Capacity	0.14			-			0.06			0.28			-
		Control Delay (s)	15			-			2			0			-
		LOS	C			-			A			A			-
		95% Queue (m)	4			-			1			0			-
Aspen Road / Grumman Place *Unsignalized*	AM	Volume (veh/h)	10	0	28	34	0	18	10	76	10	6	153	10	-
		Volume to Capacity	0.05			0.08			0.01			0.00			-
		Control Delay (s)	10			11			1			0			-
		LOS	B			B			A			A			-
		95% Queue (m)	1			2			0			0			-
	PM	Volume (veh/h)	10	0	36	18	0	10	18	160	28	15	111	10	-
		Volume to Capacity	0.07			0.05			0.01			0.01			-
		Control Delay (s)	10			12			1			1			-
		LOS	B			B			A			A			-
		95% Queue (m)	2			1			0			0			-
Hector Road / Aspen Road *Unsignalized*	AM	Volume (veh/h)	0	0	0	49	0	17	0	58	39	29	111	0	-
		Volume to Capacity	-			0.10			0.06			0.02			-
		Control Delay (s)	-			11			0			2			-
		LOS	-			B			A			A			-
		95% Queue (m)	-			3			0			1			-
	PM	Volume (veh/h)	0	0	0	44	0	38	0	120	53	29	91	0	-
		Volume to Capacity	-			0.12			0.11			0.02			-
		Control Delay (s)	-			11			0			2			-
		LOS	-			B			A			A			-
		95% Queue (m)	-			3			0			1			-
New E/W Road / Anderton Road *Unsignalized*	AM	Volume (veh/h)	INTERSECTION EXISTS IN SCENARIO 2 ONLY												
		Volume to Capacity													
		Control Delay (s)													
		LOS													
		95% Queue (m)													
	PM	Volume (veh/h)													
		Volume to Capacity													
		Control Delay (s)													
		LOS													
		95% Queue (m)													

5. Scenario 2: Traffic Operating Conditions

Capacity analysis was completed for the 20-Year Horizon (2043) condition – with development for the Scenario 2 road network during the weekday AM and PM peak hours. In Scenario 2, a new east-west road connects Anderton Road and Aspen Road, splitting the north and south portions of 2123 Hector Road while providing access to both 2123 and 2077 Hector Road. Development traffic was distributed along the alternate road network in Scenario 2 using the same trip distributions as Scenario 1 found in *Section 3.4*.

5.1. 20-YEAR HORIZON (2043) CONDITIONS – WITH DEVELOPMENT

20-Year Horizon (2043) Conditions – with development were analyzed at the study intersections described in *Section 2.2.* 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 11*. The detailed results can be found in *Appendix E.*

Based on the analysis, all intersection movements perform at a LOS C or better with minimal queues and delays and sufficient capacity to accommodate demand produced by additional development traffic. With the addition of the new east-west road, demand at other study intersections is expected to be lowered slightly. In general, compared to Scenario 1 results, conditions are expected to improve slightly at all study intersections. Notably, the westbound approach at Hector Road / Aspen Road improves from a LOS B to LOS A.

Table 11: Scenario 2: 20-Year Horizon (2043) Conditions

SCENARIO 2: 20-Year Horizon (2043) Conditions - With Development															
Intersection	Period	Attribute	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Overall
Aspen Road / Guthrie Road *Signalized*	AM	Volume (veh/h)	44	424	11	130	523	26	200	17	128	51	64	104	-
		Volume to Capacity	0.22	0.59	0.02	0.43	0.76		0.58	0.26		0.14	0.30		-
		Control Delay (s)	12	14	1	15	19		21	5		13	7		15
		LOS	B	B	A	B	B		C	A		B	A		B
		95% Queue (m)	2	24	0	7	34		14	1		3	4		-
	PM	Volume (veh/h)	97	601	19	198	539	47	191	57	140	34	44	66	-
		Volume to Capacity	0.33	0.64	0.02	0.70	0.63		0.65	0.41		0.13	0.25		-
		Control Delay (s)	13	14	3	28	13		29	8		17	9		16
		LOS	B	B	A	C	B		C	A		B	A		B
		95% Queue (m)	5	41	0	14	39		19	5		3	4		-
Aspen Road / Idiens Way *Unsignalized*	AM	Volume (veh/h)	0	76	10	10	32	0	13	0	23	0	0	0	-
		Volume to Capacity	0.06			0.01			0.04			-			-
		Control Delay (s)	0			2			9			-			-
		LOS	A			A			A			-			-
		95% Queue (m)	0			0			1			-			-
	PM	Volume (veh/h)	0	62	18	31	63	0	12	0	18	0	0	0	-
		Volume to Capacity	0.05			0.02			0.04			-			-
		Control Delay (s)	0			3			9			-			-
		LOS	A			A			A			-			-
		95% Queue (m)	0			1			1			-			-
Aspen Road / Neptune Way *Unsignalized*	AM	Volume (veh/h)	10	0	12	19	0	5	10	68	6	1	165	10	-
		Volume to Capacity	0.03			0.04			0.01			0.00			-
		Control Delay (s)	10			11			1			0			-
		LOS	B			B			A			A			-
		95% Queue (m)	1			1			0			0			-
	PM	Volume (veh/h)	10	0	21	12	0	3	15	158	18	4	128	10	-
		Volume to Capacity	0.05			0.03			0.01			0.00			-
		Control Delay (s)	10			12			1			0			-
		LOS	B			B			A			A			-
		95% Queue (m)	1			1			0			0			-
Anderton Road / Hector Road *Unsignalized*	AM	Volume (veh/h)	10	0	20	0	0	0	11	304	0	0	347	10	-
		Volume to Capacity	0.06			-			0.01			0.23			-
		Control Delay (s)	13			-			0			0			-
		LOS	B			-			A			A			-
		95% Queue (m)	2			-			0			0			-

	PM	Volume (veh/h)	10	0	16	0	0	0	23	361	0	0	435	10	-
		Volume to Capacity	0.07			-			0.02			0.28			-
		Control Delay (s)	15			-			1			0			-
		LOS	B			-			A			A			-
		95% Queue (m)	2			-			1			0			-
Aspen Road / Grumman Place *Unsignalized*	AM	Volume (veh/h)	10	0	28	0	0	0	10	69	0	0	122	10	-
		Volume to Capacity	0.05			-			0.01			0.08			-
		Control Delay (s)	10			-			1			0			-
		LOS	A			-			A			A			-
		95% Queue (m)	1			-			0			0			-
	PM	Volume (veh/h)	10	0	36	0	0	0	18	138	0	0	98	10	-
		Volume to Capacity	0.06			-			0.01			0.07			-
		Control Delay (s)	10			-			1			0			-
		LOS	A			-			A			A			-
		95% Queue (m)	2			-			0			0			-
Hector Road / Aspen Road *Unsignalized*	AM	Volume (veh/h)	0	0	0	10	0	11	0	62	10	17	123	0	-
		Volume to Capacity	-			0.03			0.05			0.01			-
		Control Delay (s)	-			10			0			1			-
		LOS	-			A			A			A			-
		95% Queue (m)	-			1			0			0			-
	PM	Volume (veh/h)	0	0	0	10	0	24	0	132	10	17	102	0	-
		Volume to Capacity	-			0.05			0.09			0.01			-
		Control Delay (s)	-			10			0			1			-
		LOS	-			A			A			A			-
		95% Queue (m)	-			1			0			0			-
New E/W Road / Anderton Road *Unsignalized*	AM	Volume (veh/h)	17	0	73	0	0	0	25	301	0	0	357	5	-
		Volume to Capacity	0.17			-			0.02			0.23			-
		Control Delay (s)	13			-			1			0			-
		LOS	B			-			A			A			-
		95% Queue (m)	5			-			1			0			-
	PM	Volume (veh/h)	9	0	47	0	0	0	69	370	0	0	439	14	-
		Volume to Capacity	0.13			-			0.07			0.29			-
		Control Delay (s)	14			-			2			0			-
		LOS	B			-			A			A			-
		95% Queue (m)	3			-			2			0			-

5.2. DISCUSSION

Providing the new east-west connection from Aspen Road through to Anderton Road would add some east-west capacity to the network, but usage would be limited due to the short length of the road and the fact that it will function as a local road. This new connection is anticipated to reduce traffic on Hector Road and on Aspen Road as development traffic has the option of using the new road to access Anderton Road to travel north-south without using Aspen Drive.

Removing the access from Hector Road to 2123 and 2077 Hector Road would eliminate conflict with a planned east-west greenway along the south side of Hector Road by removing vehicles crossing this greenway.

In order to provide for this new connection land would need to be taken from the above noted properties, as well as properties to the east between 2077 Hector Road and Anderton Road in the Comox Regional District which runs through other private properties. This would require not only land but would also require more roadway space and additional cost.

Until land outside the Town is acquired, all traffic from 2077 Hector Road would be effectively passing through 2123 Hector Road to access Aspen Road if access to Hector Road is not provided.

6. Site Access

This section provides a high-level review of the most recent site plan, including sight line assessment, large vehicle turning paths, and parking requirements.

6.1. DESCRIPTION

The subject development has two proposed site accesses:

- **For Scenario 1:** There is one access for the north half and one for the south half of the development. Both accesses will be on the east side of Aspen Road, lining up with Grumman Place and Neptune Way for the north and south accesses, respectively, to provide four leg intersections. This is desirable as it eliminates the need for offset intersections.

- **For Scenario 2:** There is one access for the north half and one for the south half of the development. The north access is planned to be on the north side of the new east-west road. Similar to Scenario 1, the south access will be on the east side of Aspen Road fronting Neptune Way to provide a four-leg intersection. The new east-west road in Scenario 2 also allows the neighbouring development at 2077 Hector Road to reroute its access from Hector Road onto the new east-west road.

6.2. SIGHT LINES

The two proposed accesses to Aspen Road are located on a straight and flat section of Aspen Road and are planned to intersect at right angles at existing intersections. Based on the Transportation Association of Canada (TAC) guidelines, for a 50 km/hr road, an intersection sight distance of 105m and 95m must be maintained for left and right turns from stop, respectively. The sight line area must also be clear of obstructions. Sight lines are not anticipated to be a problem so long as the sight triangles shown in *Figure 14* are kept clear of any obstructions such as structures, fences or vegetation. As detailed drawings of the site plan updated, these requirements can be verified and changes made if necessary.

When designing the accesses at Aspen Road, the potential future CVRD greenway trail on Aspen Road just south of Hector Road (see *Figure 4*) will need to be considered to provide driveway crossings with adequate sight lines for pedestrians and cyclists.

Figure 14: Clear Sight Triangles

6.3. TURNING MOVEMENTS

The north and south accesses to the proposed development were reviewed for large vehicle turning paths (garbage, service vehicles, emergency vehicles). Swept path analysis using AutoTURN 11 was conducted using the 2123 Hector Road site plan dated October 26, 2023 by Abele Architecture. All swept path analysis drawings are presented in *Appendix G*. Turning maneuvers for the following vehicles were analyzed as part of this study:

- TAC-2017 Passenger Vehicle (P)
- TAC-2017 Commercial Truck (MSU)
- TAC-2017 Bus (I-Bus)

Note that garbage and service vehicles were assumed similar size to the MSU vehicle and the emergency vehicles, specifically fire trucks were assumed to be a similar size to the I-Bus vehicle.

The Right-In / Right-Out (NBR and WBR) and Left-In / Left-Out (SBL and WBL) maneuvers for each vehicle described above were reviewed at both accesses.

Findings from the analysis are summarized below:

6.3.1. Passenger Vehicles (P)

Based on the analysis, no turning conflicts are expected for entering and exiting P vehicles.

6.3.2. Commercial Truck (MSU)

Based on the analysis, the following conflicts are expected for entering and exiting MSU vehicles:

- Due to the size and turning requirements of the MSU vehicle, it is difficult to maintain 2-way traffic at both site accesses for all maneuvers (NBR, WBR, SBL, WBL**)**. Other vehicles will have to yield to larger service vehicles to allow safe ingress / egress. This type of vehicle is expected to serve the site on a limited basis, daily for garbage trucks and less frequently for moving trucks.

6.3.3. Bus (I-Bus)

Based on the analysis, the following conflicts are expected for entering and exiting I-Bus vehicles:

- Due to the size and turning requirements of the I-Bus vehicle, it is difficult to maintain 2-way traffic at both site accesses for all maneuvers (NBR, WBR, SBL, WBL). Other vehicles will have to yield to emergency vehicles to allow safe ingress/egress.

- I-Bus vehicles are unable to complete the right turn maneuvers (NBR and WBR) at both site accesses without pulling into opposing traffic. Other vehicles are expected to yield to emergency vehicles for safe ingress/egress.

6.4. PARKING ASSESSMENT

The Town of Comox's zoning bylaw requires 1.5 spaces per dwelling unit plus 0.25 spaces per dwelling unit for visitors parking for townhouse developments. For apartments, the base rate is reduced to 1 space per dwelling unit plus 0.25 spaces for visitor parking.

Based on these rates, the 69 townhomes under Scenario 1 will require 104 spaces plus 18 visitor spaces. The 183 apartments will require 183 spaces plus 46 visitor stalls. Under Scenario 2, the 65 townhomes will require 98 spaces plus 17 visitor spaces. The 171 apartments will require 171 spaces plus 43 visitor stalls.

For bicycle parking, 0.25 Class I spaces per unit are required for apartments, thus 46 (Scenario 1) or 43 (Scenario 2) Class I spaces will be needed for this component of the development. In addition, 0.5 Class II spaces are required per unit resulting in a further 92 (Scenario 1) or 86 (Scenario 2) Class II spaces will be needed.

7. Future Boundary Extension Effects

The Town of Comox is planning development on the future extension of the Town's limits (Boundary Extensions B and C). If both areas are developed, it will likely impact the Town of Comox's Road network, as well as the City of Courtenay. This section provides a high-level analysis of the impacts to the surrounding road network with the development of these areas. This analysis builds on the analysis undertaken for a previous project.

7.1. STUDY AREA

The impacts of Boundary Extensions B and C on Courtenay, Ministry of Transportation and Infrastructure, and Comox's Road network, were analyzed for the following six arterial roads:

- Ryan Road
- Guthrie Road
- Lerwick Road
- Anderton Road
- Pritchard Road
- Military Row

Boundary Extensions B and C, major employment centres and the arterial road network are presented in *Figure 15*.

Figure 15: Study Area Boundary Expansion

7.2. EXISTING AND BACKGROUND ROADWAY TRAFFIC VOLUMES

To develop the existing (2023) and background (2043) traffic volumes, two-way average annual daily traffic (AADT) volumes were obtained from the following three reports:

- *The Comox Transportation Study 2011*
- *Comox Transportation Study Update 2021*
- *The 2014 Comox Valley Regional District Transportation Road Network Plan*
- *The City of Courtenay 2005 Transportation Study*

To develop the existing (2023) and background (2043) AADT, volumes from the above reports were adjusted at a rate of 1% growth rate (compounded annually) from available data. These volumes represent volumes without the Boundary Extension B and C and are presented in *Table 12*.

Table 12: 2023 and 2043 AADT Volumes

Road	2023 AADT	2043 Background AADT
Lerwick Road between McDonald Road and Ryan Road	12600	15200
Guthrie Road between McDonald Road and Anderton Road	12300	14700
Ryan Road between Lerwick Road and Anderton Road	13000	15900
Ryan Road between Anderton Road and Military Row	6900	8500
Anderton Road between Ryan Road and Knight Road	5900	7200
Anderton Road between Knight Road and Guthrie Road	7800	10100
Anderton Road between Guthrie Road and Comox Avenue	9600	13000
Knight Road Between Anderton Road and Pritchard Road	2600	2700
Military Row between Ryan Road and Knight Road	2500	3100

7.3. TRIP GENERATION, REDUCTIONS, DISTRIBUTIONS

7.3.1. Trip Generation

Similar to the procedures in Section *3.3*, trip generation estimates were developed for the boundary extensions using rates from the ITE Trip Generation, 11th Edition. The details for Boundary Extensions B and C are unknown (i.e. type and number of units). Therefore, the number of units was calculated based on the size and projected density (38 units/ha) of the boundary areas. Based on discussions with the Town of Comox and to achieve this intended density target, it is assumed that Boundary Extensions B and C will mainly be comprised of residential condos and townhouses (land use code 230).

The trips generated by Boundary Extensions B and C are presented in *Table 13*. While the AM and PM peak hour trips were not used in the analysis, they are provided for informational purposes.

Table 13: Boundary Extensions B and C – Trip Generation

Development	Type	# of Units	Period	Trip Rate	In/Out Ratio		Trips		
					IN %	OUT %	IN	OUT	TOTAL
Area B of the OCP Map (130 ha)	Residential Condo / Townhouse (220)	4940	AM	0.40	24	76	474	1502	1976
			PM	0.51	63	37	1587	932	2519
			Daily	6.74	50	50	16648	16648	33296
Area C of the OCP Map (200 ha)	Residential Condo / Townhouse (220)	7600	AM	0.40	24	76	730	2310	3040
			PM	0.51	63	37	2442	1434	3876
			Daily	6.74	50	50	25612	25612	51224

Following the general procedure of previous analysis mode share reductions were made to these Boundary extension areas; however, as most units are not expected to be within 400m of a transit corridor, a conservative 2.5% transit trip reduction was applied.

While transit ridership in Comox is expected to increase due to the development of Boundary Extensions B and C, the transit trip reduction is based on proximity to transit facilities. As most residences within the

boundary extensions will not be situated along a current transit corridor, the more conservative reduction was used. If BC Transit implements more frequent or additional service, while the ridership may go up, for purposes of this analysis, the lower reduction was used.

A walk and bike reduction of 10% was made to the trip generation to account for mode shift over times considering the large number of unites. The resulting trips are presented in *Table 14*.

Table 14: Boundary Extensions B and C - Daily Trips Generated (Reduced)

Development	Type	Period	Reduced Trips		
			IN	OUT	TOTAL
Area B of the OCP Map (130 ha)	Residential Condo / Townhouse (230)	AM	416	1318	1734
		PM	1393	818	2211
		Daily	14609	14609	29218
Area C of the OCP Map (200 ha)	Residential Condo / Townhouse (230)	AM	641	2027	2668
		PM	2143	1258	3401
		Daily	22475	22475	44950

7.3.2. Trip Distribution

The trip distribution for the boundary extensions was estimated based on the proximity of nearby employment centers and arterial roads. Since the unit type is residential, it was assumed that the trips generated would mostly be commuting trips. Therefore, during peak travel hours, trips would be to / from major employment areas such as Downtown Comox, North Island College, Comox Valley Airport, or the City of Courtenay.

For Boundary Extensions B and C, the following trip distribution was assumed:

- 55% to / from Courtenay and North Island College
- 10% to / from DND / Comox Valley Airport
- 35% to / from Downtown Comox

A graphical representation of the above trip distribution is presented in *Figure 16*.

Figure 16: Trip Distribution Assumptions – Boundary Extension

7.4. FUTURE AADT VOLUMES

The 2043 Combined AADT volumes were developed by adding the expected daily trips generated by Boundary Extensions B and C to the 2043 Background AADT volumes. These volumes are presented in *Table 15*.

Table 15: AADT Volumes

Road	2023	2043 Background	2043 Combined
Lerwick Road between McDonald Road and Ryan Road	12600	15200	25600
Guthrie Road between McDonald Road and Anderton Road	12300	14700	28100
Ryan Road between Lerwick Road and Anderton Road	13000	15900	46300
Ryan Road between Anderton Road and Military Row	6900	8500	26400
Anderton Road between Ryan Road and Knight Road	5900	7200	46700
Anderton Road between Knight Road and Guthrie Road	7800	10100	31300
Anderton Road between Guthrie Road and Comox Avenue	9600	13000	39000
Knight Road Between Anderton Road and Pritchard Road	2600	2700	16400
Military Row between Ryan Road and Knight Road	2500	3100	10500

7.5. LEVEL OF SERVICE RESULTS

To determine the roadway LOS for the existing road network, the AADT volumes and number of lanes were compared against the HCM 7 Manual, Exhibit 16-14 for the following scenarios:

- 2023 Existing Conditions
- 2043 Background Conditions (20 years of growth)
- 2043 Combined Conditions (20 years of growth + full build-out of boundaries B and C)

The HCM Manual 7th Edition, Exhibit 16-16 estimates LOS based on four variables (AADT, posted speed, design hour factor, and directional distribution factor) and multiple other assumptions (control type, access density, percentage of left turns, etc.). The exhibit is useful as a first pass to highlight where problems may exist, but a full operational analysis should be conducted before any decisions on implementing specific improvements are made. The exhibit can be found in Appendix *H*. *Table 16* presents the analysis based on the existing roadway network.

Table 16: Existing Road Network LOS Results

Road	Existing Road Network			
	# of Lanes	2023 LOS	2043 Background LOS	2043 Combined LOS
Lerwick Road between McDonald Road and Ryan Road [1]	2	E	E	F
	4	D	D	E
Guthrie Road between McDonald Road and Anderton Road	2	E	E	F
Ryan Road between Lerwick Road and Anderton Road	2	E	E	F
Ryan Road between Anderton Road and Military Row	2	D	D	F
Anderton Road between Ryan Road and Knight Road	2	D	D	F
Anderton Road between Knight Road and Guthrie Road	2	D	D	F
Anderton Road between Guthrie Road and Comox Avenue	2	D	E	F
Knight Road Between Anderton Road and Pritchard Road	2	D	D	F
Military Row between Ryan Road and Knight Road	2	D	D	D

Note:

1. Lerwick Road is either a 3- or 4-lane cross section; thus, 2- and 4-lane LOS results were presented.

As shown in *Table 16*, most roads are expected to operate at LOS D in 2023. Lerwick Road between McDonald Road and Ryan Road (with two lanes), Guthrie Road between McDonald Road and Anderton Road and Ryan Road between Lerwick Road and Anderton Road are expected to operate at Level of Service E.

By 2043, without the boundary extension development, the Levels of Service will be the same with the exception of Anderton Road between Guthrie Road and Comox Avenue which is anticipated to deteriorate to E. With the boundary extension traffic added in many of the road segments deteriorate to

Level of Service F if no improvements are made including Lerwick Road, Guthrie Road, Ryan Road, Anderton Road and Knight Road.

7.6. IMPROVEMENT OPTIONS

As traffic operations degrade, the following two road improvement options should be considered:

- Widen existing road cross-sections
- Develop new 2-lane collector / arterial roads

With the additional traffic from Boundary Extensions B and C, the roads with the highest volumes are expected to be Ryan Road east of Lerwick Road, Anderton Road between Ryan Road and Knight Road and Anderton Road south of Guthrie Road. If these roads, and others as noted in *Table 16*, are widened from 2- to 4-lane cross-sections the LOS is expected to improve as shown in *Table 17*. This will basically mean Lerwick Road, Guthrie Road, Ryan Road, Anderton Road and Knight Road between all widened to four lanes with a resulting Level of Service of E except for Ryan Road between Lerwick Road and Anderton Road, Anderton Road between Ryan Road and Knight Road and south of Guthrie Road remaining at Level of Service F. It should be noted that Anderton Road between Ryan Road and Knight Road is very close to being F as the volume is slightly below the threshold.

Table 17: LOS Results with Road Network Improvements

	With Proposed Road Network Improvements	
Road	# of Lanes	2043 Combined LOS
Lerwick Road between McDonald Road and Ryan Road [1]	4	E
Guthrie Road between McDonald Road and Anderton Road	4	E
Ryan Road between Lerwick Road and Anderton Road	4	F
Ryan Road between Anderton Road and Military Row	4	E
Anderton Road between Ryan Road and Knight Road	4	F
Anderton Road between Knight Road and Guthrie Road	4	E
Anderton Road between Guthrie Road and Comox Avenue	4	F
Knight Road Between Anderton Road and Pritchard Road	4	D
Military Row between Ryan Road and Knight Road	2	D

Alternatively, the Town of Comox could develop new collector / arterial roads to distribute traffic, rather than relying on wider arterial roads. These roads would provide alternative routes for vehicles, diverting traffic away from the congested arterial roads and providing a finer gride network which can also be beneficial to pedestrians and cyclists.

In the north south direction roads parallel to Anderton Road (to the east and west) or Pritchard Road would be desirable as the spacing between these two roads is large and the network is reliant on these two connections as well as Lerwick Road to access destinations to the north, northeast and northwest. One option is Aspen Road extending further north, the other could be an extension of Nootka Street through to Hudson Road.

To relieve congestion on Ryan Road and Guthrie Road, one or two new east-west collector / arterial roads between these roads, connecting Lerwick Road to Anderton Road and Pritchard Road, will likely be required since there are no continuous east west routes between Ryan Road and Guthrie Road.

Further planning for additional roads would be best addressed by analyzing peak hour traffic volumes in Comox and its boundary extensions using a travel demand model as the method uses in this section based on AADT is a high level method for screening purposes.

8. Hector Road

Hector Road in the town of Comox is classified as a local road based on the Transportation Master Plan. For a local road, MOTI rural collector standards call for 3.6 metre lane widths plus a shoulder of 1.0 m. This shoulder is increased to 1.5 m with a shared bikeway. Currently, Hector Road has a total pavement width of approximately 6 metres with no shoulders.

9. Conclusions and Recommendations

The purpose of this report is to review the impact of the proposed development located at 2123 Hector Road in Comox, BC on the traffic operations and transportation network connectivity in the surrounding study area. This study evaluates the Existing (2023), Opening Day (2025), and 20-Year Horizon (2043) operating conditions for weekday AM and PM peak hours at six study intersections for Scenario 1 and the 20-Year Horizon (2043) – with development conditions at seven study intersections for Scenario 2. Additionally, a site access review (including sight lines, turning movements, and parking requirements) and a high-level analysis considering future boundary extensions is provided.

9.1. CONCLUSIONS

Multimodal Network Connectivity

Pedestrians:

Pedestrian demand from the site will be primarily to oriented towards Guthrie Road where there is a bus route and commercial uses. A sidewalk along the east side of Aspen Road to connect the site to the existing sidewalks further south is recommended. If a MUP is built along Hector Road, then this could be further connected to the noted sidewalk.

Hector Road and Idiens Way currently have no sidewalks on either side of the road. A greenway trail between Anderton Road and Pritchard Road is proposed by 2024 which will provide connection to existing greenway trails connecting to Highland Secondary School to the east.

Cyclists:

The *Town of Comox 2020 Transportation Master Plan* proposes several improvements to the cyclist network to address discontinuities within the town boundaries.

The two main Arterial roads within the study area, Guthrie Road and Anderton Road have dedicated unbuffered bike lanes on both sides of the road. Buffered bicycle facilities are proposed along Guthrie Road from Nootka Street to Pritchard Road and McDonald Road to Linshart Road by 2024 and 2039, respectively. Anderton Road also has proposed buffered bicycle facilities from Comox Avenue to Guthrie Road by 2029. The timeline for the proposed buffered facilities in MoTI jurisdiction is unknown at this time.

Currently, there are no bike paths provided along other roads in this study area. However, unbuffered bicycle facilities are proposed along Aspen Road from Guthrie Road to Noel Avenue by 2024. This will provide a direct and complete bike route to Aspen Park Elementary.

Trip Generation

The proposed development under Scenario 1 is expected to generate an additional 101 vehicle trips (24 inbound / 77 outbound) during the weekday AM peak period and 111 vehicle trips (67 inbound / 44 outbound) during the PM peak period (see Table 3). Under Scenario 2, the development is expected to

generate an additional 94 vehicle trips (22 inbound / 72 outbound) during the weekday AM peak period and 104 vehicle trips (63 inbound / 41 outbound) during the PM peak period.

Traffic Analysis

The AM and PM peak hours for this study were determined to be 8:00 AM – 9:00 AM and 3:00 PM – 4:00 PM, respectively. Future volumes took into account a 1% growth rate was applied and surrounding development at 2309 McDonald Road, 695 Aspen Road, 941 Aspen Road and 2077 Hector Road.

Scenario 1: Existing (2023) Conditions

For existing conditions, all intersections currently operate at an acceptable LOS during both the AM and PM peak periods. All intersection movements operate at a LOS B or better with minimal queues and delays and sufficient capacity to accommodate demand. These findings are consistent with the 2022 conditions in McElhanney's 2018 TIA for 2309 McDonald Road.

Scenario 1: Opening Day (2025) Conditions

For the Opening Year (2025) conditions, all intersections are expected to operate at an acceptable LOS during both peak hours. All intersection movements are expected to continue operating at a LOS B or better without development traffic and LOS C or better with development traffic with minimal queues and delays and sufficient capacity to accommodate demand.

Scenario 1: 20-Year Horizon (2043) Conditions

For the 20-Year Horizon (2043) conditions, all intersections are expected to operate at an acceptable LOS during both peak hours. All intersection movements are expected to continue operating at a LOS C or better with minimal queues and delays and sufficient capacity to accommodate demand both without and with development traffic. These findings are consistent with the 2042 conditions in McElhanney's 2018 TIA for 2309 McDonald Road.

Scenario 2: 20-Year Horizon (2043) Conditions – With Development

To provide a comparison with the worst performing condition (2043 – with development) in Scenario 1, 20-Year Horizon (2043) Conditions – with development were analyzed for Scenario 2 in *Section 5.* All intersections are expected to operate at an acceptable LOS during both peak hours. The results project that all intersection movements operate at LOS C or better for the post development condition. Due to the addition of the new east-west road in Scenario 2, the conditions at other study intersections are expected to improve slightly compared to Scenario 1. The reduced vehicular traffic along Aspen Road will be beneficial for pedestrians and cyclists using the proposed new Hector Greenway.

Site Access

The site accesses were reviewed. No safety or sight line issues were identified at the site accesses along Aspen Road at this time given that the sight triangles shown in *Figure 14* are kept clear of obstructions.

Based on the Town of Comox's zoning bylaw, the 69 townhomes under Scenario 1 will require 104 spaces plus 18 visitor spaces. The 183 apartments will require 183 spaces plus 46 visitor stalls. Under Scenario 2, the 65 townhomes will require 98 spaces plus 17 visitor spaces. The 171 apartments will require 171 spaces plus 43 visitor stalls. In addition, the apartments require 46 (Scenario 1) or 43 (Scenario 2) Class I bicycle parking spaces and 92 (Scenario 1) or 86 (Scenario 2) Class II spaces.

Future Boundary Extension

The future boundary extensions have the potential to include 12,540 units of housing, the equivalent of 27,500 people. With the additional traffic this will generate a number of roads will need to be widened including Ryan Road, Lerwick Road, Anderton Road, Knight Road and Guthrie Road. Anderton Road and Ryan Road are still projected to operate at Level of Service F. As a result, additional collector and/or collector roads will be needed to support this boundary extension.

9.2. RECOMMENDATIONS

- Signal timing at Aspen Road / Guthrie Road be reviewed regularly and adjusted as required to accommodate anticipated traffic growth being generated on the north leg of Aspen Road.
- Ensure sight lines are revaluated at the detailed design stage to determine whether on-street parking needs to be restricted in the vicinity of the site access points. Additionally, it is recommended to maintain surrounding vegetation (trim and prune regularly) which may obstruct vehicle and pedestrian sight lines near the site access entrances.
- When the proposed CVRD greenway trail on Aspen Road just south of Hector Road is constructed, pedestrian and cyclist sight lines at the development access driveway crossings should be evaluated.
- Provide a sidewalk connection along the east side of Aspen Road to connect to the sidewalk further south.
- Provide a crosswalk across Aspen Way at Hector Road to provide a connection to the existing greenway to the west.

APPENDIX A
DAI LETTER

TOWN OF COMOX

DEVELOPMENT APPROVAL INFORMATION NOTICE

File: No. Pre-Application
March 3, 2023
Revised March 6, 2023 (blue text)

Trevor Dickie
Broadstreet Properties Ltd.
VIA email only: trevor.dickie@broadstreet.ca

Dear Mr. Dickie:

RE: NOTICE TO PROVIDE TRAFFIC AND CONNECTIVITY STUDY

In relation to a proposed development at:
Lot 4 District Lot 170 Comox District Plan VIP60685 (PID 023-020-148)
2123 Hector Rd, Comox, BC (the subject property)

This notice is provided in accordance with the Comox Planning Procedures Bylaw 1780, Section 8, per your request dated February 27, 2023. The following is required in relation to the proposed development at 2123 Hector Road: a **Traffic Study** prepared and certified by a Professional Traffic Engineer experienced in traffic analysis and road design, and registered in the Province of British Columbia.
Comox Planning Procedures Bylaw 1780 delegates to the Municipal Planner the authority to require an applicant to provide Development Approval Information. An applicant who is required to provide Development Approval Information is entitled to have Council reconsider such decision. **Attachment 4** contains an excerpt of Bylaw 1780 s. 12, including s.12(7) that sets out the procedure and timeline limitations for reconsideration of the Municipal Planner decision by Council.

This is a preliminary Development Approval Information (DAI) letter based on pre-application discussions and concept site plan provided on January 8, 2023 by Broadstreet Properties Ltd., for a multi-family residential development proposal[1] (**Attachment 2**), therefore, additional DAI requirements may be issued upon submission and town review of the rezoning and development permit applications.

The abutting unconstructed portions of Aspen Road (Major Collector) and Hector Road (Local) will be completed as part of development of the subject property. For reference, Major Collector and Local road cross-sections per Subdivision and Development Servicing Bylaw 1261 and alternative cross-sections acceptable to the Town are provided in **Attachment 3**. Note that west side of Aspen Road has been recently constructed to the alternative Major Collector road standard. The construction of road upgrades outside of the Town boundaries is subject to MOTI approvals.

[1] The proposal is for 52 townhouse units and 140 apartment units, surface parking, and a stormwater management pond (land required for pond is to be dedicated as municipal road).

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Fax: 250-339-7110
Email: planning@comox.ca

Address:
1809 Beaufort Avenue
Comox, B.C. V9M 1R9

We respectfully acknowledge that we gather and work on the traditional territory of the K'ómoks First Nation, the traditional keepers of this land.

The Traffic Study is to provide a detailed analysis of the impacts the proposed development will have on the Town's and Comox Valley Regional District (CVRD) transportation networks and connectivity by evaluating two potential road network scenarios described below and shall address concerns raised by community via pre-application consultation with residents in Town and CVRD.[2]
The Study shall provide recommendations to ensure good vehicular connectivity and safe, direct routes for pedestrians and cyclists in the neighbourhood, including a list of upgrades required for the MOTI portion of Hector Road up to and including intersection with Anderton Road to accommodate increasing residential traffic in the neighbourhood.

1. Scenario
   Per concept site plan submitted by Broadstreet, properties at 2123 (the subject property) and 2077 Hector Road each provide individual access to public roads (Aspen and Hector, respectively) and no vehicular connection between these properties is constructed (unless required for emergency access); and

2. Scenario
   A new east-west Local road connecting Aspen to Anderton is constructed and provides access to 2123 and 2077 Hector Road properties, while a new greenway along Hector Road remains uninterrupted by vehicle traffic (except Town maintenance access to the ponds and any emergency vehicles access, if required).

The Traffic Study shall review the Comox Official Community Plan Bylaw 1685; 2309 McDonald Road Traffic Impact Study by McElhanney Consulting Services Ltd. dated June 25, 2018; Highstreet Development Traffic Impact Assessment (695 Aspen Rd) by McElhanney dated August 18, 2019; Comox Transportation Study 2011 prepared by Boulevard Group, 2020 Transportation Master Plan Update by WATT Consulting Group, and incorporate residential traffic generated by development at 2309 McDonald Road (as if fully built out)[3] as current conditions.

https://www.comox.ca/sites/default/files/2022-04/ASP%20-%20TIA%20FINAL%20SEALED%20-%202019.08.18.pdf
https://www.comox.ca/sites/default/files/2022-04/2011%20Transportation%20Study.pdf
https://www.comox.ca/sites/default/files/2022-04/2020%20Transportation%20Master%20Plan%20Update.pdf

The previously completed reports and data may be used as a reference, including to extrapolate traffic volumes data using linear growth at 1% annual rate up to 2023, provided that traffic generated by 2309 McDonald Rd is incorporated into current conditions.

In accordance with standards generally accepted as good engineering practices and ensuring neighbourhood connectivity, the Traffic Study must provide the following:

1. Detailed analysis, which will address safety, speed and traffic volumes, level of service, identify measures to mitigate and reduce impacts of the proposed developments within the focus area comprised of the following intersections:
   - Guthrie & Aspen;

[2] Residents' letters submitted to-date were collected by Broadstreet and also available at the Comox planning department. Tentatively, Open House meeting is scheduled in March, 2023 and may result in more written submissions.

[3] 2309 McDonald Road is a residential development consisting of 8 two-dwelling, 52 single-family (potentially with secondary suites) and 22 townhouse units.

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- Aspen & Hector;
- Hector & Anderton;
- Anderton Road with the new east -west Local road (under scenario 2);
- Aspen & Idiens;
- Grumman Place and Aspen Road; and
- Neptune Way and Aspen Road

2. Identify problem areas, options to address any deficiencies. Include potential problems beyond the focus area, if any are anticipated.

3. Identify the baseline information as the current conditions (traffic volumes in 2023 shall include residential development traffic from 2309 McDonald Rd, as if fully built).

4. Provide assessment of current conditions including:
   - the impact of proposed development on the subject property; and
   - the impact of the neighbouring development's at 941 Aspen Road and 2077 Hector Road[4].

5. Provide assessment of future traffic conditions and connectivity patterns under the two road network development scenarios: over 20 years horizon (2043), including build out on the subject property, 2077 Hector Rd and 941 Aspen Road, and the cumulative effect of the development contemplated by the Town's Official Community Plan via boundary extensions to the north. Provide comparison with the findings of the 2018 McElhanney report for the focus area.

6. Review residential development proposed in the area and provide recommendations, listing "pros and cons" of the two road network development scenarios:

   a. Regarding greenway alignment: no vehicular access to Hector Road for the subject property is supported due to the desire for greenway along Hector Road to continue uninterrupted as much as possible.

   b. Specifically, provide pedestrian and bicycle connectivity analysis (including pedestrians and cyclists from surrounding neighbourhood and from the subject property), to connect to roads and major greenways envisioned in OCP.

   c. Review proposed driveways pattern on the subject property for large vehicles turning paths (garbage, moving and service trucks, emergency vehicles).

   d. Provide firm recommendation with supporting rationale of the proposed vehicle access location(s) for the subject property under both scenarios, including:
      - any required public road upgrades and greenway alignments;
      - as needed, a revised subject property concept layout plan with access location(s), internal driveways, property lines and tree retention areas.

[4] Multi-family residential development of approximately 720 residential units is proposed on the neighboring sites, consisting of apartments, townhouses and approximately 2,000 square metres of neighbourhood commercial uses, such as personal services, childcare, corner store, coffee shop, serving mainly the proposed residential development. This information is preliminary and subject to change, as there are no complete applications received by the Town for these properties.

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7. For the Hector Road works outside of the Town boundary required to address Town and public concerns (these are in addition to the upgrades along the property frontages of the subject property, 2077 Hector and 941 Aspen), the Professional Engineer shall:

    a. Consult with MOTI regarding the upgrades within Hector Road and provide a list of conditions and requirements to obtain permits for construction;

    b. Propose the scope of works and cost allocation method; and

    c. Comment on implications of constructing the Hector Road upgrades at the time of subject property development vs. incrementally, as the development of the focus area proceeds over time.

8. In accordance with standards generally accepted as good engineering practice, the Professional Traffic Engineer shall provide and certify the following statement in relation to traffic movement and safety:

    "The lands identified as <legal description> and proposed road, greenway and driveway alignments may be safely used for the intended use <state the intended use, and under which road network scenario, or both>, provided that it is used in accordance with the conditions and recommendations specified in the Study",

    OR

    "The lands identified as <legal description> may not be safely used for the intended use < state the intended use, and under which road network scenario, or both>".

The Traffic Study shall:

1. Stipulate the qualifications and accreditation of the professionals (Qualified Professionals) who are to prepare the preliminary Development Approval Information and state that the Qualified Professional(s) is/are members in good standing with their respective professional regulatory association(s) described in the requirements issued under this notice;

2. Disclose the source of all information and describe and explain the methodology used to compile and to test the accuracy and reliability of the Development Approval Information. Please provide the software outputs (as attachments to the study);

3. Contain certifications from each Qualified Professional that the Development Approval Information was prepared by them and is true and accurate to the best of their knowledge; and

4. Include with the Study or Report, the "Declaration" page in the form set out in Schedule B of Bylaw 1780 and contained in **Attachment 1** of this notice.

5. Documents required to be prepared by Professional Engineers registered in the province of British Columbia must include the following signature block. This signature block is the only format that will be accepted by the Town, with the exception of drawings where the signed seal of a professional engineer is sufficient.

Tel: 250-339-2202
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Email: planning@comox.ca

Address:
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When the Study or Report is prepared by a professional engineer:

Submitted by,
J. Smith
ABC Engineering Ltd.
Stamp of Jill Smith PEng
Signature of Jill Smith PEng
I certify this to be a report prepared by Jill Smith PEng.

OR

When a Study or Report is prepared by a junior engineer under direct supervision of a professional engineer:

Submitted by J. Smith, ABC Engineering Ltd.
Stamp of Jill Smith PEng
Signature of Jill Smith PEng
I certify this to be a report prepared under the direct supervision of Jill Smith PEng

At the option of the professional engineer, the following signature block may be added:

Signature Mike Williams
Prepared by Mike Williams, <credentials, e.g. EIT>

Any documents submitted by a professional engineer that raise concerns as to conformance with applicable Town specifications, applicable legislation or professional standards may result in the submission of a formal complaint to EGBC.

Please do not hesitate to contact me if you have any questions on this matter (250 339 2202).

Yours truly,

Marvin Kamenz
Municipal Planner,
Director of Development Services

MK/ RB

Attachments:
1. Declaration page from Bylaw 1780
2. Concept Site Plan
3. Road cross-sections

cc: Shelley Ashfield, Director of Operations
Craig Perry, Public Works Manager
Robbie Nall, Parks Manager
Clive Freundlich, Finance Director
Regina Bozerocka, Planner II

Tel: 250-339-2202
Fax: 250-339-7110
Email: planning@comox.ca

Address:
1809 Beaufort Avenue
Comox, B.C. V9M 1R9

We respectfully acknowledge that we gather and work on the traditional territory of the K'ómoks First Nation, the traditional keepers of this land.

SCHEDULE "B"

DEVELOPMENT APPROVAL INFORMATION

DECLARATION

The undersigned acknowledge that the Development Approval Information herein is not provided to the Town with any expectation of confidentiality, constitutes a record of the Town of Comox under the *Freedom of Information and Protection of Privacy Act*, and may be made available for public use in connection with the development application to which it pertains, including by posting on the Town's website.

DATED: _____

The Qualified Professionals executing below are the only Qualified Professionals who participated in the preparation of the Development Approval Information.

Applicant:

Name: _____

Address: _____

Signature

Qualified Professionals:

Name: _____

Address: _____

Signature

Name: _____

Address: _____

Signature

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ATTACHMENT 2
Concept Site Plan

Tel: 250-339-2202
Fax: 250-339-7110
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Town of Comox

Subdivision and Development Servicing Bylaw 1261

THIS IS A CONSOLIDATED VERSION PREPARED FOR CONVENIENCE PURPOSES ONLY

TABLE C-1 (#1612 JAN 20/10)
MINIMUM REQUIREMENTS, ROADWAY WIDTHS, CURBS AND SIDEWALKS

	Road Allowance Width (m)				Radius of Cul-de-sac	Pavement Width (m)						Radius of Cul-de-sac	Shoulder Width	Type of Curb	No. of Sidewalks
Land Use	Cul*	Loc	Coll	Lane	(m)	Cul	Loc	Min. Coll	Maj. Coll	Arterial	Lane	(m)	(m)	Curb	By Owner
Urban Roads♦♦♦♦	20	20	20	6	17	9.0	9.0♦	11	13	14	5.5	12.5		♦♦♦♦ Roll ** ♦	♦♦♦♦ Commercial, Multi-Family – both sides/Single-Family with secondary suite allowance – Both sides except cres & cul ***/Single family no secondary suite allowance – 1 side **** ♦
Industrial	20	20	20	7.5	17		11	13			7			Vert	
Arterials			25							14				Vert	1 side
Pedestrian Connections	required where a cul-de-sac street is longer than 120 m, or where continuous street frontage exceeds 370 metres			2.5							2.5			Asphalt or concrete	
Dedicated Walkways – Map C-2 ♦♦				14–20, avg 15											
Dedicated Walkways – Map C-2 ♦♦♦				6-9, avg 7											

*Highway Classification
Cul -Cul de Sac
Loc -Local
Coll -Collector
Lane -Lane

**Curb Type
Roll -Rollover Curb
Vert -Vertical Face Barrier Curb

***Sidewalk one side on crescent streets which are not an arterial or collector street, all cul-de-sac streets and McDonald Road South of Guthrie Road

****Sidewalk both sides on major collectors and arterials

♦ For the portion of Butchers Road from the intersection of any new road on Lot 18, District Lot 186, Comox District, Plan 449, except that part in Plan VIP75657 (471 Butchers Road) south to Lazo Road, the minimum pavement width shall be 5.5 m and shall have no curb, gutter or sidewalk. The development of the intersection shall be in accordance with Drawing SC-16

♦♦ Where shown on Map C-2 as Dedicated Walkway 14-20 m width, dedication of a highway varying in width from 14 metres to 20 metres, and having an average width of 15 metres is required.

♦♦♦ Where shown on Map C-2 as Dedicated Walkway 6-9 m width, dedication of a highway varying in width from 6 metres to 9 metres, and having an average width of 7 metres is required.

♦♦♦♦For Kye Bay Road south of Wireless Road, and Simon Crescent road construction standards contained in Standard Drawing SC-2 Rural Highway x-section apply, including no curb, gutter or sidewalk.

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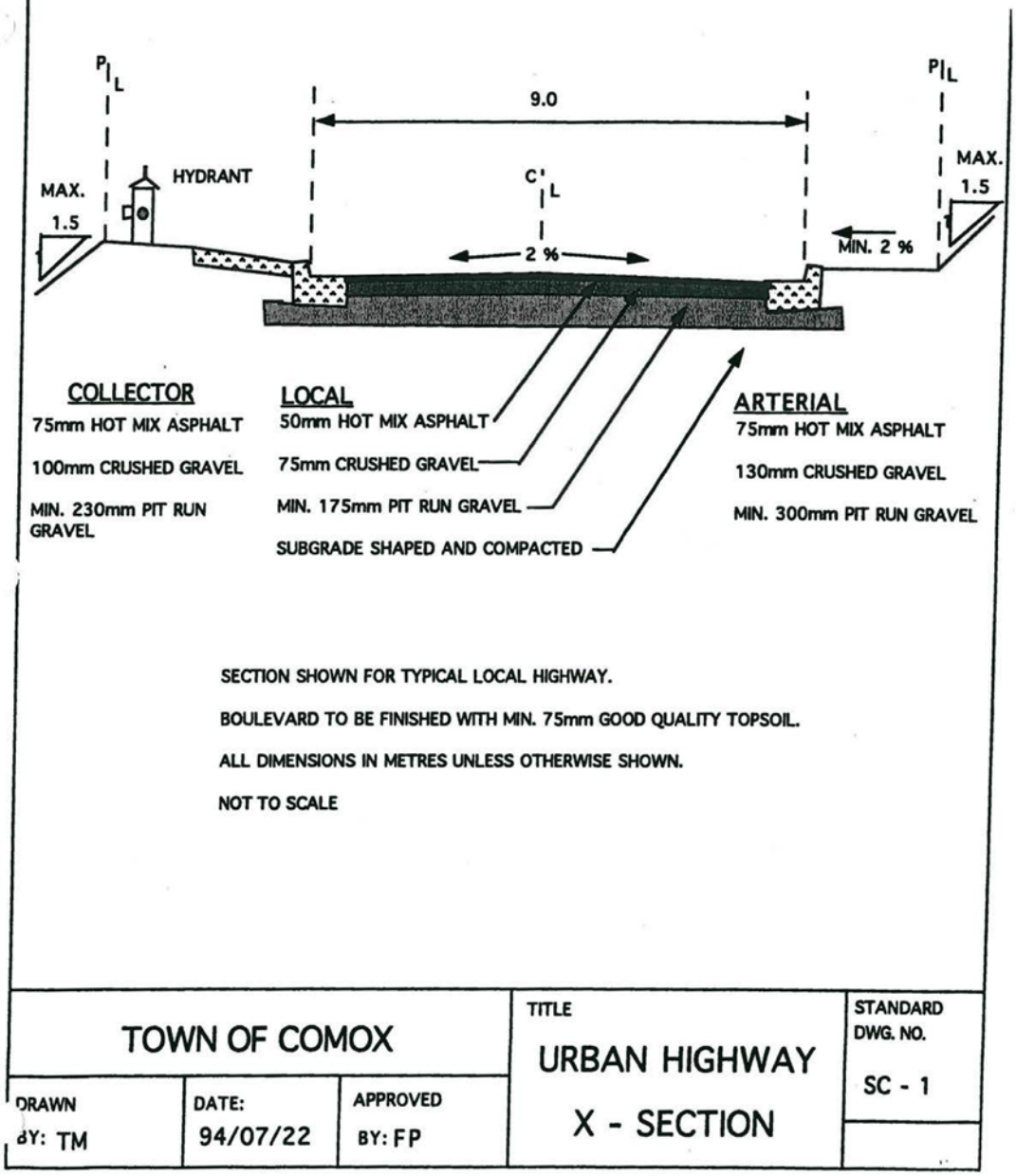
This is a consolidated version prepared for convenience purposes only.



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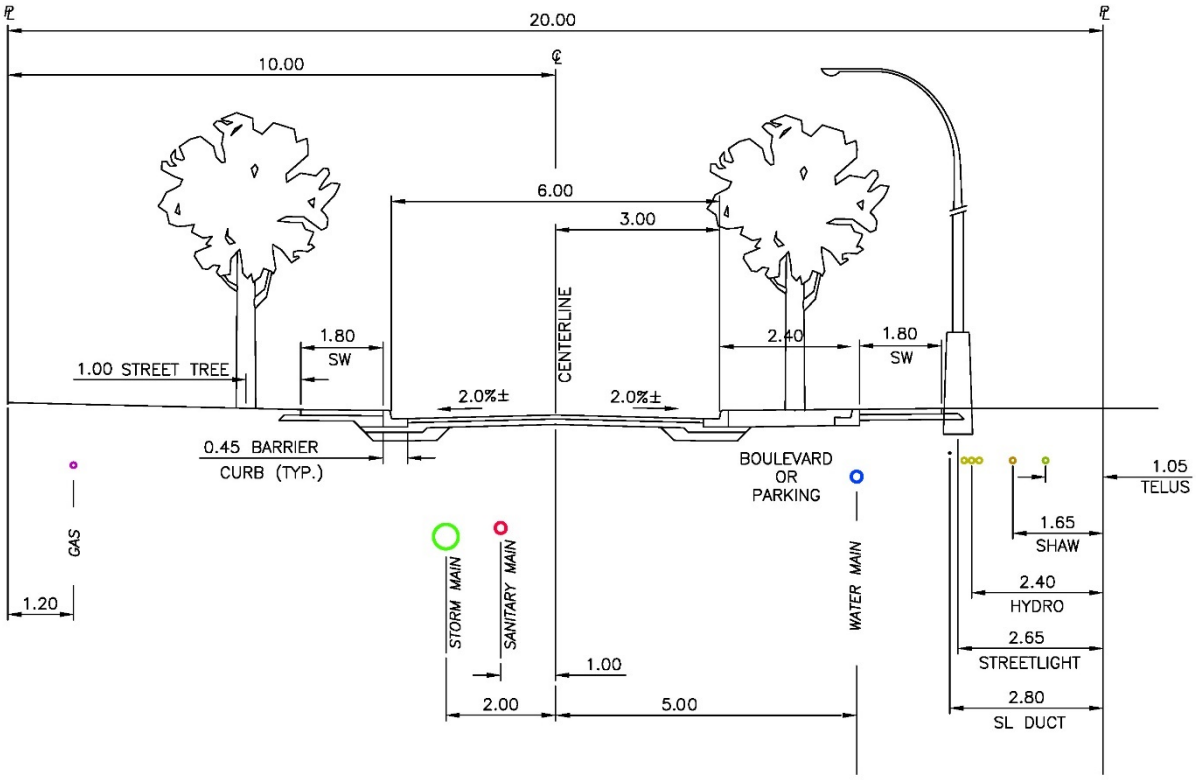
Town of Comox
ALTERNATIVE LOCAL ROAD CROSS-SECTION WITH PULL-OUT PARKING ON ONE SIDE



At time of development, where the subject properties are responsible for the off-site works within dedication of an unconstructed abutting road up to the road centerline (in case of the subject property, it is Hector Road), at a minimum 6.0 metres wide pavement shall be provided for vehicle traffic.

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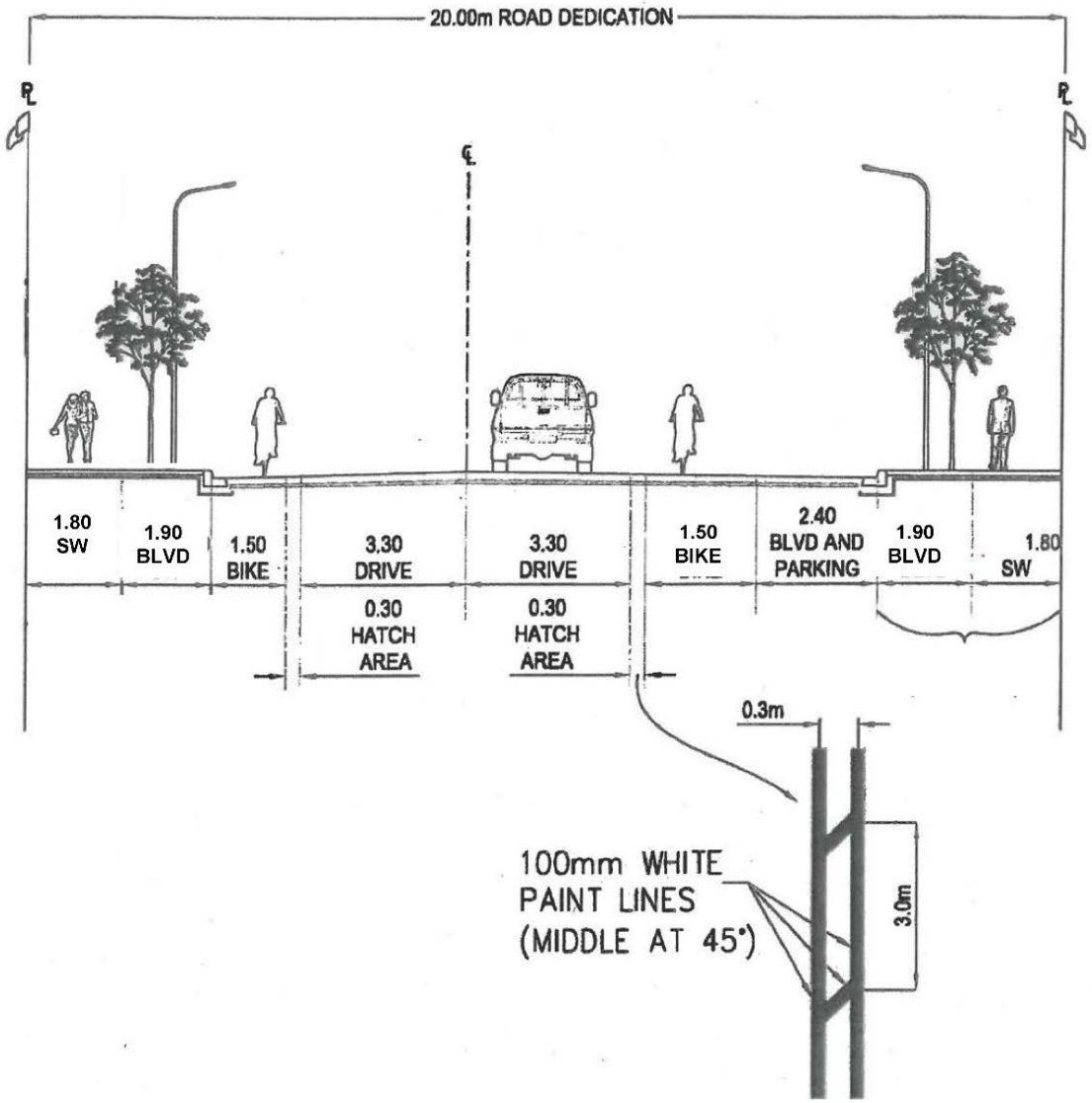
Town of Comox
ALTERNATIVE MAJOR COLLECTOR ROAD CROSS-SECTION



At time of subject property development, the developer will be responsible for off-site works within Aspen Road dedication (the unconstructed portion of this road abutting the subject property).

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12. Delegation of Authority

(1) Council delegates to the Municipal Planner:

a. the exercise of all of the powers, duties and functions of Council in respect of the issuance of development permits under sections 490 and 491 of the Local Government Act;

b. the exercise of all of the powers, duties and functions of Council in respect of the issuance of heritage alteration permits under section 617 of the Local Government Act;

c. the exercise of all of the powers, duties and functions of Council in respect of strata conversions under section 242 of the Strata Property Act in the case of conversions of commercial and industrial buildings, and residential buildings containing not more than two residential units neither of which is a secondary suite in a single family dwelling or a coach house; and

d. the exercise of all of the powers of Council in respect of the exemption of development from floodplain regulations enacted under section 524 of the Local Government Act.

(2) Council delegates to the Approving Officer the exercise of all of the powers of Council in respect of the exemption of parcels from the minimum highway frontage for subdivision specified in the zoning bylaw or section 512 of the Local Government Act, as applicable.

(3) The Municipal Planner may decide, in their sole discretion, not to exercise any delegated authority pursuant to this bylaw where the Municipal Planner considers that, for reasons of complexity, visibility or any other circumstance, the decision ought to be made by Council and where the Municipal Planner makes that determination, the Council shall consider the issue. This decision by the Municipal Planner is not subject to reconsideration by Council.

(3) The Municipal Planner may decide, in their sole discretion, not to exercise any delegated authority pursuant to this bylaw where the Municipal Planner considers that, for reasons of complexity, visibility or any other circumstance, the decision ought to be made by Council and where the Municipal Planner makes that determination, the Council shall consider the issue. This decision by the Municipal Planner is not subject to reconsideration by Council.

(4) For certainty, the delegation to the Municipal Planner of the power to issue permits and exemptions within the scope of this bylaw includes all the powers of Council in relation to those permits and exemptions, including the power to vary or supplement a land use regulation bylaw or a bylaw under Divisions 11 of Part 14 or a bylaw or permit under Part 15 of the Local Government Act and the power to impose conditions and requirements and set standards on the issuance of a permit or exemption.

(5) The authority delegated in section 12(1) includes the authority to sign and issue permits and to amend those permits and to cancel permits if an owner fails to comply with a term or condition of the permit; and in section 12(2) includes the authority to authorize an exemption or cancel an exemption if an owner fails to comply with a term or condition of an authorization.

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(6) The Municipal Planner and Approving Officer must provide a notice of any exercise of delegated authority in writing to the Applicant.

(7) Reconsideration of a Delegated Decision

a. An Applicant who is notified of a decision of the Municipal Planner under section 12(1) or of the Approving Officer under 12(2), or who is required to provide Development Approval Information under section 8(5) or a review under section 8(10), is entitled to have Council reconsider such decision without charge.

b. An Applicant may initiate a Council reconsideration by providing to the Administrator notice in writing, objecting either to the whole of the decision or requirement, or to specifically identified terms or conditions or requirements for provision of Development Approval Information. The notice must specifically state the Applicant's reasons for each objection. The notice must be received by the Administrator within:

i. 30 days of the date that the notice of decision is deemed by this bylaw to have been received by the Applicant; or

ii. within 60 days of the issuance of the requirement under subsection 8(5) or 8(10).

c. Upon receipt of a notice under this section 12(7), the Administrator must

i. provide a copy of the notice requesting reconsideration to the Municipal Planner or Approving Officer, as applicable; and

ii. refer the matter to Council to reconsider the decision or requirement to provide information.

d. Council may, on reconsideration, either confirm the decision or requirement or modify the decision or requirement in whole or in part, or set aside the decision or requirement and substitute the decision or requirement of Council.

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Address:
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APPENDIX B
SITE PLANS

PHASE 2 FOR RENT:

LOT AREA = 21095.97 m²
= 5.212 Ac
EXCL: GREENBELT

UNIT COUNT
BLD A = 91
BLD B = 92
TOTAL = 183

DENSITY = / = DU/ACRE
183 / 5.21 = 35.12

PARKING
229 DWELLING UNIT
46 VISITOR PARKING
275 REQUIRED

234 PARKING PROVIDED

PHASE 1 FOR SALE:

LOT AREA = 24619.68 m²
6.08 Ac

UNIT COUNT
11 - 4 UNIT BLDGS = 44
5 - 5 UNIT BLDGS = 25
TOTAL = 69

DENSITY = 69 / 6.08 = 11.34 DU/ACRE

PARKING REQ.

1 SITE PLAN LAYOUT
Scale: 1 : 500

10/26/2023 3:59:52 PM

SEYMOUR PACIFIC DEVELOPMENTS LTD.
100 St Anns Street, Campbell River, B.C.
(T)250.286.8045 (F)250.286.8046
www.seymourpacific.ca

SITE MAP:

PROJECT STATUS:
CONCEPT

Revision Schedule

No.	Description	Revision Date
A	ISSUED FOR REVIEW	09/11/2023
B	ISSUED FOR REVIEW	10/26/2023

SEAL: **ABELE**ARCHITECTURE
THOMAS C. ABELE, ARCHITECT AIBC, T: 604-682-6818

PROJECT NAME:
HECTOR ROAD

PROJECT NUMBER:
VP ----

ADDRESS:
ASPEN ROAD
COMOX BC

DRAWING TITLE:
SITE PLAN

DRAWN BY:	PD
CHECKED BY:	TD
DATE:	10/26/2023
SCALE:	1 : 500
DRAWING #:	REV #:
A1.0	B

PHASE 2 FOR RENT:

LOT AREA = 19,237.03m²
= 4.75 Acres
EXCL: GREENBELT

UNIT COUNT
BLD A 115
BLD B 56
TOTAL **=** 171

DENSITY = / = DU/ACRE
171 / 4.75 = 36

PARKING
214 DWELLING UNIT
43 VISITOR PARKING
257 REQUIRED

234 PARKING PROVIDED

PHASE 1 FOR SALE:

LOT AREA = 22,516.07 m²
5.56 Acres

UNIT COUNT
10 - 4 UNIT BLDGS = 40
5 - 5 UNIT BLDGS = 25
TOTAL **= 65**

DENSITY = 65 / 5.56 = 11.69 DU/ACRE

PARKING REQ.

1 SITE PLAN LAYOUT
Scale: 1 : 500

10/26/2023 4:00:56 PM

SEYMOUR PACIFIC DEVELOPMENTS LTD.
100 St Anns Street, Campbell River, B.C.
(T)250.286.8045 (F)250.286.8046
www.seymourpacific.ca

SITE MAP:

PROJECT STATUS:
CONCEPT

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PROJECT NAME:
HECTOR ROAD

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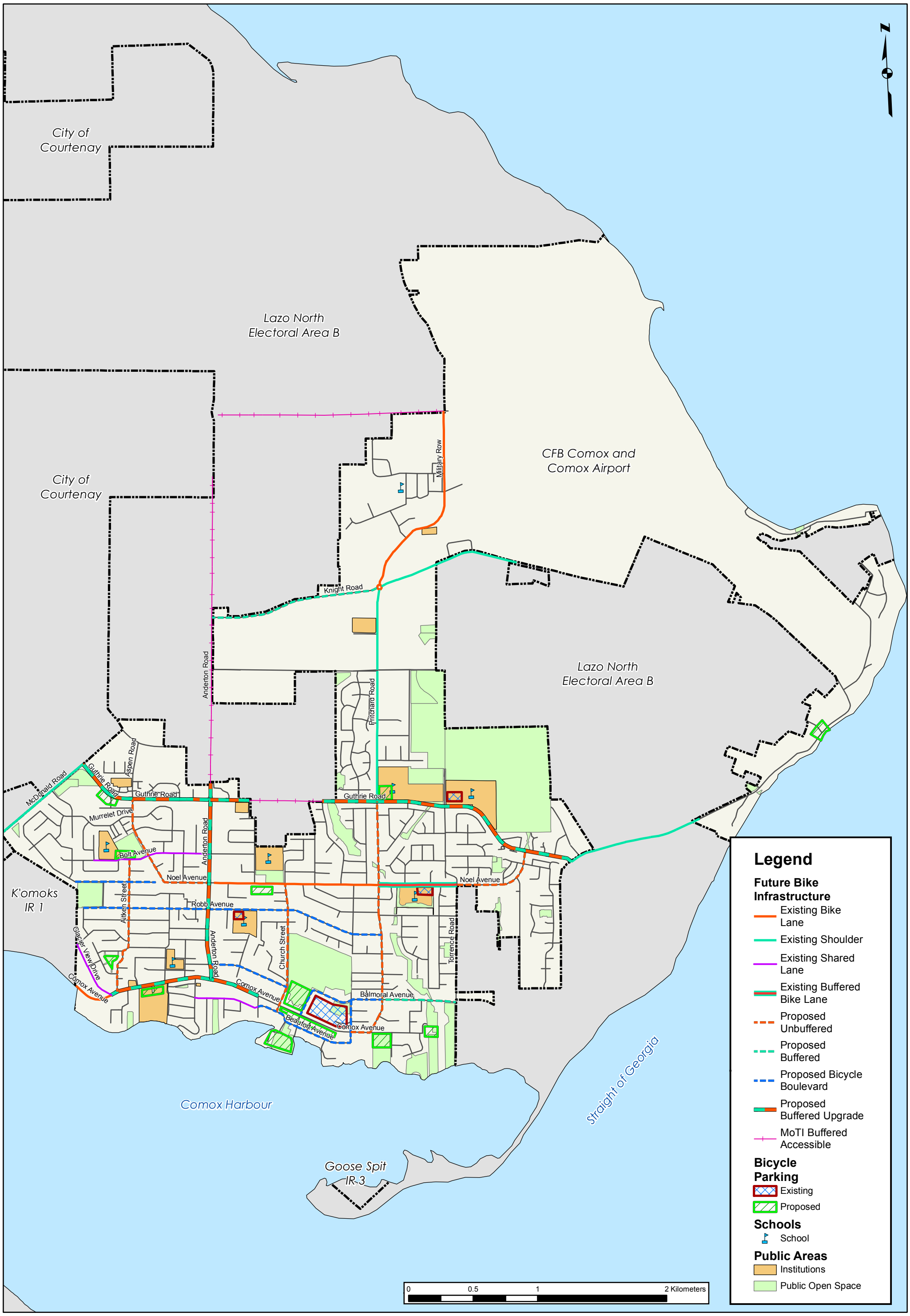
VP ----

ADDRESS:
ASPEN ROAD
COMOX BC

DRAWING TITLE:
SITE PLAN

DRAWN BY:	PD
CHECKED BY:	TD
DATE:	10/26/2023
SCALE:	1 : 500
DRAWING #:	REV #:
A1.0	B

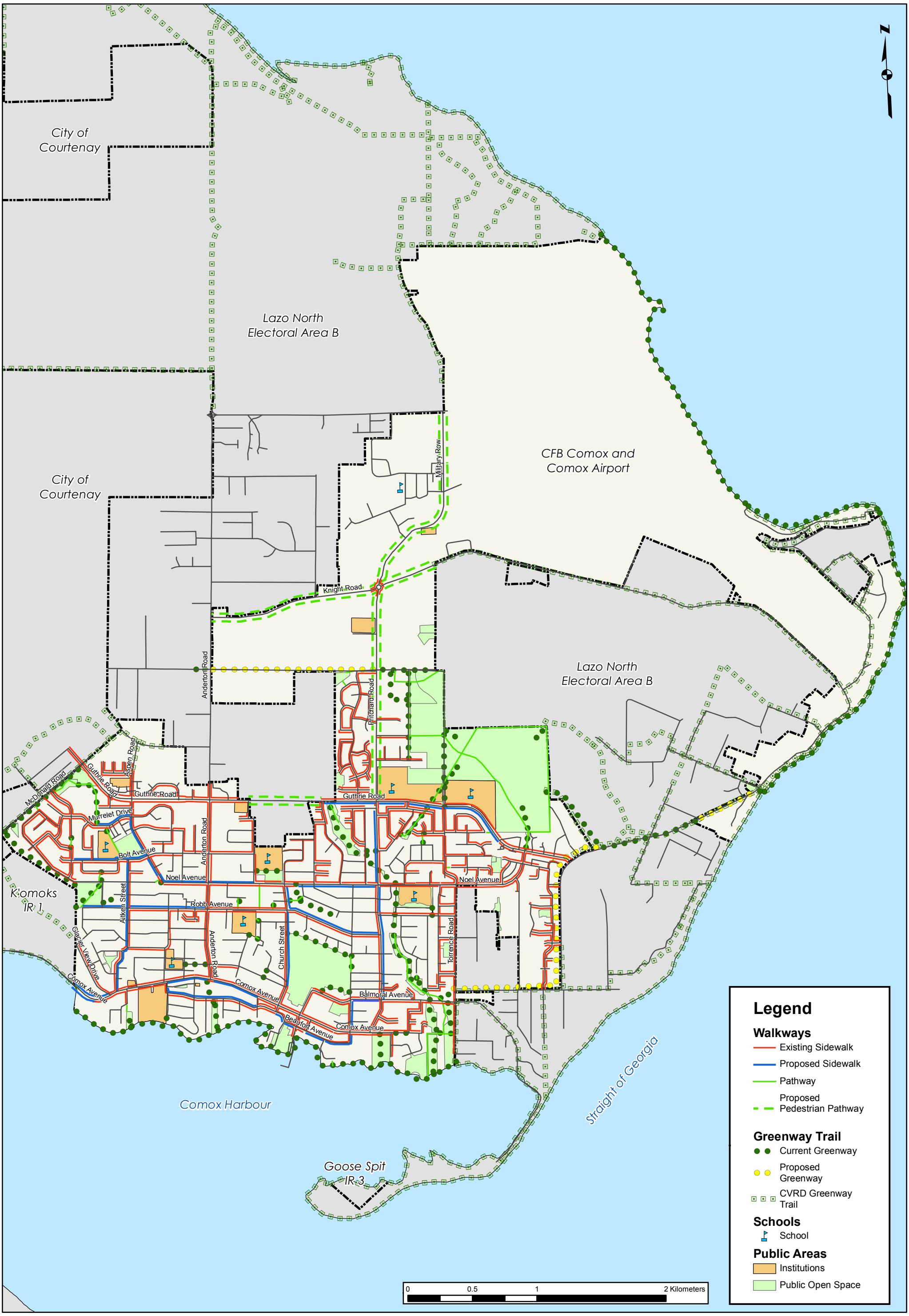
APPENDIX C
MULTIMODAL MAPS



#501, 740 Hillside Ave
Victoria, BC Canada V8T 1Z4
Tel.: 250 388 9877
Fax: 250 388 9879
www.wattconsultinggroup.com

Comox Bicycle Network

Comox Transportation Master Plan Update 2020



#501, 740 Hillside Ave
Victoria, BC Canada V8T 1Z4
Tel.: 250 388 9877
Fax: 250 388 9879
www.wattconsultinggroup.com

Comox Pedestrian Network

Comox Transportation Master Plan Update 2020

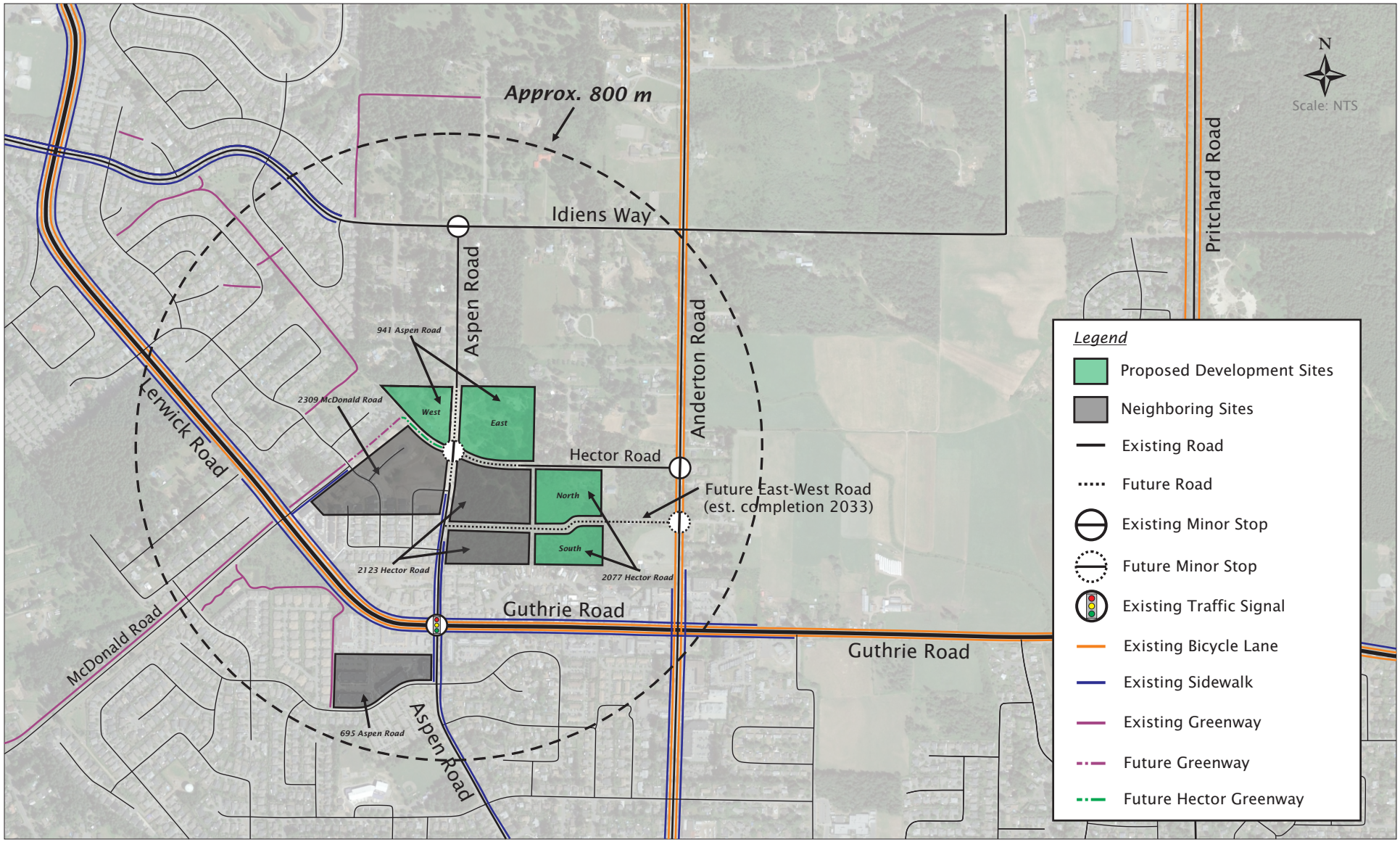


Exhibit 2.3

Active Transportation Network

941 Aspen Road and 2077 Hector Road Comox, BC
04-22-0364 April 2023

bunt & associates

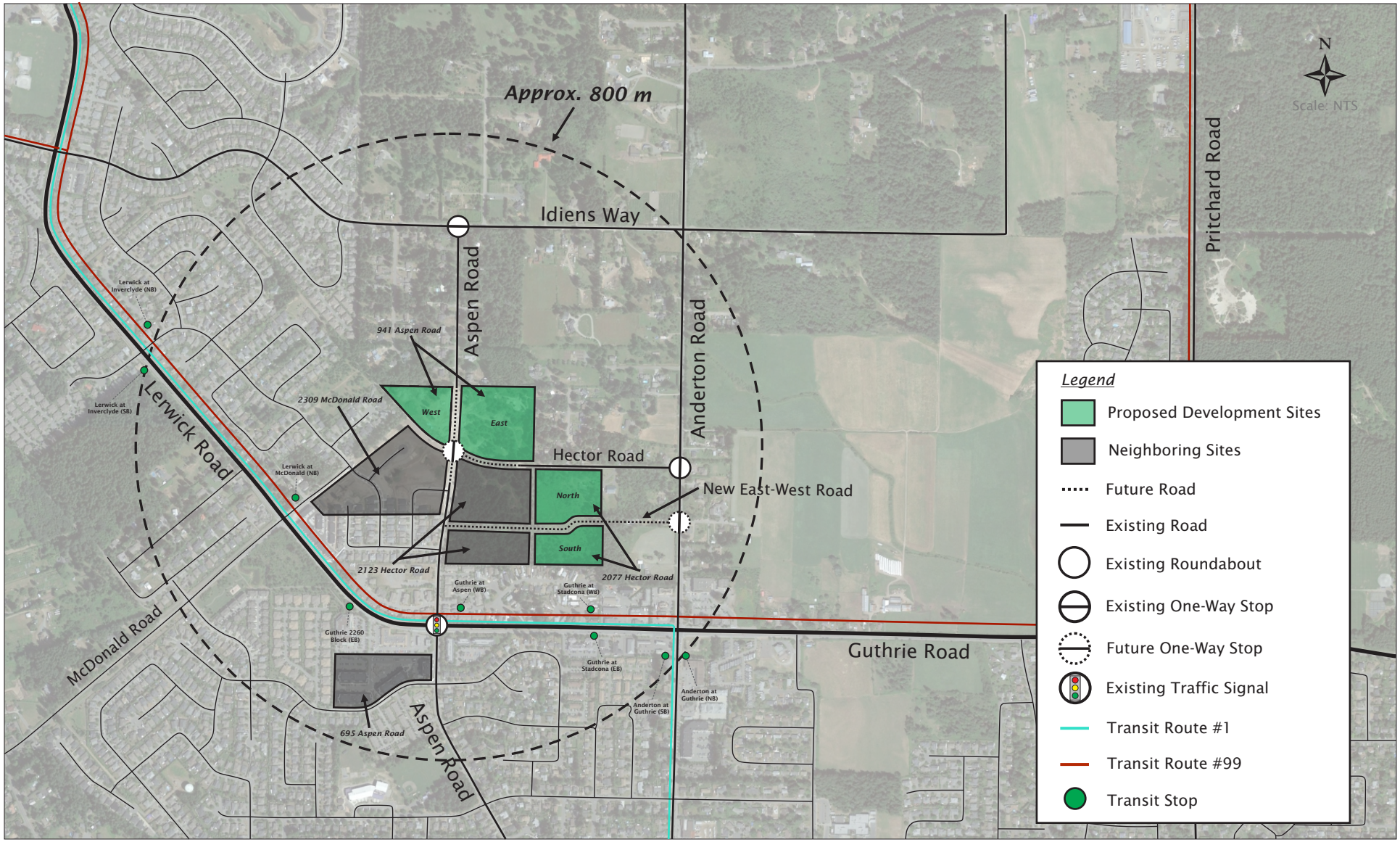


Exhibit 2.2

Transit Network

941 Aspen Road & 2077 Hector Road Comox, BC
04-22-0364 April 2023

bunt & associates

APPENDIX D
RAW TRAFFIC COUNTS

Aspen Rd and Neptune Way - TMC

Thu Jun 22, 2023
Full Length (7 AM-9 AM, 2 PM-6 PM)
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 1085047, Location: 49.690261, -124.943125

McElhanney

Provided by: McElhanney Kamloops
710 Laval Crescent, Kamloops, BC, V2C5P3, CA

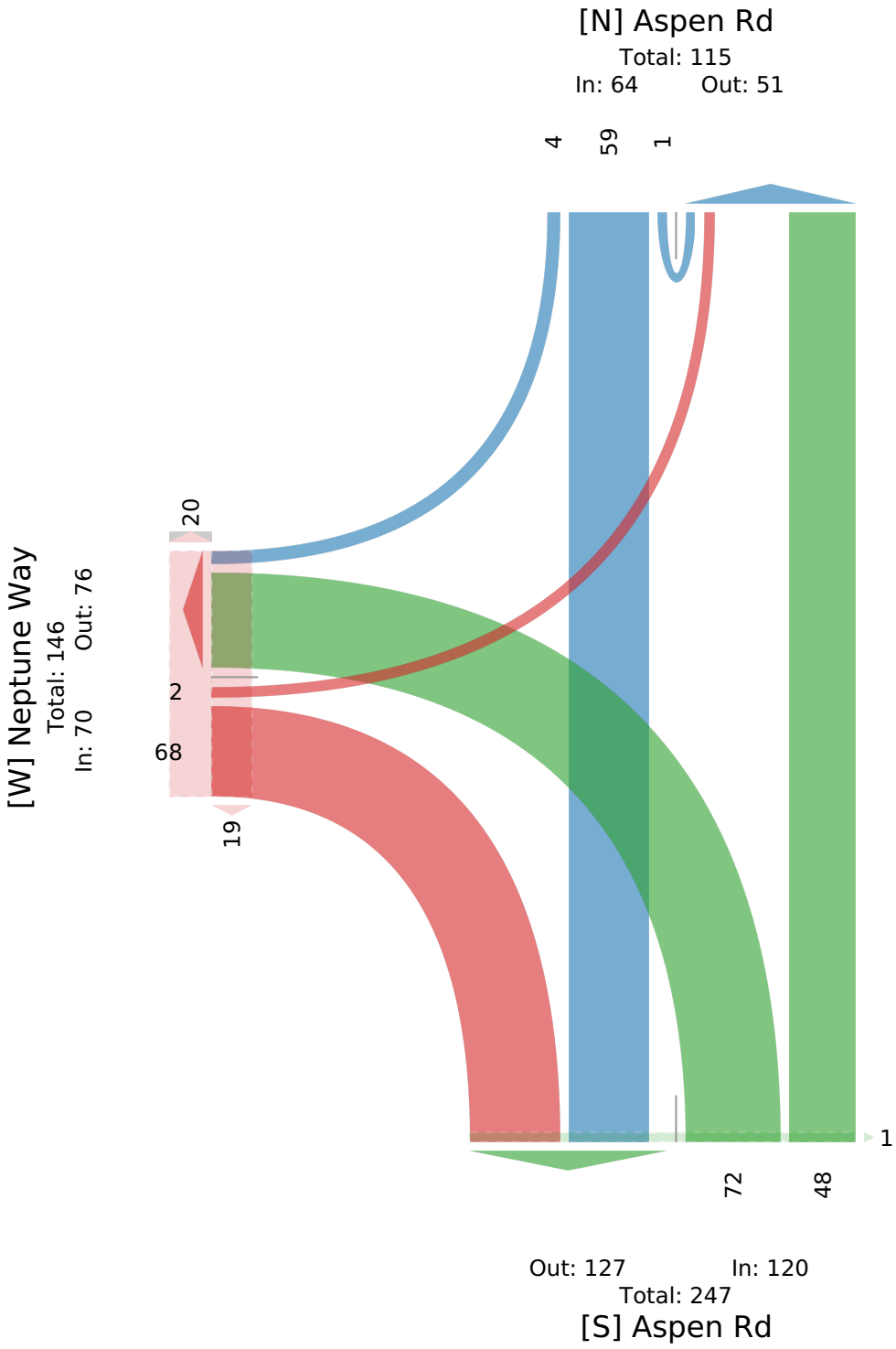
Leg	Neptune Way					Aspen Rd					Aspen Rd					
Direction	Eastbound					Northbound					Southbound					
Time	L	R	U	App	Ped*	L	T	U	App	Ped*	T	R	U	App	Ped*	Int
2023-06-22 7:00AM	0	3	0	**3**	1	0	0	0	**0**	0	0	0	0	**0**	0	**3**
7:15AM	0	3	0	**3**	1	1	1	0	**2**	0	1	0	0	**1**	0	**6**
7:30AM	1	0	0	**1**	1	1	1	0	**2**	0	0	0	0	**0**	0	**3**
7:45AM	0	4	0	**4**	0	1	1	0	**2**	0	1	0	0	**1**	0	**7**
Hourly Total	1	10	0	**11**	3	3	3	0	**6**	0	2	0	0	**2**	0	**19**
8:00AM	0	1	0	**1**	6	0	3	0	**3**	0	2	0	0	**2**	0	**6**
8:15AM	1	3	0	**4**	0	1	2	0	**3**	0	5	1	0	**6**	0	**13**
8:30AM	0	5	0	**5**	0	3	3	0	**6**	1	1	0	0	**1**	0	**12**
8:45AM	0	1	0	**1**	5	2	2	0	**4**	0	1	0	1	**2**	0	**7**
Hourly Total	1	10	0	**11**	11	6	10	0	**16**	1	9	1	1	**11**	0	**38**
2:00PM	0	0	0	**0**	0	2	1	0	**3**	0	3	0	0	**3**	0	**6**
2:15PM	0	2	0	**2**	2	1	4	0	**5**	0	1	1	0	**2**	0	**9**
2:30PM	0	2	0	**2**	2	6	6	0	**12**	0	2	2	0	**4**	0	**18**
2:45PM	0	4	0	**4**	8	6	0	0	**6**	0	3	0	0	**3**	0	**13**
Hourly Total	0	8	0	**8**	12	15	11	0	**26**	0	9	3	0	**12**	0	**46**
3:00PM	0	4	0	**4**	0	4	2	0	**6**	0	5	0	0	**5**	0	**15**
3:15PM	0	2	0	**2**	2	1	1	0	**2**	0	8	0	0	**8**	0	**12**
3:30PM	0	7	0	**7**	0	7	2	0	**9**	0	6	0	0	**6**	0	**22**
3:45PM	0	4	0	**4**	2	0	4	0	**4**	0	2	0	0	**2**	0	**10**
Hourly Total	0	17	0	**17**	4	12	9	0	**21**	0	21	0	0	**21**	0	**59**
4:00PM	0	5	0	**5**	0	2	2	0	**4**	0	5	0	0	**5**	0	**14**
4:15PM	0	3	0	**3**	0	6	1	0	**7**	0	0	0	0	**0**	0	**10**
4:30PM	0	3	0	**3**	1	7	2	0	**9**	0	3	0	0	**3**	0	**15**
4:45PM	0	4	0	**4**	2	1	1	0	**2**	0	3	0	0	**3**	0	**9**
Hourly Total	0	15	0	**15**	3	16	6	0	**22**	0	11	0	0	**11**	0	**48**
5:00PM	0	2	0	**2**	0	2	1	0	**3**	0	0	0	0	**0**	0	**5**
5:15PM	0	3	0	**3**	0	4	5	0	**9**	0	1	0	0	**1**	0	**13**
5:30PM	0	2	0	**2**	2	9	3	0	**12**	0	3	0	0	**3**	0	**17**
5:45PM	0	1	0	**1**	4	5	0	0	**5**	0	3	0	0	**3**	0	**9**
Hourly Total	0	8	0	**8**	6	20	9	0	**29**	0	7	0	0	**7**	0	**44**
Total	2	68	0	**70**	39	72	48	0	**120**	1	59	4	1	**64**	0	**254**
% Approach	2.9%	97.1%	0%	**-**	-	60.0%	40.0%	0%	**-**	-	92.2%	6.3%	1.6%	**-**	-	-
% Total	0.8%	26.8%	0%	**27.6%**	-	28.3%	18.9%	0%	**47.2%**	-	23.2%	1.6%	0.4%	**25.2%**	-	-
Motorcycles	0	0	0	**0**	-	1	2	0	**3**	-	3	0	1	**4**	-	7
% Motorcycles	0%	0%	0%	**0%**	-	1.4%	4.2%	0%	**2.5%**	-	5.1%	0%	100%	**6.3%**	-	2.8%
Lights	2	62	0	**64**	-	63	18	0	**81**	-	25	2	0	**27**	-	172
% Lights	100%	91.2%	0%	**91.4%**	-	87.5%	37.5%	0%	**67.5%**	-	42.4%	50.0%	0%	**42.2%**	-	67.7%
Single-Unit Trucks	0	1	0	**1**	-	1	2	0	**3**	-	1	2	0	**3**	-	7
% Single-Unit Trucks	0%	1.5%	0%	**1.4%**	-	1.4%	4.2%	0%	**2.5%**	-	1.7%	50.0%	0%	**4.7%**	-	2.8%
Articulated Trucks	0	1	0	**1**	-	0	0	0	**0**	-	0	0	0	**0**	-	1
% Articulated Trucks	0%	1.5%	0%	**1.4%**	-	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0.4%
Buses	0	0	0	**0**	-	0	0	0	**0**	-	0	0	0	**0**	-	0
% Buses	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%
Bicycles on Road	0	4	0	**4**	-	7	26	0	**33**	-	30	0	0	**30**	-	67
% Bicycles on Road	0%	5.9%	0%	**5.7%**	-	9.7%	54.2%	0%	**27.5%**	-	50.8%	0%	0%	**46.9%**	-	26.4%
Pedestrians	-	-	-	-	39	-	-	-	-	1	-	-	-	-	0	
% Pedestrians	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Aspen Rd and Neptune Way - TMC
Thu Jun 22, 2023
Full Length (7 AM-9 AM, 2 PM-6 PM)
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 1085047, Location: 49.690261, -124.943125

McElhanney

Provided by: McElhanney Kamloops
710 Laval Crescent, Kamloops, BC, V2C5P3, CA



Aspen Rd and Neptune Way - TMC

Thu Jun 22, 2023
AM Peak (7:45 AM - 8:45 AM)
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 1085047, Location: 49.690261, -124.943125

McElhanney

Provided by: McElhanney Kamloops
710 Laval Crescent, Kamloops, BC, V2C5P3, CA

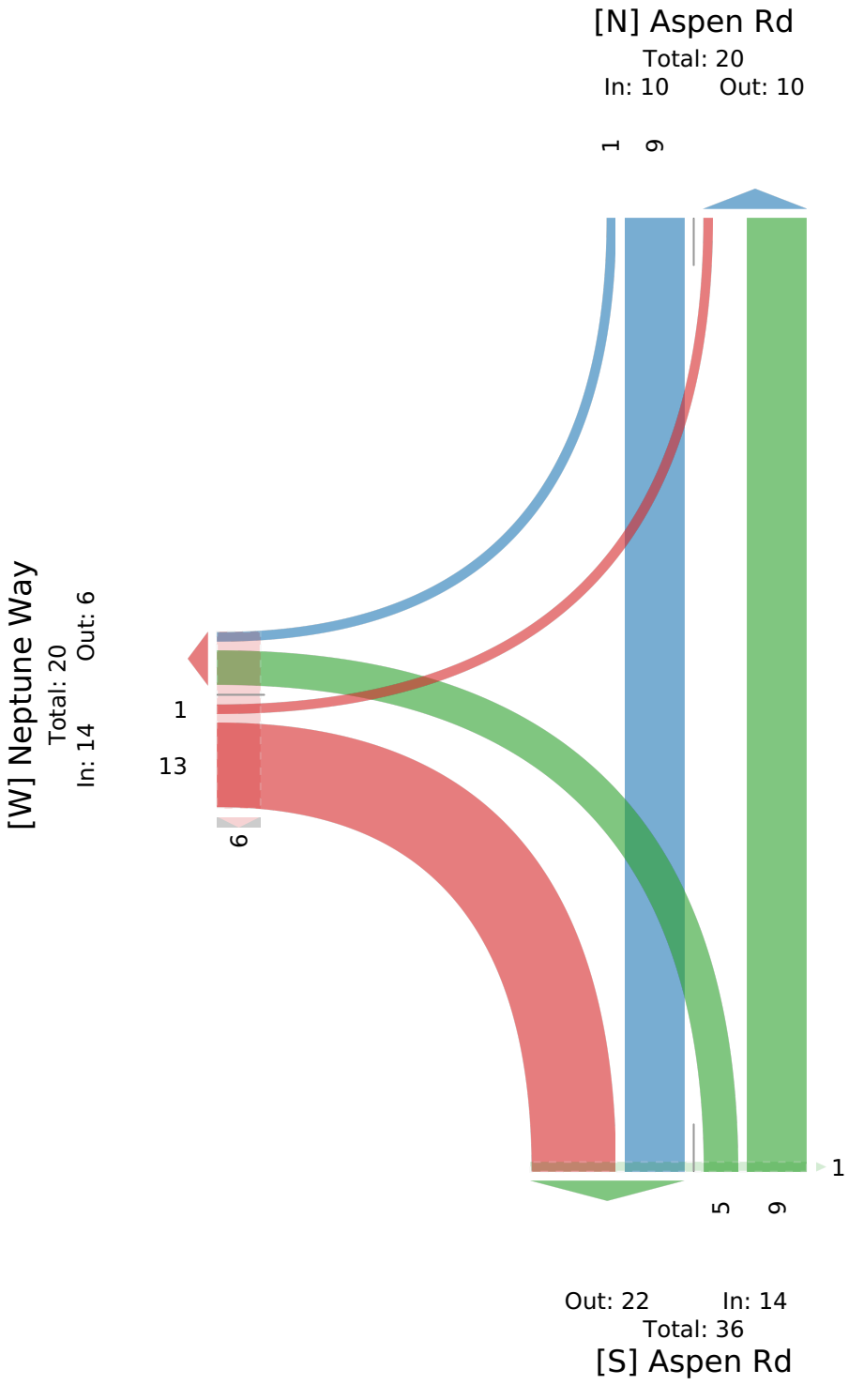
Leg	Neptune Way					Aspen Rd					Aspen Rd					
Direction	Eastbound					Northbound					Southbound					
Time	L	R	U	**App**	Ped*	L	T	U	**App**	Ped*	T	R	U	**App**	Ped*	**Int**
2023-06-22 7:45AM	0	4	0	**4**	0	1	1	0	**2**	0	1	0	0	**1**	0	**7**
8:00AM	0	1	0	**1**	6	0	3	0	**3**	0	2	0	0	**2**	0	**6**
8:15AM	1	3	0	**4**	0	1	2	0	**3**	0	5	1	0	**6**	0	**13**
8:30AM	0	5	0	**5**	0	3	3	0	**6**	1	1	0	0	**1**	0	**12**
Total	1	13	0	**14**	6	5	9	0	**14**	1	9	1	0	**10**	0	**38**
% Approach	7.1%	92.9%	0%	**-**	-	35.7%	64.3%	0%	**-**	-	90.0%	10.0%	0%	**-**	-	**-**
% Total	2.6%	34.2%	0%	**36.8%**	-	13.2%	23.7%	0%	**36.8%**	-	23.7%	2.6%	0%	**26.3%**	-	**-**
PHF	0.250	0.650	-	**0.700**	-	0.417	0.500	-	**0.688**	-	1.000	0.250	-	**0.625**	-	0.750
Motorcycles	0	0	0	**0**	-	0	0	0	**0**	-	0	0	0	**0**	-	0
% Motorcycles	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%
Lights	1	12	0	**13**	-	5	5	0	**10**	-	4	0	0	**4**	-	27
% Lights	100%	92.3%	0%	**92.9%**	-	100%	55.6%	0%	**71.4%**	-	44.4%	0%	0%	**40.0%**	-	71.1%
Single-Unit Trucks	0	1	0	**1**	-	0	1	0	**1**	-	0	1	0	**1**	-	3
% Single-Unit Trucks	0%	7.7%	0%	**7.1%**	-	0%	11.1%	0%	**7.1%**	-	0%	100%	0%	**10.0%**	-	7.9%
Articulated Trucks	0	0	0	**0**	-	0	0	0	**0**	-	0	0	0	**0**	-	0
% Articulated Trucks	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%
Buses	0	0	0	**0**	-	0	0	0	**0**	-	0	0	0	**0**	-	0
% Buses	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%
Bicycles on Road	0	0	0	**0**	-	0	3	0	**3**	-	5	0	0	**5**	-	8
% Bicycles on Road	0%	0%	0%	**0%**	-	0%	33.3%	0%	**21.4%**	-	55.6%	0%	0%	**50.0%**	-	21.1%
Pedestrians	-	-	-	-	6	-	-	-	-	1	-	-	-	-	0	
% Pedestrians	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Aspen Rd and Neptune Way - TMC
Thu Jun 22, 2023
AM Peak (7:45 AM - 8:45 AM)
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 1085047, Location: 49.690261, -124.943125

McElhanney

Provided by: McElhanney Kamloops
710 Laval Crescent, Kamloops, BC, V2C5P3, CA



Aspen Rd and Neptune Way - TMC

Thu Jun 22, 2023
PM Peak (2:30 PM - 3:30 PM) - Overall Peak Hour
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 1085047, Location: 49.690261, -124.943125

McElhanney

Provided by: McElhanney Kamloops
710 Laval Crescent, Kamloops, BC, V2C5P3, CA

Leg	Neptune Way					Aspen Rd					Aspen Rd					
Direction	Eastbound					Northbound					Southbound					
Time	L	R	U	**App**	Ped*	L	T	U	**App**	Ped*	T	R	U	**App**	Ped*	**Int**
2023-06-22 2:30PM	0	2	0	**2**	2	6	6	0	**12**	0	2	2	0	**4**	0	**18**
2:45PM	0	4	0	**4**	8	6	0	0	**6**	0	3	0	0	**3**	0	**13**
3:00PM	0	4	0	**4**	0	4	2	0	**6**	0	5	0	0	**5**	0	**15**
3:15PM	0	2	0	**2**	2	1	1	0	**2**	0	8	0	0	**8**	0	**12**
Total	0	12	0	**12**	12	17	9	0	**26**	0	18	2	0	**20**	0	**58**
% Approach	0%	100%	0%	**-**	-	65.4%	34.6%	0%	**-**	-	90.0%	10.0%	0%	**-**	-	**-**
% Total	0%	20.7%	0%	**20.7%**	-	29.3%	15.5%	0%	**44.8%**	-	31.0%	3.4%	0%	**34.5%**	-	**-**
PHF	-	0.688	-	**0.688**	-	0.708	0.375	-	**0.625**	-	0.688	0.250	-	**0.813**	-	0.786
Motorcycles	0	0	0	**0**	-	0	0	0	**0**	-	0	0	0	**0**	-	0
% Motorcycles	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%
Lights	0	10	0	**10**	-	17	2	0	**19**	-	11	1	0	**12**	-	41
% Lights	0%	83.3%	0%	**83.3%**	-	100%	22.2%	0%	**73.1%**	-	61.1%	50.0%	0%	**60.0%**	-	70.7%
Single-Unit Trucks	0	0	0	**0**	-	0	1	0	**1**	-	0	1	0	**1**	-	2
% Single-Unit Trucks	0%	0%	0%	**0%**	-	0%	11.1%	0%	**3.8%**	-	0%	50.0%	0%	**5.0%**	-	3.4%
Articulated Trucks	0	1	0	**1**	-	0	0	0	**0**	-	0	0	0	**0**	-	1
% Articulated Trucks	0%	8.3%	0%	**8.3%**	-	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	1.7%
Buses	0	0	0	**0**	-	0	0	0	**0**	-	0	0	0	**0**	-	0
% Buses	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%
Bicycles on Road	0	1	0	**1**	-	0	6	0	**6**	-	7	0	0	**7**	-	14
% Bicycles on Road	0%	8.3%	0%	**8.3%**	-	0%	66.7%	0%	**23.1%**	-	38.9%	0%	0%	**35.0%**	-	24.1%
Pedestrians	-	-	-	-	12	-	-	-	-	0	-	-	-	-	0	
% Pedestrians	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-

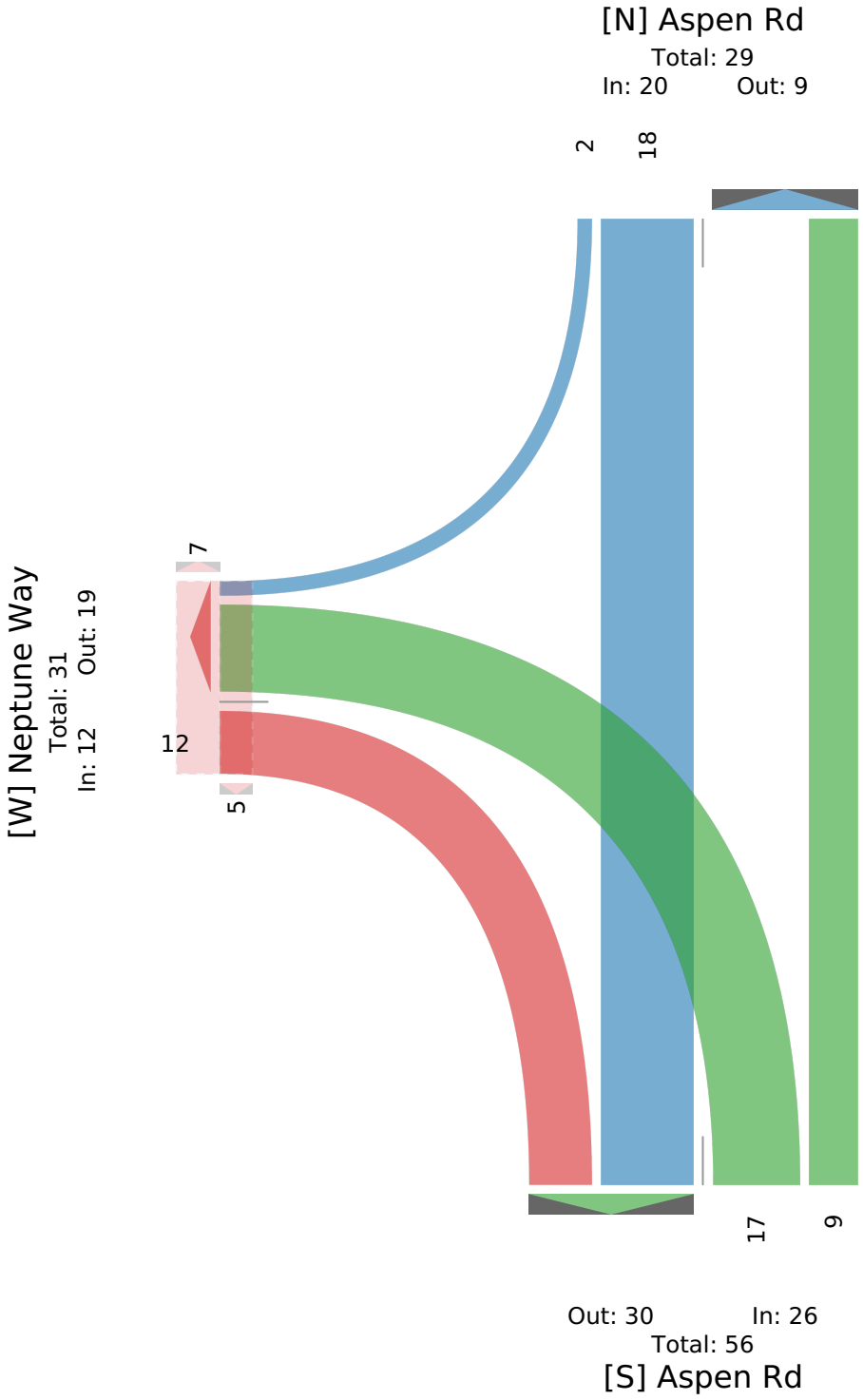
*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Aspen Rd and Neptune Way - TMC

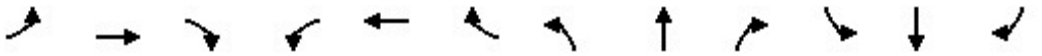
Thu Jun 22, 2023
PM Peak (2:30 PM - 3:30 PM) - Overall Peak Hour
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 1085047, Location: 49.690261, -124.943125

McElhanney

Provided by: McElhanney Kamloops
710 Laval Crescent, Kamloops, BC, V2C5P3, CA



APPENDIX E
SYNCHRO OUTPUTS

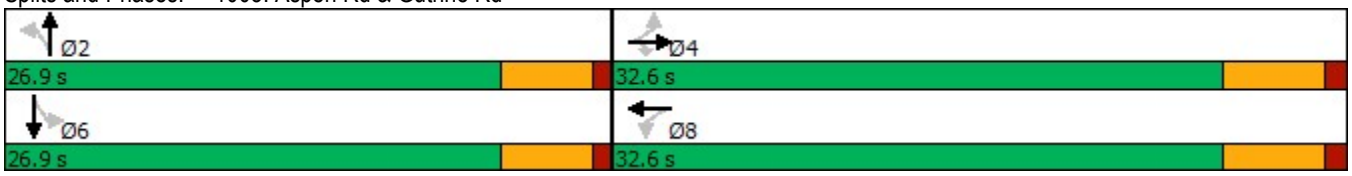


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	354	10	110	437	17	170	10	109	34	34	37
Future Volume (vph)	18	354	10	110	437	17	170	10	109	34	34	37
Satd. Flow (prot)	1742	1834	1559	1742	1823	0	1742	1531	0	1742	1661	0
Flt Permitted	0.385			0.507			0.707			0.674		
Satd. Flow (perm)	702	1834	1511	924	1823	0	1280	1531	0	1220	1661	0
Satd. Flow (RTOR)			35		4			118			40	
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	20	385	11	120	493	0	185	129	0	37	77	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.6	32.6	32.6	31.6	31.6		23.9	23.9		25.9	25.9	
Total Split (s)	32.6	32.6	32.6	32.6	32.6		26.9	26.9		26.9	26.9	
Total Split (%)	54.8%	54.8%	54.8%	54.8%	54.8%		45.2%	45.2%		45.2%	45.2%	
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.1	1.1	1.1	1.1	1.1		0.9	0.9		0.9	0.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.6	5.6	5.6	5.6	5.6		4.9	4.9		4.9	4.9	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		Min	Min		Min	Min	
Act Effct Green (s)	16.0	16.0	16.0	16.0	16.0		13.0	13.0		13.0	13.0	
Actuated g/C Ratio	0.40	0.40	0.40	0.40	0.40		0.32	0.32		0.32	0.32	
v/c Ratio	0.07	0.53	0.02	0.33	0.68		0.45	0.22		0.09	0.14	
Control Delay	8.7	12.3	1.0	11.4	15.3		16.2	4.8		11.9	7.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	8.7	12.3	1.0	11.4	15.3		16.2	4.8		11.9	7.6	
LOS	A	B	A	B	B		B	A		B	A	
Approach Delay		11.8			14.5			11.5			9.0	
Approach LOS		B			B			B			A	
Queue Length 50th (m)	0.7	15.7	0.0	4.4	21.4		8.8	0.5		1.6	1.5	
Queue Length 95th (m)	4.2	45.0	0.8	17.0	61.2		29.0	9.5		7.6	9.5	
Internal Link Dist (m)		170.6			275.4			115.7			164.6	
Turn Bay Length (m)	44.0			50.0			24.0			16.0		
Base Capacity (vph)	500	1308	1088	659	1301		744	939		709	982	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.04	0.29	0.01	0.18	0.38		0.25	0.14		0.05	0.08	

Intersection Summary	
Cycle Length: 59.5	
Actuated Cycle Length: 40.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 12.7	Intersection LOS: B
Intersection Capacity Utilization 60.3%	ICU Level of Service B
Analysis Period (min) 15	

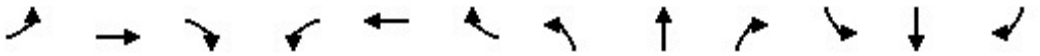
Splits and Phases: 1003: Aspen Rd & Guthrie Rd



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	63	10	10	27	10	10
Future Volume (Veh/h)	63	10	10	27	10	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)	68	11	11	29	11	11
Pedestrians	10			10	10	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			89		144	94
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			89		144	94
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	99
cM capacity (veh/h)			1494		827	947

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	79	40	22
Volume Left	0	11	11
Volume Right	11	0	11
cSH	1700	1494	883
Volume to Capacity	0.05	0.01	0.02
Queue Length 95th (m)	0.0	0.2	0.6
Control Delay (s)	0.0	2.1	9.2
Lane LOS		A	A
Approach Delay (s)	0.0	2.1	9.2
Approach LOS			A

Intersection Summary			
Average Delay		2.0	
Intersection Capacity Utilization		21.5%	ICU Level of Service
Analysis Period (min)		15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	10	16	0	9	10	26	5	3	59	10
Future Volume (Veh/h)	10	0	10	16	0	9	10	26	5	3	59	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	11	0	11	17	0	10	11	28	5	3	64	11
Pedestrians		10						10			10	
Lane Width (m)		3.7						3.7			3.7	
Walking Speed (m/s)		1.2						1.2			1.2	
Percent Blockage		1						1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								189				
pX, platoon unblocked												
vC, conflicting volume	158	140	90	149	144	40	85			33		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	158	140	90	149	144	40	85			33		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	99	98	100	99	99			100		
cM capacity (veh/h)	776	737	952	792	734	1022	1499			1579		

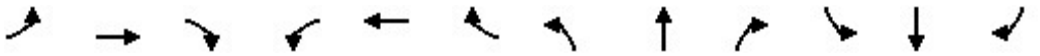
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	22	27	44	78
Volume Left	11	17	11	3
Volume Right	11	10	5	11
cSH	855	864	1499	1579
Volume to Capacity	0.03	0.03	0.01	0.00
Queue Length 95th (m)	0.6	0.7	0.2	0.0
Control Delay (s)	9.3	9.3	1.9	0.3
Lane LOS	A	A	A	A
Approach Delay (s)	9.3	9.3	1.9	0.3
Approach LOS	A	A		

Intersection Summary				
Average Delay	3.3			
Intersection Capacity Utilization	16.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	19	10	240	286	10
Future Volume (Veh/h)	10	19	10	240	286	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	21	11	261	311	11
Pedestrians	10			10	10	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	620	336	332			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	620	336	332			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	97	99			
cM capacity (veh/h)	440	694	1217			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	32	272	322
Volume Left	11	11	0
Volume Right	21	0	11
cSH	579	1217	1700
Volume to Capacity	0.06	0.01	0.19
Queue Length 95th (m)	1.3	0.2	0.0
Control Delay (s)	11.6	0.4	0.0
Lane LOS	B	A	
Approach Delay (s)	11.6	0.4	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	34.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	26	34	0	18	10	19	10	6	10	10
Future Volume (Veh/h)	10	0	26	34	0	18	10	19	10	6	10	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	11	0	28	37	0	20	11	21	11	7	11	11
Pedestrians		10						10			10	
Lane Width (m)		3.7						3.7			3.7	
Walking Speed (m/s)		1.2						1.2			1.2	
Percent Blockage		1						1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								315				
pX, platoon unblocked												
vC, conflicting volume	119	94	36	117	94	36	32			32		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	119	94	36	117	94	36	32			32		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	97	95	100	98	99			100		
cM capacity (veh/h)	813	780	1018	816	780	1027	1567			1580		

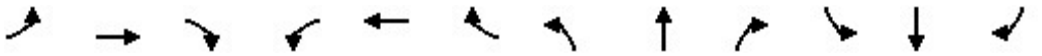
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	39	57	43	29
Volume Left	11	37	11	7
Volume Right	28	20	11	11
cSH	951	879	1567	1580
Volume to Capacity	0.04	0.06	0.01	0.00
Queue Length 95th (m)	1.0	1.6	0.2	0.1
Control Delay (s)	8.9	9.4	1.9	1.8
Lane LOS	A	A	A	A
Approach Delay (s)	8.9	9.4	1.9	1.8
Approach LOS	A	A		

Intersection Summary				
Average Delay	6.1			
Intersection Capacity Utilization	19.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	10	14	25	10	10
Future Volume (Veh/h)	10	10	14	25	10	10
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	11	15	27	11	11
Pedestrians	10		10			10
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			401			
pX, platoon unblocked						
vC, conflicting volume	82	48			52	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	82	48			52	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			99	
cM capacity (veh/h)	898	1003			1541	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	22	42	22
Volume Left	11	0	11
Volume Right	11	27	0
cSH	948	1700	1541
Volume to Capacity	0.02	0.02	0.01
Queue Length 95th (m)	0.5	0.0	0.2
Control Delay (s)	8.9	0.0	3.7
Lane LOS	A		A
Approach Delay (s)	8.9	0.0	3.7
Approach LOS	A		

Intersection Summary			
Average Delay		3.2	
Intersection Capacity Utilization		20.6%	ICU Level of Service
Analysis Period (min)		15	

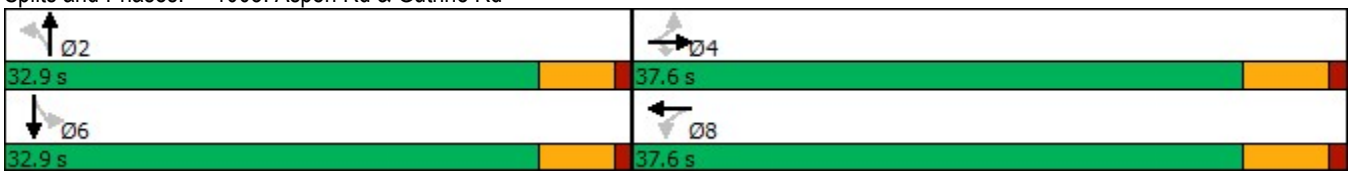


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	503	17	169	451	29	162	23	120	20	19	26
Future Volume (vph)	40	503	17	169	451	29	162	23	120	20	19	26
Satd. Flow (prot)	1742	1834	1559	1742	1814	0	1742	1551	0	1742	1641	0
Flt Permitted	0.377			0.354			0.725			0.659		
Satd. Flow (perm)	688	1834	1508	646	1814	0	1309	1551	0	1190	1641	0
Satd. Flow (RTOR)			29		6			130			28	
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	547	18	184	522	0	176	155	0	22	49	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.6	32.6	32.6	31.6	31.6		23.9	23.9		25.9	25.9	
Total Split (s)	37.6	37.6	37.6	37.6	37.6		32.9	32.9		32.9	32.9	
Total Split (%)	53.3%	53.3%	53.3%	53.3%	53.3%		46.7%	46.7%		46.7%	46.7%	
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.1	1.1	1.1	1.1	1.1		0.9	0.9		0.9	0.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.6	5.6	5.6	5.6	5.6		4.9	4.9		4.9	4.9	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		Min	Min		Min	Min	
Act Effct Green (s)	21.4	21.4	21.4	21.4	21.4		13.5	13.5		13.5	13.5	
Actuated g/C Ratio	0.46	0.46	0.46	0.46	0.46		0.29	0.29		0.29	0.29	
v/c Ratio	0.14	0.64	0.03	0.62	0.62		0.46	0.28		0.06	0.10	
Control Delay	8.5	13.5	2.5	19.9	12.9		20.1	6.5		15.1	9.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	8.5	13.5	2.5	19.9	12.9		20.1	6.5		15.1	9.6	
LOS	A	B	A	B	B		C	A		B	A	
Approach Delay		12.8			14.7			13.7			11.3	
Approach LOS		B			B			B			B	
Queue Length 50th (m)	1.6	27.4	0.0	9.0	25.4		11.2	1.4		1.2	1.2	
Queue Length 95th (m)	7.2	68.9	1.9	33.6	64.3		30.8	12.6		5.9	7.7	
Internal Link Dist (m)		170.6			275.4			115.7			164.6	
Turn Bay Length (m)	44.0			50.0			24.0			16.0		
Base Capacity (vph)	506	1351	1118	475	1337		849	1052		772	1074	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.08	0.40	0.02	0.39	0.39		0.21	0.15		0.03	0.05	

Intersection Summary	
Cycle Length: 70.5	
Actuated Cycle Length: 46.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 13.7	Intersection LOS: B
Intersection Capacity Utilization 67.4%	ICU Level of Service C
Analysis Period (min) 15	

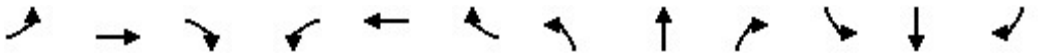
Splits and Phases: 1003: Aspen Rd & Guthrie Rd



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	52	10	10	53	10	10
Future Volume (Veh/h)	52	10	10	53	10	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)	57	11	11	58	11	11
Pedestrians	10			10	10	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			78		162	82
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			78		162	82
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	99
cM capacity (veh/h)			1507		808	960

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	68	69	22
Volume Left	0	11	11
Volume Right	11	0	11
cSH	1700	1507	878
Volume to Capacity	0.04	0.01	0.03
Queue Length 95th (m)	0.0	0.2	0.6
Control Delay (s)	0.0	1.2	9.2
Lane LOS		A	A
Approach Delay (s)	0.0	1.2	9.2
Approach LOS			A

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	22.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	17	10	0	5	12	55	15	8	50	10
Future Volume (Veh/h)	10	0	17	10	0	5	12	55	15	8	50	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	11	0	18	11	0	5	13	60	16	9	54	11
Pedestrians		4						10			10	
Lane Width (m)		3.7						3.7			3.7	
Walking Speed (m/s)		1.2						1.2			1.2	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								189				
pX, platoon unblocked												
vC, conflicting volume	190	184	74	200	181	78	69			76		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	190	184	74	200	181	78	69			76		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	98	98	100	99	99			99		
cM capacity (veh/h)	746	698	977	729	700	974	1527			1523		

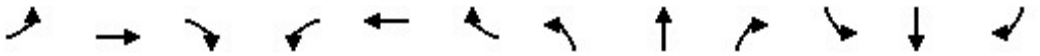
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	29	16	89	74
Volume Left	11	11	13	9
Volume Right	18	5	16	11
cSH	874	791	1527	1523
Volume to Capacity	0.03	0.02	0.01	0.01
Queue Length 95th (m)	0.8	0.5	0.2	0.1
Control Delay (s)	9.3	9.6	1.1	0.9
Lane LOS	A	A	A	A
Approach Delay (s)	9.3	9.6	1.1	0.9
Approach LOS	A	A		

Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	16.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	12	19	294	352	10
Future Volume (Veh/h)	10	12	19	294	352	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	13	21	320	383	11
Pedestrians	10			10	10	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	770	408	404			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	770	408	404			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	98	98			
cM capacity (veh/h)	356	632	1145			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	24	341	394
Volume Left	11	21	0
Volume Right	13	0	11
cSH	466	1145	1700
Volume to Capacity	0.05	0.02	0.23
Queue Length 95th (m)	1.2	0.4	0.0
Control Delay (s)	13.1	0.7	0.0
Lane LOS	B	A	
Approach Delay (s)	13.1	0.7	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	32	18	0	10	19	13	28	15	10	10
Future Volume (Veh/h)	10	0	32	18	0	10	19	13	28	15	10	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	11	0	35	20	0	11	21	14	30	16	11	11
Pedestrians		10						10			10	
Lane Width (m)		3.7						3.7			3.7	
Walking Speed (m/s)		1.2						1.2			1.2	
Percent Blockage		1						1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								315				
pX, platoon unblocked												
vC, conflicting volume	150	144	36	164	135	39	32			44		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	150	144	36	164	135	39	32			44		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	97	97	100	99	99			99		
cM capacity (veh/h)	775	723	1018	747	732	1024	1567			1564		

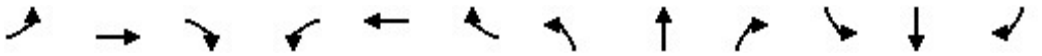
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	46	31	65	38
Volume Left	11	20	21	16
Volume Right	35	11	30	11
cSH	947	827	1567	1564
Volume to Capacity	0.05	0.04	0.01	0.01
Queue Length 95th (m)	1.2	0.9	0.3	0.2
Control Delay (s)	9.0	9.5	2.4	3.1
Lane LOS	A	A	A	A
Approach Delay (s)	9.0	9.5	2.4	3.1
Approach LOS	A	A		

Intersection Summary				
Average Delay	5.5			
Intersection Capacity Utilization	19.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	20	10	10	16	10	10
Future Volume (Veh/h)	20	10	10	16	10	10
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	11	11	17	11	11
Pedestrians	10		10			10
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			401			
pX, platoon unblocked						
vC, conflicting volume	72	40			38	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	72	40			38	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			99	
cM capacity (veh/h)	909	1014			1559	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	33	28	22
Volume Left	22	0	11
Volume Right	11	17	0
cSH	942	1700	1559
Volume to Capacity	0.04	0.02	0.01
Queue Length 95th (m)	0.8	0.0	0.2
Control Delay (s)	9.0	0.0	3.7
Lane LOS	A		A
Approach Delay (s)	9.0	0.0	3.7
Approach LOS	A		

Intersection Summary			
Average Delay	4.5		
Intersection Capacity Utilization	20.6%	ICU Level of Service	A
Analysis Period (min)	15		



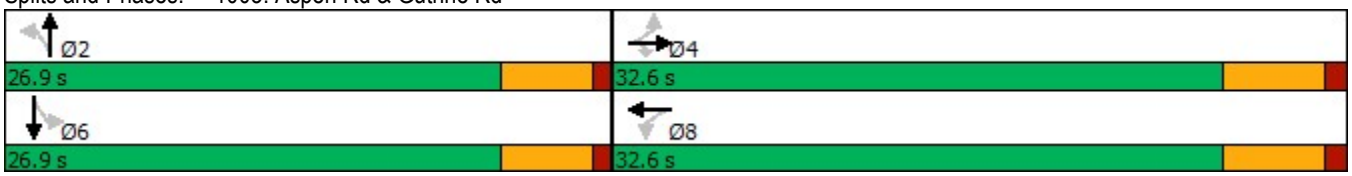
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	424	11	130	523	40	200	17	128	92	65	106
Future Volume (vph)	44	424	11	130	523	40	200	17	128	92	65	106
Satd. Flow (prot)	1742	1834	1559	1742	1810	0	1742	1540	0	1742	1628	0
Flt Permitted	0.273			0.421			0.640			0.657		
Satd. Flow (perm)	499	1834	1511	768	1810	0	1161	1540	0	1190	1628	0
Satd. Flow (RTOR)			35		8			139			115	
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	48	461	12	141	611	0	217	157	0	100	186	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.6	32.6	32.6	31.6	31.6		23.9	23.9		25.9	25.9	
Total Split (s)	32.6	32.6	32.6	32.6	32.6		26.9	26.9		26.9	26.9	
Total Split (%)	54.8%	54.8%	54.8%	54.8%	54.8%		45.2%	45.2%		45.2%	45.2%	
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.1	1.1	1.1	1.1	1.1		0.9	0.9		0.9	0.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.6	5.6	5.6	5.6	5.6		4.9	4.9		4.9	4.9	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		Min	Min		Min	Min	
Act Effct Green (s)	19.9	19.9	19.9	19.9	19.9		14.7	14.7		14.7	14.7	
Actuated g/C Ratio	0.44	0.44	0.44	0.44	0.44		0.32	0.32		0.32	0.32	
v/c Ratio	0.22	0.58	0.02	0.42	0.77		0.58	0.27		0.26	0.31	
Control Delay	12.0	13.5	1.3	14.3	19.2		21.5	5.1		14.9	7.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	12.0	13.5	1.3	14.3	19.2		21.5	5.1		14.9	7.4	
LOS	B	B	A	B	B		C	A		B	A	
Approach Delay		13.1			18.3			14.6			10.1	
Approach LOS		B			B			B			B	
Queue Length 50th (m)	2.1	24.1	0.0	6.8	35.5		14.2	1.0		5.8	4.0	
Queue Length 95th (m)	9.2	58.1	0.8	22.6	#87.8		35.4	10.7		16.5	16.0	
Internal Link Dist (m)		170.6			275.4			115.7			164.6	
Turn Bay Length (m)	44.0			50.0			24.0			16.0		
Base Capacity (vph)	312	1146	957	479	1134		591	852		606	885	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.15	0.40	0.01	0.29	0.54		0.37	0.18		0.17	0.21	

Intersection Summary	
Cycle Length: 59.5	
Actuated Cycle Length: 45.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 15.0	Intersection LOS: B
Intersection Capacity Utilization 78.3%	ICU Level of Service D
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

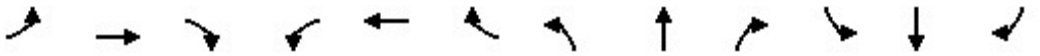
Splits and Phases: 1003: Aspen Rd & Guthrie Rd



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	76	10	10	32	13	26
Future Volume (Veh/h)	76	10	10	32	13	26
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)	83	11	11	35	14	28
Pedestrians	10			10	10	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			104		166	108
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			104		166	108
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	97
cM capacity (veh/h)			1475		805	929

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	94	46	42
Volume Left	0	11	14
Volume Right	11	0	28
cSH	1700	1475	884
Volume to Capacity	0.06	0.01	0.05
Queue Length 95th (m)	0.0	0.2	1.1
Control Delay (s)	0.0	1.8	9.3
Lane LOS		A	A
Approach Delay (s)	0.0	1.8	9.3
Approach LOS			A

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	21.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	12	16	0	9	10	84	5	3	211	10
Future Volume (Veh/h)	10	0	12	16	0	9	10	84	5	3	211	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	11	0	13	17	0	10	11	91	5	3	229	11
Pedestrians		4						10			10	
Lane Width (m)		3.7						3.7			3.7	
Walking Speed (m/s)		1.2						1.2			1.2	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								189				
pX, platoon unblocked												
vC, conflicting volume	380	362	248	379	366	104	244			96		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	380	362	248	379	366	104	244			96		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	98	97	100	99	99			100		
cM capacity (veh/h)	559	557	781	558	555	943	1318			1498		

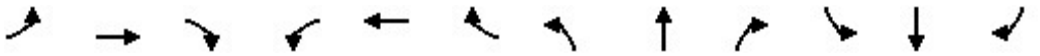
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	24	27	107	243
Volume Left	11	17	11	3
Volume Right	13	10	5	11
cSH	661	658	1318	1498
Volume to Capacity	0.04	0.04	0.01	0.00
Queue Length 95th (m)	0.9	1.0	0.2	0.0
Control Delay (s)	10.7	10.7	0.9	0.1
Lane LOS	B	B	A	A
Approach Delay (s)	10.7	10.7	0.9	0.1
Approach LOS	B	B		

Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	22.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	53	22	287	342	10
Future Volume (Veh/h)	25	53	22	287	342	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	58	24	312	372	11
Pedestrians	10			10	10	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	758	398	393			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	758	398	393			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	91	98			
cM capacity (veh/h)	361	641	1156			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	85	336	383
Volume Left	27	24	0
Volume Right	58	0	11
cSH	514	1156	1700
Volume to Capacity	0.17	0.02	0.23
Queue Length 95th (m)	4.5	0.5	0.0
Control Delay (s)	13.4	0.8	0.0
Lane LOS	B	A	
Approach Delay (s)	13.4	0.8	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	48.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	28	34	0	18	10	76	10	6	153	10
Future Volume (Veh/h)	10	0	28	34	0	18	10	76	10	6	153	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	11	0	30	37	0	20	11	83	11	7	166	11
Pedestrians		10						10			10	
Lane Width (m)		3.7						3.7			3.7	
Walking Speed (m/s)		1.2						1.2			1.2	
Percent Blockage		1						1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								315				
pX, platoon unblocked												
vC, conflicting volume	336	312	192	336	312	98	187			94		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	336	312	192	336	312	98	187			94		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	96	94	100	98	99			100		
cM capacity (veh/h)	585	591	836	581	591	949	1375			1500		

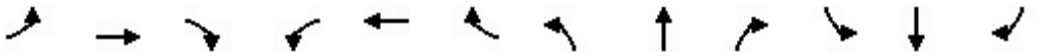
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	41	57	105	184
Volume Left	11	37	11	7
Volume Right	30	20	11	11
cSH	749	672	1375	1500
Volume to Capacity	0.05	0.08	0.01	0.00
Queue Length 95th (m)	1.3	2.1	0.2	0.1
Control Delay (s)	10.1	10.8	0.9	0.3
Lane LOS	B	B	A	A
Approach Delay (s)	10.1	10.8	0.9	0.3
Approach LOS	B	B		

Intersection Summary				
Average Delay	3.1			
Intersection Capacity Utilization	24.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	49	17	58	39	29	111
Future Volume (Veh/h)	49	17	58	39	29	111
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	53	18	63	42	32	121
Pedestrians	10		10			10
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			401			
pX, platoon unblocked						
vC, conflicting volume	289	104			115	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	289	104			115	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	98			98	
cM capacity (veh/h)	674	934			1461	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	71	105	153
Volume Left	53	0	32
Volume Right	18	42	0
cSH	726	1700	1461
Volume to Capacity	0.10	0.06	0.02
Queue Length 95th (m)	2.5	0.0	0.5
Control Delay (s)	10.5	0.0	1.7
Lane LOS	B		A
Approach Delay (s)	10.5	0.0	1.7
Approach LOS	B		

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	27.7%	ICU Level of Service	A
Analysis Period (min)	15		



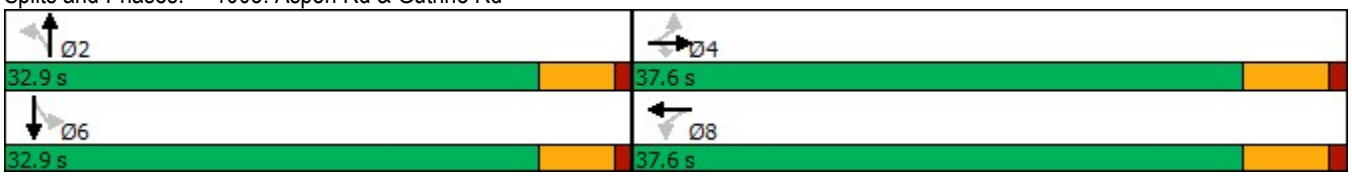
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	601	19	198	539	87	191	58	140	61	44	67
Future Volume (vph)	98	601	19	198	539	87	191	58	140	61	44	67
Satd. Flow (prot)	1742	1834	1559	1742	1787	0	1742	1595	0	1742	1632	0
Flt Permitted	0.280			0.301			0.679			0.587		
Satd. Flow (perm)	512	1834	1508	550	1787	0	1228	1595	0	1062	1632	0
Satd. Flow (RTOR)			29		15			152			73	
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	107	653	21	215	681	0	208	215	0	66	121	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.6	32.6	32.6	31.6	31.6		23.9	23.9		25.9	25.9	
Total Split (s)	37.6	37.6	37.6	37.6	37.6		32.9	32.9		32.9	32.9	
Total Split (%)	53.3%	53.3%	53.3%	53.3%	53.3%		46.7%	46.7%		46.7%	46.7%	
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.1	1.1	1.1	1.1	1.1		0.9	0.9		0.9	0.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.6	5.6	5.6	5.6	5.6		4.9	4.9		4.9	4.9	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		Min	Min		Min	Min	
Act Effct Green (s)	32.2	32.2	32.2	32.2	32.2		15.1	15.1		15.1	15.1	
Actuated g/C Ratio	0.56	0.56	0.56	0.56	0.56		0.26	0.26		0.26	0.26	
v/c Ratio	0.38	0.64	0.02	0.70	0.68		0.65	0.41		0.24	0.25	
Control Delay	14.0	13.7	3.1	28.3	15.0		28.8	8.3		18.4	9.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	14.0	13.7	3.1	28.3	15.0		28.8	8.3		18.4	9.1	
LOS	B	B	A	C	B		C	A		B	A	
Approach Delay		13.5			18.2			18.4			12.4	
Approach LOS		B			B			B			B	
Queue Length 50th (m)	5.5	40.9	0.0	14.3	43.1		19.3	5.1		5.4	3.8	
Queue Length 95th (m)	20.5	94.9	2.4	#56.9	#106.4		37.2	17.9		13.4	13.4	
Internal Link Dist (m)		170.6			275.4			115.7			164.6	
Turn Bay Length (m)	44.0			50.0			24.0			16.0		
Base Capacity (vph)	284	1019	851	305	1000		597	854		516	831	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.38	0.64	0.02	0.70	0.68		0.35	0.25		0.13	0.15	

Intersection Summary	
Cycle Length: 70.5	
Actuated Cycle Length: 57.9	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 16.1	Intersection LOS: B
Intersection Capacity Utilization 83.2%	ICU Level of Service E
Analysis Period (min) 15	

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

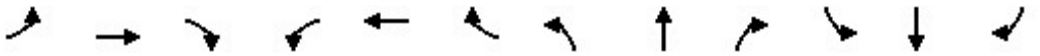
Splits and Phases: 1003: Aspen Rd & Guthrie Rd



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	62	18	31	63	13	20
Future Volume (Veh/h)	62	18	31	63	13	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)	67	20	34	68	14	22
Pedestrians	10			10	10	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			97		233	97
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			97		233	97
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		98	98
cM capacity (veh/h)			1484		725	943

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	87	102	36
Volume Left	0	34	14
Volume Right	20	0	22
cSH	1700	1484	844
Volume to Capacity	0.05	0.02	0.04
Queue Length 95th (m)	0.0	0.5	1.0
Control Delay (s)	0.0	2.6	9.5
Lane LOS		A	A
Approach Delay (s)	0.0	2.6	9.5
Approach LOS			A

Intersection Summary			
Average Delay		2.7	
Intersection Capacity Utilization		24.7%	ICU Level of Service A
Analysis Period (min)		15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	21	10	0	5	15	201	15	8	157	10
Future Volume (Veh/h)	10	0	21	10	0	5	15	201	15	8	157	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	11	0	23	11	0	5	16	218	16	9	171	11
Pedestrians		10						10			10	
Lane Width (m)		3.7						3.7			3.7	
Walking Speed (m/s)		1.2						1.2			1.2	
Percent Blockage		1						1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								189				
pX, platoon unblocked												
vC, conflicting volume	478	470	196	486	468	236	192			234		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	478	470	196	486	468	236	192			234		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	97	98	100	99	99			99		
cM capacity (veh/h)	477	478	830	465	480	796	1370			1333		

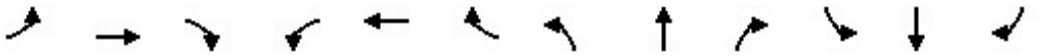
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	34	16	250	191
Volume Left	11	11	16	9
Volume Right	23	5	16	11
cSH	670	534	1370	1333
Volume to Capacity	0.05	0.03	0.01	0.01
Queue Length 95th (m)	1.2	0.7	0.3	0.2
Control Delay (s)	10.7	11.9	0.6	0.4
Lane LOS	B	B	A	A
Approach Delay (s)	10.7	11.9	0.6	0.4
Approach LOS	B	B		

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	27.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	16	37	54	351	421	24
Future Volume (Veh/h)	16	37	54	351	421	24
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	40	59	382	458	26
Pedestrians	10			10	10	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	991	491	494			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	991	491	494			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	93	94			
cM capacity (veh/h)	253	568	1060			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	57	441	484
Volume Left	17	59	0
Volume Right	40	0	26
cSH	414	1060	1700
Volume to Capacity	0.14	0.06	0.28
Queue Length 95th (m)	3.6	1.3	0.0
Control Delay (s)	15.1	1.7	0.0
Lane LOS	C	A	
Approach Delay (s)	15.1	1.7	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	36	18	0	10	18	160	28	15	111	10
Future Volume (Veh/h)	10	0	36	18	0	10	18	160	28	15	111	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	11	0	39	20	0	11	20	174	30	16	121	11
Pedestrians		10						10			10	
Lane Width (m)		3.7						3.7			3.7	
Walking Speed (m/s)		1.2						1.2			1.2	
Percent Blockage		1						1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								315				
pX, platoon unblocked												
vC, conflicting volume	418	412	146	436	403	199	142			204		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	418	412	146	436	403	199	142			204		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	96	96	100	99	99			99		
cM capacity (veh/h)	515	512	885	489	518	835	1429			1368		

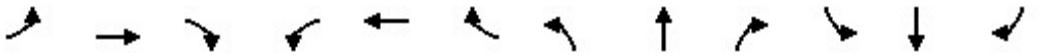
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	50	31	224	148
Volume Left	11	20	20	16
Volume Right	39	11	30	11
cSH	764	574	1429	1368
Volume to Capacity	0.07	0.05	0.01	0.01
Queue Length 95th (m)	1.6	1.3	0.3	0.3
Control Delay (s)	10.0	11.6	0.8	0.9
Lane LOS	B	B	A	A
Approach Delay (s)	10.0	11.6	0.8	0.9
Approach LOS	B	B		

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	27.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	44	38	120	53	29	91
Future Volume (Veh/h)	44	38	120	53	29	91
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	48	41	130	58	32	99
Pedestrians	10		10			10
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			401			
pX, platoon unblocked						
vC, conflicting volume	342	179			198	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	342	179			198	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	95			98	
cM capacity (veh/h)	628	849			1363	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	89	188	131
Volume Left	48	0	32
Volume Right	41	58	0
cSH	714	1700	1363
Volume to Capacity	0.12	0.11	0.02
Queue Length 95th (m)	3.2	0.0	0.5
Control Delay (s)	10.8	0.0	2.0
Lane LOS	B		A
Approach Delay (s)	10.8	0.0	2.0
Approach LOS	B		

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	35.2%	ICU Level of Service	A
Analysis Period (min)	15		

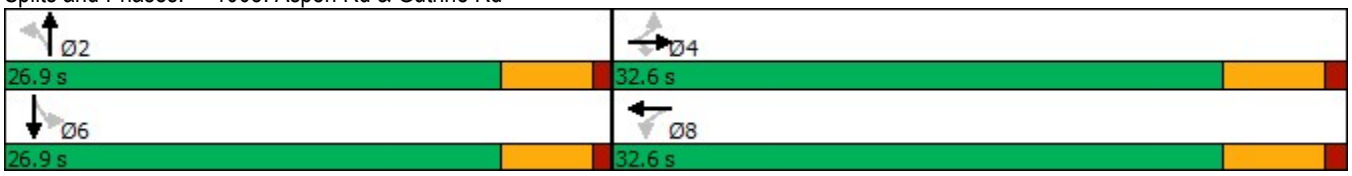


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	424	11	130	523	26	200	17	128	51	64	104
Future Volume (vph)	44	424	11	130	523	26	200	17	128	51	64	104
Satd. Flow (prot)	1742	1834	1559	1742	1818	0	1742	1540	0	1742	1629	0
Flt Permitted	0.284			0.419			0.642			0.657		
Satd. Flow (perm)	519	1834	1511	764	1818	0	1164	1540	0	1190	1629	0
Satd. Flow (RTOR)			35		5			139			113	
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	48	461	12	141	596	0	217	157	0	55	183	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.6	32.6	32.6	31.6	31.6		23.9	23.9		25.9	25.9	
Total Split (s)	32.6	32.6	32.6	32.6	32.6		26.9	26.9		26.9	26.9	
Total Split (%)	54.8%	54.8%	54.8%	54.8%	54.8%		45.2%	45.2%		45.2%	45.2%	
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.1	1.1	1.1	1.1	1.1		0.9	0.9		0.9	0.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.6	5.6	5.6	5.6	5.6		4.9	4.9		4.9	4.9	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		Min	Min		Min	Min	
Act Effct Green (s)	19.3	19.3	19.3	19.3	19.3		14.6	14.6		14.6	14.6	
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.43		0.32	0.32		0.32	0.32	
v/c Ratio	0.22	0.59	0.02	0.43	0.76		0.58	0.26		0.14	0.30	
Control Delay	11.8	13.8	1.3	14.7	18.8		20.9	5.1		13.2	7.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	11.8	13.8	1.3	14.7	18.8		20.9	5.1		13.2	7.3	
LOS	B	B	A	B	B		C	A		B	A	
Approach Delay		13.3			18.0			14.2			8.7	
Approach LOS		B			B			B			A	
Queue Length 50th (m)	2.0	23.8	0.0	6.7	33.9		13.8	0.9		3.0	3.8	
Queue Length 95th (m)	9.0	58.1	0.8	22.6	82.5		35.4	10.7		10.1	15.8	
Internal Link Dist (m)		170.6			275.4			115.7			164.6	
Turn Bay Length (m)	44.0			50.0			24.0			16.0		
Base Capacity (vph)	329	1166	973	485	1157		602	864		616	898	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.15	0.40	0.01	0.29	0.52		0.36	0.18		0.09	0.20	

Intersection Summary	
Cycle Length: 59.5	
Actuated Cycle Length: 45	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 14.8	Intersection LOS: B
Intersection Capacity Utilization 77.2%	ICU Level of Service D
Analysis Period (min) 15	

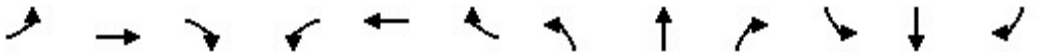
Splits and Phases: 1003: Aspen Rd & Guthrie Rd



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	76	10	10	32	13	23
Future Volume (Veh/h)	76	10	10	32	13	23
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)	83	11	11	35	14	25
Pedestrians	10			10	10	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			104		166	108
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			104		166	108
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	97
cM capacity (veh/h)			1475		805	929

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	94	46	39
Volume Left	0	11	14
Volume Right	11	0	25
cSH	1700	1475	880
Volume to Capacity	0.06	0.01	0.04
Queue Length 95th (m)	0.0	0.2	1.1
Control Delay (s)	0.0	1.8	9.3
Lane LOS		A	A
Approach Delay (s)	0.0	1.8	9.3
Approach LOS			A

Intersection Summary			
Average Delay		2.5	
Intersection Capacity Utilization		21.8%	ICU Level of Service A
Analysis Period (min)		15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	12	19	0	5	10	68	6	1	165	10
Future Volume (Veh/h)	10	0	12	19	0	5	10	68	6	1	165	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	11	0	13	21	0	5	11	74	7	1	179	11
Pedestrians		4						10			10	
Lane Width (m)		3.7						3.7			3.7	
Walking Speed (m/s)		1.2						1.2			1.2	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								189				
pX, platoon unblocked												
vC, conflicting volume	305	294	198	309	296	88	194			81		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	305	294	198	309	296	88	194			81		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	98	97	100	99	99			100		
cM capacity (veh/h)	630	610	832	622	608	963	1374			1517		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	24	26	92	191
Volume Left	11	21	11	1
Volume Right	13	5	7	11
cSH	726	668	1374	1517
Volume to Capacity	0.03	0.04	0.01	0.00
Queue Length 95th (m)	0.8	0.9	0.2	0.0
Control Delay (s)	10.1	10.6	1.0	0.0
Lane LOS	B	B	A	A
Approach Delay (s)	10.1	10.6	1.0	0.0
Approach LOS	B	B		

Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	21.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	20	11	304	347	10
Future Volume (Veh/h)	10	20	11	304	347	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	22	12	330	377	11
Pedestrians	10			10	10	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	756	402	398			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	756	402	398			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	97	99			
cM capacity (veh/h)	365	637	1151			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	33	342	388
Volume Left	11	12	0
Volume Right	22	0	11
cSH	510	1151	1700
Volume to Capacity	0.06	0.01	0.23
Queue Length 95th (m)	1.6	0.2	0.0
Control Delay (s)	12.5	0.4	0.0
Lane LOS	B	A	
Approach Delay (s)	12.5	0.4	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	38.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	28	10	69	122	10
Future Volume (Veh/h)	10	28	10	69	122	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	30	11	75	133	11
Pedestrians	10			10	10	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				315		
pX, platoon unblocked						
vC, conflicting volume	256	158	154			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	256	158	154			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	97	99			
cM capacity (veh/h)	715	872	1414			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	41	86	144
Volume Left	11	11	0
Volume Right	30	0	11
cSH	823	1414	1700
Volume to Capacity	0.05	0.01	0.08
Queue Length 95th (m)	1.2	0.2	0.0
Control Delay (s)	9.6	1.0	0.0
Lane LOS	A	A	
Approach Delay (s)	9.6	1.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	25.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	11	62	10	17	123
Future Volume (Veh/h)	10	11	62	10	17	123
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	12	67	11	18	134
Pedestrians	10		10			10
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			401			
pX, platoon unblocked						
vC, conflicting volume	262	92			88	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	262	92			88	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			99	
cM capacity (veh/h)	705	948			1495	

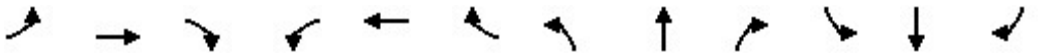
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	23	78	152
Volume Left	11	0	18
Volume Right	12	11	0
cSH	814	1700	1495
Volume to Capacity	0.03	0.05	0.01
Queue Length 95th (m)	0.7	0.0	0.3
Control Delay (s)	9.5	0.0	1.0
Lane LOS	A		A
Approach Delay (s)	9.5	0.0	1.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	27.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	17	73	25	301	357	5
Future Volume (Veh/h)	17	73	25	301	357	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	79	27	327	388	5
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	772	390	393			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	772	390	393			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	88	98			
cM capacity (veh/h)	360	658	1166			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	97	354	393
Volume Left	18	27	0
Volume Right	79	0	5
cSH	570	1166	1700
Volume to Capacity	0.17	0.02	0.23
Queue Length 95th (m)	4.6	0.5	0.0
Control Delay (s)	12.6	0.8	0.0
Lane LOS	B	A	
Approach Delay (s)	12.6	0.8	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		



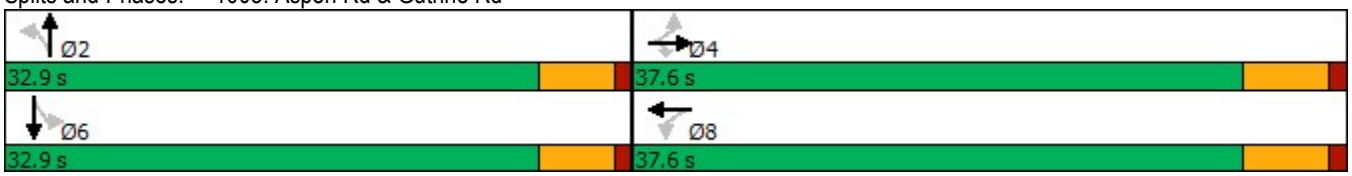
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	97	601	19	198	539	47	191	57	140	34	44	66
Future Volume (vph)	97	601	19	198	539	47	191	57	140	34	44	66
Satd. Flow (prot)	1742	1834	1559	1742	1807	0	1742	1593	0	1742	1632	0
Flt Permitted	0.312			0.301			0.680			0.589		
Satd. Flow (perm)	570	1834	1508	550	1807	0	1229	1593	0	1066	1632	0
Satd. Flow (RTOR)			29		8			152			72	
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	105	653	21	215	637	0	208	214	0	37	120	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.6	32.6	32.6	31.6	31.6		23.9	23.9		25.9	25.9	
Total Split (s)	37.6	37.6	37.6	37.6	37.6		32.9	32.9		32.9	32.9	
Total Split (%)	53.3%	53.3%	53.3%	53.3%	53.3%		46.7%	46.7%		46.7%	46.7%	
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.1	1.1	1.1	1.1	1.1		0.9	0.9		0.9	0.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.6	5.6	5.6	5.6	5.6		4.9	4.9		4.9	4.9	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		Min	Min		Min	Min	
Act Effct Green (s)	32.2	32.2	32.2	32.2	32.2		15.1	15.1		15.1	15.1	
Actuated g/C Ratio	0.56	0.56	0.56	0.56	0.56		0.26	0.26		0.26	0.26	
v/c Ratio	0.33	0.64	0.02	0.70	0.63		0.65	0.41		0.13	0.25	
Control Delay	12.5	13.7	3.1	28.3	13.4		28.8	8.2		16.7	9.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	12.5	13.7	3.1	28.3	13.4		28.8	8.2		16.7	9.1	
LOS	B	B	A	C	B		C	A		B	A	
Approach Delay		13.3			17.2			18.4			10.9	
Approach LOS		B			B			B			B	
Queue Length 50th (m)	5.2	40.9	0.0	14.3	39.1		19.3	5.0		3.0	3.8	
Queue Length 95th (m)	18.7	94.9	2.4	#56.9	91.3		37.2	17.9		8.5	13.4	
Internal Link Dist (m)		170.6			275.4			115.7			164.6	
Turn Bay Length (m)	44.0			50.0			24.0			16.0		
Base Capacity (vph)	317	1020	851	305	1008		598	853		518	831	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.33	0.64	0.02	0.70	0.63		0.35	0.25		0.07	0.14	

Intersection Summary	
Cycle Length: 70.5	
Actuated Cycle Length: 57.9	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 15.6	Intersection LOS: B
Intersection Capacity Utilization 83.1%	ICU Level of Service E
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

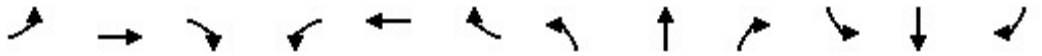
Splits and Phases: 1003: Aspen Rd & Guthrie Rd



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	62	18	31	63	12	18
Future Volume (Veh/h)	62	18	31	63	12	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)	67	20	34	68	13	20
Pedestrians	10			10	10	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			97		233	97
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			97		233	97
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		98	98
cM capacity (veh/h)			1484		725	943

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	87	102	33
Volume Left	0	34	13
Volume Right	20	0	20
cSH	1700	1484	843
Volume to Capacity	0.05	0.02	0.04
Queue Length 95th (m)	0.0	0.5	0.9
Control Delay (s)	0.0	2.6	9.4
Lane LOS		A	A
Approach Delay (s)	0.0	2.6	9.4
Approach LOS			A

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	24.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	21	12	0	3	15	158	18	4	128	10
Future Volume (Veh/h)	10	0	21	12	0	3	15	158	18	4	128	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	11	0	23	13	0	3	16	172	20	4	139	11
Pedestrians		10						10			10	
Lane Width (m)		3.7						3.7			3.7	
Walking Speed (m/s)		1.2						1.2			1.2	
Percent Blockage		1						1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								189				
pX, platoon unblocked												
vC, conflicting volume	390	386	164	400	382	192	160			192		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	390	386	164	400	382	192	160			192		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	97	98	100	100	99			100		
cM capacity (veh/h)	548	535	865	532	538	842	1407			1381		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	34	16	208	154
Volume Left	11	13	16	4
Volume Right	23	3	20	11
cSH	729	571	1407	1381
Volume to Capacity	0.05	0.03	0.01	0.00
Queue Length 95th (m)	1.1	0.7	0.3	0.1
Control Delay (s)	10.2	11.5	0.7	0.2
Lane LOS	B	B	A	A
Approach Delay (s)	10.2	11.5	0.7	0.2
Approach LOS	B	B		

Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	26.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	16	23	361	435	10
Future Volume (Veh/h)	10	16	23	361	435	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	17	25	392	473	11
Pedestrians	10			10	10	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	940	498	494			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	940	498	494			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	97	98			
cM capacity (veh/h)	281	562	1060			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	28	417	484
Volume Left	11	25	0
Volume Right	17	0	11
cSH	403	1060	1700
Volume to Capacity	0.07	0.02	0.28
Queue Length 95th (m)	1.7	0.6	0.0
Control Delay (s)	14.6	0.8	0.0
Lane LOS	B	A	
Approach Delay (s)	14.6	0.8	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	36	18	138	98	10
Future Volume (Veh/h)	10	36	18	138	98	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	39	20	150	107	11
Pedestrians	10			10	10	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				315		
pX, platoon unblocked						
vC, conflicting volume	322	132	128			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	322	132	128			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	96	99			
cM capacity (veh/h)	651	901	1445			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	50	170	118
Volume Left	11	20	0
Volume Right	39	0	11
cSH	831	1445	1700
Volume to Capacity	0.06	0.01	0.07
Queue Length 95th (m)	1.5	0.3	0.0
Control Delay (s)	9.6	1.0	0.0
Lane LOS	A	A	
Approach Delay (s)	9.6	1.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	28.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	24	132	10	17	102
Future Volume (Veh/h)	10	24	132	10	17	102
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	26	143	11	18	111
Pedestrians	10		10			10
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			401			
pX, platoon unblocked						
vC, conflicting volume	316	168			164	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	316	168			164	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	97			99	
cM capacity (veh/h)	657	861			1402	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	37	154	129
Volume Left	11	0	18
Volume Right	26	11	0
cSH	788	1700	1402
Volume to Capacity	0.05	0.09	0.01
Queue Length 95th (m)	1.1	0.0	0.3
Control Delay (s)	9.8	0.0	1.2
Lane LOS	A		A
Approach Delay (s)	9.8	0.0	1.2
Approach LOS	A		

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	32.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	47	69	370	439	14
Future Volume (Veh/h)	9	47	69	370	439	14
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	51	75	402	477	15
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	1036	484	492			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1036	484	492			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	91	93			
cM capacity (veh/h)	238	582	1071			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	61	477	492
Volume Left	10	75	0
Volume Right	51	0	15
cSH	471	1071	1700
Volume to Capacity	0.13	0.07	0.29
Queue Length 95th (m)	3.4	1.7	0.0
Control Delay (s)	13.8	2.0	0.0
Lane LOS	B	A	
Approach Delay (s)	13.8	2.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		

APPENDIX D
SIGNAL TIMING SHEET

SIGNAL TIMING SHEET

DATE ISSUED	Oct 17, 2022	INTERSECTION	Guthrie Rd @ Aspen Rd
CONTROLLER	Naztec 900	LOCATION	Comox, BC
CABINET TYPE	M RACK	DRAWING NUMBER & REV	NA
SEQUENCE	NEMA DUAL RING	PREVIOUS STS ISSUE DATE	Jul 12, 2012

PHASE NUMBER	1	2	3	4	5	6	7	8
PHASE SETTINGS	OFF	ON	OFF	ON	ON	ON	OFF	ON
DESCRIPTION		Guthrie Rd EB		Aspen Rd NB		Guthrie Rd WB		Aspen Rd SB
PRE-EMPTION PHASE(S)								
FUNCTION		A1		B1		A2		B2
OVERLAPS								
MINIMUM GREEN		10		7		10		7
PASSAGE		3.0		3.0		3.0		3.0
YELLOW		4.0		4.5		4.0		4.5
RED		0.9		1.1		0.9		1.1
TIMING PLAN 1 - MAX 1 | 2 | 3		22 28		27 32		22 28		27 32
TIMING PLAN 2 - MAX 1 | 2 | 3								
WALK TIME		7		7		7		7
PED CLEARANCE (FDW TIME)		12		20		14		19
RECALL		MIN				MIN		
COORDINATION ON PHASE								
FIRST GREEN DISPLAY				XXXX				XXXX
INTERSECTION FLASH		RED		RED		RED		RED
AWF TIME								

PRE-EMPTION

	EMERGENCY	TRANSIT	QUEUE	RAIL
ACTIVATION METHOD	NONE			
DELAY TIME (S)				
PRE-EMPTION TIME (S)				
TERMINATE ALL PHASES				

DETECTION DELAY/EXTENSION

TYPE	LOOPS	TIME (S)
RT DELAY	SB and NB TH/RT	5

OPERATING SPECIFICATIONS

POSTED SPEED (km/h)	GUTHRIE RD EB	50	GUTHRIE RD WB	50	ASPEN RD NB	50	APSEN RD SB	50
AWF DISTANCES (m)								

ADDITIONAL PROGRAMMING COMMENTS

1	WALKING SPEED = 0.9m/s
2	
3	
4	
5	
6	

ADDITIONAL OPERATING COMMENTS

1	
2	
3	
4	
5	
6	

TIME CLOCK SETTINGS

TIME OF DAY	DAY OF WEEK	TIMING PLAN	MAX PLAN	CYCLE LENGTH	OFFSET	COORD SPLIT TIME 1	2	3	4	5	6	7	8	ADDITIONAL TIME CLOCK SETTINGS
DEFAULT														
1430 - 1800	MON - FRI	1	2											
-														
-														
-														

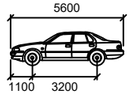
ANDY KADING, P.Eng. — DESIGNED BY — Oct 17, 2022 — DATE

NADINE KING, P.Eng., PTOE — REVIEWED BY — Oct 17, 2022 — DATE

PERMIT TO PRACTICE
WATT CONSULTING GROUP LTD.
SIGNATURE _____
DATE _____
PERMIT NUMBER 1001432
ENGINEERS & GEOSCIENTISTS
BRITISH COLUMBIA

RECEIVED & DISTRIBUTED BY — DATE — ENGINEER OF RECORD SEAL & PERMIT TO PRACTICE

APPENDIX G
TURNING MANEUVERS



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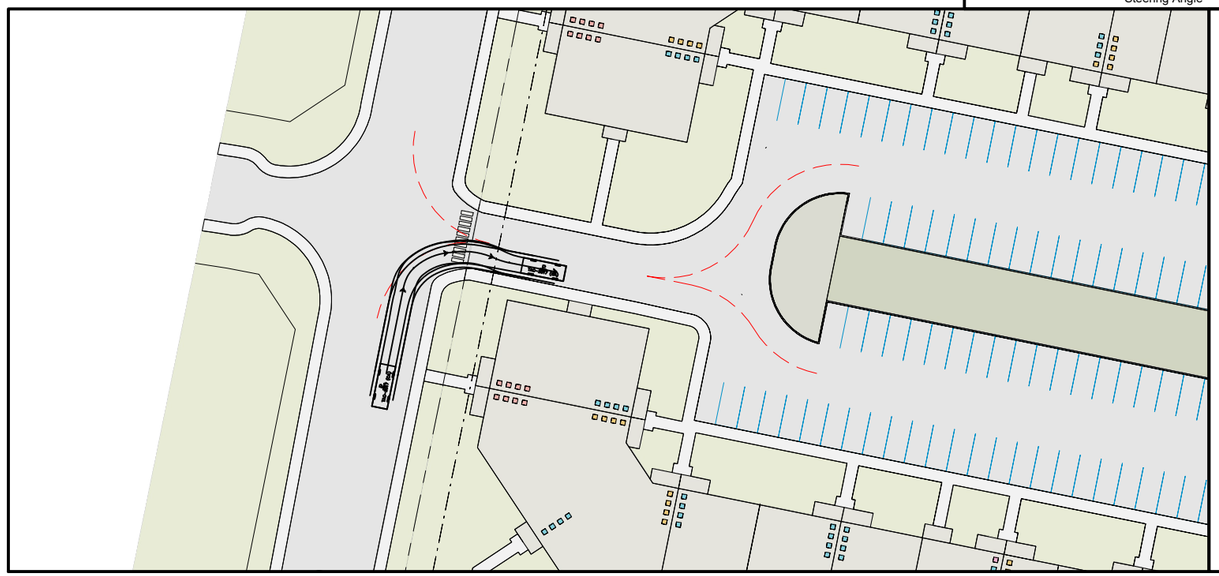

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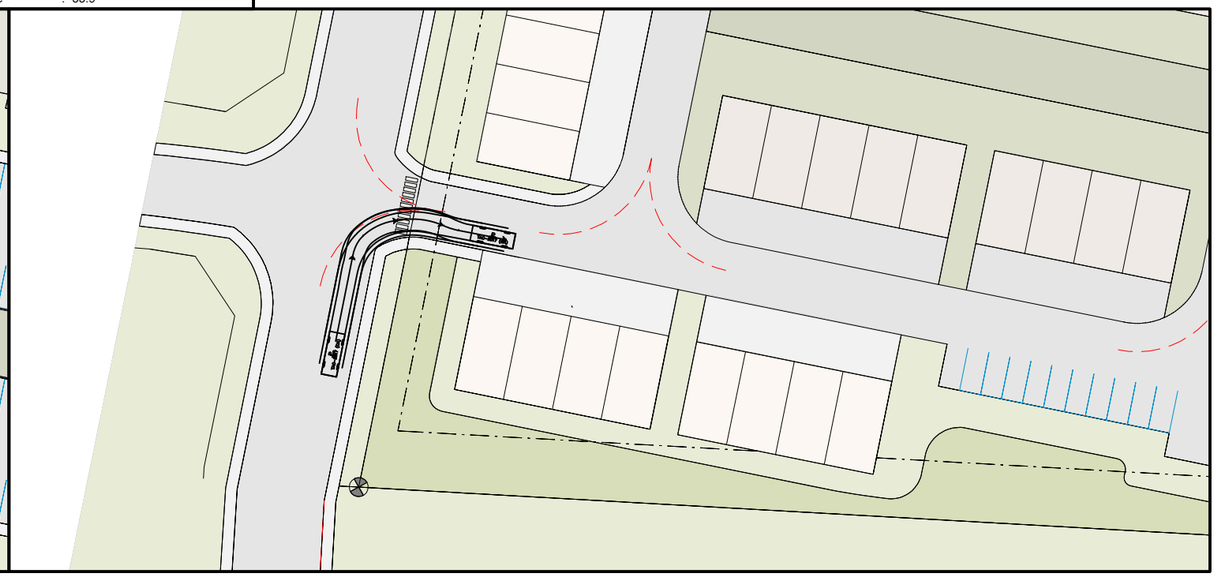

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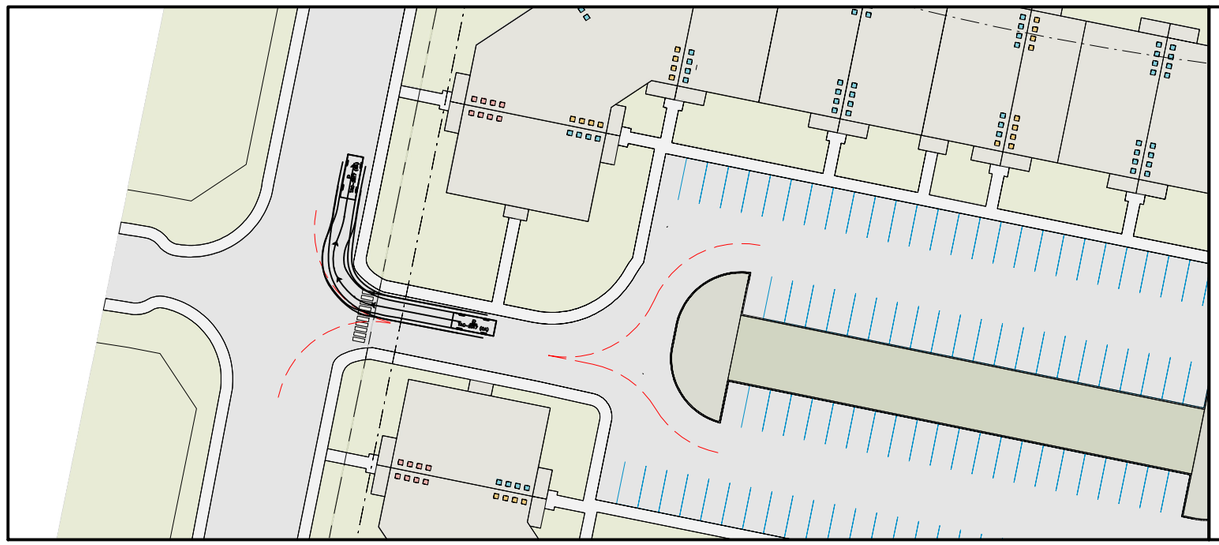

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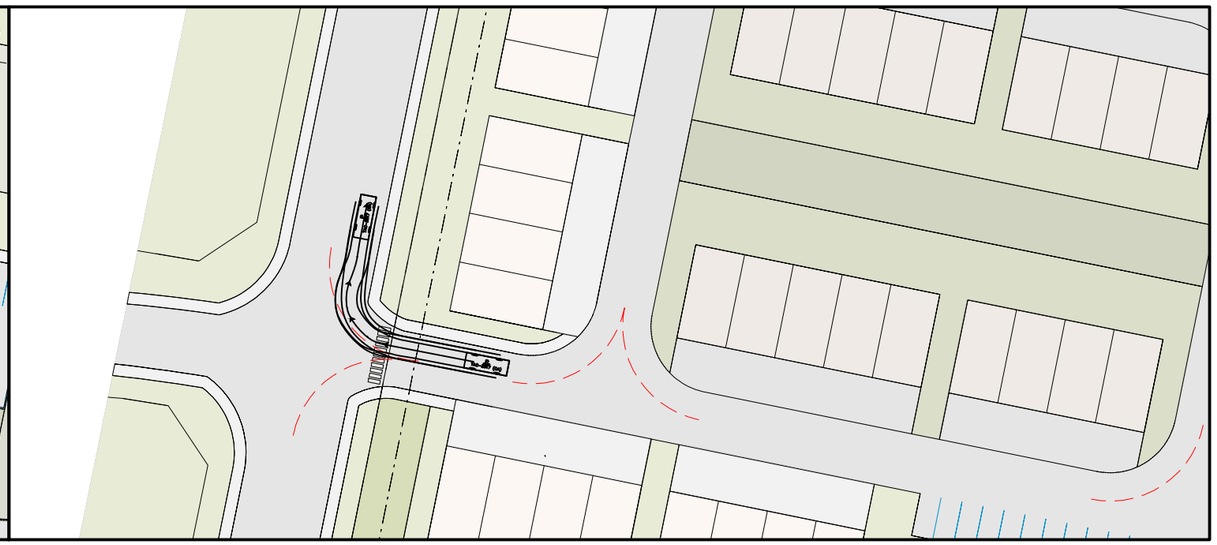


SOUTH ACCESS - WBR

Rev	Date	Description	Drawn	Design	App'd
A	11/10/2023	ISSUED FOR REVIEW	PA	PA	MM

ORIGINAL DWG SIZE: ANSI B (11" x 17")

McElhanney

Suite 200
858 Beatty Street
Vancouver BC
Canada V6B 1C1
T 604 683 8521

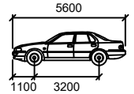
BROADSTREET PROPERTIES LTD.

2123 Hector Road TIA
Turning Movement Diagram
Right Turns - Passenger Car

Drawing No.
S-101

Project Number
2111-06247-00

Rev.
A



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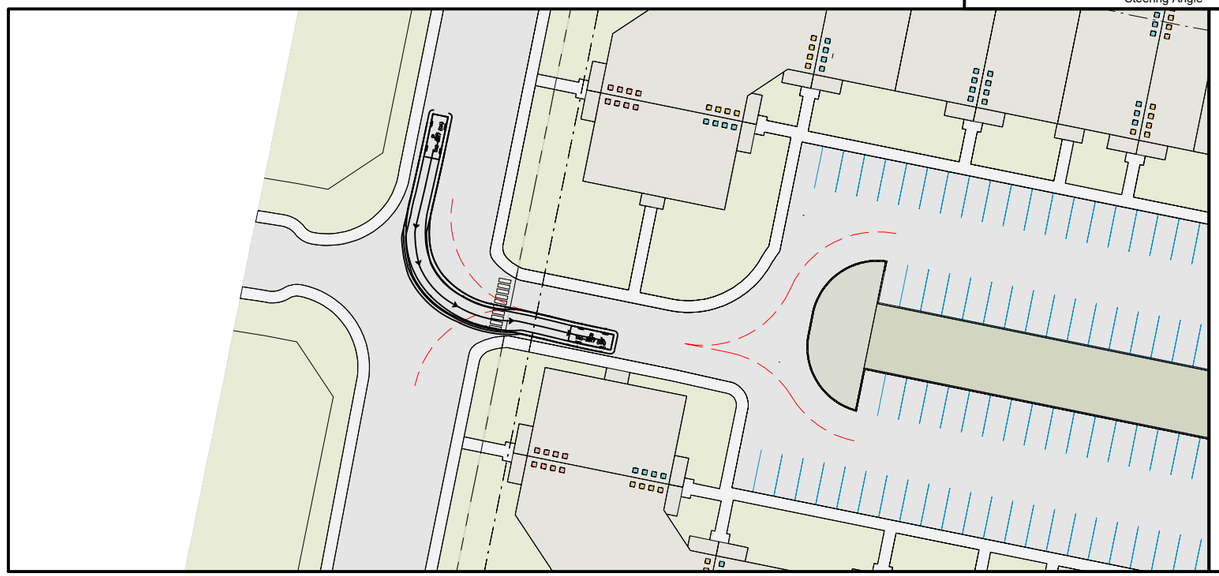

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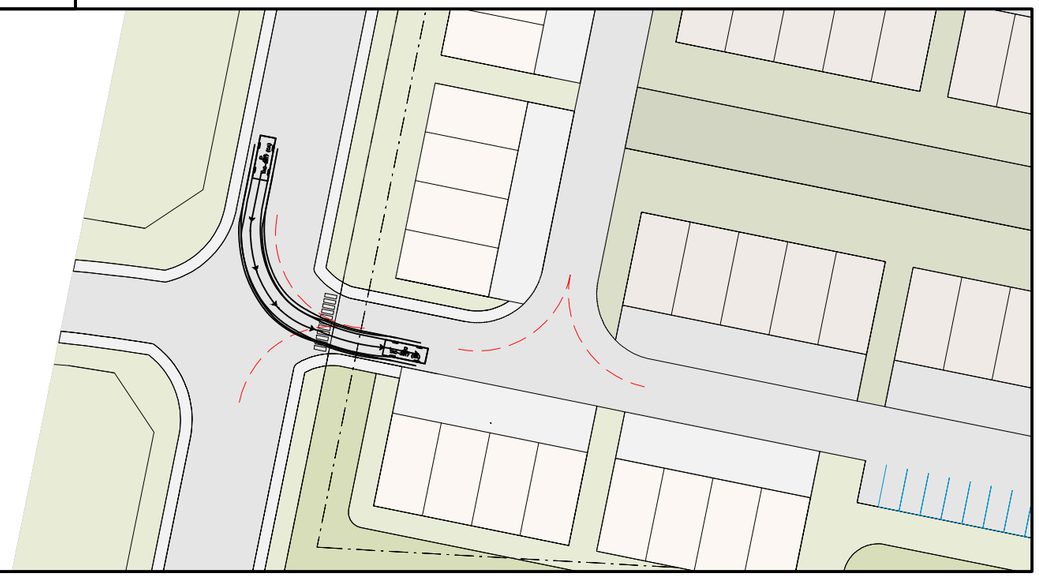

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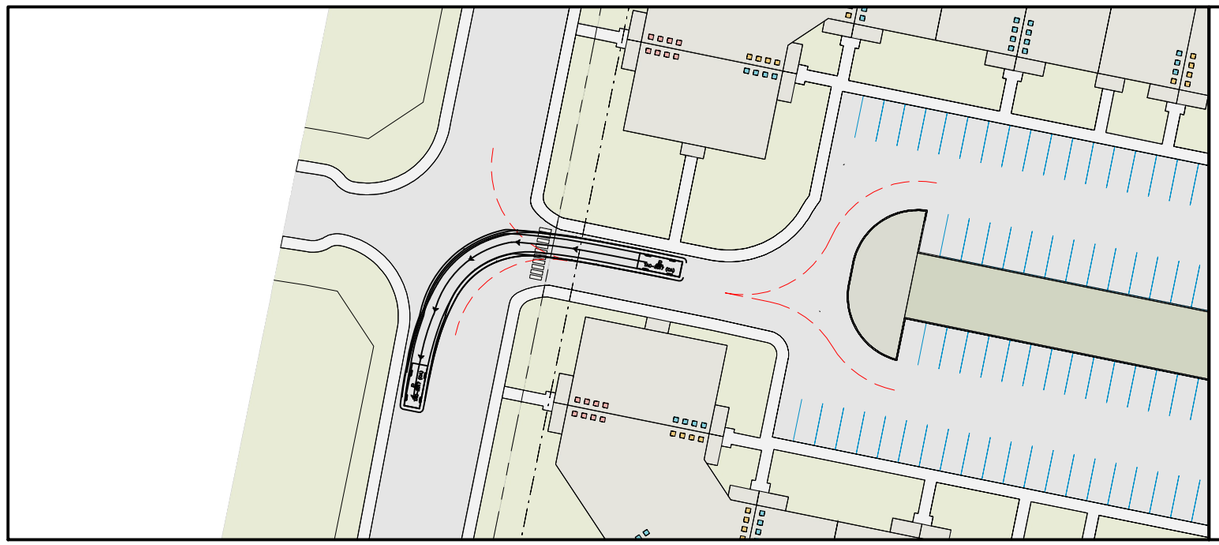

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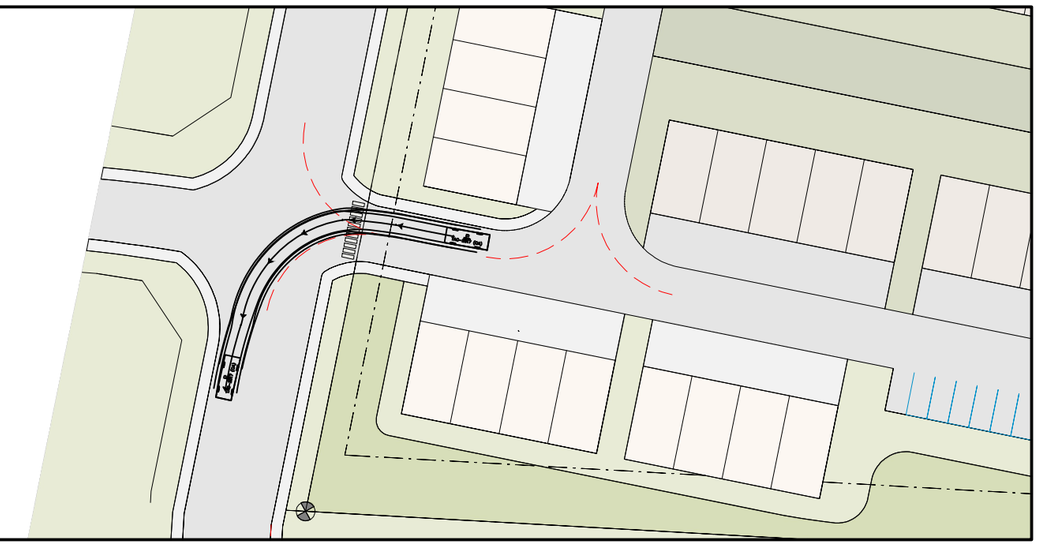

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Rev	Date	Description	Drawn	Design	App'd
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ORIGINAL DWG SIZE: ANSI B (11" x 17")

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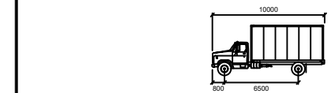
BROADSTREET PROPERTIES LTD.

2123 Hector Road TIA
Turning Movement Diagram
Left Turns - Passenger Car

Drawing No.
S-102

Project Number	Rev.
2111-06247-00	A



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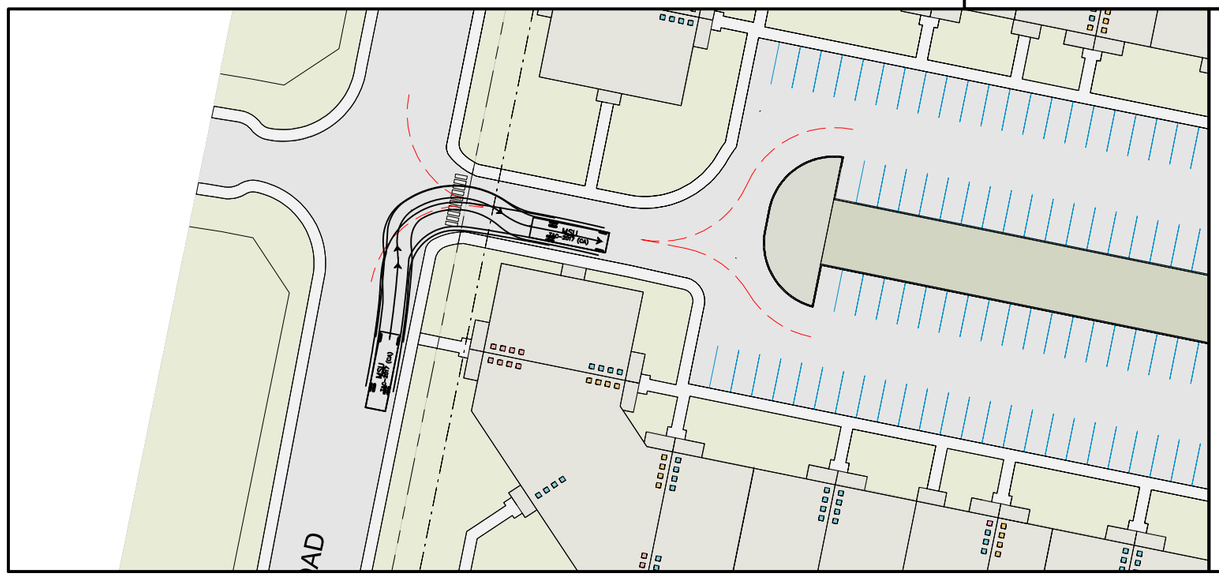

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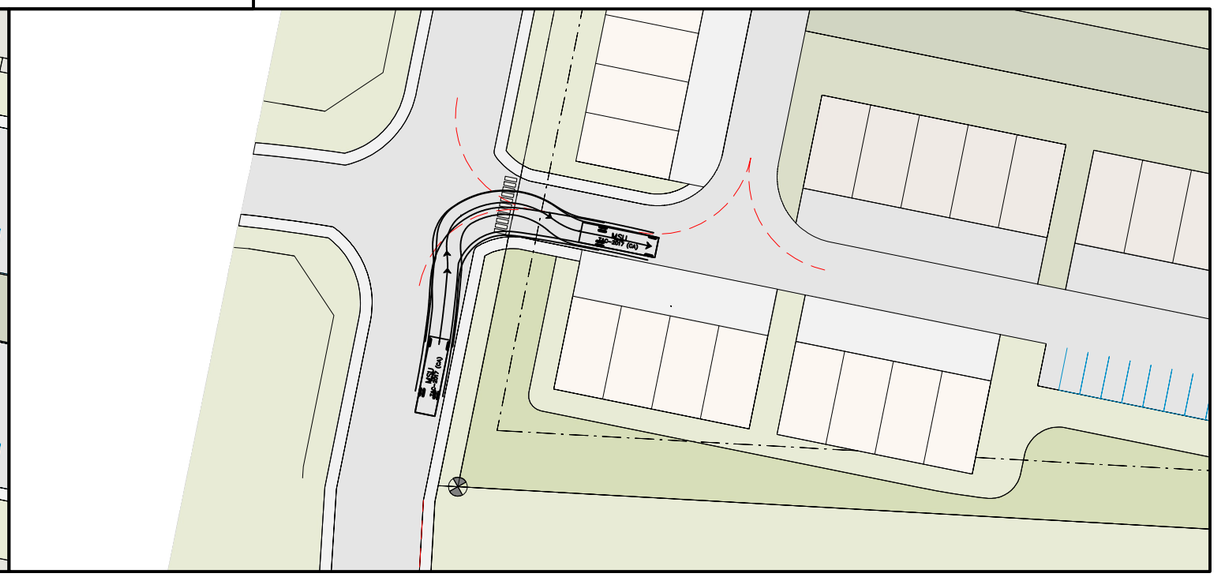

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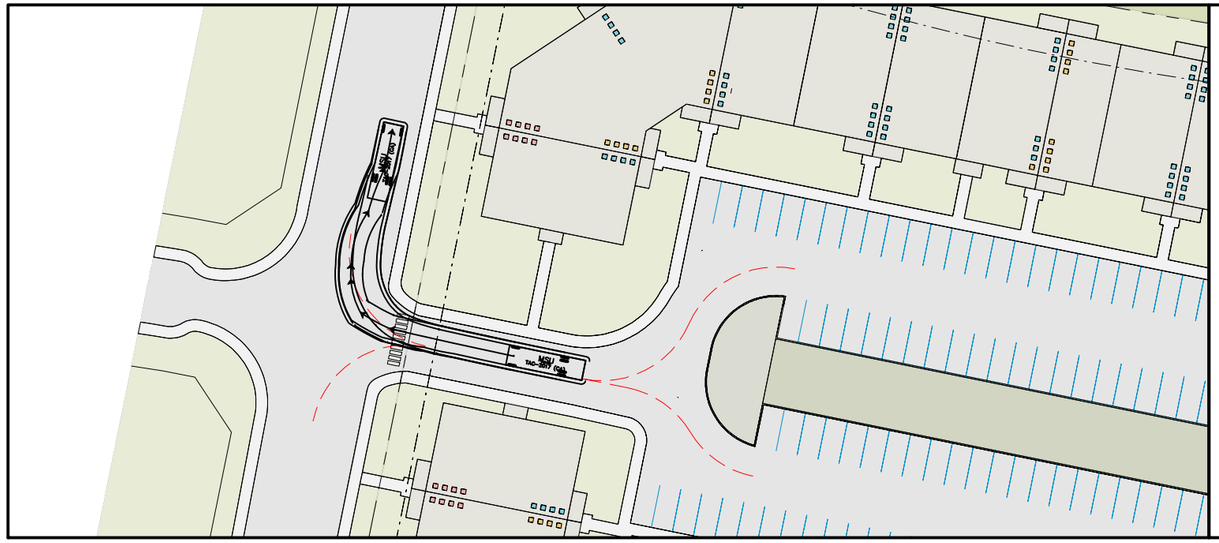

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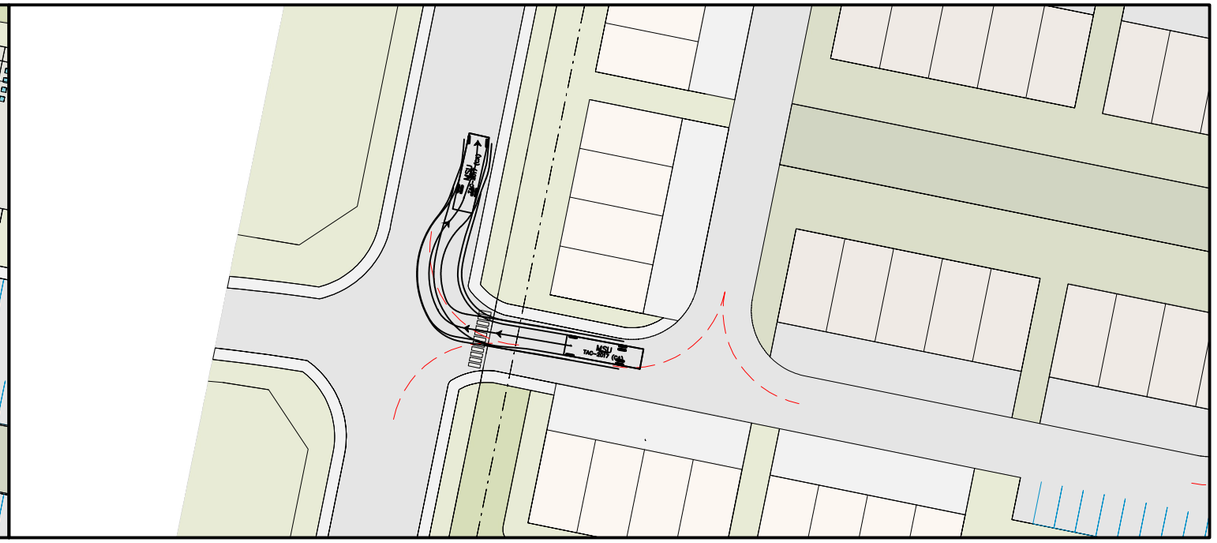

SOUTH ACCESS - WBR

Rev	Date	Description	Drawn	Design	App'd
A	11/10/2023	ISSUED FOR REVIEW	PA	PA	MM

ORIGINAL DWG SIZE: ANSI B (11" x 17")

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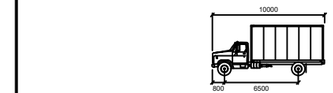
2123 Hector Road TIA
Turning Movement Diagram
Right Turns - MSU

Drawing No.
S-103

Project Number
2111-06197-00

Rev.
A



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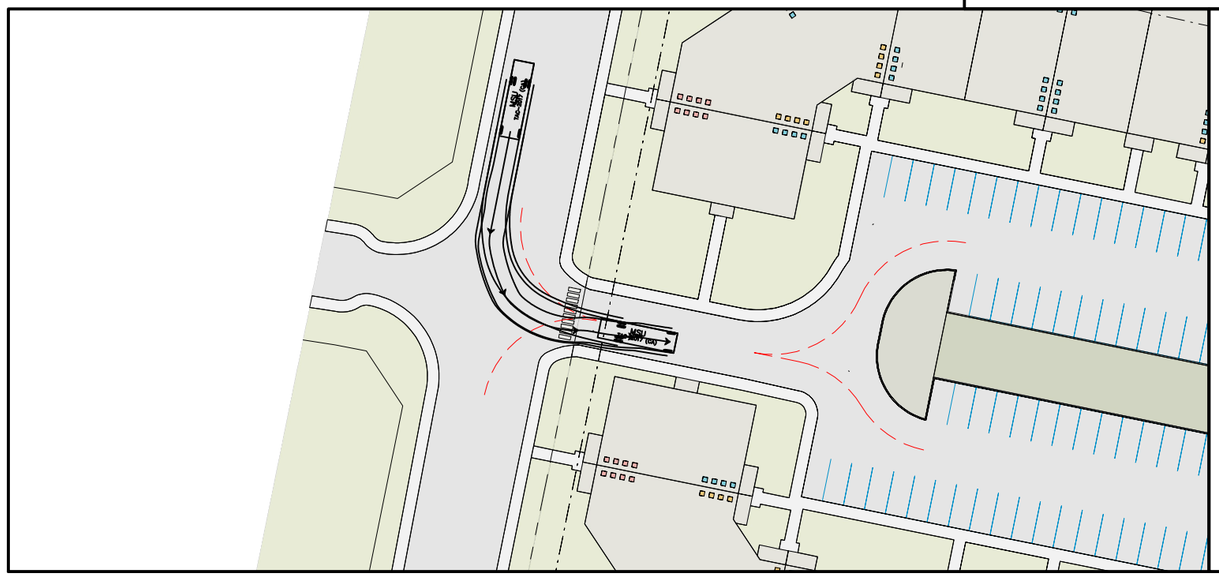

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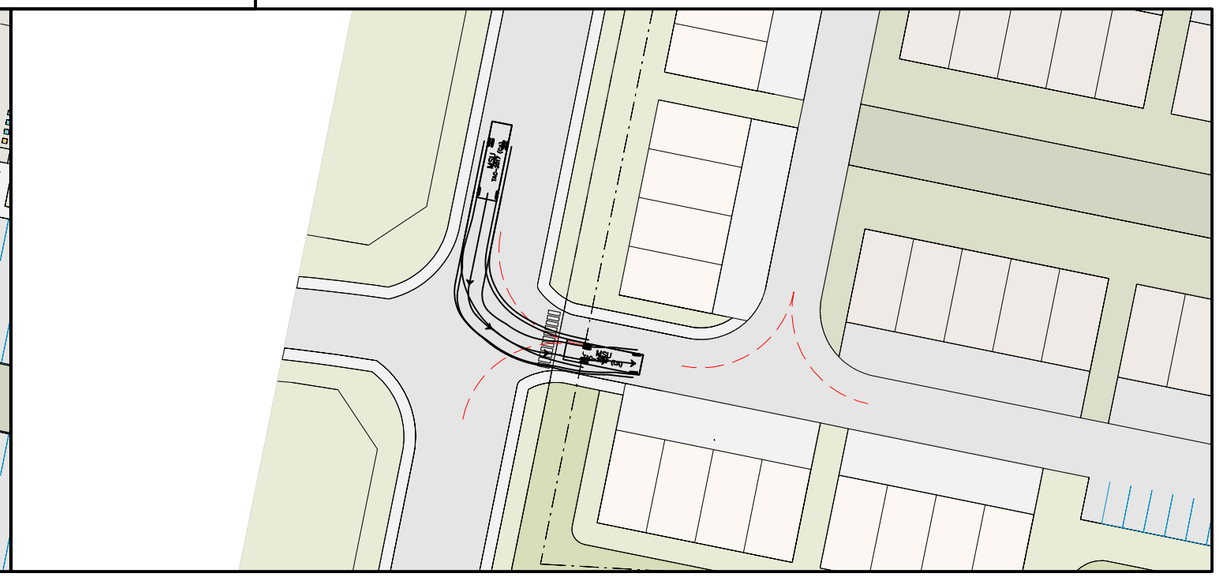

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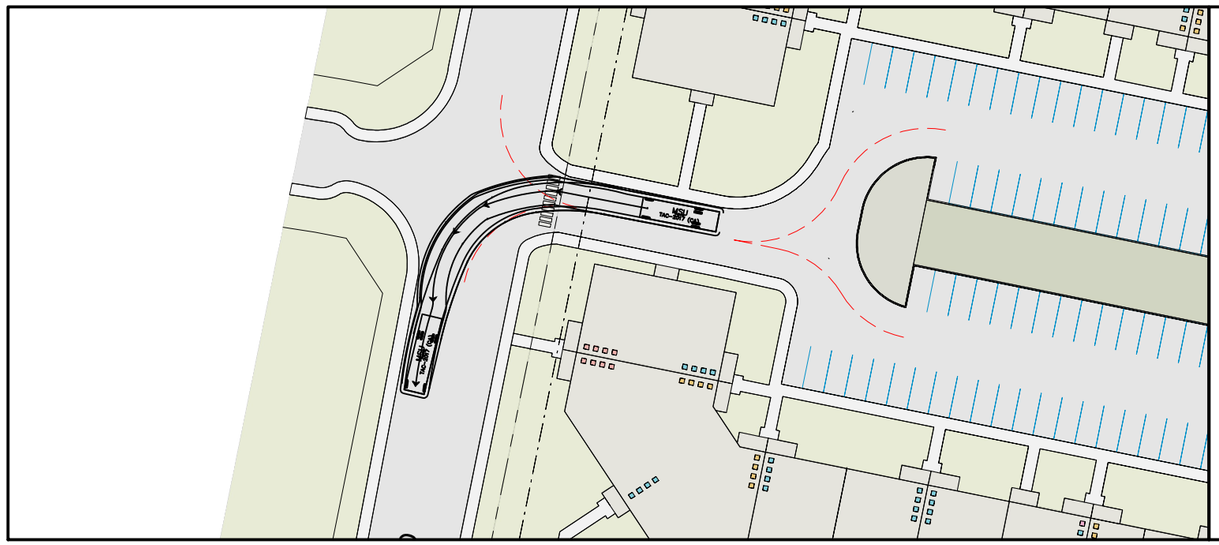

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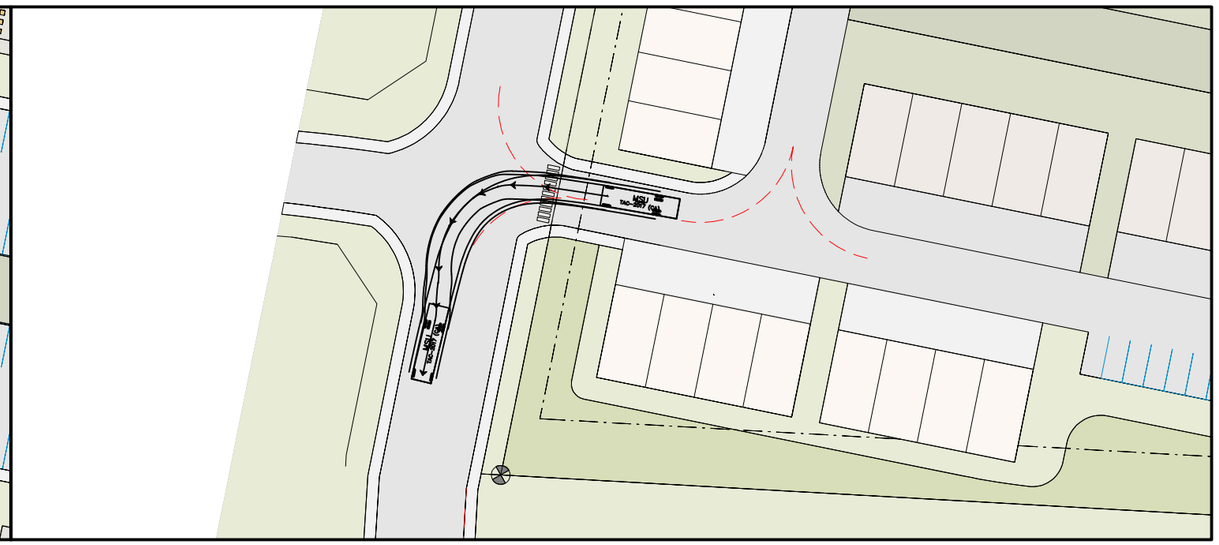

SOUTH ACCESS - WBL

Rev	Date	Description	Drawn	Design	App'd
A	11/10/2023	ISSUED FOR REVIEW	PA	PA	MM

ORIGINAL DWG SIZE: ANSI B (11" x 17")

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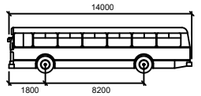
BROADSTREET PROPERTIES LTD.

2123 Hector Road TIA
Turning Movement Diagram
Left Turns - MSU

Drawing No.
S-104

Project Number	Rev.
2111-06197-00	A



I-BUS
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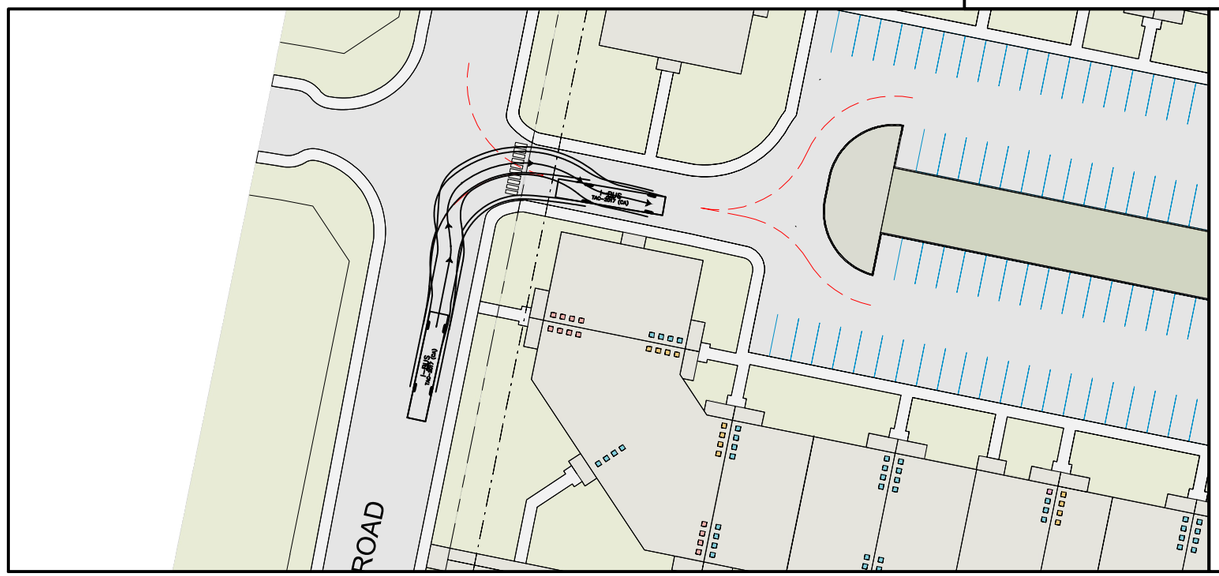

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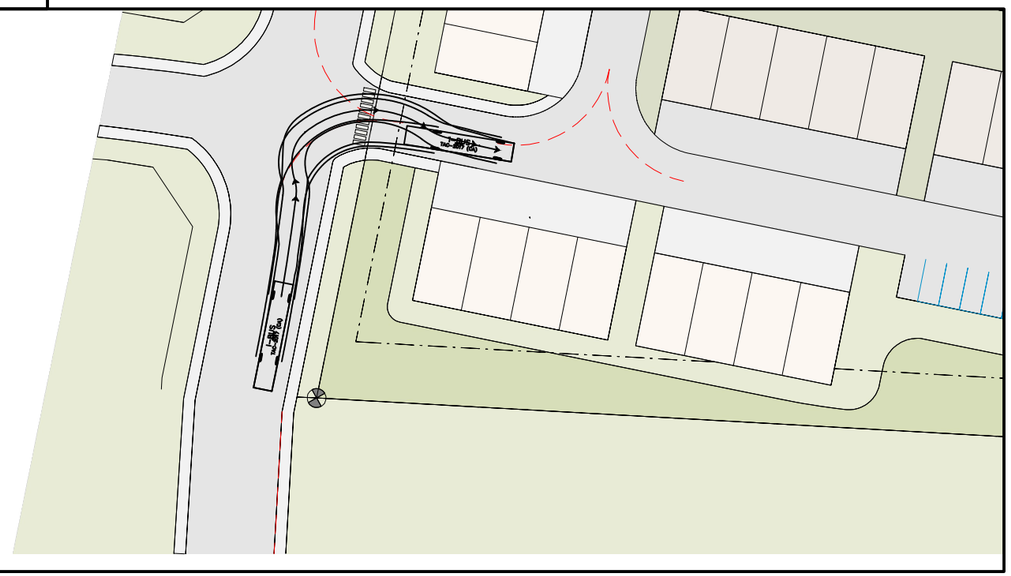

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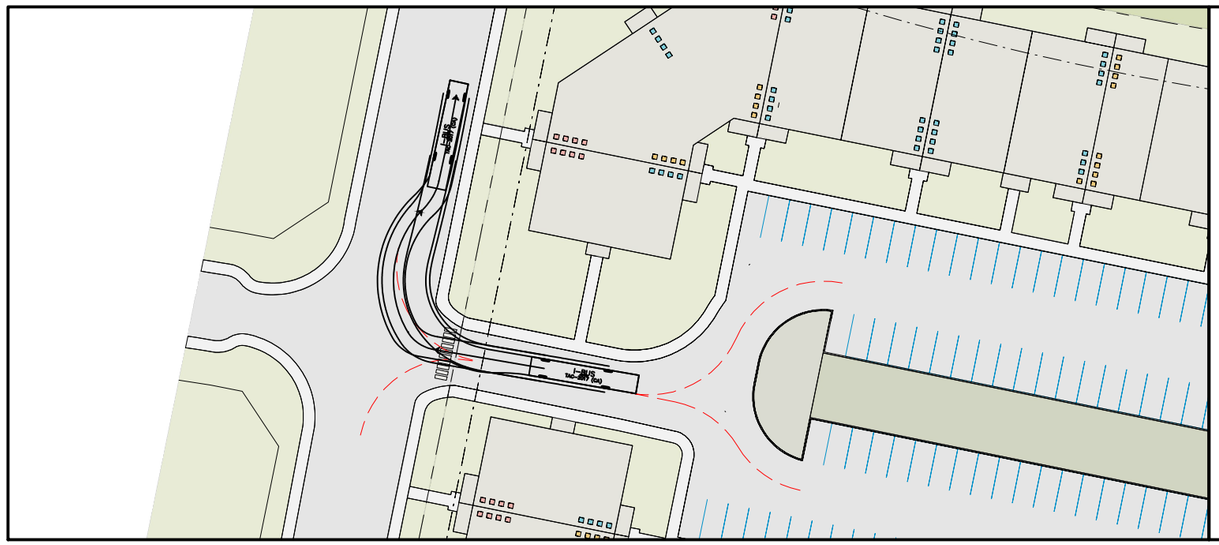

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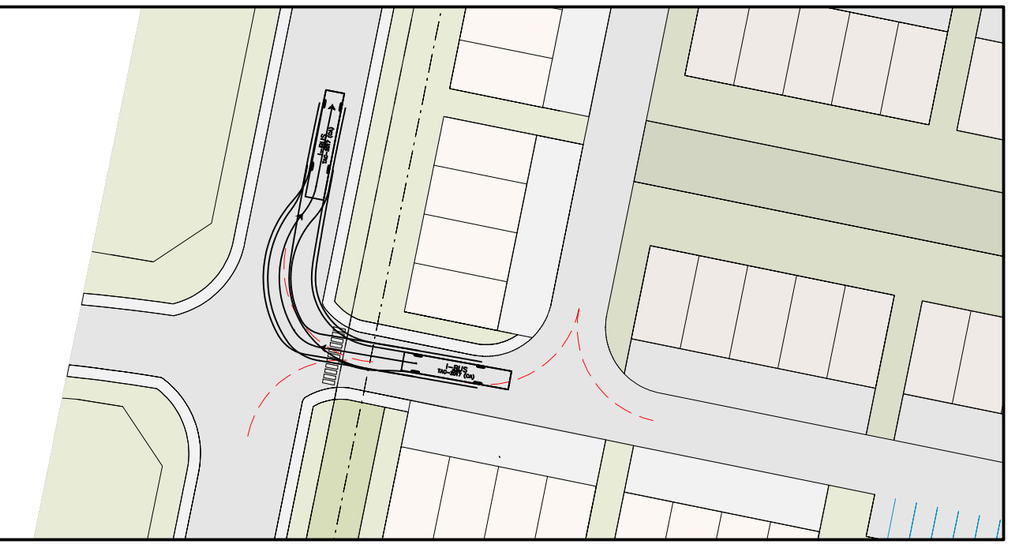

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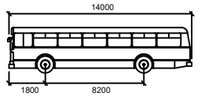
BROADSTREET PROPERTIES LTD.

2123 Hector Road TIA
Turning Movement Diagram
Right Turns - I-Bus

Drawing No. S-105

Project Number 2111-06197-00

Rev. A



I-BUS
mm

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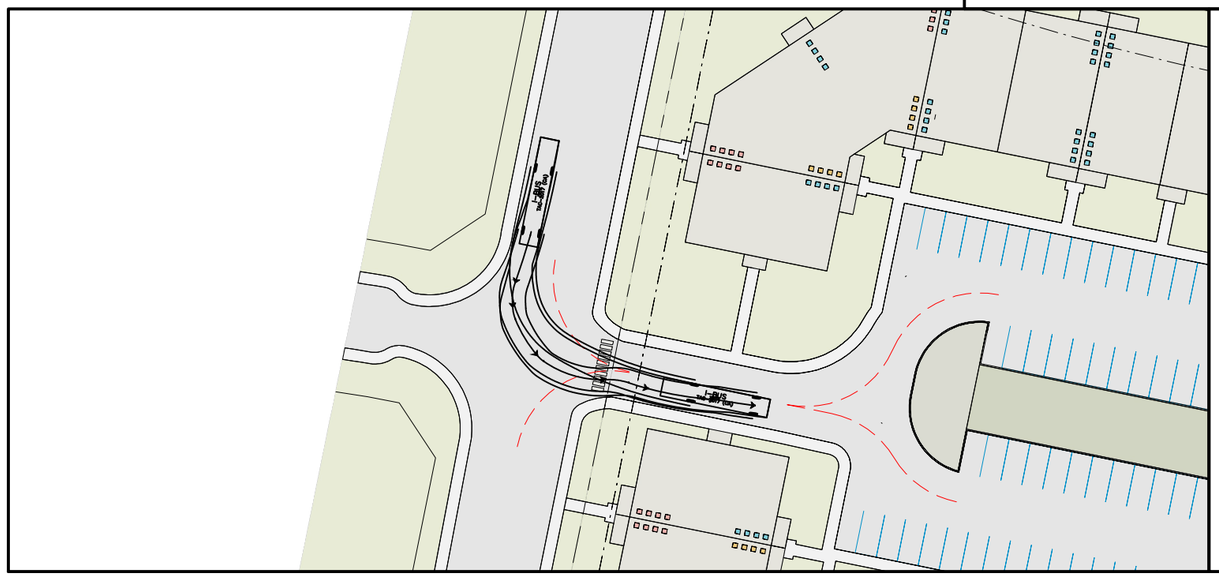

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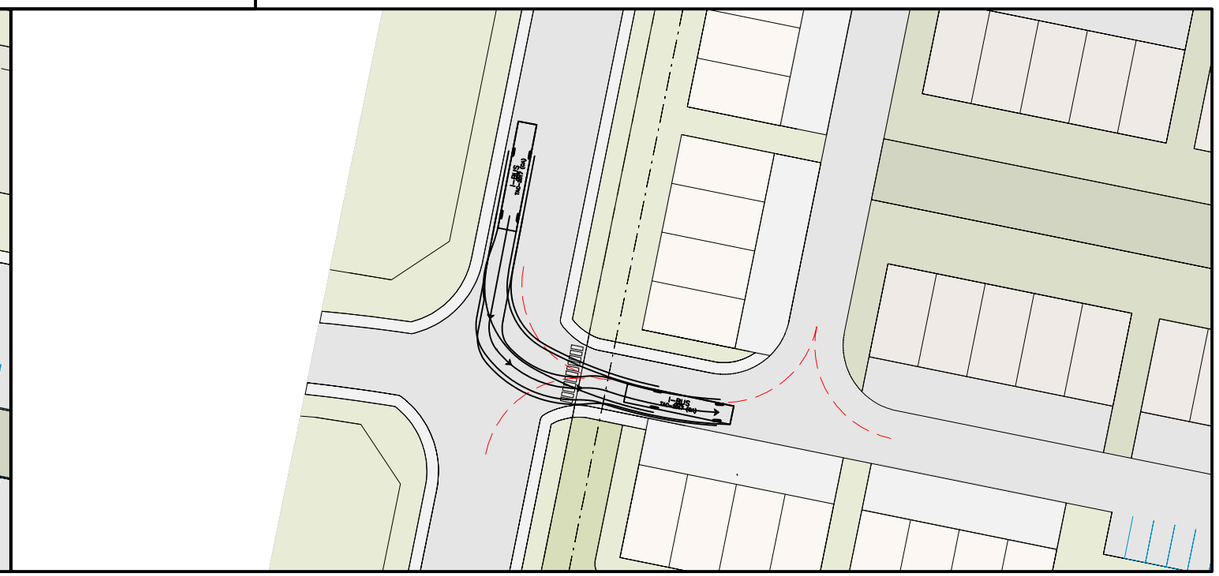

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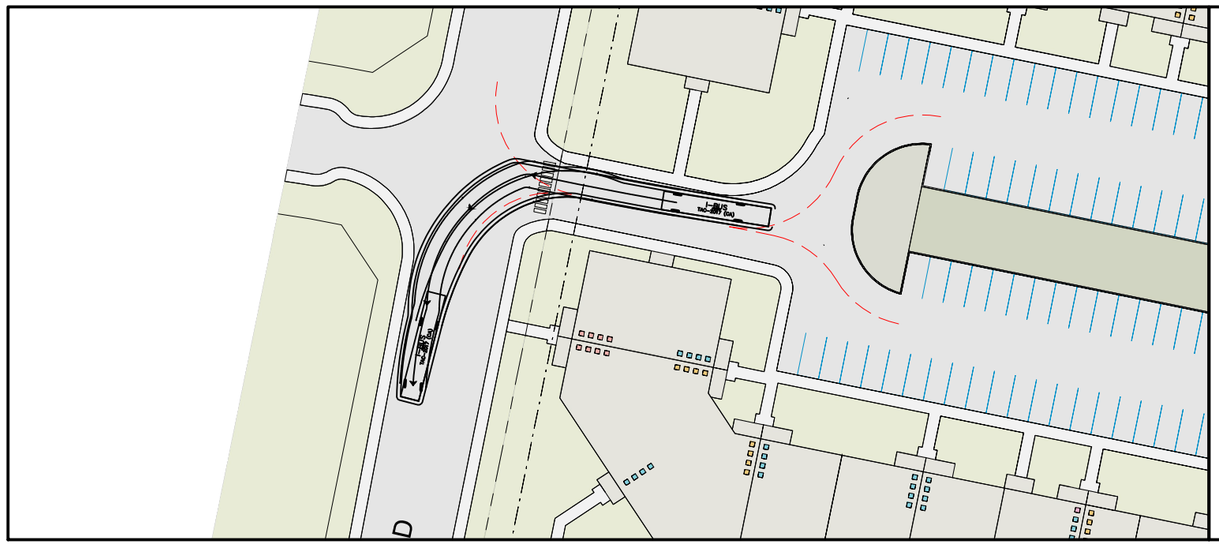

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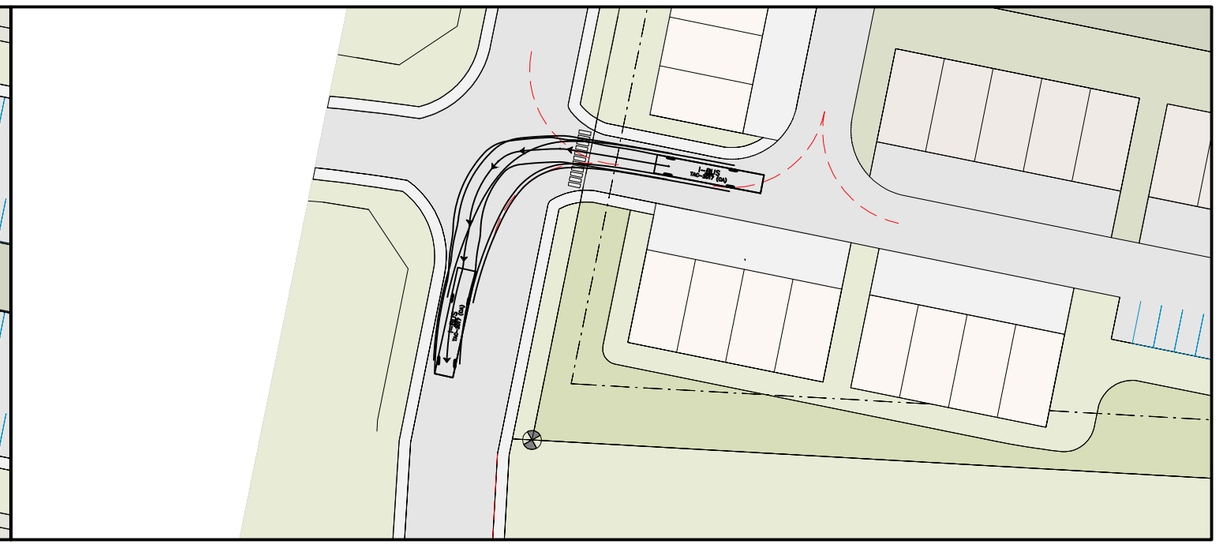

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Rev	Date	Description	Drawn	Design	App'd
A	11/10/2023	ISSUED FOR REVIEW	PA	PA	MM

ORIGINAL DWG SIZE: ANSI B (11" x 17")

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Vancouver BC
Canada V6B 1C1
T 604 683 8521

BROADSTREET PROPERTIES LTD.

2123 Hector Road TIA
Turning Movement Diagram
Left Turns - I-Bus

Drawing No.
S-106

Project Number
2111-06197-00

Rev.
A

APPENDIX H

HCM MANUAL 7TH EDITION EXHIBIT 16-16

GENERALIZED DAILY SERVICE VOLUMES

Generalized daily service volume tables provide a means of assessing a large number of urban streets in a region or jurisdiction quickly to determine which facilities need to be assessed more carefully (by using operational analysis) to ameliorate existing or pending problems.

To build a generalized daily service volume table for urban street facilities, a number of simplifying assumptions must be made. The assumptions made here include the following:

- All segments of the facility have the same number of through lanes (one, two, or three) in each direction.
- Only traffic signal control is used along the facility (i.e., no roundabouts or all-way STOP-controlled intersections exist).
- The traffic signals are coordinated and semiactuated, the arrival type is 4, the traffic signal cycle time *C* is 120 s, and the weighted average green-to-cycle-length (*g/C*) ratio for through movements (defined below) is 0.45.
- Exclusive left-turn lanes with protected left-turn phasing and adequate queue storage are provided at each signalized intersection, and no exclusive right-turn lanes are provided.
- At each traffic signal, 10% of the traffic on the urban street facility turns left and 10% turns right.
- The peak hour factor is 0.92.
- The facility length is 2 mi, and no restrictive medians exist along the facility.
- The base saturation flow rate s_o is 1,900 passenger cars per hour per lane (pc/h/ln).

The weighted average *g/C* ratio of an urban street is the average of the critical intersection through *g/C* ratio and the average of all the other *g/C* ratios for the urban street. For example, if there are four signals with a through *g/C* ratio of 0.50 and one signal with a through *g/C* ratio of 0.40, the weighted average *g/C* ratio for the urban street is 0.45. The weighted *g/C* ratio takes into account the adverse effect of the critical intersection and the overall quality of flow for the urban street.

Generalized daily service volumes are provided in Exhibit 16-16 for urban street facilities with posted speeds of 30 and 45 mi/h; two, four, or six lanes (both directions); and six combinations of the *K*-factor and *D*-factor. To use this table, analysts must select a combination of *K* and *D* appropriate for their locality.

The 30-mi/h values further assume an average traffic signal spacing of 1,050 ft and 20 access points/mi, while the 45-mi/h values assume an average traffic signal spacing of 1,500 ft and 10 access points/mi.

Exhibit 16-16: Generalized Daily Service Volumes for Urban Street Facilities

K -Factor	*D* -Factor	Daily Service Volume by Lanes, LOS, and Speed (1,000 veh/day)											
		Two-Lane Streets				Four-Lane Streets				Six-Lane Streets			
		LOS B	LOS C	LOS D	LOS E	LOS B	LOS C	LOS D	LOS E	LOS B	LOS C	LOS D	LOS E
Posted Speed = 30 mi/h													
0.09	0.55	NA	1.7	11.8	17.8	NA	2.2	24.7	35.8	NA	2.6	38.7	54.0
	0.60	NA	1.6	10.8	16.4	NA	2.0	22.7	32.8	NA	2.4	35.6	49.5
0.10	0.55	NA	1.6	10.7	16.1	NA	2.0	22.3	32.2	NA	2.4	34.9	48.6
	0.60	NA	1.4	9.8	14.7	NA	1.8	20.4	29.5	NA	2.2	32.0	44.5
0.11	0.55	NA	1.4	9.7	14.6	NA	1.8	20.3	29.3	NA	2.1	31.7	44.1
	0.60	NA	1.3	8.9	13.4	NA	1.7	18.6	26.9	NA	2.0	29.1	40.5
Posted Speed = 45 mi/h													
0.09	0.55	NA	7.7	15.9	18.3	NA	16.5	33.6	36.8	NA	25.4	51.7	55.3
	0.60	NA	7.1	14.5	16.8	NA	15.1	30.8	33.7	NA	23.4	47.4	50.7
0.10	0.55	NA	7.0	14.3	16.5	NA	14.9	30.2	33.1	NA	23.0	46.5	49.7
	0.60	NA	6.4	13.1	15.1	NA	13.6	27.7	30.3	NA	21.0	42.7	45.6
0.11	0.55	NA	6.3	13.0	15.0	NA	13.5	27.5	30.1	NA	20.9	42.3	45.2
	0.60	NA	5.8	11.9	13.8	NA	12.4	25.2	27.6	NA	19.1	38.8	41.5

Notes: NA = not applicable; LOS cannot be achieved with the stated assumptions.
General assumptions include no roundabouts or all-way STOP-controlled intersections along the facility; coordinated, semiactuated traffic signals; Arrival Type 4; 120-s cycle time; protected left-turn phases; 0.45 weighted average *g/C* ratio; exclusive left-turn lanes with adequate queue storage provided at traffic signals; no exclusive right-turn lanes provided; no restrictive median; 2-mi facility length; 10% of traffic turns left and 10% turns right at each traffic signal; peak hour factor = 0.92; and base saturation flow rate = 1,900 pc/h/ln.
Additional assumptions for 30-mi/h facilities: signal spacing = 1,050 ft and 20 access points/mi.
Additional assumptions for 45-mi/h facilities: signal spacing = 1,500 ft and 10 access points/mi.

APPENDIX I
SCHEDULE “B”

SCHEDULE "B"

DEVELOPMENT APPROVAL INFORMATION

DECLARATION

The undersigned acknowledge that the Development Approval Information herein is not provided to the Town with any expectation of confidentiality, constitutes a record of the Town of Comox under the *Freedom of Information and Protection of Privacy Act*, and may be made available for public use in connection with the development application to which it pertains, including by posting on the Town's website.

DATED: November 20, 2023

The Qualified Professionals executing below are the only Qualified Professionals who participated in the preparation of the Development Approval Information.

Applicant:

Name: Trevor Dickie, Vice President of Real Estate Development

Address: Broadstreet Properties, 100 St. Ann's Road, Campbell River, BC

Signature 

Qualified Professionals:

Name: Mark Merlo, P.Eng., P.T.O.E.

Address: McElhanney, Suite 2300 Central City Tower, 13450 – 102nd Avenue, Surrey, BC

Signature 

Name: Emily Shibata, EIT

Address: McElhanney, Suite 2300 Central City Tower, 13450 – 102nd Avenue, Surrey, BC

Signature 

Tel: 250-339-2202
Fax: 250-339-7110
Email: planning@comox.ca

Address:
1809 Beaufort Avenue
Comox, B.C. V9M 1R9

APPENDIX J
STATEMENT OF LIMITATIONS

Statement of Limitations

Use of this Report. This report was prepared by McElhanney Ltd. ("**McElhanney**") for the particular site, design objective, development and purpose (the "**Project**") described in this report and for the exclusive use of the client identified in this report (the "**Client**"). The data, interpretations and recommendations pertain to the Project and are not applicable to any other project or site location and this report may not be reproduced, used or relied upon, in whole or in part, by a party other than the Client, without the prior written consent of McElhanney. The Client may provide copies of this report to its affiliates, contractors, subcontractors and regulatory authorities for use in relation to and in connection with the Project provided that any reliance, unauthorized use, and/or decisions made based on the information contained within this report are at the sole risk of such parties. McElhanney will not be responsible for the use of this report on projects other than the Project, where this report or the contents hereof have been modified without McElhanney's consent, to the extent that the content is in the nature of an opinion, and if the report is preliminary or draft. This is a technical report and is not a legal representation or interpretation of laws, rules, regulations, or policies of governmental agencies.

Standard of Care and Disclaimer of Warranties. This report was prepared with the degree of care, skill, and diligence as would reasonably be expected from a qualified member of the same profession, providing a similar report for similar projects, and under similar circumstances, and in accordance with generally accepted engineering and scientific judgments, principles and practices. McElhanney expressly disclaims any and all warranties in connection with this report.

Information from Client and Third Parties. McElhanney has relied in good faith on information provided by the Client and third parties noted in this report and has assumed such information to be accurate, complete, reliable, non-fringing, and fit for the intended purpose without independent verification. McElhanney accepts no responsibility for any deficiency, misstatements or inaccuracy contained in this report as a result of omissions or errors in information provided by third parties or for omissions, misstatements or fraudulent acts of persons interviewed.

Effect of Changes. All evaluations and conclusions stated in this report are based on facts, observations, site-specific details, legislation and regulations as they existed at the time of the site assessment/report preparation. Some conditions are subject to change over time and the Client recognizes that the passage of time, natural occurrences, and direct or indirect human intervention at or near the site may substantially alter such evaluations and conclusions. Construction activities can significantly alter soil, rock and other geologic conditions on the site. McElhanney should be requested to re-evaluate the conclusions of this report and to provide amendments as required prior to any reliance upon the information presented herein upon any of the following events: a) any changes (or possible changes) as to the site, purpose, or development plans upon which this report was based, b) any changes to applicable laws subsequent to the issuance of the report, c) new information is discovered in the future during site excavations,

construction, building demolition or other activities, or d) additional subsurface assessments or testing conducted by others.

Independent Judgments. McElhanney will not be responsible for the independent conclusions, interpretations, interpolations and/or decisions of the Client, or others, who may come into possession of this report, or any part thereof. This restriction of liability includes decisions made to purchase, finance or sell land or with respect to public offerings for the sale of securities.

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