COWAN POINT

TRANSPORTATION IMPACT ASSESSMENT

PREPARED FOR BOWEN ISLAND PROPERTIES

2025-07-14

STEP ONE MOBILITY
PLANNING AND ENGINEERING

Project No.	052-001
Project Name:	Cowan Point – Transportation Impact Assessment

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STEP ONE MOBILITY
PLANNING AND ENGINEERING

TABLE OF CONTENTS

1 INTRODUCTION

Bowen Island Properties is seeking to rezone their properties at Cowan Point (the Site) on Bowen Island. The rezoning would enable construction of a mixed-use development consisting of multiple low-rise and detached dwelling, accommodation, recreation uses, and limited commercial space (the Development). A total of about 190 residential and accommodation units are planned, along with 800m^2 of mixed commercial space. The site's approximate location on Bowen Island is shown in Figure 1.

Figure 1 - Map of Site Location (Modified from Google Maps)

Today, the Site is undeveloped. The several parcels which comprise the development are located in an area with existing single-family homes as well as undeveloped single-family lots. The site has a significant slope down towards Seymour Bay.

1.1 STUDY SCOPE

The objectives of this Transportation Impact Study (TIS) are:

1. To plan for the potential transportation impacts of the proposed projects,
2. To consider measures that can support active transportation and reduce external vehicle trips, and
3. To, at a high level, consider potential longer-term impacts and opportunities from new transportation connections in the area including a passenger ferry in Seymour Bay, a Valhalla Ridge multi-use path, and a potential new transit service to Cowan Point.

A terms of reference (ToR) for this study was confirmed with staff at Bowen Island Municipality.

1.2 REPORT STRUCTURE

This report is organized into the following sections.

Section 2 Existing Conditions: Overview of the area, including nearby transportation infrastructure, and transportation policy context.

Section 3 Existing Mobility Level of Service: Reviewing the existing quality of service provided to all travel modes near the site.

Section 4 Future Conditions: Estimating future background traffic volumes and development transportation demand.

Section 5 Future No Development Mobility Service Quality: Reviewing the quality of service provided to all travel modes near the site in the future without the proposed development.

Section 6 Future Post Development Mobility Service Quality: Reviewing the quality of service provided to all travel modes near the site in the future with the proposed development.

Section 7 Discussion on Operations, Deficiencies and Potential Mitigations: Identifying transportation issues and recommendations.

Section 8 Transportation Demand Management (TDM): Reviewing potential opportunities to reduce vehicle trips and reliance on personal vehicles.

Section 9 Future Mobility Considerations: Considers impacts and opportunities from new transportation connections.

Section 10 Conclusions and Recommendations

This report is intended to be read in conjunction with the complete rezoning application submission.

1.3 DEVELOPMENT CONCEPT

The Development plan includes a variety of housing types, accommodation, and a mix of potential non-residential service and retail uses. The Development would be built over several phases, and the mix of non-residential uses would be informed by market conditions at the time of development, and area needs.

The analysis presented here explores the completed Development including a typical mix of housing types and non-residential uses. Non-residential floor areas are based on advice from the project planning team. The Development program as assessed in this study is shown in Table 1.

Table 1 – Proposed Development Statistics

Land Use Category	Subcategory	Unit Count/ Floor Area (m^2)
Residential	Attached (Townhouse/Multiplex/Duplex)	140 units
Residential	Low Rise Apartment	20 units
Accommodation	Tourist Accommodation	30 units
Restaurant		**300 m^2**
Retail		**250 m^2**
General Services		**250 m^2**

Figure 2 shows a plan view of the proposed Development including existing streets and the location of different land uses within the Site.

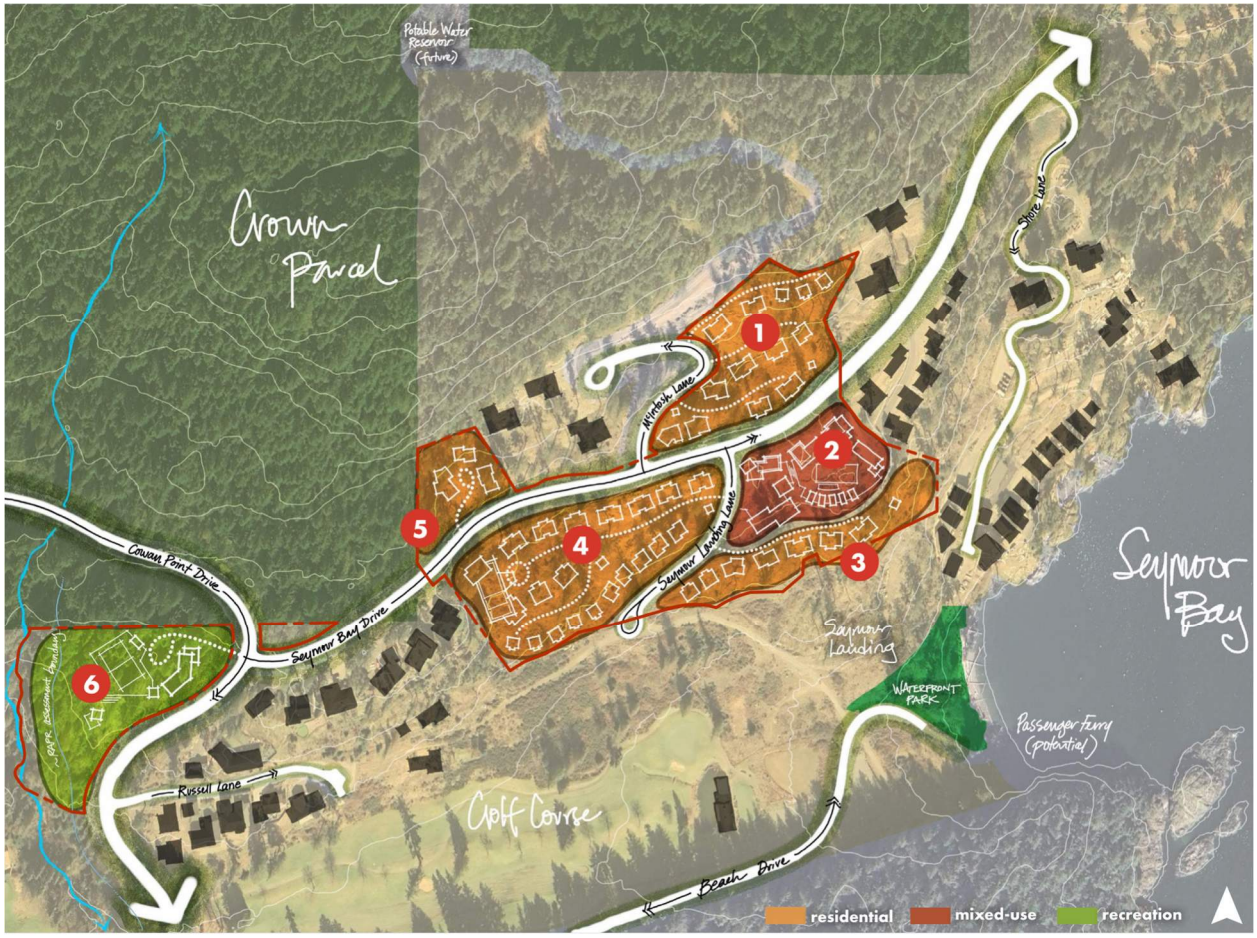

Figure 2 – Plan View of the Proposed Development (MODUS Planning and Design)

Access to the site is proposed from the existing Seymour Bay Drive. Parcel 6, designated for recreational use, is shown to be accessed directly from Cowan Point Drive at its intersection with Seymour Bay Drive.

1.4 STUDY AREA

The study area includes three intersections. These are outlined in Table 2.

Table 2 - Study Area Intersections

ID	Intersection	Traffic Control
1	Cowan Point Drive at Fairweather Road	Minor stop control on Fairweather Road
2	Cowan Point Drive at Seymour Bay Drive	Minor stop control on Seymour Bay Drive
3	Cowan Point Drive at Beach Road/Arbutus Bay Lane	Irregular stop control on Beach Road and Cowan Point Road

This study will also review access and circulation for people walking, cycling, and taking transit including routes to the nearest cycling facilities and transit stops. The study area is shown in Figure 3.

Figure 3 - Study Area

1.5 POLICY CONTEXT

Background information was reviewed to understand mobility policy and long-term plans for transportation on Cowan Point. Overall, the planning documents suggest that Cowan Point may see improved transportation

connections at some point in the future. However, there are no firm timelines to deliver improved active transportation connections or transit service to Cowan Point.

1.5.1 ACTIVE TRANSPORTATION PLAN (2023)

Following the availability of Provincial funding, Bowen Island Municipality undertook the creation of the Active Transportation Plan (ATP), which was presented to Council in the Fall of 2023. The ATP contains three components: the Background Report, which focuses on existing policy, transportation conditions, and community engagement, the Network Plan, focusing on what active transportation improvements should be contained in the ATP, and the Implementation Plan, detailing how and when implementation could occur.

In the ATP, Cowan Point Drive is identified as a future secondary bike route, connecting the principal cross-island multi-use path to the Cowan Point area. However, in the implementation plan, this is identified as a lower priority route with implementation around 2037. The total cost was estimated at $300,000. A reduced speed limit of 30km/hr is recommended for secondary bikeways.

1.5.2 TRANSPORTATION PLAN 2018-2038

The Integrated Transportation Master Plan (ITMP) is the Bowen Island Municipality's 20-year transportation plan. Adopted in 2018, Bowen Island's Integrated Transportation Master Plan sets out the strategic approach for developing the transportation system of the municipality and promoting sustainable transportation on the island. The three overarching strategic transportation goals for the community contained in this plan are improving connections on the island, increasing the transportation choices on the island, and improving residents' health.

In the ITMP, Cowan Point is identified as having residential, recreation, and institutional nodes, with a potential future transportation node noted at the water (a potential future ferry terminal). There is a future residential node located at the proposed Development.

The plan identifies a future foot path connecting Cowan Point with Snug Cove, approximately along Valhalla Ridge, which would allow for a shorter path of travel than what currently exists between these points. Similarly, a secondary bicycle route is shown connecting to Cowan Point, with public bike parking at Cowan Point.

The Plan supports advocating for establishing transit service to Cowan Point.

1.5.3 TRANSPORT 2050

Transport 2050, TransLink's regional transportation plan, does not contemplate expanded transit services on Bowen Island.

2 EXISTING CONDITIONS

The Site is located within Cowan Point on the south side of Bowen Island. Cowan Point is a low-density neighbourhood characterized by single family homes on large lots. Some properties appear to include multiple strata titled detached homes or vacation rentals. Cowan Point is connected to the rest of Bowen Island by Cowan Point Road. Within Cowan Point, the mobility network consists of steep streets, a mix of paved and unpaved roads, as well as a walking trail.

2.1 BACKGROUND DATA REVIEW

Bowen Island Municipality provided anonymized source data from the ITMP report for use in understanding travel patterns on Cowan Point and to destinations on the Island. This data was examined and analyzed to determine what travel patterns exist for the Cowan Point area.

Overall, travel to and from Cowan Point was similar to other areas of the island as a whole, including trip purpose and origins/destinations. Over 60% of recorded on-island trips started and over 55% of on-island trips ended in and around Snug Cove. Relatively few trips were made to and from the south side of the island, including Cowan Point. 6% of all trips began somewhere along or near Cowan Point Drive, and about 3% began in Cowan Point. Similarly, destinations along Cowan Point Drive made up 5% of all trip ends, with 2% at Cowan Point. The golf course accounted for nearly 80% of the trips that began or ended at Cowan Point. The proportion of origins and destinations on Bowen Island overall can be found in Figure 4, below.

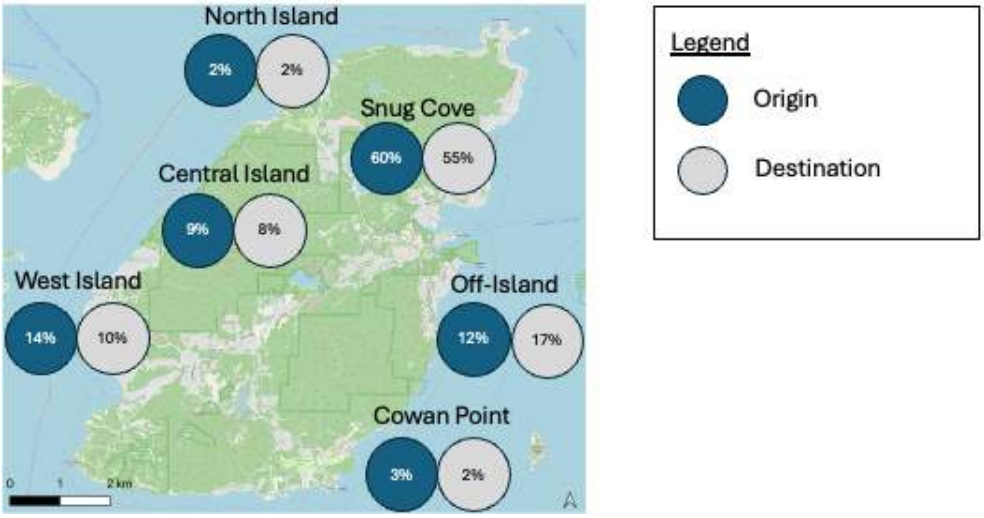

Figure 4 - Bowen Island Trip Origin and Destination Distribution

This distribution of trips is similar to the population distribution on the island. About 12% to 17% of trips were off-island in the data set. The significant proportion of trips to and from Snug Cove highlights its role as the town centre of the island.

The proportion of origins and destinations for trips to and from Cowan Point is shown in Figure 5,

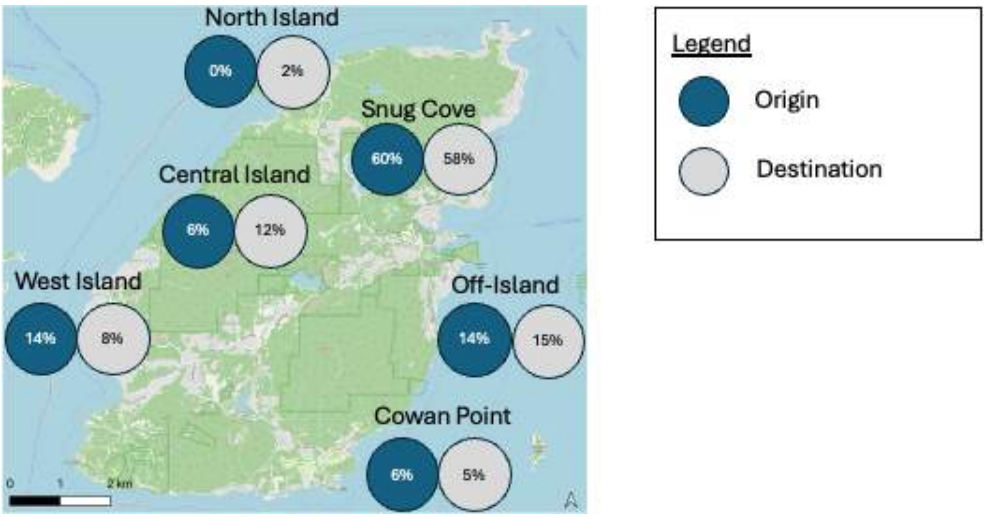

Figure 5 - Cowan Point Trip Origin and Destination Distribution

Trips to and from Cowan Point have a similar distribution as trips for Bowen Island as a whole, with most trips to or from Snug Cove and about 15% of trips off-island.

Table 3 outlines the distribution of work trips originating from Bowen Island and Cowan Point. Work trips are approximately twice as likely to be off-island compared to on-island. The proportion of work trips ending on and off-island is similar for both Cowan Point and the broader Bowen Island.

Table 3 - Work Trips On Island and Off Island

Destination	Percentage of work trips originating along Cowan Point Drive (n = 10)	Percentage of all work trips (n = 227)
On-Island	70%	73%
Off-Island	30%	27%

Overall, the travel survey data suggests that Cowan Point makes up only a small proportion of trips on the island, but that the destinations of trips to and from Cowan Point is similar to the rest of the island.

2.2 EXISTING MOBILITY INFRASTRUCTURE

2.2.1 WALKING AND ROLLING INFRASTRUCTURE

There are few formal walking facilities within Cowan Point. A pathway, roughly following Cowan Point Drive, connects from Arbutus Bay Lane to Headwaters Park, north of Josephine Drive. Within Cowan Point, a network of trails connect around the golf course and to the waterfront in several locations. The trail is gravel or dirt, with steep sections and some areas over bare rock. This trail would not be accessible to people with disabilities or families with strollers. A typical section of the trail adjacent to Cowan Point Drive is shown in Figure 6.

Figure 6 - Typical Trail Section Adjacent Cowan Point Drive

At the intersection of Seymour Bay Road and Cowan Point Drive, the trail cuts through a ditch, making it difficult to access from the development side of Cowan Point Drive, as shown in Figure 7.

Figure 7 - Access to Trail from Cowan Point Drive at Seymour Bay Drive (looking west)

There are three marked and signed pedestrian crossings of Cowan Point Drive near the study area where the trail crosses the road. Two are situated where the golf course crosses the Cowan Point Drive, and one is located further north. Crossings near the golf course are shown in Figure 8.

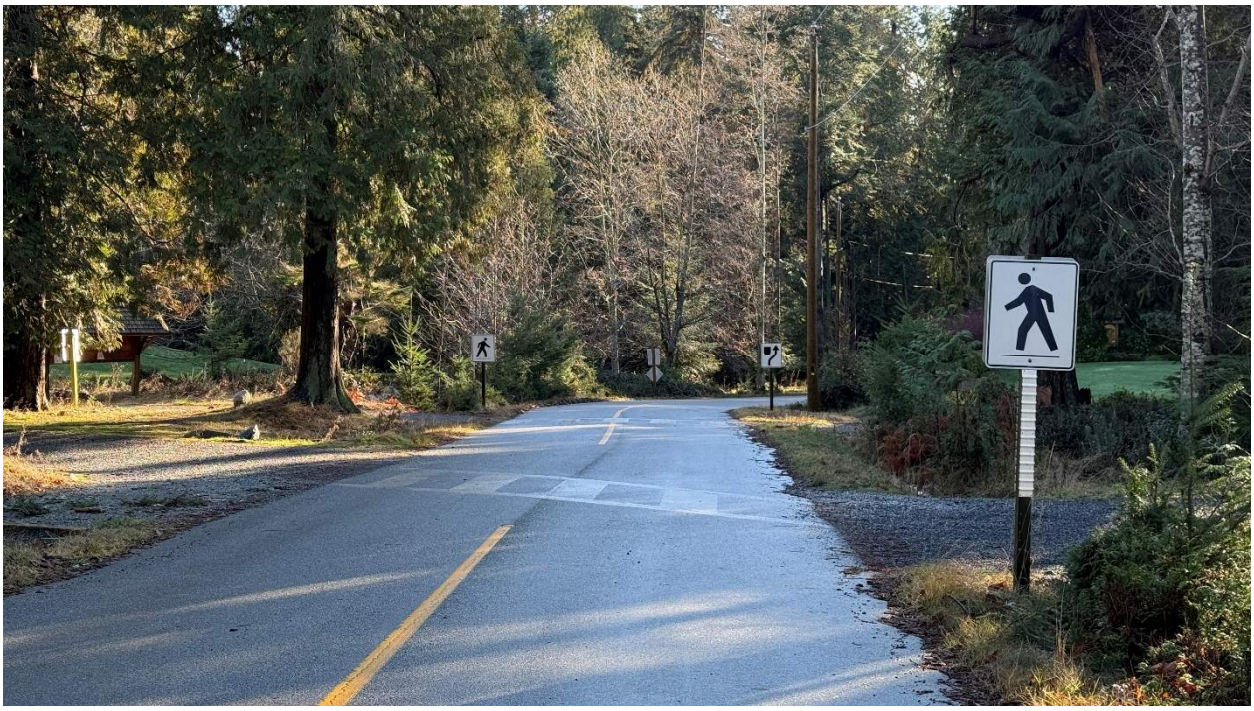

Figure 8 - Pedestrian Crossings of Cowan Point Drive at Golf Course

Cowan Point Drive and other roads in the area are generally narrow and don't have a significant shoulder. However, as traffic volumes are very low, walking in mixed traffic conditions where trail connections are not available may be acceptable for many users. Several pedestrians were observed walking on the road during a site visit.

2.2.2 CYCLING INFRASTRUCTURE

There is no formal cycling infrastructure to or within Cowan Point. Only two cyclists were recorded during the traffic count program in December, although seasonality may play a role in this and bike trips may be higher in the summer.

2.2.3 TRANSIT INFRASTRUCTURE AND SERVICE

Transit service is lightly used on the island, with the most recent figures from TransLink showing that the 280 bus route had 24,105 annual boardings in 2022, while the 281 had 13,389 boardings in 2019. Ridership data from the 282 was not available as this is a special route operating only on Saturdays, Sundays and holidays. Overall, with about 3,000 to 4,000 transit boardings per month across the island, transit use likely represents a small proportion of travel on the island.

There is no formal transit service to Cowan Point today. However, there is a Bowen LIFT stop along Cowan Point near the golf course crossing. Bowen LIFT is an informal ride-sharing program. The stop is marked with signage but does not include any seating or weather protection. The stop is shown in Figure 9.

Figure 9 - Bowen LIFT Stop on Cowan Point Drive

2.2.4 VEHICLE INFRASTRUCTURE AND GOODS MOVEMENT

Existing information for streets within the study area is shown in Table 4.

Table 4 -Study Area Street Characteristics

Street	Classification (ITMP 2018)	Two-Way Peak Hr. Volume			Travel Lanes	Speed Limit	Notes
		AM	Midday	PM			
Cowan Point Drive	Main Road	24	36	40	2	40	
Seymour Bay Drive	Service Road	13	11	13	2	40	
Beach Drive	Service Road	2	16	8	2	40	Dirt road – No posted speed
Arbutus Bay Lane	Service Road	13	21	19	2	40	Includes one-lane bridge with yield condition. No posted speed

All streets within the study area have very low traffic volumes today. The streets within the study area generally do not provide sufficient width for parking. While some streets do not have signed speed limits and legally operate at 40km/hr, the pavement condition, width, and meandering routes mean operating speeds are likely lower.

A summary of existing mobility infrastructure around the site is shown in Figure 10.

Figure 10- Existing Mobility Context

2.3 EXISTING SITE MODE SHARE

Essentially all trips to and from Cowan Point today are expected to be by vehicle. Because of limited connectivity for active transportation infrastructure, and significant grades and distances to destinations in Snug Cove, cycling and walking trips within Cowan Point are likely recreational in nature (i.e. to the beach, golf course, or pure recreation without a destination). There is no existing public transit access. For the purposes of this assessment, 100% of trips are assumed to be by vehicle.

2.4 EXISTING VOLUMES

Existing traffic volumes are based on multimodal turning movement counts conducted in early December 2024. These traffic counts have been used to estimate existing trip generation rates for residences at Cowan Point as an input to future expected volumes in Section 6.

Table 5 - Turning Movement Count Locations and Dates

Intersection	Count Dates and Times	Count Type
Cowan Point Dr, at Fairweather Rd.	Wednesday, Dec. 4, 2024	AM, Midday and PM Peak
Cowan Point Dr. at Seymour Bay Rd.	Wednesday, Dec. 4, 2024	AM, Midday and PM Peak
Cowan Point Dr. at Arbutus Bay Ln./Beach Dr,	Wednesday, December 4, 2024	AM, Midday and PM Peak

Counts include passenger vehicles, trucks, bicycles and pedestrians.

Counts were completed in December when the golf course was not in operation, and seasonal traffic is expected to be lower than in the summer months. To account for this, two adjustments were applied.

1. Golf course trips were estimated using Institute of Transportation Engineers (ITE) rates for golf courses. This results in approximately 16 am peak hour trips and 26 pm peak hour trips. As the ITE Trip Generation Manual does not include midday trip rates for the relevant land uses, PM peak hour rates were used as an estimate.
2. A seasonal adjustment factor was applied to all background volumes, increasing them by 27% compared to observed rates. This adjustment was derived by taking the ratio of BC Ferries passenger vehicle traffic volumes for December and comparing it to the busiest month (August).

Adjusted peak hour traffic volumes within the study area are shown in Figure 11. Volumes within the study area today are very low. Few pedestrians or cyclists were observed.

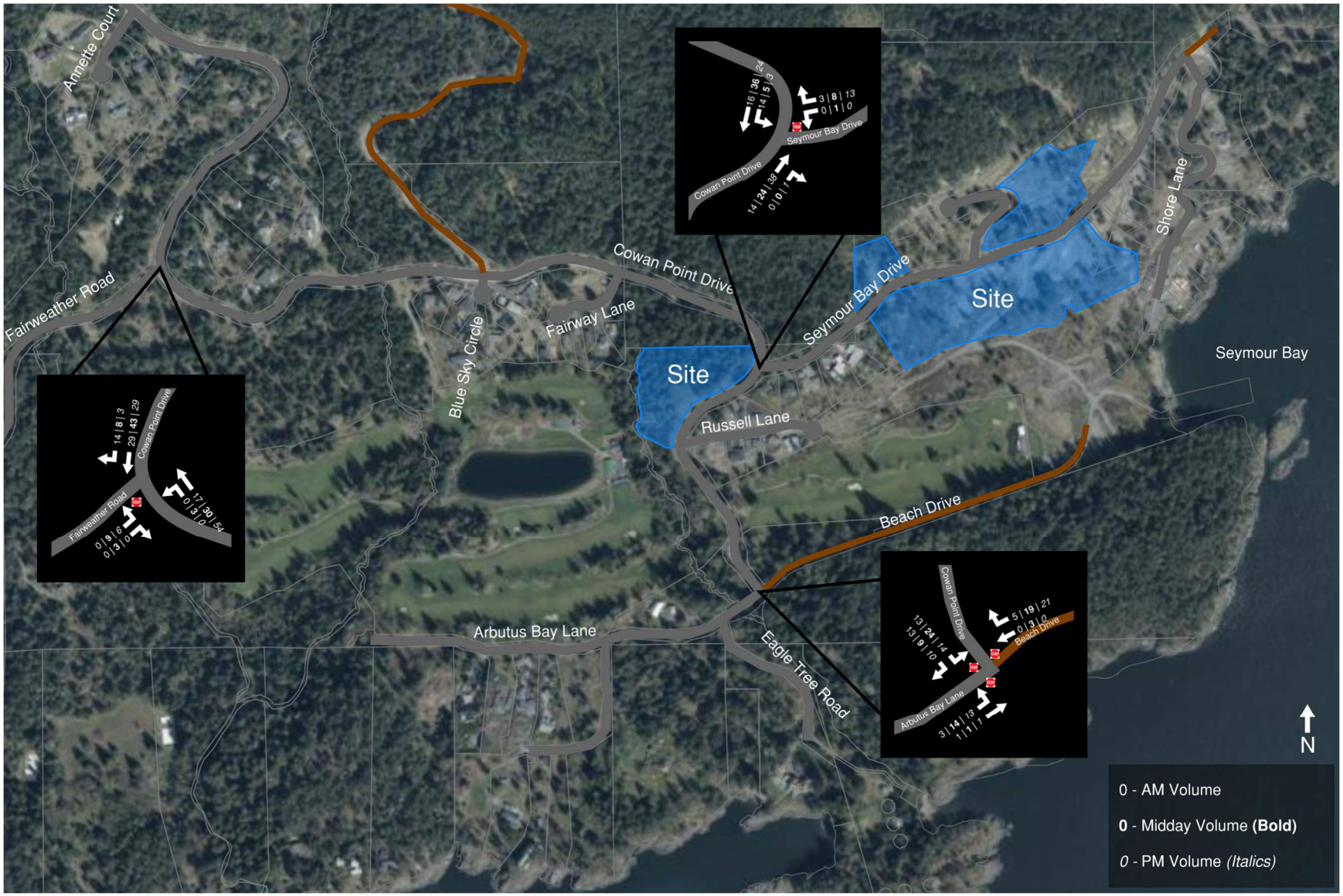

Figure 11 – Adjusted Existing Peak Hour Vehicle Traffic Volumes

3 EXISTING MOBILITY LEVEL OF SERVICE

3.1 NON-VEHICLE MODES QUALITATIVE LEVEL OF SERVICE METHODOLOGY

Analysis of walking, rolling, cycling and transit service in this report is qualitative, and informed by the existing conditions observed during a site visit and outlined in Section 2.2.

3.2 EXISTING WALKING AND ROLLING SERVICE QUALITY

Few people walking or rolling were observed as part of the traffic count program, with a total of only 5 pedestrians recorded throughout the study period at all three intersections combined. This may be partially due to people using the trail network and not being visible to the counting cameras. Seasonality may also play a role since counts and the site visit were conducted in December.

At the intersection of Cowan Point Drive and Seymour Bay Drive, pedestrian access to the trail network is limited. Currently, trail users must cross or walk through a roadside ditch, presenting a barrier to safe and convenient access. While the trail along Cowan Point Drive is continuous and features marked crossings, there is no formal pedestrian connection along Seymour Bay Drive to provide direct and accessible access from the Development. This is not a significant issue today as traffic volumes on Seymour Bay Drive are low.

During a site visit, sections of the trail were challenging to navigate due to puddles and mud. Some sections were also slippery due to exposed bare rock surfaces. The quality of the trail may reduce the ability for some to use it, and who instead may walk along Cowan Point Drive.

3.3 EXISTING CYCLING SERVICE QUALITY

As discussed in Section 2.2, cycling access to the site is limited to mixed traffic on Cowan Point Drive. The grades along Cowan Point Drive are steep in places, which would lead to slower cycling speeds and increased friction between people cycling and driving.

Cycling access is also challenging along the trail adjacent to Cowan Point Drive due to numerous rocky sections. Although mountain bikes may be able to traverse the path, it does not provide access for all ages and abilities.

Overall, cycling within Cowan Point is expected to be comfortable for some cyclists, in particular recreational road cyclists, and those with e-bikes. Low traffic volumes and a 40km/hr speed limit are conducive to people cycling on street.

3.4 EXISTING TRANSIT ACCESS QUALITY

No data is available on the use of the Bowen Lift stop on Cowan Point and no use of the stop was observed during the site visit. Transit service to Cowan Point is poor, with no scheduled transit connectivity and a need to rely on informal ride hailing networks along a low volume road.

3.5 VEHICLE OPERATIONAL ANALYSIS METHODOLOGY

Vehicle volumes have been analysed using Synchro 11, including bicycles (where observed) as part of mixed traffic. Assumptions and considerations included in the analysis are that:

- The am peak is 7:15am to 8:15am, the Midday peak is 11:00am to 12:00pm and the pm peak is 3:00pm to 4:00pm.
- Existing peak hour factors (PHF) were inputted by approach for existing and future no-development conditions.
- For future conditions with development, existing PHF were maintained. However, very low PHF below 0.5 were raised to 0.5 where development traffic is assigned.
- The heavy vehicle percentages (HVP) were set at 2% for all movements.
- Unsignalized intersections are assessed using HCM6 all-way stop control (AWSC) or two-way stop control (TWSC) methodology, as the case may be.
- Traffic controls at the intersection of Arbutus Bay Lane, Beach Drive and Cowan Point Drive are non-standard, with no stop sign present along Arbutus Bay Lane, and stop controls along both Cowan Point Drive and Beach Drive which are perpendicular to one another. Operations have been modelled as an all way stop intersection.

Outputs reported (where available) include volume, delay, Level of Service (LOS) and 95th percentile queue for each lane group, as well as the overall intersection LOS. Synchro outputs for all traffic analyses are provided in Appendix A.

Thresholds for reporting Level of Service are shown in Table 6, with poor Level of Service coloured as indicated. In addition to LOS reporting, queue lengths exceeding storage or extending to an adjacent intersection are highlighted in red. Note that there are no signalized intersections within the study area.

Table 6 – Unsignalized Intersection Level of Service Criteria

LOS	Description	Control Delay (s)	
		Signalized Int.	Unsignalized Int.
A	Free Flow	≤ 10	≤ 10
B	Reasonably Free Flow	>10-20	>10-15
C	Steady Flow	>20-35	>15-25
D	Approaching Unstable Flow	>35-55	>25-35
E	Unstable Flow/At Capacity	>55-80	>35-50
F	Forced/Breakdown Flow	>80	>50

3.6 EXISTING VEHICLE OPERATIONS

Vehicle operations for existing conditions are summarized in Table 7, Table 8, and Table 9 for AM, midday and PM periods, respectively.

Table 7 - Existing AM Peak Hour Vehicle Operations

ID	Location	Control	MOE	Approach																Overall LOS
				EB				WB				NB				SB				
				EBL	EBT	EBR	Tot	WBL	WBT	WBR	Tot	NBL	NBT	NBR	Total	SBL	SBT	SBR	Tot	
1	Cowan Point Drive & Fairweather Road	Minor Stop Control	Vol.	0		0	0					0	17		17		29	14	43	A
			Delay	-			0					0	-		0		-	-	0	
			LOS	-			A					A	-		A		-	-	A	
			95% Q (m)	-								0	-				-	-		
2	Cowan Point Drive & Seymour Bay Drive	Minor Stop Control	Vol.					0		3	3		14	0	14	14	16		30	A
			Delay					9			9				0	7	0		3	
			LOS					A			A				A	A	A		A	
			95% Q (m)					0								0	-			
3	Cowan Point Drive & Arbutus Bay Lane	All Way Stop Control	Vol.	3	1		4		0	5	5					13		13	26	A
			Delay				7				7								7	
			LOS				A				A								A	
			95% Q (veh)				0.1				0								0.2	

Table 8 - Existing Midday Peak Hour Vehicle Operations

ID	Location	Control	MOE	Approach																Overall LOS
				EB				WB				NB				SB				
				EBL	EBT	EBR	Tot	WBL	WBT	WBR	Tot	NBL	NBT	NBR	Total	SBL	SBT	SBR	Tot	
1	Cowan Point Drive & Fairweather Road	Minor Stop Control	Vol.	9		3	12					3	30		33		43	8	51	A
			Delay	9			9					7	0		1		-	-	0	
			LOS	A			A					A	A		A		-	-	A	
			95% Q (m)	0.1								0	-				-	-		
2	Cowan Point Drive & Seymour Bay Drive	Minor Stop Control	Vol.					1		8	9		24	0	24	5	36		41	A
			Delay					9			9		-	-	0	7	0		1	
			LOS					A			A		-	-	A	A	A		A	
			95% Q (m)					0					-	-		0	-			
3	Cowan Point Drive & Arbutus Bay Lane	All Way Stop Control	Vol.	14	1		15		3	19	22					24		9	33	A
			Delay				7				7								7	
			LOS				A				A								A	
			95% Q (veh)				0.1				0.1								0.2	

Table 9 - Existing PM Peak Hour Vehicle Operations

ID	Location	Control	MOE	Approach																Overall LOS
				EB				WB				NB				SB				
				EBL	EBT	EBR	Tot	WBL	WBT	WBR	Tot	NBL	NBT	NBR	Total	SBL	SBT	SBR	Tot	
1	Cowan Point Drive & Fairweather Road	Minor Stop Control	Vol.	6		0	6					0	54		54		29	3	32	A
			Delay	9			9					0	-		0		-	-	0	
			LOS	A			A					A	-		A		-	-	A	
			95% Q (m)	0								0	-				-	-		
2	Cowan Point Drive & Seymour Bay Drive	Minor Stop Control	Vol.					0		13	13		38	1	39	3	24		27	A
			Delay					9			9		-	-	0	7	0		1	
			LOS					A			A		-	-	A	A	A		A	
			95% Q (m)					0.1					-	-		0	-			
3	Cowan Point Drive & Arbutus Bay Lane	All Way Stop Control	Vol.	13	1		14		0	21	21					14		10	24	A
			Delay				7				7								7	
			LOS				A				A								A	
			95% Q (veh)				0.1				0.1								0.3	

All intersections within the study area operate well today and no issues have been identified. Volumes in the study area today are low, even after accounting for seasonality and the effects of the golf course.

3.7 EXISTING SITE TRIP GENERATION

The Site is undeveloped today; therefore no existing site vehicle volumes are expected. Trips generated by single family homes near the site are included in the background data collected. Note that some construction traffic was observed on the Site during a site visit so the counted volumes may be slightly conservative.

4 FUTURE CONDITIONS

No significant mobility infrastructure projects have been identified in the study area. Therefore, the future mobility network is expected to be the same as existing. While a future cycling route has been identified to Cowan Point, it is not expected to proceed prior to the proposal development. Future conditions around the site are assessed for two scenarios:

- Future no-development conditions,
- Opening day conditions with the full development built.

4.1 COWAN POINT RESIDENTIAL TRIP GENERATION RATES

Residential uses on Bowen Island are different from those in typical communities. The number of vehicle trips generated by Bowen Island residences was estimated based on survey data. To estimate this, the number of peak hour trips generated by residential properties along Fairweather Road and Arbutus Lane were divided by the number of residences along these roads. Similar to the existing background volumes, a 27% increase is applied to account for seasonality. This is summarized in Table 10.

Table 10 - Residential Trip Rate Estimation

Road	Unit Count	AM Trips	AM Rate per Unit	Midday Trips	Midday Rate per Unit	PM Trips	PM Rate per Unit
Fairweather Road	28	11	0.39	20	0.71	15	0.54
Arbutus Lane	26	13	0.50	21	0.81	19	0.73
Weighted Average			**0.44**		**0.76**		**0.63**
Seasonal Adjusted			**0.57**		**0.97**		**0.80**

These rates are lower than typical single family residential trip rates per unit for the am and pm. Typical single family homes generate about 0.70 trips in the am peak and 0.94 in the pm peak. On Cowan Point, residential trip rates peak at 0.97 per unit midday, which is higher than the 0.82 trips per unit estimated for typical single family homes using ITE data.

Directionality (i.e. whether trips are entering or exiting) was also estimated using the same method as shown in Table 11.

Table 11 - Residential Trip Directionality

Road	AM		Midday		PM	
	IN %	OUT %	IN %	OUT %	IN %	OUT %
Fairweather Road	64%	36%	45%	55%	20%	80%
Arbutus Lane	77%	23%	43%	57%	42%	58%
Weight Average	**70%**	**30%**	**44%**	**56%**	**31%**	**69%**

Directional distributions are reversed from typical residential uses in the am and pm, with primarily inbound trips in the am peak and outbound trips in the pm peak period.

Trip generation rates for multifamily residential, including attached, duplex and townhouse residences, as well as apartment buildings, are lower than for single family homes. Since the existing data is primarily for single family homes and the proposed development is composed of attached and apartment dwellings, the observed trip rates have been adjusted. The adjustment is based on the ratio of ITE trip generation rates for single family homes compared to single family attached and multi-family low rise residential uses. This is shown in Table 12.

Table 12 - Cowan Point Residential Trip Rate Estimates

Land Use	AM			Midday			PM		
	ITE Rate	Vs. Single Family Rate	Cowan Point Rate	ITE Rate	Vs. Single Family Rate	Cowan Point Rate	ITE Rate	Vs. Single Family Rate	Cowan Point Rate
Single Family Detached	0.7	-	**0.57**	0.82	-	**0.97**	0.94	-	**0.80**
Single Family Attached	0.48	69%	**0.39**	0.53	65%	**0.62**	0.57	61%	**0.49**
Multi-Family (Low Rise)	0.4	57%	**0.32**	0.46	56%	**0.54**	0.51	54%	**0.44**

The residential trip rates in Table 12 and directionality in Table 11 are used for future residential units on Cowan Point.

4.2 FUTURE NO-DEVELOPMENT TRAFFIC VOLUMES

Since no other land use changes are proposed at Cowan Point, little background traffic growth is expected. Therefore, future conditions without development are generally expected to be the same as existing conditions.

There will be some background traffic growth along Seymour Bay Drive due to additional single family residential development on existing lots. There are approximately 18 undeveloped lots along this road and volumes along Seymour Bay Drive is included to account for this based on the observed trip rate per unit for homes on Cowan Point. This adds 10 am trips, 17 midday trips, and 14 pm trips.

Total traffic volumes for the no-development scenario are shown in Figure 12.

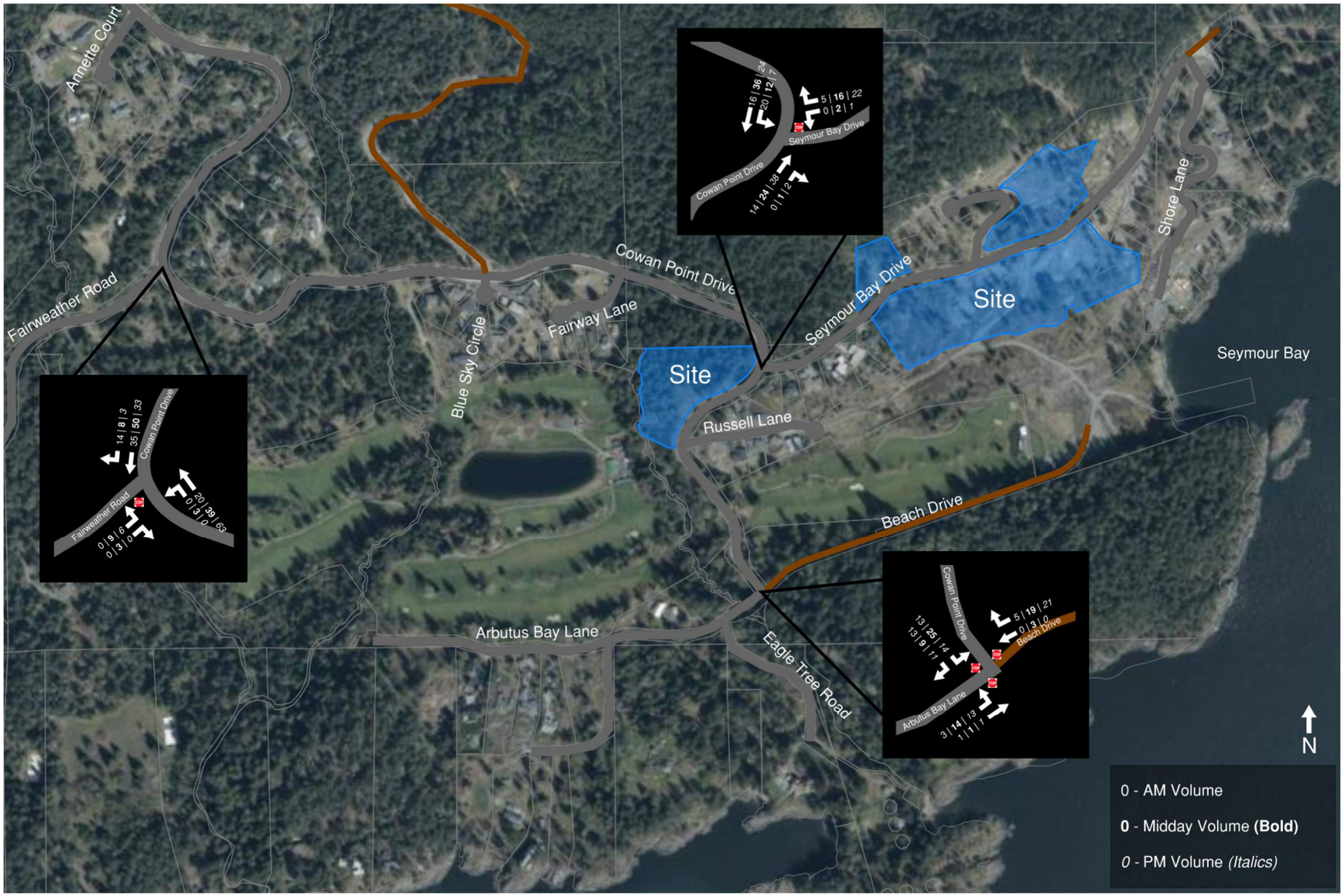

Figure 12 - Future No Development Total Vehicle Volumes

4.3 SITE TRIP GENERATION

Site trips are calculated using the estimated trip generation rates for residential uses, and ITE trip generation rates for non-residential uses. For simplicity, the recreational land use is treated separately, as this is accessed from a different location. Land uses and trip rates are summarized in Table 13.

Table 13 - Base Development Trip Generation Rates

Land use (ITE Code)	Size	AM Peak	In	Out	Midday Peak	In	Out	PM Peak	In	Out
Single Family Attached	140 Units	0.39	70%	30%	0.62	44%	56%	0.49	31%	69%
Multi-Family Low Rise	20 Units	0.32	70%	30%	0.54	44%	56%	0.44	31%	69%
330 - Hotel	30 Rooms	0.32	72%	28%	0.50	60%	40%	0.41	43%	57%
932 - Restaurant	300 m2	9.57	55%	45%	13.12	50%	50%	9.05	61%	39%
712 - Office	250 m2	1.67	82%	18%	2.42	43%	57%	2.16	34%	66%
822 - Retail	250 m2	2.36	60%	40%	7.86	50%	50%	9.59	50%	50%

The mix of uses within the development allows for some trips to be made without leaving the Site. This may include trips like residents visiting the restaurant, or hotel guests shopping at the on-site retail. Internal trip capture methodology as outlined in NCHRP report 684 was used to estimate this effect. About 11% of AM trips and 29% of PM trips are expected to be internal to the site. The NCHRP methodology does not assess midday trips and so the average of the am and pm is used, 20%.

The resulting total site trips, including all adjustments are shown in Table 14.

Table 14 - Total Site Trips

AM Trips			Midday Trips			PM Trips		
Total Trips	In	Out	Total Trips	In	Out	Total Trips	In	Out
100	66	34	147	68	79	107	41	66

4.3.1 RECREATION AREA TRIPS

The usage of the recreation space is currently under development. The approximately 3-acre parcel may include indoor gathering spaces, sports amenities like pickleball courts, and more passive recreation features like trails and picnic areas. The uses are intended to serve the local community and are therefore expected to primarily

generate active transportation trips from within the neighbourhood, as well as a small number of vehicle trips from further away.

While the facility may host events on occasion, these are anticipated to occur infrequently and are not expected to significantly impact typical transportation patterns. For example, events could include a weekend artisan market or private social events, which would generally be on weekends or off-peak hours.For the purposes of this study, the recreational parcel is assumed to generate 10 vehicle trips in each of the three assessed peak and split evenly between inbound and outbound trips. This is a relatively small portion of the overall trips generated by the Development.

4.4 SITE TRIP DISTRIBUTION

Distribution of new trips within the study area is informed by the prevailing background vehicle traffic volumes which are primarily to and from the remainder of the island outside of Cowan Point. In the analysis, 90% of vehicles are expected to travel along Cowan Point Drive, either coming from or returning to outside of the Cowan Point area. The remaining 10% of vehicle volumes exit the study area to Beach Drive and Arbutus Bay Drive, split evenly between the two roads.

Total vehicle volumes for the future with Development condition are shown in Figure 13.

Figure 13 - Future With Development Vehicle Volumes

5 FUTURE NO DEVELOPMENT MOBILITY SERVICE QUALITY

Future background traffic has been assessed based on the traffic volumes according to the same methodology as the existing operations in Section 3.

5.1 FUTURE BACKGROUND VEHICLE OPERATIONS

Analysis of future background traffic for the 2026 Opening Day scenario is shown in Table 15, Table 16, and Table 17.

Table 15 – Future No Development AM Peak Hour Vehicle Operations

ID	Location	Control	MOE	Approach																Overall LOS
				EB				WB				NB				SB				
				EBL	EBT	EBR	Tot	WBL	WBT	WBR	Tot	NBL	NBT	NBR	Total	SBL	SBT	SBR	Tot	
1	Cowan Point Drive & Fairweather Road	Minor Stop Control	Vol.	0		0	0					0	20		20		35	14	49	A
			Delay	-			0					0	-		0		-	-	0	
			LOS	-			A					A	-		A		-	-	A	
			95% Q (m)	-								0	-				-	-		
2	Cowan Point Drive & Seymour Bay Drive	Minor Stop Control	Vol.					0		5	5		14	0	14	20	16		36	A
			Delay					9			9				0	7	0		3	
			LOS					A			A				A	A	A		A	
			95% Q (m)					0.1								0.1	-			
3	Cowan Point Drive & Arbutus Bay Lane	All Way Stop Control	Vol.	3	1		4		0	5	5					13		13	26	A
			Delay				7				7								7	
			LOS				A				A								A	
			95% Q (veh)				0.1				0								0.2	

Table 16 - Future No Development Midday Peak Hour Vehicle Operations

ID	Location	Control	MOE	Approach																Overall LOS
				EB				WB				NB				SB				
				EBL	EBT	EBR	Tot	WBL	WBT	WBR	Tot	NBL	NBT	NBR	Total	SBL	SBT	SBR	Tot	
1	Cowan Point Drive & Fairweather Road	Minor Stop Control	Vol.	9		3	12					3	39		42		503	8	51	A
			Delay	9			9					7	0		1		-	-	0	
			LOS	A			A					A	A		A		-	-	A	
			95% Q (m)	0.1								0	-				-	-		
2	Cowan Point Drive & Seymour Bay Drive	Minor Stop Control	Vol.					2		16	18		24	1	25	12	36		48	A
			Delay					9			9		-	-	0	7	0		2	
			LOS					A			A		-	-	A	A	A		A	
			95% Q (m)					0.1					-	-		0	-			
3	Cowan Point Drive & Arbutus Bay Lane	All Way Stop Control	Vol.	14	1		15		3	19	22					25		9	33	A
			Delay				7				7								7	
			LOS				A				A								A	
			95% Q (veh)				0.1				0.1								0.2	

Table 17 - Future No Development PM Peak Hour Vehicle Operations

ID	Location	Control	MOE	Approach																Overall LOS
				EB				WB				NB				SB				
				EBL	EBT	EBR	Tot	WBL	WBT	WBR	Tot	NBL	NBT	NBR	Total	SBL	SBT	SBR	Tot	
1	Cowan Point Drive & Fairweather Road	Minor Stop Control	Vol.	6		0	6					0	63		63		33	3	36	A
			Delay	9			9					0	-		0		-	-	0	
			LOS	A			A					A	-		A		-	-	A	
			95% Q (m)	0								0	-				-	-		
2	Cowan Point Drive & Seymour Bay Drive	Minor Stop Control	Vol.					1		22	23		38	2	40	7	24		31	A
			Delay					9			9		-	-	0	7	0		2	
			LOS					A			A		-	-	A	A	A		A	
			95% Q (m)					0.2					-	-		0	-			
3	Cowan Point Drive & Arbutus Bay Lane	All Way Stop Control	Vol.	13	1		14		0	21	21					14		11	25	A
			Delay				8				7								7	
			LOS				A				A								A	
			95% Q (veh)				0.1				0.1								0.3	

Future operations without development, including vehicle traffic from completion of homes on already subdivided parcel near the study area, is similar to existing conditions. No movements meet reporting thresholds.

6 FUTURE POST DEVELOPMENT MOBILITY SERVICE QUALITY

Future total traffic with the Development has been assessed according to the same methodology as the existing operations in Section 3.

6.1 FUTURE WITH DEVELOPMENT TRAFFIC OPERATIONS

Operations for opening day 2026 total traffic conditions have been assessed and are presented in Table 18, Table 19, and Table 20 for the AM, midday and PM peak periods respectively.

Table 18 – Future With Development AM Peak Hour Vehicle Operations

ID	Location	Control	MOE	Approach																Overall LOS
				EB				WB				NB				SB				
				EBL	EBT	EBR	Tot	WBL	WBT	WBR	Tot	NBL	NBT	NBR	Total	SBL	SBT	SBR	Tot	
1	Cowan Point Drive & Fairweather Road	Minor Stop Control	Vol.	0		0	0					0	56		56		100	14	114	A
			Delay	-			0					0	-		0		-	-	0	
			LOS	-			A					A	-		A		-	-	A	
			95% Q (m)	-								0	-				-	-		
2	Cowan Point Drive & Seymour Bay Drive	Minor Stop Control	Vol.	5	0	0	5	4	0	36	40	0	14	7	21	80	16	5	101	A
			Delay	12			12	9			9	0	-	-	0	8	0	-	6	
			LOS	B			B	A			A	A	-	-	A	A	A	-	A	
			95% Q (m)	0				0.3				0	-	-		0.3	-	-		
3	Cowan Point Drive & Arbutus Bay Lane	All Way Stop Control	Vol.	3	1		4		0	5	5					13		13	26	A
			Delay				7				7								7	
			LOS				A				A								A	
			95% Q (veh)				0.1				0								0.2	

Table 19 – Future With Development Midday Peak Hour Vehicle Operations

ID	Location	Control	MOE	Approach																Overall LOS
				EB				WB				NB				SB				
				EBL	EBT	EBR	Tot	WBL	WBT	WBR	Tot	NBL	NBT	NBR	Total	SBL	SBT	SBR	Tot	
1	Cowan Point Dive. & Fairweather Road	Minor Stop Control	Vol.	9		3	12					3	116		119		117	8	125	A
			Delay	11			11					8	0		0		-	-	0	
			LOS	B			B					A	A		A		-	-	A	
			95% Q (m)	0.1								0	-				-	-		
2	Cowan Point Drive & Seymour Bay Drive	Minor Stop Control	Vol.	5	0	0	5	10	0	88	98	0	24	8	32	74	36	5	115	A
			Delay	14			14	9.7			9.7	0	-	-	0	8	0	-	5	
			LOS	B			B	A			A	A	-	-	A	A	A	-	A	
			95% Q (m)	0				0.7				0	-	-		0.3	-	-		
3	Cowan Point Drive & Arbutus Bay Lane	All Way Stop Control	Vol.	18	1		19		3	22	25					29		13	42	A
			Delay				7				7								7	
			LOS				A				A								A	
			95% Q (veh)				0.1				0.1								0.2	

Table 20 – Future With Development PM Peak Hour Vehicle Operations

ID	Location	Control	MOE	Approach																Overall LOS
				EB				WB				NB				SB				
				EBL	EBT	EBR	Tot	WBL	WBT	WBR	Tot	NBL	NBT	NBR	Total	SBL	SBT	SBR	Tot	
1	Cowan Point Drive & Fairweather Road	Minor Stop Control	Vol.	6		0	0					0	128		128		75	3	78	A
			Delay	10			10					0	-		0		-	-	0	
			LOS	B			B					A	-		A		-	-	A	
			95% Q (m)	0.1								0	-				-	-		
2	Cowan Point Drive & Seymour Bay Drive	Minor Stop Control	Vol.	5	0	0	5	8	0	81	89	0	38	6	44	43	24	5	72	A
			Delay	13			13	9.7			9.7	0	-	-	0	8	0	-	5	
			LOS	B			B	A			A	A	-	-	A	A	A	-	A	
			95% Q (m)	0				0.7				0	-	-		0.2	-	-		
3	Cowan Point Drive & Arbutus Bay Lane	All Way Stop Control	Vol.	15	1		16		0	23	23					18		14	32	A
			Delay				7				7								7	
			LOS				A				A								A	
			95% Q (veh)				0.1				0.2								0.4	

Future operations are good, with no movements exceeding level of service B, and minimal queueing expected.

6.2 POTENTIAL BC FERRIES IMPACTS

The Horseshoe Bay to Snug Cove BC Ferries route is the primary connection on and off of the island for residents and visitors. From the 2018 transportation survey we estimate that about 15% of all trips to or from Cowan Point are off-island trips. This is shown previously in Figure 5. Analysis of 2023/2024 data from BC Ferries indicates that about 42% of all ferry passengers are vehicle drivers (excluding trucks and buses).

While not all off-island trips use the BC Ferry, with some people using water taxis, floatplanes, or personal boats we expect about 6.4% of all trips are vehicle driver trips to the ferry (42% driers out of the 15% of trips to the ferry). The proposed development is expected to generate between 100 and 147 external vehicle trips in each peak hour which would mean between 7 and 12 ferry vehicle driver trips in each peak hour. This is broken down by peak hour and direction in Table 21.

Table 21 - Potential Ferry Trips Generated

AM Trips			Midday Trips			PM Trips		
Total Trips	In	Out	Total Trips	In	Out	Total Trips	In	Out
7	5	2	12	6	6	10	4	6

The Queen of Capilano has capacity for about 100 cars and 427 passengers, as reported by BC Ferries. The route runs each day from early in the morning from 5:15am to late in the evening at about 11:30pm. There are typically 15 to 16 sailings each day with headways ranging from 45 minutes during busy periods, to 80 minutes through the middle of the day. Due to trucks and buses, actual vehicle capacity may be less than 100 vehicles.

Existing utilization of the Horseshoe Bay to Snug Cove route was assessed in detail as part of the Cape Roger Curtis Regional Park Transportation Impact Assessment (Bunt & Associates, 2023). This work has been referenced here to understand peak period utilization of ferry capacity. Note that a freedom of information request was made to BC Ferries for updated information on passenger and vehicle volumes on this route, but this was rejected due to concerns about commercial sensitivity of this information.

The Cape Roger Curtis analysis indicates that passenger volumes during July of 2022 were highest on Saturdays, when up to 80% of capacity was used on the busiest sailings. For the Snug Cove to Horseshoe Bay direction, this peak was in the evening, and for the Horseshoe Bay to Snug Cove direction, the peak was in the late morning.

During the week, capacity utilization peaked at about 60% in the late morning and midday periods from Horseshoe Bay to Snug Cove, and at about 55% in the early evening from Snug Cove to Horseshoe Bay.

Vehicle capacity is more constrained, with about 100 vehicles, or sometimes slightly more, indicated for many sailings. From Snug Cove to Horseshoe Bay, weekday mornings from 7:00am to 10:00am were busiest, with average occupancy from 81 to 104 vehicles. Sunday midday sailings were busiest on the weekends with 90 to 94 vehicles. From Horseshoe Bay to Snug Cove, weekday afternoons between 3:00pm and 6:00pm were busiest (90 to 103 vehicles). Saturday late morning sailings were the busiest weekend period (about 95 vehicles).

Tourism Bowen Island has published a guide to busy times for the ferry during the peak, shoulder, and off-peak periods. Their guideline also includes advice to manage demand and encourage travel during less busy periods or without a car. Figure 14 shows available capacity by sailing throughout the year.

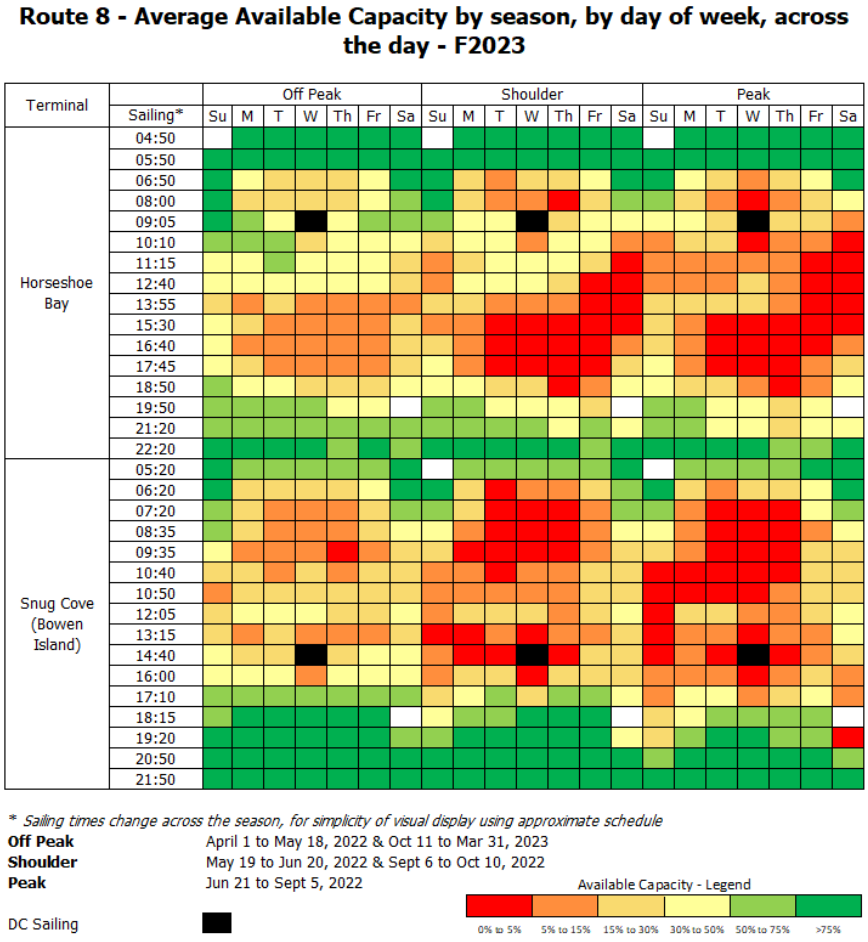

Figure 14 - Available Ferry Capacity (Tourism Bowen Island)

This suggests that the ferry operates at or near capacity during peak periods, resulting in the potential missed sailings.

Because the ferry is at or near capacity during peak periods in the summer, the additional demand generated by the proposed development may contribute incrementally to existing delays. However, the total number of ferry driver trips expected in any direction is six or fewer, which is unlikely to materially change conditions. With existing capacity available outside of peak periods, there is an opportunity for further peak spreading to occur, where demand reallocates based on available supply. There is also significant capacity for non-driver passengers, with at most about 80% of capacity used. Additional transit service, car share, and other strategies may help to reduce the number of vehicles accessing the ferry generally.

Finally, the proposed development is expected to take shape over fifteen years or more. This means any increases to ferry driver travel would happen over a long period of time. During this time period, additional ferry capacity may become available to support travel growth, either through expanded BC Ferries service, or from private ferry services like the proposed Seymour Bay passenger ferry.

7 DISCUSSION ON OPERATIONS, DEFICIENCIES AND POTENTIAL MITIGATIONS

7.1 TRAFFIC OPERATIONS

Overall, the analysis estimates that traffic impacts from the proposed development will be acceptable with good Levels of Service and minimal queuing across all study intersections and time periods. Vehicle volumes are low, from a traffic management perspective, in all assessed periods.

7.2 INTERSECTIONS OF INTEREST

7.2.1 COWAN POINT DRIVE AND SEYMOUR BAY DRIVE

The proposed outdoor recreation space is currently shown to create a four-legged intersection with Cowan Point Drive and Seymour Bay Drive. The location of this leg of the intersection is on the inside of a turn and on a slope. Based on our site visit, this location is like to have poor sight lines due to the curve and extensive vegetation along Cowan Point Drive.

Relocation of the access to midway between Seymour Bay Drive and Russell Lane is recommended to offer improved sight lines and safety.

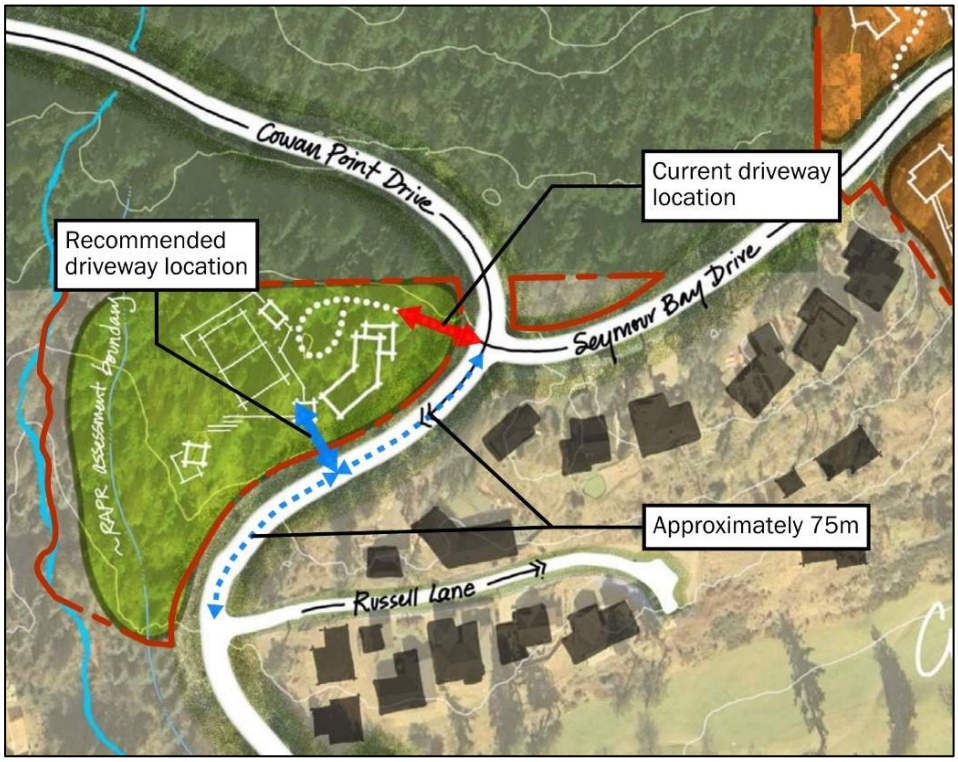

Figure 15 - Recommended Relocation of Outdoor Recreation Driveway Access (Modified from MODUS)

This location is approximately 75m from both Seymour Bay Drive and Russell Lane, which is an acceptable intersection spacing.

Pedestrian access to the trail network is poor from Seymour Bay Drive today. Improvements are recommended to support pedestrian access to the trail and improve safety for those walking along Seymour Bay Drive. This would include:

- A marked pedestrian crossing of Cowan Point Drive on the south side of Seymour Bay Drive.
- A new walking connection along the south side of Seymour Bay Drive connecting to the Site. This should be an accessible connection if possible.
- A new walking connection across the existing ditch to access the existing trail. This should be an accessible connection, if possible, in order to facilitate future improvements to the trail.

The general arrangement of these improvements is shown in Figure 16.

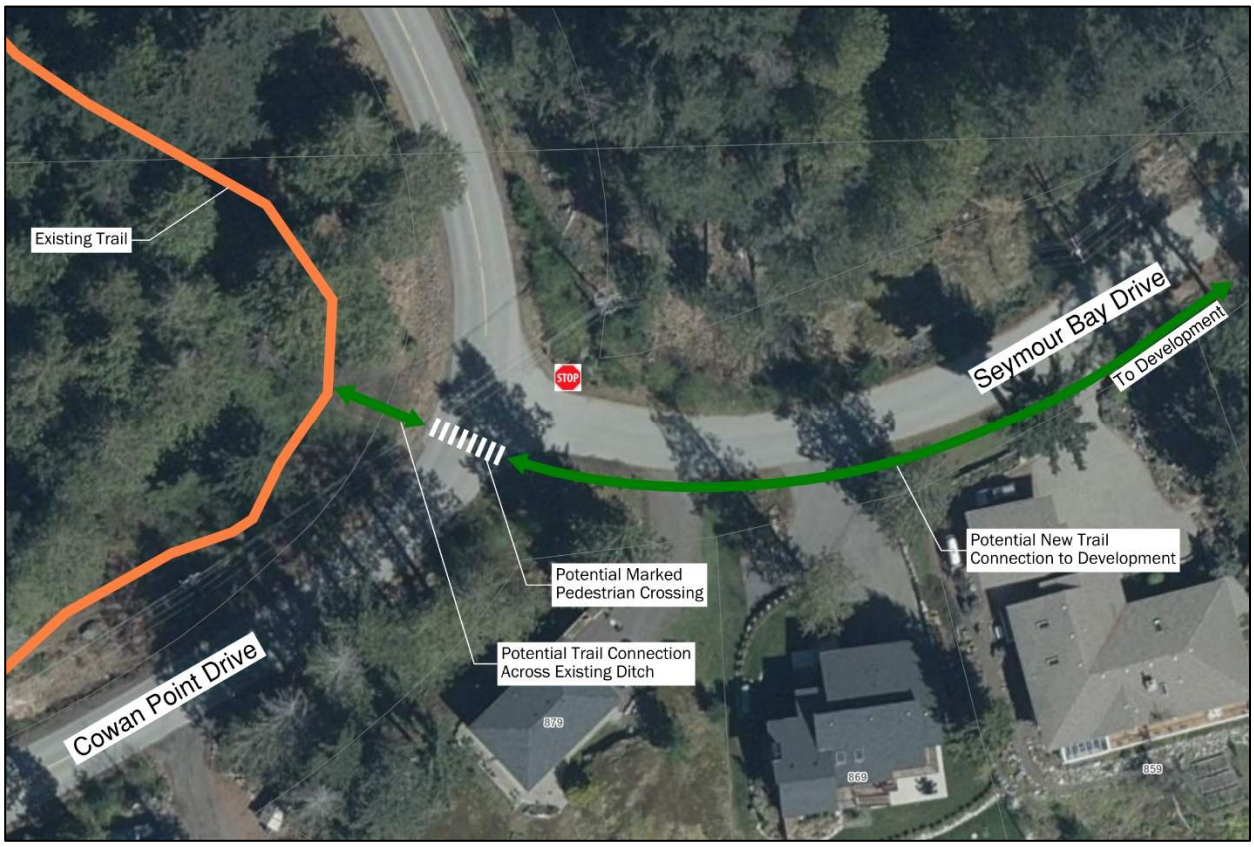

Figure 16 - Pedestrian Improvements at Cowan Point Drive and Seymour Bay Drive

New intersection lighting may also be considered to facilitate safer pedestrian crossings, although this may generate nuisance lighting for nearby residents.

7.2.2 ARBUTUS BAY LANE AT COWAN POINT DRIVE

Signage at this location should be adjusted to an all way stop condition. This will address the existing non-standard signage. A minor stop control was also considered, with a stop sign on Cowan Point Drive and free movement along Arbutus Bay Lane. However, due to the proximity of a single lane bridge on Arbutus Bay Lane,

an all way stop condition is expected to offer better safety performance by reducing all vehicle speeds through the intersection.

8 TRANSPORTATION DEMAND MANAGEMENT (TDM)

TDM represents an opportunity to reduce vehicle driver trips in new developments. TDM is a set of strategies aimed at providing and maximizing the utility of sustainable transportation choices. TDM is used to manage traffic and parking demands and enhance the effectiveness of non-personal vehicle transportation. TDM can include programmatic measures that aim to encourage behaviour shifts by providing financial subsidies and information to support non-personal auto travel, and fees and disincentives to deter personal auto travel. In buildings, TDM can also include built infrastructure that goes above and beyond typical requirements to support sustainable transportation choices.

Bowen Island Municipality does not have a formal TDM strategy or policy for land development projects.

This section discusses several potential TDM strategies that may be considered as part of the development plan in order to better support sustainable transportation. These measures are listed roughly based on their expected effectiveness at changing travel behaviour, cost, and complexity of implementation.

1. **Shuttle Services**: Implement a community shuttle service that connects the Development to key amenities, such as grocery stores, schools, and transit hubs. This can reduce the need for individual car trips and could be an initial step towards transit service in Cowan Point. While effective, this is expected to be a more expensive than other measures due to the need for ongoing staffing and equipment. Connections to the ferry may be effective at reducing ferry driver trips in the absence of public transit service.
2. **Carpooling and Ridesharing Programs**: Encourage residents to carpool or use ridesharing services. This can be facilitated through a community app or bulletin board where residents can coordinate trips. This is similar to the existing Bowen LIFT system, but could be supported through a new online portal and improved waiting locations with enhanced lighting, seating and weather protection.
3. **Shared Electric Bike and Scooter**: Provide electric bike and scooter rentals to make it easier for residents to navigate the hilly terrain near the site. This may be paid or free, depending on the user. This measure may be most effective for hotel guests.
4. **On-Demand Transit**: Work with TransLink to provide on-demand transit services that can be booked via an app. This flexible service can reduce the need for personal vehicle use. On-demand transit was tested on Bowen Island previously, although uptake was low. The additional population on Cowan Point may make this type of service more feasible today.
5. **Shared Workspaces**: Create shared workspaces within the development that residents can use for remote work. This may reduce the need for commuting, which was a primary generator of vehicle trips as well as ferry vehicle trips.
6. **Community Car Share**: Establish a car-sharing program, ideally with electric vehicles, that residents can rent for short trips. This reduces the need for individual car ownership and especially the need for second vehicles in a household, while also promoting more sustainable mobility. This service may rely

on an existing car share provider or be managed by the property owner. Note, however, that self managed car share is not recommended due to historical challenges with uptake. The size of the development is not likely sufficient to generate sufficient demand for profitable car sharing on its own. However, in combination with a potential future passenger ferry service to Seymour Bay, there may be significant demand for car share here in the future.

7. **Eco-Friendly Delivery Solutions**: Many online retailers, such as Amazon, do not provide delivery services to rural areas. It may be possible to partner with delivery services to provide centralized parcel lock-up boxes within the development. This may facilitate deliveries, which may reduce the number of vehicle trips generated.
8. **Flexible Parking Policies**: Implement a district parking approach as much as possible. This would avoid assigning parking spaces to individuals within the development in favour of flexible allocation of spaces based on need. Visitor parking could also be centralized and shared with commercial parking spaces. This is how on-street parking functions in many urban areas, and is an effective way to manage space. Reducing parking can also encourage lower vehicle use and may lead to less driving.
9. **Targeted Commercial Services**: Target the lease of commercial spaces to businesses that are most likely to reduce travel outside of Cowan Point, and may generate a significant number of trips from existing residents outside of the Site. Based on the survey information provided by BIM, this may include a small grocery store, pharmacy, café, or daycare.
10. **Seasonal Equipment Rentals**: Offer seasonal equipment rentals such as kayaks or hiking poles. This encourages outdoor activities without the need for residents to own and store bulky equipment and could reduce the need for vehicles to transport equipment.

These measures, individually or as a group may help to change travel behaviour and reduce the number of vehicle trips generated by the Development. The scale of this change depends on the multiple factors such as how the measures are implemented, the specific suite of measures selected, and the future transportation context on Bowen Island, including potentially expanded or new ferry and transit services.

9 FUTURE MOBILITY CONSIDERATIONS

Several potential changes to the mobility network have been identified as relevant to the Development. These considerations, while not forming part of the proposed project, could substantially change how people move to and through Cowan Point in the future. This includes people destined for the proposed Development, as well as or other parts of the area. This section contemplates the potential impacts and opportunities created by these network changes at a high level. It is expected that any future implementation would include their own transportation studies.

The three considerations are:

1. How might a new passenger ferry service from Seymour Bay to Downtown Vancouver change travel patterns?
2. How could a new active transportation connection along Valhalla Ridge change access to Snug Cove and development travel patterns?
3. What is the potential for transit service to Cowan Point?

Each consideration is discussed separately below.

9.1 SEYMOUR BAY PASSENGER FERRY

Greenline, a coastal transportation company focused on all-electric passenger ferries, has proposed a new service between Downtown Vancouver and Bowen Island. An additional route from Vancouver to Gibsons is also proposed. While official communications don't indicate a precise location for a passenger terminal on Bowen Island, we understand that Seymour Bay is currently being explored as an opportunity. Information from Greenline seems to indicate a location on the south side of Bowen Island, approximately in the same areas as Seymour Bay, may be feasible, as shown in Figure 16.

Figure 17 - Proposed Greenline Passenger Ferry Routes (Greenline, 2025)

Media coverage from February 2025 indicates service could start as early at 2027, which would be before opening day of the proposed project. However, through discussion with Bowen Island Municipality we understand that no formal applications have been made and no approvals for a passenger terminal have been granted.

Should a new passenger ferry service with a terminal in Seymour Bay go ahead, there would be significant changes to mobility patters on Cowan Point, and on Bowen Island generally. Currently, approximately 15% of all trips on Bowen Island originate or end off of the island.

The following high-level assessment is speculative and based on limited information. The development of a new ferry service will require substantial work to understand passenger behaviour and patterns of use. The impacts on the broader transportation system on Bowen Island will vary depending on the location of the terminal, transportation services connected at the terminal (such as car sharing and transit), the amount and cost of private vehicle parking available, destinations located near Seymour Landing on Cowan Point, the cost of the passenger ferry, as well as the same characteristics of the Downtown Vancouver terminal, among other things.

Based on the assumption that the new service seeks to provide strong mobility connections at both terminals and achieves significant ridership, some changes that might be expected include the following.

1. **The number of vehicle and passenger trips on BC Ferries between Horseshoe Bay and Snug Cove may decrease.**

   With about 27% of work-related trips being off-island, the direct passenger connection to Downtown Vancouver may substitute for current commute traffic using the ferry. This substitution would impact both vehicle trips and passenger trips on the Snug Cove route.

   Information on Greenline's website references declining commuter ridership on Washington State's car ferry services, with corresponding increases to ridership on passenger only ferries. It is reasonable to expect a similar adjustment with the creation of a new passenger ferry to Bowen Island.

   In addition to reductions in commuter traffic, a passenger ferry service may be a more attractive option to visitors of Bowen Island as well by providing a faster connection to the Island from Downtown Vancouver.

2. **Traffic along Cowan Point Drive may increase.**

   New traffic to Cowan Point is likely to include a variety of modes, with demand for long term vehicle parking and passenger pick-up/drop off being most significant. Some active transportation demand may be present, especially from residents of Cowan Point. However, since active transportation volumes are low on the island generally, limited active connections to other parts of the island from Cowan Point,

and topography and distances are significant, we would expect most ferry passengers to arrive by vehicle.

The creation of transit service, whether a public service, or private shuttle, may be able to significantly reduce the number of vehicle trips accessing Cowan Point related to the ferry.

3. Demand for vehicle parking at Cowan Point may increase

Passengers accessing the ferry for daily commutes may generate new vehicle parking demand. Parking demand may also be generated for long term parking, if permitted. This may be generated by people going to the mainland for a weekend, those who live on Bowen Island part time, or other arrangements.It will be important to consider how much vehicle parking is provided as part of the ferry terminal, how much it will cost, and how long parking will be permitted for. Public parking within the proposed development should be managed to avoid being used by ferry traffic.

4. The timeline for transit service to Cowan Point may need to be accelerated.

With increased travel demand to Cowan Point, it is expected that the case for transit service will improve. Greenline's website notes that their approach includes "seamless connections for onward travel by transit, car share, and ride hail." The ability for infrastructure to accommodate ferry trips will be improved by providing transit service between the passenger terminal and other parts of the island. This may be provided as a private shuttle service if TransLink is unable to provide this connection, or could be a public service. Transit service may be most effective if well aligned with ferry schedules, and with straightforward connections to the terminal, and other destinations on Bowen Island. However, given the current low levels of service on the island, we anticipate this transit service will only be able to serve a portion of ferry trips.

5. Accelerating development of a bikeway or multi-use path to Cowan Point may be beneficial

Public surveys as part of the Active Transportation Plan indicated that a new bikeway to Cowan Point was a lower priority than other routes. However, the presence of a ferry service may increase the need to develop this connection. While the number of people expected to walk or cycle to Cowan Point is likely to be small compared to the number who are likely to drive or take transit, providing this connection will support lower automobile dependence, and improve safety for those who do choose to travel by bicycle or on foot.

Overall, we assess that the proposed passenger ferry service could significantly change mobility patterns within Bowen Island. If implemented with adequate consideration for connections on Cowan Point, it is possible this ferry could reduce the overall number of vehicle trips on and off of the island. In either case, the number of

vehicle trips to Cowan Point could significantly increase relative to today, as it is likely that many or most passenger ferry users will rely on personal vehicles to access the terminal.

9.2 VALHALLA RIDGE ACTIVE CONNECTION

Valhalla Ridge is an existing trail between Snug Cove and Cowan Point along the east side of the Bowen Island Ecological Reserve. We understand that there have been proposals to improve this trail in order to enhance connections between Snug Cove and Cowan Point, and to increase the number of people walking and cycling between these two parts of the island. The existing trail route is shown in Figure 18.

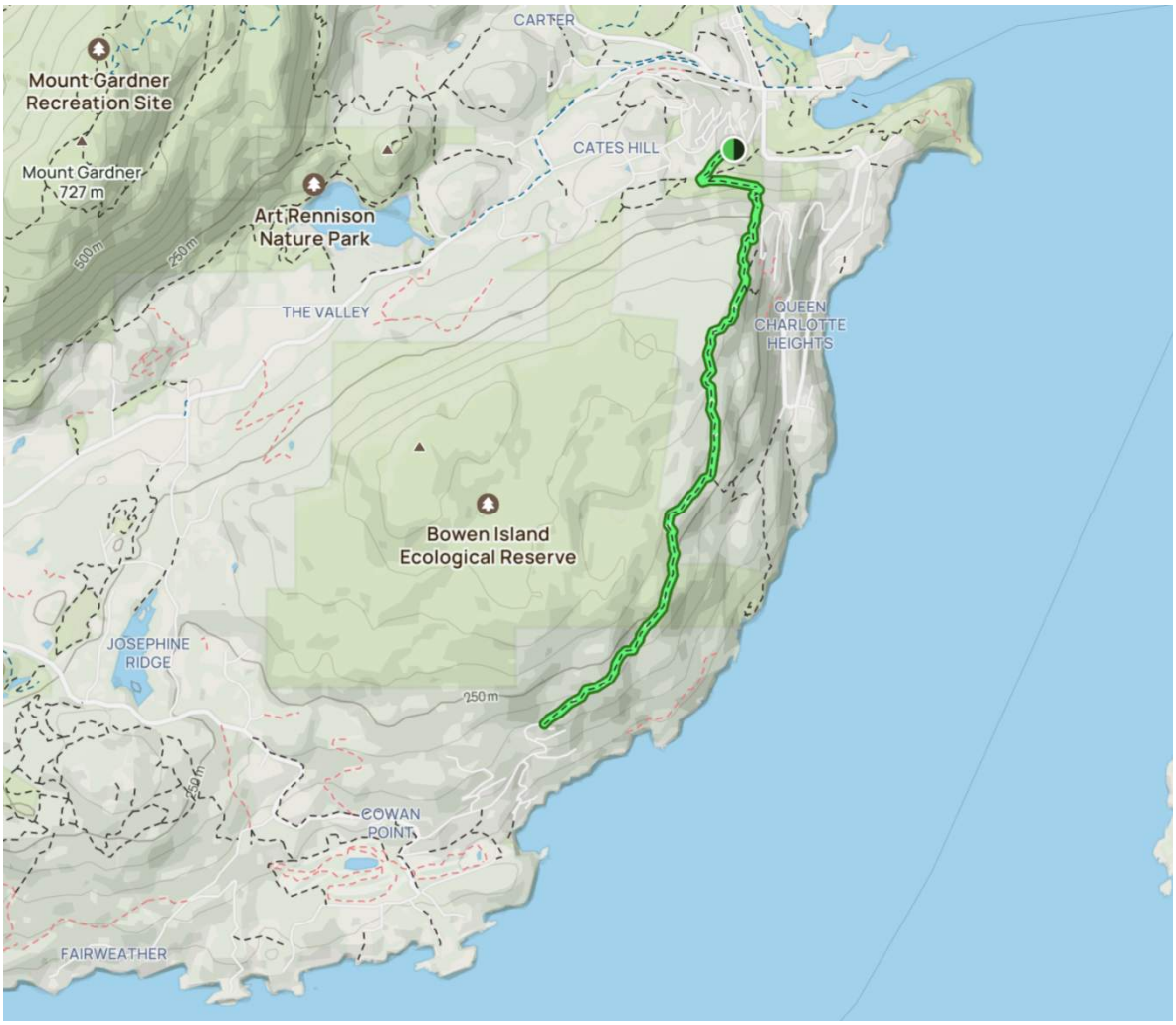

Figure 18 - Existing Valhalla Ridge Trail (alltrails.com)

The 4.4km trail today is rugged, as shown in Figure 19, and not suitable for cycling or access by all ages and abilities.

Figure 19 - Existing Valhalla Ridge Trail (Jacob Meilleur, 2024)

The potential for an upgraded Valhalla Ridge trail should be weighed against the planned active transportation connection along Cowan Point Drive identified in the Active Transportation Plan. Measuring from the intersection of Bowen Island Trunk Road and Miller/Dorman Road in Snug Cove, to the intersection of Seymour Bay Drive and Cowan Point Drive, the route proposed in the Active Transportation Plan is about 9.7km. Using the Valhalla Ridge Trail, the distance is about 6.1km. The Valhalla Ridge Trial presents a significantly shorter route. However, it appears that the elevation change along the Valhalla Ridge route is greater, with a maximum elevation of about 360m compared to a maximum elevation of about 270m along Cowan Point Drive.

Development of the Valhalla Ridge Trail to accommodate cycling and improve accessibility for a wider range of users would strengthen connections between the site and Snug Cove. However, the travel distance remains significant, and steep grades along the route, and ruggedness of the terrain, may limit the utility of the connection. The number of people willing to cycle a 6.1km route with significant elevation may not be much higher than the number of people willing to cycle a 9.7km route with a lower elevation gain. The approximate time savings would be about 15 minutes per direction. Conversely, there may be more people willing to walk a 6.1km route than a 9.7km route (approximate time savings of 40 minutes).

The planned connection along Cowan Point Drive also improves connectivity with the west side of Bowen Island, whereas the Valhalla Ridge connection would only improve connectivity to Snug Cove. If a passenger ferry service begins operating to Seymour Bay, there may be an increased rationale for an enhanced and more direct active transportation connection to Snug Cove in addition to the Cowan Point Drive connection.

Finally, the existing, rugged, nature of the trail may mean that improvements would be costly in comparison to the planned multi-use path along Cowan Point Drive identified in the Active Transportation Plan. It may not be possible to create a cycle friendly connection.

Overall, an upgraded Valhalla Trail may increase the number of people cycling and/or walking between Cowan Point and Snug Cove. However, the currently planned connection along Cowan Point Drive may generate more active transportation activity overall, since the route connects to more parts of the island and has less elevation. It would be ideal to have both connections, if possible. This would maximize the number of active transportation trips on Bowen Island. Future work may focus on the ability to accommodate cycling along Valhalla Ridge, and exploration of route options that minimize travel distance and grades which would maximize use of the trail for transportation purposes, especially if there were a new passenger ferry service to Seymour Bay. It may be more beneficial to provide an improved walking connection along Valhalla Ridge, rather than invest in the more substantial work required to make it a bikeable and accessible trail.

9.3 COWAN POINT TRANSIT SERVICE

Transit service is usually provided in response to existing demand. Currently the number of homes and businesses in Cowan Point is likely too low to warrant transit service.

TransLink currently operates routes to other low density areas of Bowen Island. To understand the level of development which might support transit service, the number of parcels served by existing bus routes was compared to the existing and future number of parcels and housing units on Cowan Point. Figure 9 compares the number of land parcels in areas of Bowen Island with active transit service, to the existing and future unit counts at Cowan Point. This methodology, based on parcel counts, assumes that the vast majority of development in other parts of the island are single-family homes and it intended to provide a rough sense of the scale of development which may lead to transit service.

Route 281 extends north of Miller Landing, serving about 140 properties (#1 in Figure 19). Miller Landing itself has over 290 properties (#2). TransLink also operates route 280 which extends through King Edward Bay along Windjammer Road on the west side of the island. The last few stops of this route serve about 270 properties (#3).

Figure 20 - Number of Properties in Transit Served Areas (Modified from TransLink)

For comparison, there are currently approximately 90 properties on Cowan Point south of Fairweather Road (#4), as well as the golf course. With an additional 140 residential units, there would be 230 properties on Cowan Point. In combination with the proposed commercial spaces, golf course, and hotel. This may generate sufficient travel demand to warrant a basic transit service similar to routes 280 and 281. However, this would require support from TransLink and is not shown in their current planning documents. The provision of a new passenger ferry service to Seymour Bay would further increase demand for transit to Cowan Point.

10 CONCLUSIONS AND RECOMMENDATIONS

The following summarizes conclusions and recommendations include in the foregoing analysis.

10.1 EXISTING OPERATIONS

- Existing vehicle operations are acceptable.

10.2 FUTURE OPERATIONS

- Future vehicle operations are acceptable in both the no-development and development conditions.
- The driveway to the outdoor recreation facility is recommended to be relocated midway on Cowan Point Drive between Seymour Bay Drive and Russell Lane.
- To support pedestrian access to the existing trail, improvements are recommended at the intersection of Seymour Bay Drive and Cowan Point Drive, including:
    - A marked pedestrian crossing of Cowan Point Drive on the south side of Seymour Bay Drive.
    - A new walking connection along the south side of Seymour Bay Drive connecting to the Site. This should be an accessible connection if possible.
    - A new walking connection across the existing ditch to access the existing trail. This should be an accessible connection, if possible, in order to facilitate future improvements to the trail.
- New intersection lighting may also be considered to facilitate pedestrian crossings.
- The intersection of Arbutus Bay Lane at Cowan Point Road is recommended to be signed as all way stop control.
- The development is expected to generate between 4 and 9 ferry vehicle trips in each peak hour per direction. These new trips may have an incremental impact on delays during peak periods but are expected to be accommodated within existing capacity outside of peak periods.

10.3 FUTURE MOBILITY CONSIDERATIONS

- The proposed passenger ferry service at Seymour Bay could significantly change mobility patterns within Bowen Island.
    - If implemented with adequate non-auto connections to Cowan Point, it could reduce the number of vehicle trips on and off of the island and relieve ferry congestion.
    - The number of vehicle trips to Cowan Point could significantly increase.
- The Valhalla Ridge Active Connection may help increase the number of people walking and cycling to Cowan Point from Snug Cove.
    - The existing rugged nature of the trail may make it better suited as a walking connection.
    - The planned Cowan Point Drive cycling connection should also be created as this provides better connectivity to other parts of Bowen Island.

- Future transit service to Cowan Point is likely not warranted with the number of existing properties. However, with the proposed Development, the total number of properties is similar to other areas of Bowen Island that have transit service.

APPENDIX A – SYNCHRO 11 OUTPUT FILES

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	17	29	14
Future Vol, veh/h	0	0	0	17	29	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	55	55	68	68
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	31	43	21

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	85	54	64	0	-	0
Stage 1	54	-	-	-	-	-
Stage 2	31	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	916	1013	1538	-	-	-
Stage 1	969	-	-	-	-	-
Stage 2	992	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	916	1013	1538	-	-	-
Mov Cap-2 Maneuver	916	-	-	-	-	-
Stage 1	969	-	-	-	-	-
Stage 2	992	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1538	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	3	14	0	14	16
Future Vol, veh/h	0	3	14	0	14	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	25	25	50	50	58	58
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	12	28	0	24	28

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	104	28	0	0	28	0
Stage 1	28	-	-	-	-	-
Stage 2	76	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	894	1047	-	-	1585	-
Stage 1	995	-	-	-	-	-
Stage 2	947	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	881	1047	-	-	1585	-
Mov Cap-2 Maneuver	881	-	-	-	-	-
Stage 1	995	-	-	-	-	-
Stage 2	933	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.5	0	3.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1047	1585	-
HCM Lane V/C Ratio	-	-	0.011	0.015	-
HCM Control Delay (s)	-	-	8.5	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Intersection Delay, s/veh	7
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	1	0	5	13	13
Future Vol, veh/h	3	1	0	5	13	13
Peak Hour Factor	0.25	0.25	0.38	0.38	0.50	0.50
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	4	0	13	26	26
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.3	6.5	7
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	75%	0%	50%
Vol Thru, %	25%	0%	0%
Vol Right, %	0%	100%	50%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	4	5	26
LT Vol	3	0	13
Through Vol	1	0	0
RT Vol	0	5	13
Lane Flow Rate	16	13	52
Geometry Grp	1	1	1
Degree of Util (X)	0.019	0.013	0.055
Departure Headway (Hd)	4.185	3.436	3.785
Convergence, Y/N	Yes	Yes	Yes
Cap	857	1041	949
Service Time	2.204	1.458	1.796
HCM Lane V/C Ratio	0.019	0.012	0.055
HCM Control Delay	7.3	6.5	7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0	0.2

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	3	3	30	43	8
Future Vol, veh/h	9	3	3	30	43	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	69	69	64	64	65	65
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	4	5	47	66	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	129	72	78	0	-	0
Stage 1	72	-	-	-	-	-
Stage 2	57	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	865	990	1520	-	-	-
Stage 1	951	-	-	-	-	-
Stage 2	966	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	862	990	1520	-	-	-
Mov Cap-2 Maneuver	862	-	-	-	-	-
Stage 1	948	-	-	-	-	-
Stage 2	966	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	0.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1520	-	891	-	-
HCM Lane V/C Ratio	0.003	-	0.02	-	-
HCM Control Delay (s)	7.4	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	8	24	0	5	36
Future Vol, veh/h	1	8	24	0	5	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	58	58	56	56	58	58
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	14	43	0	9	62

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	123	43	0	0	43	0
Stage 1	43	-	-	-	-	-
Stage 2	80	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	872	1027	-	-	1566	-
Stage 1	979	-	-	-	-	-
Stage 2	943	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	867	1027	-	-	1566	-
Mov Cap-2 Maneuver	867	-	-	-	-	-
Stage 1	979	-	-	-	-	-
Stage 2	937	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.6	0	0.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1006	1566	-
HCM Lane V/C Ratio	-	-	0.015	0.006	-
HCM Control Delay (s)	-	-	8.6	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Intersection Delay, s/veh	7.1
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	14	1	3	19	24	9
Future Vol, veh/h	14	1	3	19	24	9
Peak Hour Factor	0.50	0.50	0.58	0.58	0.63	0.63
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	2	5	33	38	14
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.4	6.7	7.3
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	93%	0%	73%
Vol Thru, %	7%	14%	0%
Vol Right, %	0%	86%	27%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	15	22	33
LT Vol	14	0	24
Through Vol	1	3	0
RT Vol	0	19	9
Lane Flow Rate	30	38	52
Geometry Grp	1	1	1
Degree of Util (X)	0.035	0.037	0.059
Departure Headway (Hd)	4.243	3.531	4.034
Convergence, Y/N	Yes	Yes	Yes
Cap	844	1012	888
Service Time	2.269	1.561	2.056
HCM Lane V/C Ratio	0.036	0.038	0.059
HCM Control Delay	7.4	6.7	7.3
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.1	0.2

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	0	0	54	29	3
Future Vol, veh/h	6	0	0	54	29	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	54	54	66	66	61	61
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	0	0	82	48	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	133	51	53	0	-	0
Stage 1	51	-	-	-	-	-
Stage 2	82	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	861	1017	1553	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	941	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	861	1017	1553	-	-	-
Mov Cap-2 Maneuver	861	-	-	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	941	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1553	-	861	-	-
HCM Lane V/C Ratio	-	-	0.013	-	-
HCM Control Delay (s)	0	-	9.2	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	13	38	1	3	24
Future Vol, veh/h	0	13	38	1	3	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	42	42	58	58	42	42
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	31	66	2	7	57

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	138	67	0	0	68	0
Stage 1	67	-	-	-	-	-
Stage 2	71	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	855	997	-	-	1533	-
Stage 1	956	-	-	-	-	-
Stage 2	952	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	851	997	-	-	1533	-
Mov Cap-2 Maneuver	851	-	-	-	-	-
Stage 1	956	-	-	-	-	-
Stage 2	947	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	0.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	997	1533	-
HCM Lane V/C Ratio	-	-	0.031	0.005	-
HCM Control Delay (s)	-	-	8.7	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Intersection Delay, s/veh	7.1
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	13	1	0	21	14	10
Future Vol, veh/h	13	1	0	21	14	10
Peak Hour Factor	0.55	0.55	0.44	0.44	0.33	0.33
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	2	0	48	42	30
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.4	6.7	7.3
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	93%	0%	58%
Vol Thru, %	7%	0%	0%
Vol Right, %	0%	100%	42%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	14	21	24
LT Vol	13	0	14
Through Vol	1	0	0
RT Vol	0	21	10
Lane Flow Rate	25	48	73
Geometry Grp	1	1	1
Degree of Util (X)	0.03	0.046	0.079
Departure Headway (Hd)	4.284	3.481	3.927
Convergence, Y/N	Yes	Yes	Yes
Cap	834	1025	913
Service Time	2.316	1.515	1.948
HCM Lane V/C Ratio	0.03	0.047	0.08
HCM Control Delay	7.4	6.7	7.3
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.1	0.3

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	20	35	14
Future Vol, veh/h	0	0	0	20	35	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	55	55	68	68
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	36	51	21

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	98	62	72	0	-	0
Stage 1	62	-	-	-	-	-
Stage 2	36	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	901	1003	1528	-	-	-
Stage 1	961	-	-	-	-	-
Stage 2	986	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	901	1003	1528	-	-	-
Mov Cap-2 Maneuver	901	-	-	-	-	-
Stage 1	961	-	-	-	-	-
Stage 2	986	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1528	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	3.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	5	14	0	20	16
Future Vol, veh/h	0	5	14	0	20	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	25	25	50	50	58	58
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	20	28	0	34	28

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	124	28	0	0	28	0
Stage 1	28	-	-	-	-	-
Stage 2	96	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	871	1047	-	-	1585	-
Stage 1	995	-	-	-	-	-
Stage 2	928	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	852	1047	-	-	1585	-
Mov Cap-2 Maneuver	852	-	-	-	-	-
Stage 1	995	-	-	-	-	-
Stage 2	908	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.5	0	4.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1047	1585	-
HCM Lane V/C Ratio	-	-	0.019	0.022	-
HCM Control Delay (s)	-	-	8.5	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Intersection	
Intersection Delay, s/veh	7
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	1	0	5	13	13
Future Vol, veh/h	3	1	0	5	13	13
Peak Hour Factor	0.25	0.25	0.38	0.38	0.50	0.50
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	4	0	13	26	26
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.3	6.5	7
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	75%	0%	50%
Vol Thru, %	25%	0%	0%
Vol Right, %	0%	100%	50%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	4	5	26
LT Vol	3	0	13
Through Vol	1	0	0
RT Vol	0	5	13
Lane Flow Rate	16	13	52
Geometry Grp	1	1	1
Degree of Util (X)	0.019	0.013	0.055
Departure Headway (Hd)	4.185	3.436	3.785
Convergence, Y/N	Yes	Yes	Yes
Cap	857	1041	949
Service Time	2.204	1.458	1.796
HCM Lane V/C Ratio	0.019	0.012	0.055
HCM Control Delay	7.3	6.5	7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0	0.2

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	3	3	39	50	8
Future Vol, veh/h	9	3	3	39	50	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	69	69	64	64	65	65
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	4	5	61	77	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	154	83	89	0	-	0
Stage 1	83	-	-	-	-	-
Stage 2	71	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	838	976	1506	-	-	-
Stage 1	940	-	-	-	-	-
Stage 2	952	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	835	976	1506	-	-	-
Mov Cap-2 Maneuver	835	-	-	-	-	-
Stage 1	937	-	-	-	-	-
Stage 2	952	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	0.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1506	-	866	-	-
HCM Lane V/C Ratio	0.003	-	0.02	-	-
HCM Control Delay (s)	7.4	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	16	24	1	12	36
Future Vol, veh/h	2	16	24	1	12	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	58	58	56	56	58	58
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	28	43	2	21	62

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	148	44	0	0	45	0
Stage 1	44	-	-	-	-	-
Stage 2	104	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	844	1026	-	-	1563	-
Stage 1	978	-	-	-	-	-
Stage 2	920	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	832	1026	-	-	1563	-
Mov Cap-2 Maneuver	832	-	-	-	-	-
Stage 1	978	-	-	-	-	-
Stage 2	907	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	1.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1000	1563	-
HCM Lane V/C Ratio	-	-	0.031	0.013	-
HCM Control Delay (s)	-	-	8.7	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Intersection Delay, s/veh	7.1
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	14	1	3	19	25	9
Future Vol, veh/h	14	1	3	19	25	9
Peak Hour Factor	0.50	0.50	0.58	0.58	0.63	0.63
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	2	5	33	40	14
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.4	6.7	7.3
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	93%	0%	74%
Vol Thru, %	7%	14%	0%
Vol Right, %	0%	86%	26%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	15	22	34
LT Vol	14	0	25
Through Vol	1	3	0
RT Vol	0	19	9
Lane Flow Rate	30	38	54
Geometry Grp	1	1	1
Degree of Util (X)	0.035	0.037	0.061
Departure Headway (Hd)	4.245	3.533	4.041
Convergence, Y/N	Yes	Yes	Yes
Cap	843	1010	887
Service Time	2.273	1.565	2.062
HCM Lane V/C Ratio	0.036	0.038	0.061
HCM Control Delay	7.4	6.7	7.3
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.1	0.2

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	0	0	63	33	3
Future Vol, veh/h	6	0	0	63	33	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	54	54	66	66	61	61
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	0	0	95	54	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	152	57	59	0	-	0
Stage 1	57	-	-	-	-	-
Stage 2	95	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	840	1009	1545	-	-	-
Stage 1	966	-	-	-	-	-
Stage 2	929	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	840	1009	1545	-	-	-
Mov Cap-2 Maneuver	840	-	-	-	-	-
Stage 1	966	-	-	-	-	-
Stage 2	929	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1545	-	840	-	-
HCM Lane V/C Ratio	-	-	0.013	-	-
HCM Control Delay (s)	0	-	9.3	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	3.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	22	38	2	7	24
Future Vol, veh/h	1	22	38	2	7	24
Conflicting Peds, #/hr	22	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	42	42	58	58	42	42
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	52	66	3	17	57

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	181	68	0	0	69	0
Stage 1	68	-	-	-	-	-
Stage 2	113	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	808	995	-	-	1532	-
Stage 1	955	-	-	-	-	-
Stage 2	912	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	784	995	-	-	1532	-
Mov Cap-2 Maneuver	784	-	-	-	-	-
Stage 1	955	-	-	-	-	-
Stage 2	886	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	1.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	983	1532	-
HCM Lane V/C Ratio	-	-	0.056	0.011	-
HCM Control Delay (s)	-	-	8.9	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Intersection Delay, s/veh	7.1
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	13	1	0	21	14	11
Future Vol, veh/h	13	1	0	21	14	11
Peak Hour Factor	0.55	0.55	0.44	0.44	0.33	0.33
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	2	0	48	42	33
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.5	6.7	7.3
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	93%	0%	56%
Vol Thru, %	7%	0%	0%
Vol Right, %	0%	100%	44%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	14	21	25
LT Vol	13	0	14
Through Vol	1	0	0
RT Vol	0	21	11
Lane Flow Rate	25	48	76
Geometry Grp	1	1	1
Degree of Util (X)	0.03	0.046	0.082
Departure Headway (Hd)	4.288	3.485	3.908
Convergence, Y/N	Yes	Yes	Yes
Cap	833	1023	917
Service Time	2.322	1.521	1.929
HCM Lane V/C Ratio	0.03	0.047	0.083
HCM Control Delay	7.5	6.7	7.3
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.1	0.3

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	56	100	14
Future Vol, veh/h	0	0	0	56	100	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	55	55	68	68
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	102	147	21

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	260	158	168	0	-	0
Stage 1	158	-	-	-	-	-
Stage 2	102	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	729	887	1410	-	-	-
Stage 1	871	-	-	-	-	-
Stage 2	922	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	729	887	1410	-	-	-
Mov Cap-2 Maneuver	729	-	-	-	-	-
Stage 1	871	-	-	-	-	-
Stage 2	922	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1410	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	0	0	4	0	36	0	14	7	80	16	5
Future Vol, veh/h	5	0	0	4	0	36	0	14	7	80	16	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	50	50	50	50	50	50	58	58	58
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	0	0	8	0	72	0	28	14	138	28	9

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	380	351	33	344	348	35	37	0	0	42	0	0
Stage 1	309	309	-	35	35	-	-	-	-	-	-	-
Stage 2	71	42	-	309	313	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	578	573	1041	610	576	1038	1574	-	-	1567	-	-
Stage 1	701	660	-	981	866	-	-	-	-	-	-	-
Stage 2	939	860	-	701	657	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	501	521	1041	568	524	1038	1574	-	-	1567	-	-
Mov Cap-2 Maneuver	501	521	-	568	524	-	-	-	-	-	-	-
Stage 1	701	601	-	981	866	-	-	-	-	-	-	-
Stage 2	874	860	-	638	598	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.3	9.1	0	6
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1574	-	-	501	959	1567	-	-
HCM Lane V/C Ratio	-	-	-	0.011	0.083	0.088	-	-
HCM Control Delay (s)	0	-	-	12.3	9.1	7.5	0	-
HCM Lane LOS	A	-	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.3	0.3	-	-

Intersection	
Intersection Delay, s/veh	7
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	1	0	8	14	15
Future Vol, veh/h	6	1	0	8	14	15
Peak Hour Factor	0.38	0.38	0.50	0.50	0.50	0.50
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	3	0	16	28	30
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.3	6.5	7
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	86%	0%	48%
Vol Thru, %	14%	0%	0%
Vol Right, %	0%	100%	52%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	7	8	29
LT Vol	6	0	14
Through Vol	1	0	0
RT Vol	0	8	15
Lane Flow Rate	18	16	58
Geometry Grp	1	1	1
Degree of Util (X)	0.022	0.015	0.061
Departure Headway (Hd)	4.22	3.45	3.779
Convergence, Y/N	Yes	Yes	Yes
Cap	850	1037	950
Service Time	2.239	1.472	1.792
HCM Lane V/C Ratio	0.021	0.015	0.061
HCM Control Delay	7.3	6.5	7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0	0.2

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	3	3	116	117	8
Future Vol, veh/h	9	3	3	116	117	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	69	69	64	64	65	65
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	4	5	181	180	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	377	186	192	0	-	0
Stage 1	186	-	-	-	-	-
Stage 2	191	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	625	856	1381	-	-	-
Stage 1	846	-	-	-	-	-
Stage 2	841	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	623	856	1381	-	-	-
Mov Cap-2 Maneuver	623	-	-	-	-	-
Stage 1	843	-	-	-	-	-
Stage 2	841	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.5	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1381	-	668	-	-
HCM Lane V/C Ratio	0.003	-	0.026	-	-
HCM Control Delay (s)	7.6	0	10.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	6.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	0	0	10	0	88	0	24	8	74	36	5
Future Vol, veh/h	5	0	0	10	0	88	0	24	8	74	36	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	58	58	58	56	56	56	58	58	58
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	0	0	17	0	152	0	43	14	128	62	9

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	449	380	67	373	377	50	71	0	0	57	0	0
Stage 1	323	323	-	50	50	-	-	-	-	-	-	-
Stage 2	126	57	-	323	327	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	520	552	997	584	555	1018	1529	-	-	1547	-	-
Stage 1	689	650	-	963	853	-	-	-	-	-	-	-
Stage 2	878	847	-	689	648	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	413	505	997	545	507	1018	1529	-	-	1547	-	-
Mov Cap-2 Maneuver	413	505	-	545	507	-	-	-	-	-	-	-
Stage 1	689	594	-	963	853	-	-	-	-	-	-	-
Stage 2	747	847	-	630	592	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.8	9.7	0	4.8
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1529	-	-	413	935	1547	-	-
HCM Lane V/C Ratio	-	-	-	0.013	0.181	0.082	-	-
HCM Control Delay (s)	0	-	-	13.8	9.7	7.5	0	-
HCM Lane LOS	A	-	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.7	0.3	-	-

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	18	1	3	22	29	13
Future Vol, veh/h	18	1	3	22	29	13
Peak Hour Factor	0.50	0.50	0.58	0.58	0.63	0.63
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	2	5	38	46	21
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.5	6.8	7.4
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	95%	0%	69%
Vol Thru, %	5%	12%	0%
Vol Right, %	0%	88%	31%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	19	25	42
LT Vol	18	0	29
Through Vol	1	3	0
RT Vol	0	22	13
Lane Flow Rate	38	43	67
Geometry Grp	1	1	1
Degree of Util (X)	0.045	0.043	0.075
Departure Headway (Hd)	4.273	3.551	4.026
Convergence, Y/N	Yes	Yes	Yes
Cap	836	1003	889
Service Time	2.309	1.592	2.057
HCM Lane V/C Ratio	0.045	0.043	0.075
HCM Control Delay	7.5	6.8	7.4
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.1	0.2

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	0	0	128	75	3
Future Vol, veh/h	6	0	0	128	75	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	54	54	66	66	64	64
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	0	0	194	117	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	314	120	122	0	-	0
Stage 1	120	-	-	-	-	-
Stage 2	194	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	679	931	1465	-	-	-
Stage 1	905	-	-	-	-	-
Stage 2	839	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	679	931	1465	-	-	-
Mov Cap-2 Maneuver	679	-	-	-	-	-
Stage 1	905	-	-	-	-	-
Stage 2	839	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1465	-	679	-	-
HCM Lane V/C Ratio	-	-	0.016	-	-
HCM Control Delay (s)	0	-	10.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	0	0	8	0	81	0	38	6	43	24	5
Future Vol, veh/h	5	0	0	8	0	81	0	38	6	43	24	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	50	50	50	58	58	58	50	50	50
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	0	0	16	0	162	0	66	10	86	48	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	377	301	53	296	301	71	58	0	0	76	0	0
Stage 1	225	225	-	71	71	-	-	-	-	-	-	-
Stage 2	152	76	-	225	230	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	580	612	1014	656	612	991	1546	-	-	1523	-	-
Stage 1	778	718	-	939	836	-	-	-	-	-	-	-
Stage 2	850	832	-	778	714	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	463	577	1014	627	577	991	1546	-	-	1523	-	-
Mov Cap-2 Maneuver	463	577	-	627	577	-	-	-	-	-	-	-
Stage 1	778	676	-	939	836	-	-	-	-	-	-	-
Stage 2	711	832	-	733	673	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.9	9.7	0	4.5
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1546	-	-	463	942	1523	-	-
HCM Lane V/C Ratio	-	-	-	0.012	0.189	0.056	-	-
HCM Control Delay (s)	0	-	-	12.9	9.7	7.5	0	-
HCM Lane LOS	A	-	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.7	0.2	-	-

Intersection	
Intersection Delay, s/veh	7.2
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	15	1	0	23	18	14
Future Vol, veh/h	15	1	0	23	18	14
Peak Hour Factor	0.55	0.55	0.44	0.44	0.33	0.33
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	2	0	52	55	42
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.5	6.8	7.4
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	94%	0%	56%
Vol Thru, %	6%	0%	0%
Vol Right, %	0%	100%	44%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	16	23	32
LT Vol	15	0	18
Through Vol	1	0	0
RT Vol	0	23	14
Lane Flow Rate	29	52	97
Geometry Grp	1	1	1
Degree of Util (X)	0.035	0.051	0.106
Departure Headway (Hd)	4.332	3.525	3.924
Convergence, Y/N	Yes	Yes	Yes
Cap	823	1009	912
Service Time	2.376	1.572	1.951
HCM Lane V/C Ratio	0.035	0.052	0.106
HCM Control Delay	7.5	6.8	7.4
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.2	0.4