TRANSPORTATION PLANNERS AND ENGINEERS

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CSF Sechelt School

Transportation Impact Assessment

Version 1

Prepared for

CSF Sechelt School

Date

January 31, 2024

Project No.

04-23-0251

Bunt & Associates acknowledges and respects the Traditional Territories upon which our work spans, and from which we benefit. We are grateful for the unique cultures and histories of Indigenous Peoples that enrich our understanding and connection to the lands we call home. We honour learning, listening, and truth in our journey to reconciliation.

January 31, 2023
04-23-0251

Craig Burns
Architect AIBC, MRAIC, ALEP
Principle Architecture
302-980 George Street
Vancouver, BC
V6A 0H9

Dear Mr. Burns:

Re: CSF Sechelt School
Transportation Impact Assessment

Bunt & Associates Engineering Ltd. has conducted a Transportation Impact Assessment for CSF's proposed development of a school in Sechelt, BC. This review has been completed in accordance with the Terms of Reference agreed upon with the District of Sechelt.

This Transportation Impact Assessment reviews existing traffic volumes and operations, site trip generation and distribution, future traffic forecasting and capacity analysis, site design requirements, and high-level safety of Medusa Street.

We trust this will assist in the approval project of the development. Please do not hesitate to contact us should you have any questions.

Yours truly,
Bunt & Associates

Ian Hancock, EIT
Transportation Analyst

Yulia Liem, P.Eng., PTOE
Principal, Regional Manager BC

CORPORATE AUTHORIZATION

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Principal, Regional Manager BC

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2024-02-02

Written with respect and gratitude for the Traditional Territories upon which we work and live.

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EXECUTIVE SUMMARY

Conseil Scolaire Francophone de la Colombie-Britannique (CSF) plans to build a new school in the District of Sechelt, located at the west end of Medusa Street. The school is planned to accommodate 206 students including 36 infant/toddler and pre-kindergarten children. Approximately 54 parking spaces, layby spaces for three school buses' parking and pick-up/drop-off activities are provided west of the school building.

CSF operates school bus to transport the majority of students to/from their school sites including this new Sechelt site. Therefore, only a small number of students will travel by private vehicles, walking, cycling or public transit. Based on Bunt observation conducted in 2019 at the existing CSF Ecole du Pacifique in Sechelt, the school is estimated to generate between 35 - 70 vehicle trips during the morning and afternoon peak hour, which translates to an average of 1 vehicle every 1-2 minutes.

All intersections within the study area are expected to operate well in the future horizon years with the addition of school trips. No improvements are required to accommodate the additional trips nor the projected background traffic growth in the area.

Bunt's recommendation proposed for the school site:

- Provision of two EV charging stations to meet the minimum Bylaw requirements.

Potential improvements along Medusa Street are also identified:

- Additional streetlight where long gap was found on Medusa Street to improve visibility,
- Pruning of vegetation at the northwest corner of Medusa Street and Medusa Place intersection and relocation of stop sign to the north on Medusa Place to improve visibility,
- Installation of sidewalk on the north side of Medusa Street west of Ocean Avenue, crosswalk on the west leg of Medusa Street and Ocean Avenue along with curb bulges to enhance pedestrian connectivity,
- Sharrow marking implementation on Medusa Street to better facilitate cycling.

1. INTRODUCTION

1.1 Study Purpose & Objectives

Conseil Scolaire Francophone de la Colombie-Britannique (CSF) plans to construct a new school to support 170 students from kindergarten to Grade 12, in addition to 36 infant/toddler and pre-kindergarten childcare, for a total of 206 students. The proposed site is located at the west end of Medusa Street, north of the existing Ecole Chatelech Secondary School, in Sechelt, BC. The site is currently zoned as CD-3, also known as a "Comprehensive Development Zone – Seniors Lodge", though there is currently no existing infrastructure at the site. Therefore, rezoning will be required to allow for school use.

As part of the rezoning process, Bunt and Associates Engineering Ltd. (Bunt) was retained to prepare a Transportation Impact Assessment (TIA) to understand the impact of the development traffic on the area road network, review the transportation-related design elements of the proposed development, develop a TDM strategy, and provide a high-level safety review of Medusa Street from Ocean Avenue to the school in terms of walking and cycling for school-age children.

1.2 Study Scope & Area

This report has been prepared based on the study Terms of Reference (ToR) approved by the District of Sechelt, which is attached to this report in **Appendix A**. Key tasks for Bunt that were identified in the ToR include data collection, assessment of existing and forecasting of future conditions, site trip generation and distribution, site design review, generating a suitable TDM plan, and providing a safety review. The study area agreed upon in this ToR includes the intersections of Ocean Avenue with Medusa, Cowrie, and Dolphin Street. The site location and surrounding area context are shown in **Exhibit 1.1**.

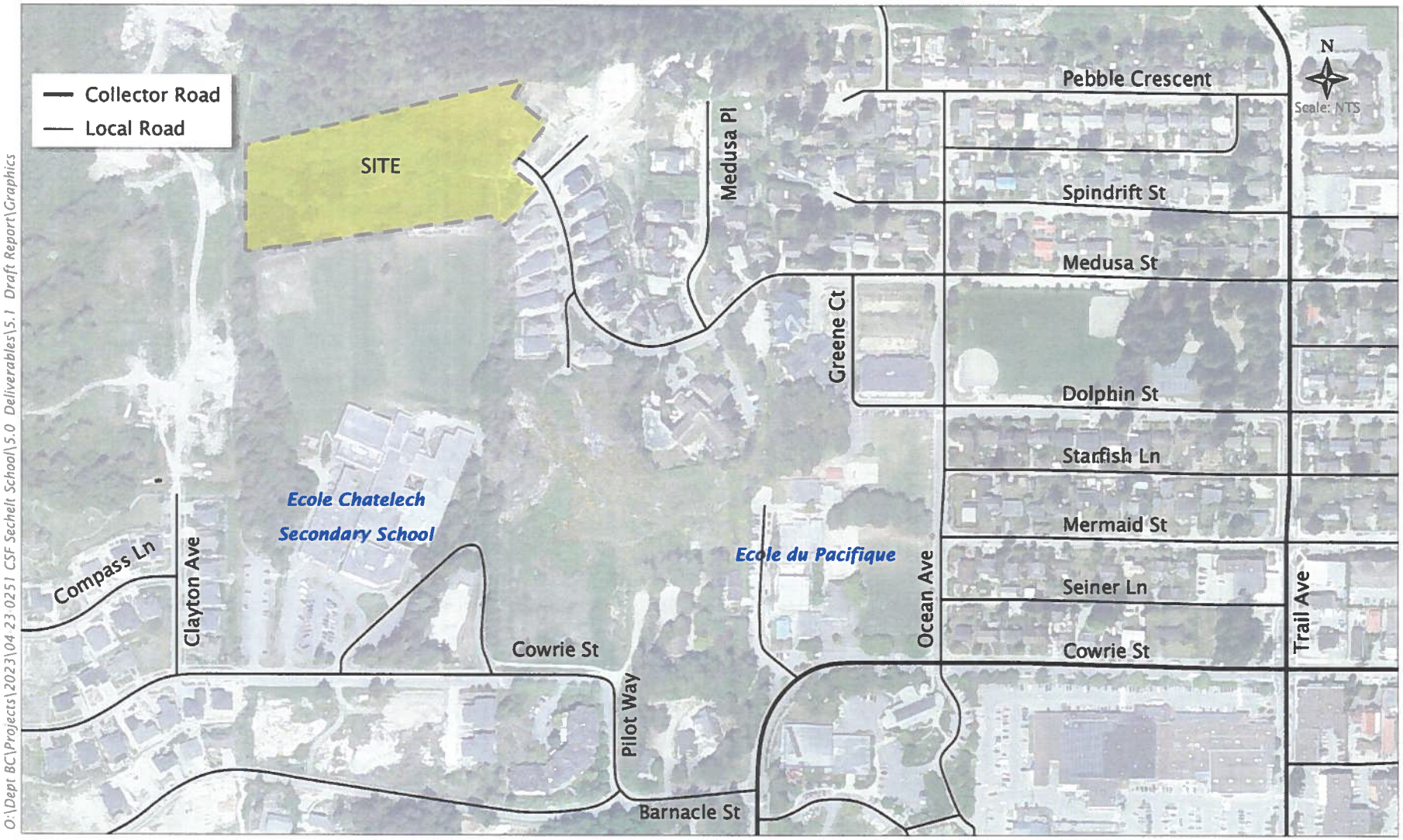

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Exhibit 1.1

Site Location

CSF Sechelt School
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1.3 Organization of Report

This TAMS report has been set out in the following manner:

- **Section 1** summarizes and introduces the purpose and scope of the study including a description of the proposed development.
- **Section 2** describes the existing transportation network conditions, covers relevant policies, and analyzes the existing traffic volumes and operations.
- **Section 3** presents the proposed development in detail and analyzes its projected impact on the transportation network.
- **Section 4** details the current site plan, site accessibility, including parking and loading supply, and vehicle circulation.
- **Section 5** reviews the Transportation Demand Management (TDM) requirements.
- **Section 6** outlines the high-level safety review for pedestrians walking and cycling on Medusa Street; and,
- **Section 7** concludes the report and summarizes Bunt's recommendations.

1.4 Proposed Development

The proposed development includes a two-story building that aims to accommodate 206 total students. The pick-up/drop-off area and parking are located to the east of the building with access via Medusa Street. The preliminary site plan is illustrated in **Exhibit 1.2.**.

The current development site statistics broken down by the land uses per the description on page 89 of the District of Sechelt's Zoning Bylaw No. 580, 2022 are summarized in **Table 1.1**. Square footage that is shared between all students, such as hallways, the gym, the library, or administration, was divided up between these land uses based on the approximate percentage makeup of each of the student populations.

Table 1.1: Proposed Land Uses

LAND USE	GFA PROVIDED*	STUDENTS
Child Care Facility, Minor and Major	848.2 m²	36
School - Elementary	1839.6 m²	120
School - Secondary	628.2 m²	50
TOTAL	3316.0 M²	206

* Includes a factored amount of the 2341 m² GFA shared among all students (hallways, gym, etc.), based on a percentage makeup of the total number of students.

Typical CSF schools including the existing Ecole du Pacifique and Ecole Chateleh Secondary School have approximately 80% of students arriving to/departing from the schools by school bus. Based on the projected student capacity, CSF is planning to run 3 large school buses to transfer students, each bus with a capacity of up to 82 seats. Therefore, only about 40 students are expected to arrive/depart from school by private vehicles, transit, bike or walk.

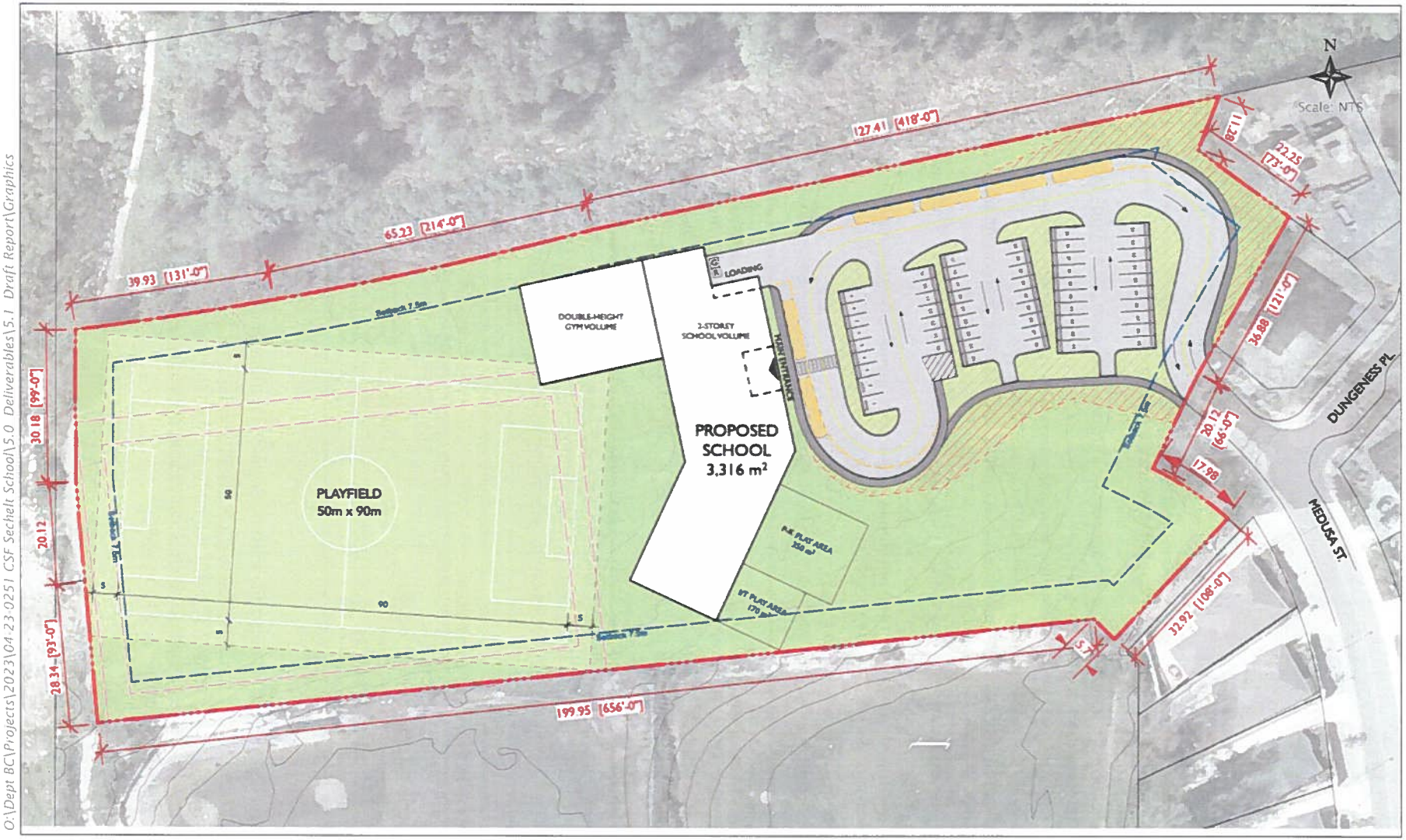

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Exhibit 1.2
Site Plan

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2. EXISTING CONDITIONS

2.1 Land Use

There is no infrastructure that currently exists on the site, besides a small unpaved footpath that connects to the northeast and northwest corners of the Ecole Chatelech Secondary School property and runs north-south along the west side of the property up to the powerline access trail. The local area predominantly features single family housing along Medusa Street, Dungeness Place and Medusa Place. Shorncliffe Intermediate Care Home is also located along Medusa Street.

The site is currently zoned as CD-3, a "Comprehensive Development Zone - Seniors Lodge", and rezoning to CC-1, "Community and Civic One Zone", is proposed.

2.2 Existing Transportation Network

2.2.1 Road Network

To the east of the site, Ocean Avenue is a local street, running north-south between Cowrie Street to the south and Pebble Crescent to the north. Ocean Avenue features one travel lane per direction with on-street parking available on the east side and sidewalk provided on the west side for the portion between Cowrie and Medusa Street.

Medusa Street is a local road extending to Inlet Avenue to the east. The road features one travel lane per direction with on-street parking on one side or both sides of the road between Medusa Place and Inlet Avenue. Sidewalk is available on both sides of the road from the site to the 5824 Medusa Street property, then only on the south side of the road until Trail Avenue. East of Ocean Ave, sidewalk is provided on both sides.

Dolphin Street is also a local east-west road stretching between Ocean Avenue to the west and Wharf Avenue to the east, then becomes Sunshine Coast Highway further east. Angle parking is provided along the north side fronting the Hackett baseball Park with parallel parking along the south side. East of Trail Avenue, parallel parking is available on both sides of the street. West of Ocean Avenue, Dolphin Street becomes Greene Ct with 90-degree parking spaces along the south side.

Cowrie Street is a collector east-west road stretching from Shorncliffe Avenue to the west and Sunshine Coast Highway to the east. It has one travel lane per direction with parallel parking and sidewalk on both sides of the road.

Ocean Avenue and Cowrie Street features an all-way stop, while the intersections of Ocean Avenue at Dolphin and Medusa Street have stop signs for the east-west legs.

This laning and traffic control along with the street classifications are presented in **Exhibit 2.1**, and summarized in **Table 2.1**.

Table 2.1: Existing Street Characteristics

STREET	CLASSIFICATION	NUMBER OF TRAVEL LANES	POSTED SPEED (KM/H)	PARKING FACILITIES
Medusa Street	Local Road	2	30	Sections of no, one, or both sides of on-street parking allowed
Dolphin Street	Local Road	2	50	Both sides
Cowrie Street	Collector Road	2	50	Both sides
Ocean Avenue	Local Road	2	30	East side only

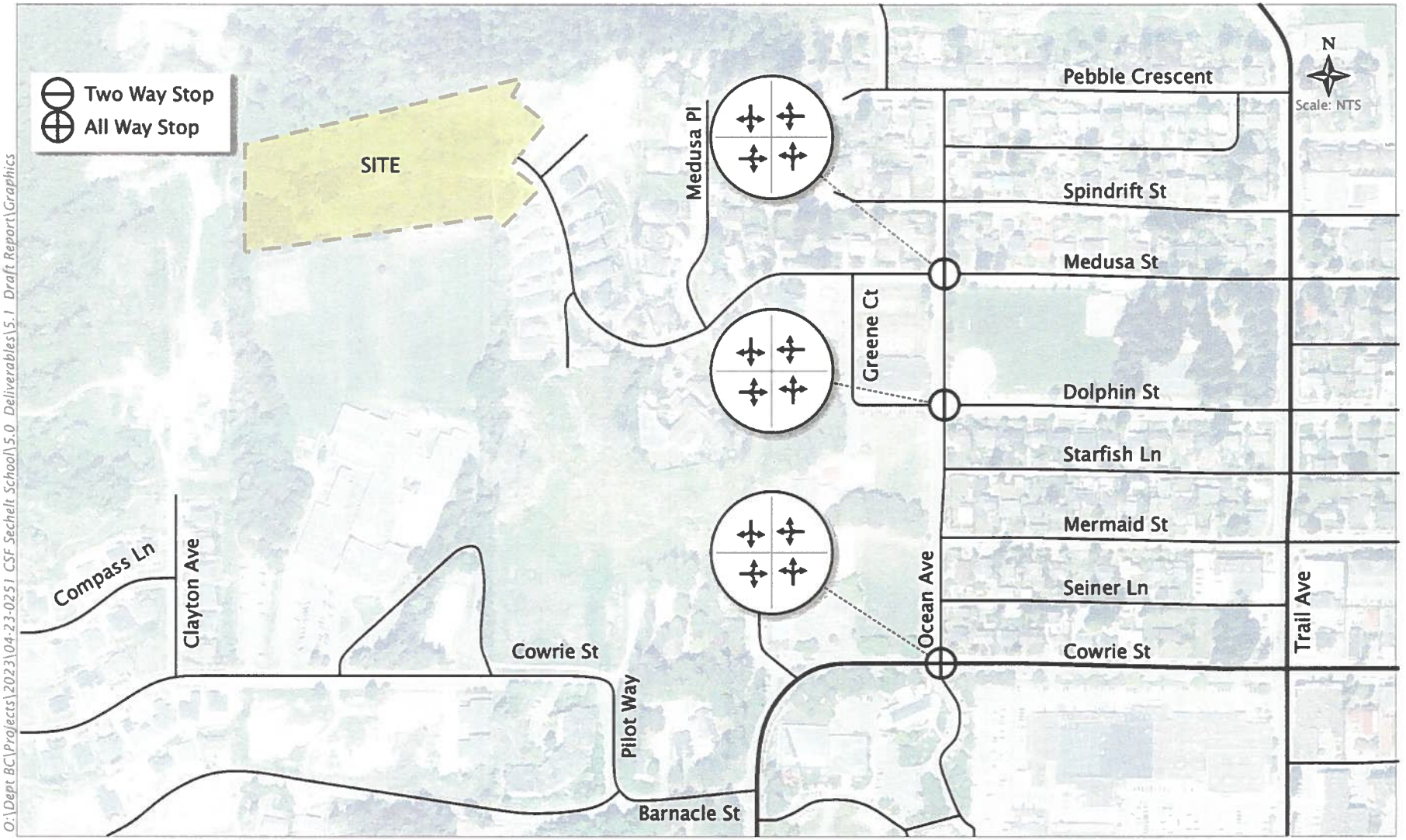

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Exhibit 2.1

Existing Laning and Traffic Control

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2.2.2 Transit Network

Bus routes #1 and #90 lines can be accessed between Dolphin and Mermaid Street on Ocean Avenue just slightly outside of a 400m radius from the site, and is the closest bus stop accessible while staying on paved sidewalks. Within an 800m radius of the school, or what is approximately a 10-minute walk, is multiple stops in the downtown area that service the #2, #3, and #4 lines. Students that specifically want to take the #3 line northbound can walk to the slightly closer Trail Avenue and Sherlock Lane stop. Similarly, students wanting to access the nearest #2 line can theoretically cut through the Ecole Chatelech Secondary School property to the nearest bus stop on Cowrie Street, if and when the connection remains.

The #1 and #90 lines allow for commuters to travel southeast as far as the Langdale ferry terminal. The #2 line provides a local loop to access the west of Sechelt, while the #4 provides a much longer line that extends out to Halfmoon Bay. The #3 line also allows for access to the north of Sechelt. This places the site at a very advantageous location of being within walking distance of every bus route in the Sunshine Coast Transit System, which services a wide range of locations for commuting students.

A summary of the nearest bus stops that service each of these lines is provided in **Table 2.2**, along with a more accurate estimate of how long it would take to walk to them via sidewalks. The entire nearby transit network is depicted in **Exhibit 2.3**.

Table 2.2: Nearest Transit Stops within Walking Distance of Site

STOP LOCATION	DIRECTION	STOP ID	AMENITY	ROUTES SERVICED	BEELINE DISTANCE	WALKING DISTANCE ALONG SIDEWALKS
Cowrie at Clayton	Westbound	118024	None	#2	385m	1400m
Ocean at Mermaid	Southbound	118010	Bench	#1, #90	485m	650m
Shorncliffe at Barnacle	Northbound	118039	Handicap Parking	#2, #3, #4	540m	950m
Trail at Sherlock	Northbound	170237	None	#3	700m	800m

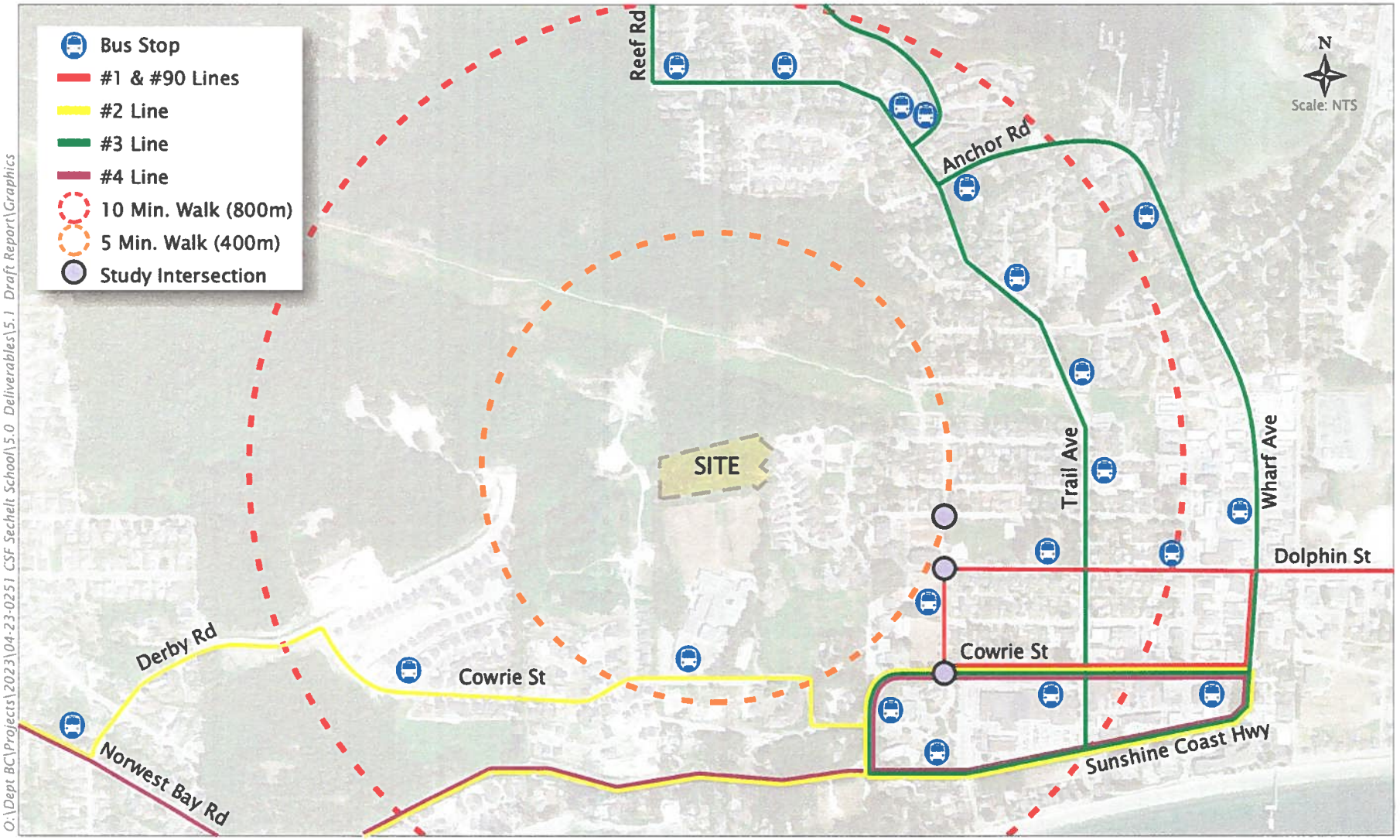

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Exhibit 2.3

Transit Routes and Stops

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2.2.3 Cycling & Pedestrian Networks

Exhibit 2.4 illustrates the available cycling network within proximity of the site. Within 800 meters (approximately a 10 minute walk) of the proposed site are two main sections of the bike network. The first of these to the northeast along Trail Avenue, from Cowrie Street to the block before Anchor Road, features a raised, separated bike lane on both sides of the road. Past this point before Anchor Road, the lane transitions into an at grade, painted lane on just the northeast side of the road. About 300 meters before the bike lanes terminate at the intersection with Reef Road, painted bike lanes are again available on both sides of Trail Avenue. The raised bike lane along Trail Avenue also extends onto the north side of Dolphin Avenue to the east of Trail Avenue.

At the other section to the southwest, cyclists may ride between painted bike lanes on either side of Derby Road which transitions into a single raised, separated lane on the south side of the road. This continues at the intersection onto Cowrie Street for another 150 meters, before turning to painted bike lanes on either side of the road.

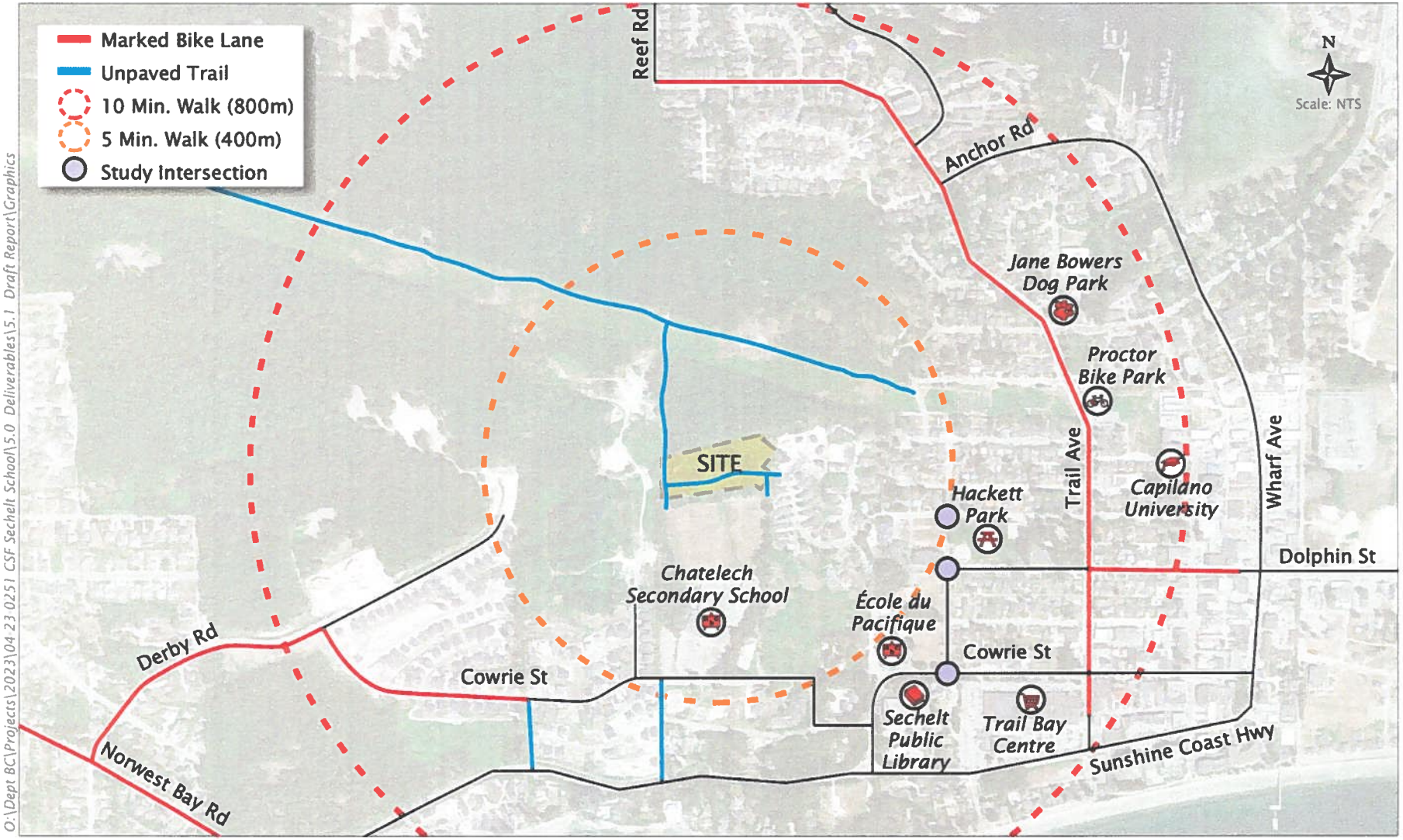

Exhibit 2.4

Pedestrian and Cycling Routes

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2.3 Current Relevant Policies & Plans

2.3.1 Municipal Plans

The District of Sechelt adopted its Official Community Plan in 2011 that contains A Transportation Master Plan (TMP) completed in 2009. The District is currently in the process of creating a new TMP that will guide the planning and prioritization of the transportation infrastructure needs for the next 20 years to accommodate the growing community. The 2009 Official Community Plan calls out a large parcel of land, "Special Infill Area #4", which shares a border with the north edge of the proposed development. This is an area that is largely undeveloped, and due to topographic constraints is recommended to be zoned as high-density residential housing in order to preserve open space areas elsewhere in Sechelt. This is relevant as development of this area could potentially introduce additional connectivity to the site.

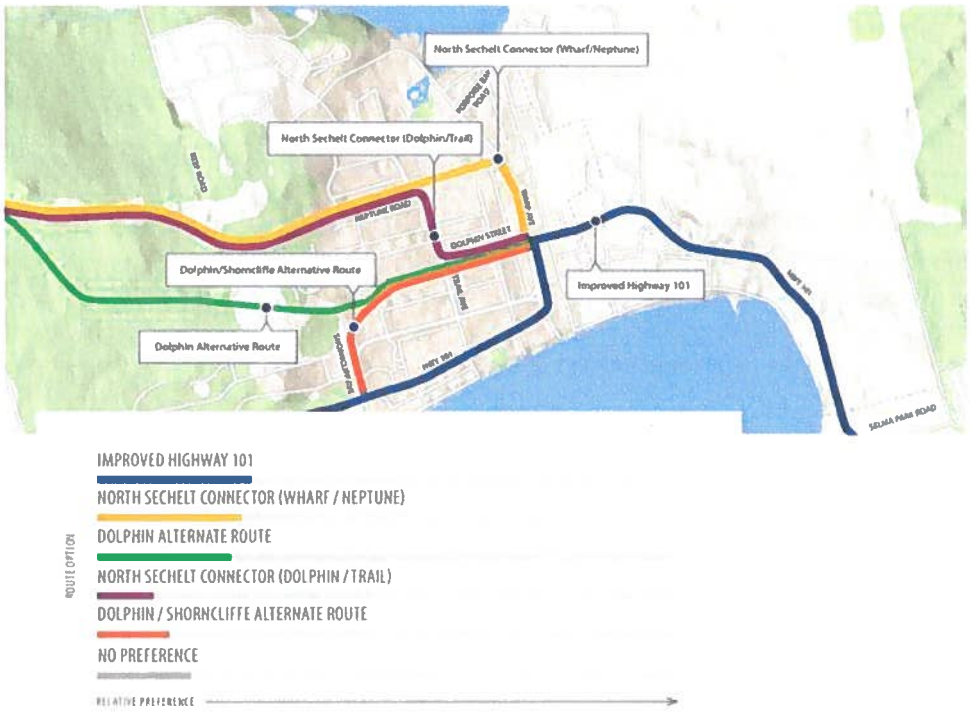
2.3.2 Regional Plans

The most recent regional plan with an effect on the development is the "Sunshine Coast - Transit Future Action Plan" of February 2022. This lays out a series of improvements that are targeted to be completed between 2022-2026, and another series of targets after 2026. Of these improvements some have already been made and improve connectivity to the site, such as increasing the service along the Route 90 bus line to 30-minute service between 6:00 AM - 6:00 PM on weekdays and rerouting of Route 1 (already reflected in this report). Future improvements include increasing Route 90-to-30-minute service for the entire day, modifying Route 2 to bi-directional service, increasing Route 2 service frequency, and addition of multiple new lines to Pender Harbour and Earls Cove Ferry Terminal/Egmont which would connect to the Sechelt transit network. They also list several less concrete improvements, such as optimization of underperforming services, improving timing and connections, and investing in bus stop infrastructure. Beyond 2026 other frequency improvements, route extensions, and new routes are outlined as well. These improvements stand to considerably improve the transit experience for the students and staff that will be commuting to this development.

2.3.3 Provincial Plans

As mentioned in the 2009 TMP, the improvement or addition of an alternate arterial to Highway 101/the Sunshine Coast Highway is a conversation that has been ongoing for a considerable time. Most recently in May of 2023 the BC Ministry of Transportation and Infrastructure (MoTI) released the "Highway 101 Alternate Route Planning Study Engagement Report". This report calls out a 20 per cent increase in traffic volumes between 2017 and 2023, primarily between Sechelt and Gibsons as the motivating factor for the investigation. Though it finds "no foreseeable need for a full, end-to-end bypass route", it does investigate how alternate routes or improvements along key segments could be implemented. This report gathered comments from locals in the Sechelt community on potential options, some of which route through or near the development location. **Figure 2.1** shows the potential options that respondents preferred.

Figure 2.1: Sechelt Public Engagement Results of Highway 101 Improvement/Rerouting Options



Source: Highway 101 Alternate Route Planning Study Engagement Report

2.4 Existing Traffic Volumes

2.4.1 Traffic Data Collection Program

Bunt conducted a traffic count on the afternoon of November 1st and the morning of November 2nd of 2023, a Wednesday and Thursday respectively, to acquire data for a typical weekday. These counts, at the three study intersections of Cowrie, Dolphin, and Medusa Street with Ocean Avenue were captured between 7:00-9:00 AM for the morning, and 3:00-6:00 PM for the afternoon. As summarized in **Table 2.4**, the peak hours of the study network were found to be between 8:00-9:00 AM and 3:00-4:00. A summary of the traffic data collected can be found in **Appendix B**. Notably, there was an active construction project on the parcel directly southwest of the Medusa Street and Ocean Avenue intersection. This particularly inflated the number of heavy vehicles that would be expected on the study network.

Table 2.4: Summary of Available and Counted Traffic Data

INTERSECTION	SOURCE	DATE OF COUNT	PEAK HOURS	
			AM	PM
Ocean Ave & Medusa St	Bunt	Nov 1 & 2, 2023	8:00-9:00	3:15-4:15
Ocean Ave & Dolphin St	Bunt	Nov 1 & 2, 2023	8:00-9:00	3:00-4:00
Ocean Ave & Cowrie St	Bunt	Nov 1 & 2, 2023	8:00-9:00	3:00-4:00
	OVERALL STUDY AREA PEAK HOUR		8:00-9:00 AM	3:00-4:00 PM

2.4.2 Peak Hour Traffic Volumes

The existing peak hour vehicle volumes are illustrated in **Exhibit 2.5** while **Table 2.5** presents a summary of the two-way peak-hour vehicle movements for the streets in the study area. **Exhibit 2.6** shows the pedestrian and cycling volumes during the AM and PM peak hour. The influxes of pedestrian and cyclist traffic correspond with the beginning and end of the day at nearby schools, which is likely also a factor in the early PM peak hour.

Table 2.5: Existing Peak Hour Roadway Link Volumes

ROAD LINK	PEAK LINK VOLUMES (VEH/HR)	
	AM	PM
Ocean Ave, north of Medusa St	40	53
Medusa St, west of Ocean Ave	44	71
Medusa St, east of Ocean Ave	35	54
Dolphin St, east of Ocean Ave	152	242
Ocean Ave, north of Cowrie St	185	221
Cowrie St, east of Ocean Ave	233	378
Cowrie St, west of Ocean Ave	363	329
Rosina Giles Way, south of Cowrie St	43	232

Currently, Medusa Street west of Ocean Avenue carries a low level of traffic, between 40 - 70 vehicles during the weekday peak hour.

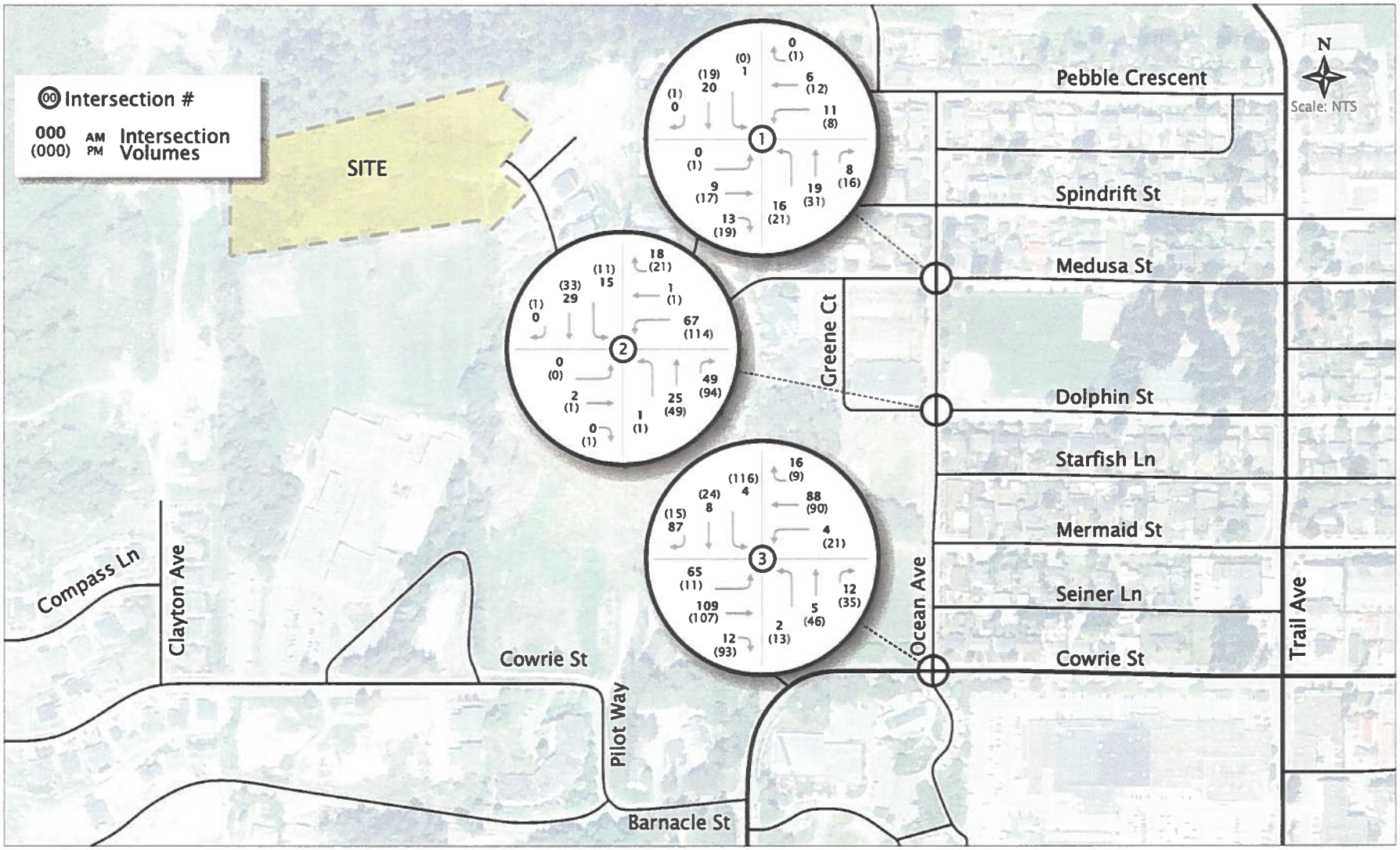


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Exhibit 2.5

Existing Peak Hour Vehicle Traffic Volumes

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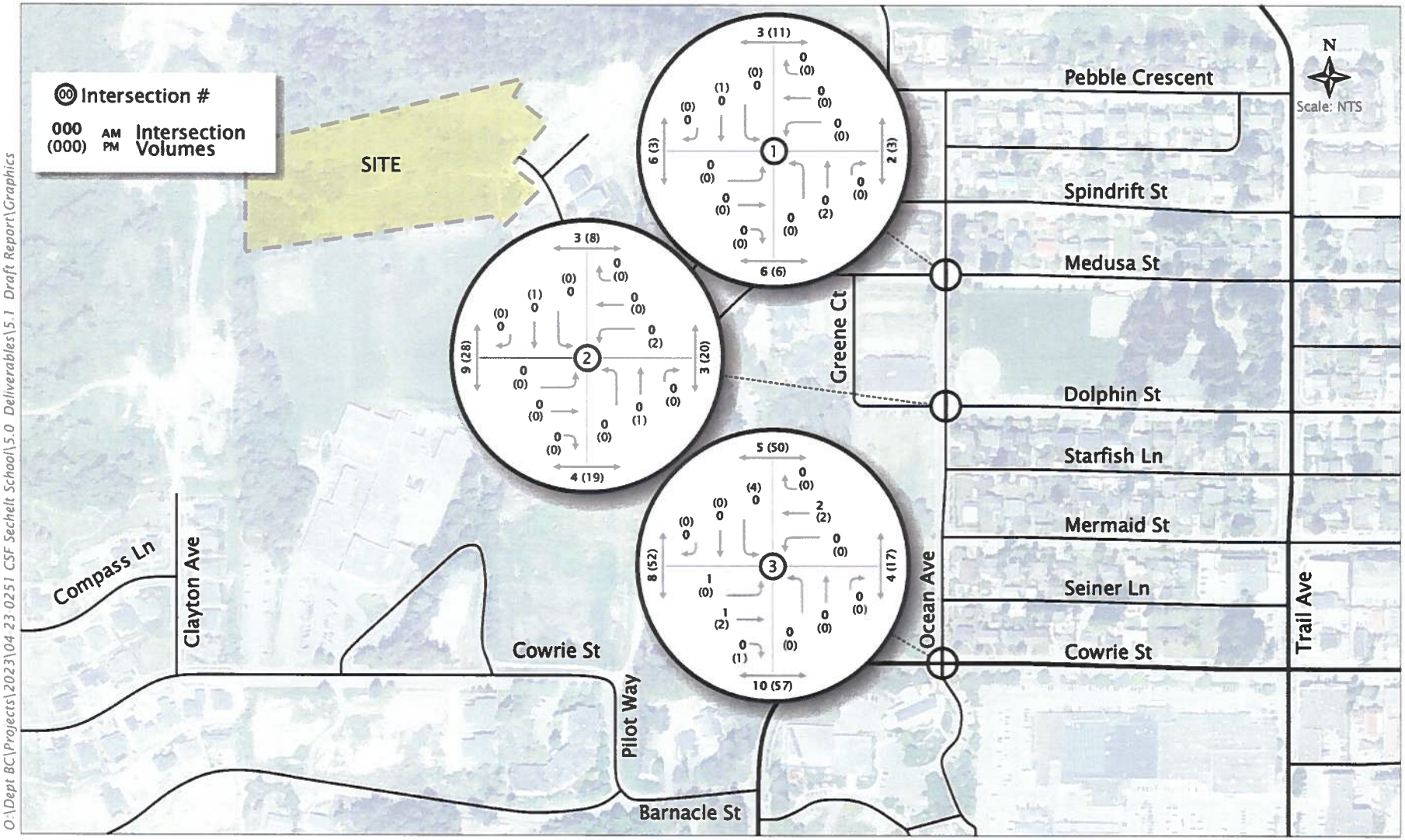

Exhibit 2.6

Existing Peak Hour Cyclist and Pedestrian Volumes

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2.5 Existing Operations

2.5.1 Performance Thresholds

The existing operations of study area intersections and access points were assessed using the methods outlined in the 2000 Highway Capacity Manual (HCM), using the Synchro 11.1 analysis software (Build 1, Revision 6). The traffic operations were assessed using the performance measures of Level of Service (LOS) and volume-to-capacity (V/C) ratio.

The LOS rating is based on average vehicle delay and ranges from "A" to "F" based on the quality of operation at the intersection. LOS "A" represents optimal, minimal delay conditions while a LOS "F" represents an over-capacity condition with considerable congestion and/or delay. Delay is calculated in seconds and is based on the average intersection delay per vehicle.

Table 2.6 below summarizes the LOS thresholds for the six Levels of Service, for both signalized and unsignalized intersections.

Table 2.6: Intersection Level of Service Thresholds

LEVEL OF SERVICE	AVERAGE CONTROL DELAY PER VEHICLE (SECONDS)	
	SIGNALIZED	UNSIGNALIZED
A	≤10	≤10
B	>10 and ≤20	>10 and ≤15
C	>20 and ≤35	>15 and ≤25
D	>35 and ≤55	>25 and ≤35
E	>55 and ≤80	>35 and ≤50
F	>80	>50

Source: Highway Capacity Manual

The volume to capacity (V/C) ratio of an intersection represents ratio between the demand volume and the available capacity. A V/C ratio less than 0.85 indicates that there is sufficient capacity to accommodate demands and generally represents reasonable traffic conditions in suburban settings. A V/C value between 0.85 and 0.95 indicates an intersection is approaching practical capacity; a V/C ratio over 0.95 indicates that traffic demands are close to exceeding the available capacity, resulting in saturated conditions. A V/C ratio over 1.0 indicates a very congested intersection where drivers may have to wait through several signal cycles. In downtown and Town Centre contexts, during peak demand periods, V/C ratios over 0.90 and even 1.0 are common.

For an unsignalized intersection, the target individual moment Level of Service should be E or better, unless volumes are very low and LOS F is acceptable. A LOS worse than this would justify consideration of roadway or traffic control improvements.

In interpreting of the analysis results, note that the HCM methodology reports performance differently for various types of intersection traffic control. In this report, the performance reporting convention is as follows:

- For unsignalized two-way stop-controlled intersections: HCM 2000 LOS and V/C output is reported just for individual lanes as the HCM methodology does not report overall performance;
- For unsignalized all-way Stop controlled intersections: HCM 2000 unsignalized LOS is reported for the overall intersection as well as by intersection approach LOS. The HCM 2000 methodology does not report an overall V/C ratio for all-way Stop controlled intersections. Degree of Utilization calculated with the HCM 2000 methodology is reported for individual movements in place of V/C, which is not part of the HCM 2000 report;

The performance reporting conventions noted above have been consistently applied throughout this document and the detailed outputs are provided in **Appendix C**.

2.5.2 Existing Conditions Analysis Assumptions

Synchro Parameters

Some adjustments were made to the Synchro model to assess existing conditions:

- Road widths reflect actual conditions measured from aerial and/or site observations,
- PHF was adjusted based on count data,
- Heavy vehicle % reflect observed traffic.

Other than the above noted changes, the Synchro default settings were applied.

2.5.3 Existing Operational Analysis Results

The intersection operations of the study intersections are shown in **Exhibits 2.7** and **2.8** for weekday AM and PM peak conditions, respectively. As indicated in the exhibits and confirmed through the site visit, no operation issues were identified.

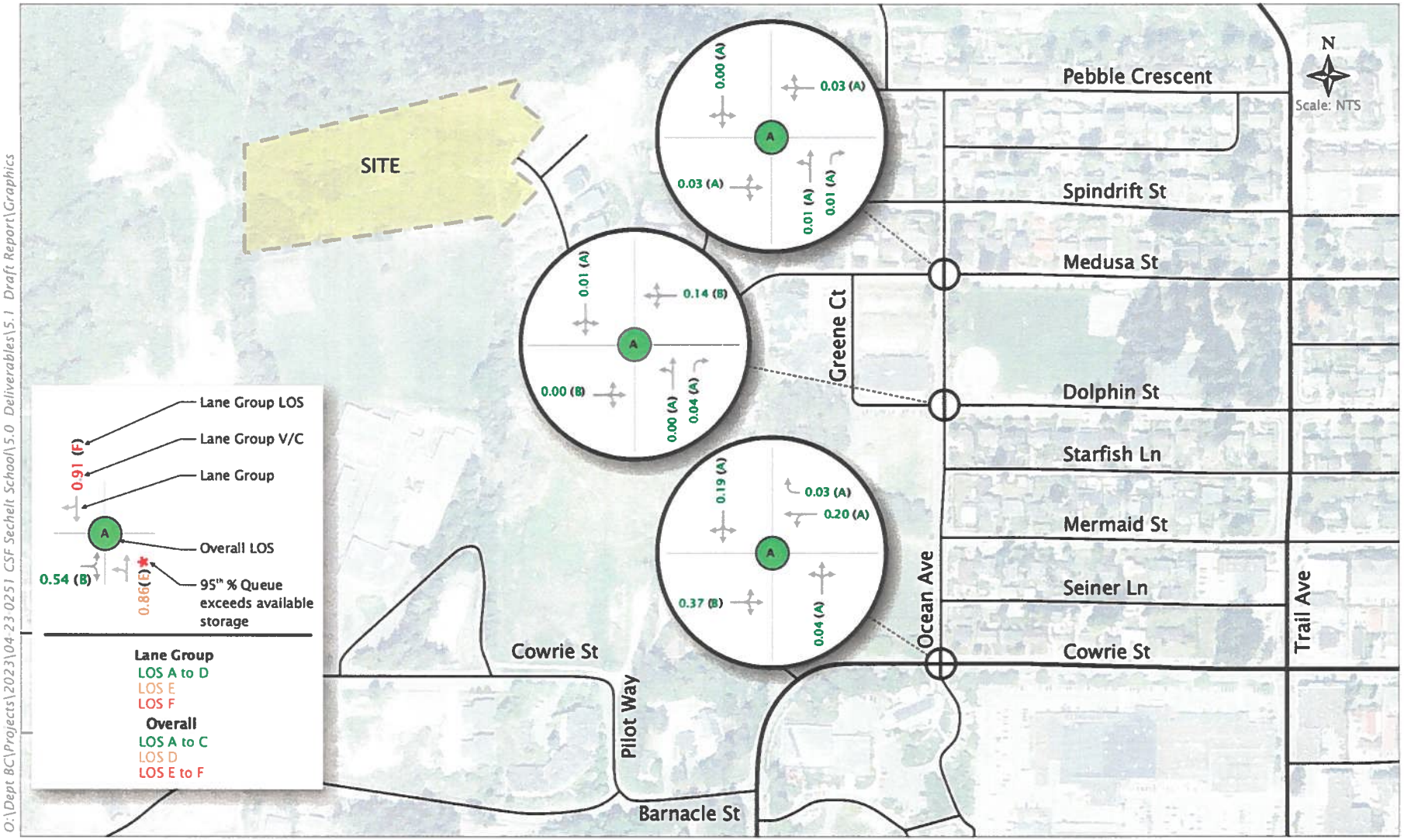

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Exhibit 2.7

Existing AM Peak Hour Performance

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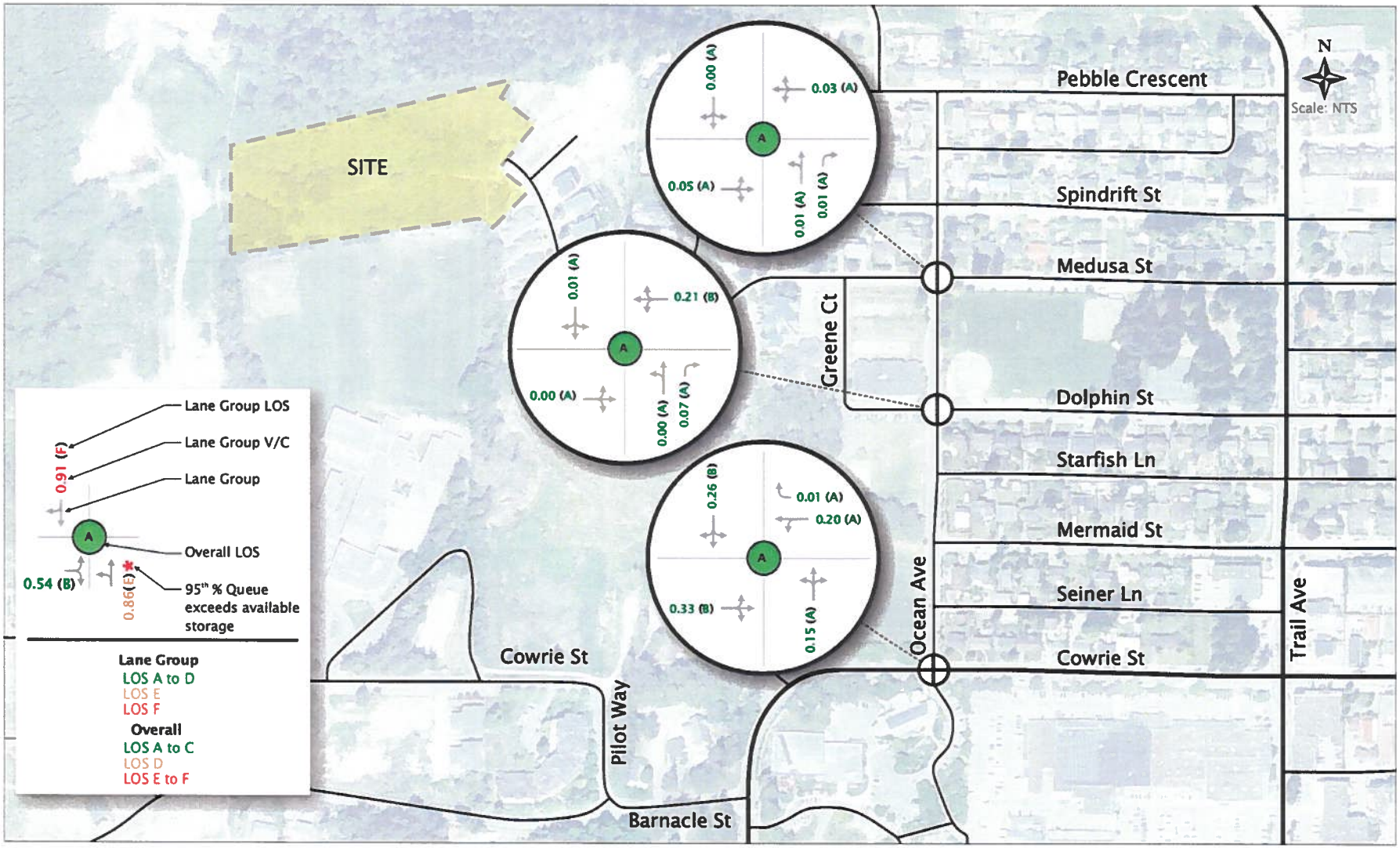

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Exhibit 2.8

Existing PM Peak Hour Performance

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3. FUTURE TRAFFIC CONDITIONS

3.1 Traffic Forecasts

3.1.1 Background Traffic Forecasts

Background traffic is traffic that would be present on the road network if the site did not redevelop. Given that the site is currently vacant, this will reflect the current non-site traffic. A conservative linear growth rate of 2.0% growth per year is applied to estimate the future background traffic volumes in the area. This is shown in **Exhibit 3.1** for the opening day of the site in 2029, and then again 10 years after opening day in **Exhibit 3.2**.

3.1.2 Site Traffic

Trip Generation

Bunt has conducted trip generation observations on November 28, 2019 at the existing Ecole du Pacifique site as part of the traffic study completed for the proposed school expansion at the time. As the site does not follow a typical school traffic, with 80% of students arrive/depart by school buses, ITE Trip Generation rates are not applicable to the site. Therefore, Bunt feels it appropriate to apply the observed trip rates collected at the site access in 2019 to estimate the future school vehicle trips, but use the in/out split based on ITE Trip Generation Manual for daycare, elementary and high-school. As the observed school did not have secondary school component, it was assumed that the trip rates for elementary school represent the secondary school component. The trip generation calculation table is included in **Appendix D**.

Table 3.1: Peak Hour Vehicle Trip Rates

LAND USE	UNITS (STUDENTS)	AM PEAK HOUR			PM PEAK HOUR		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Day Care Center (565)	36	53%	47%	0.21	47%	53%	0.63
Elementary School (520)	120	54%	46%	0.17	46%	54%	0.27
High School (525)	50	68%	32%	0.17	48%	52%	0.27
TOTAL	206						

Table 3.2 summarizes the anticipated future site generated vehicle trips for the proposed development based on the above rates.

Table 3.2: Estimated Peak Hour Site Vehicle Trips

LAND USE	AM PEAK HOUR			PM PEAK HOUR		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Day Care Center (565)	4	4	8	11	12	23
Elementary School (520)	11	9	20	15	17	32
High School (525)	6	3	9	7	7	14
TOTAL	21	16	37	33	36	69

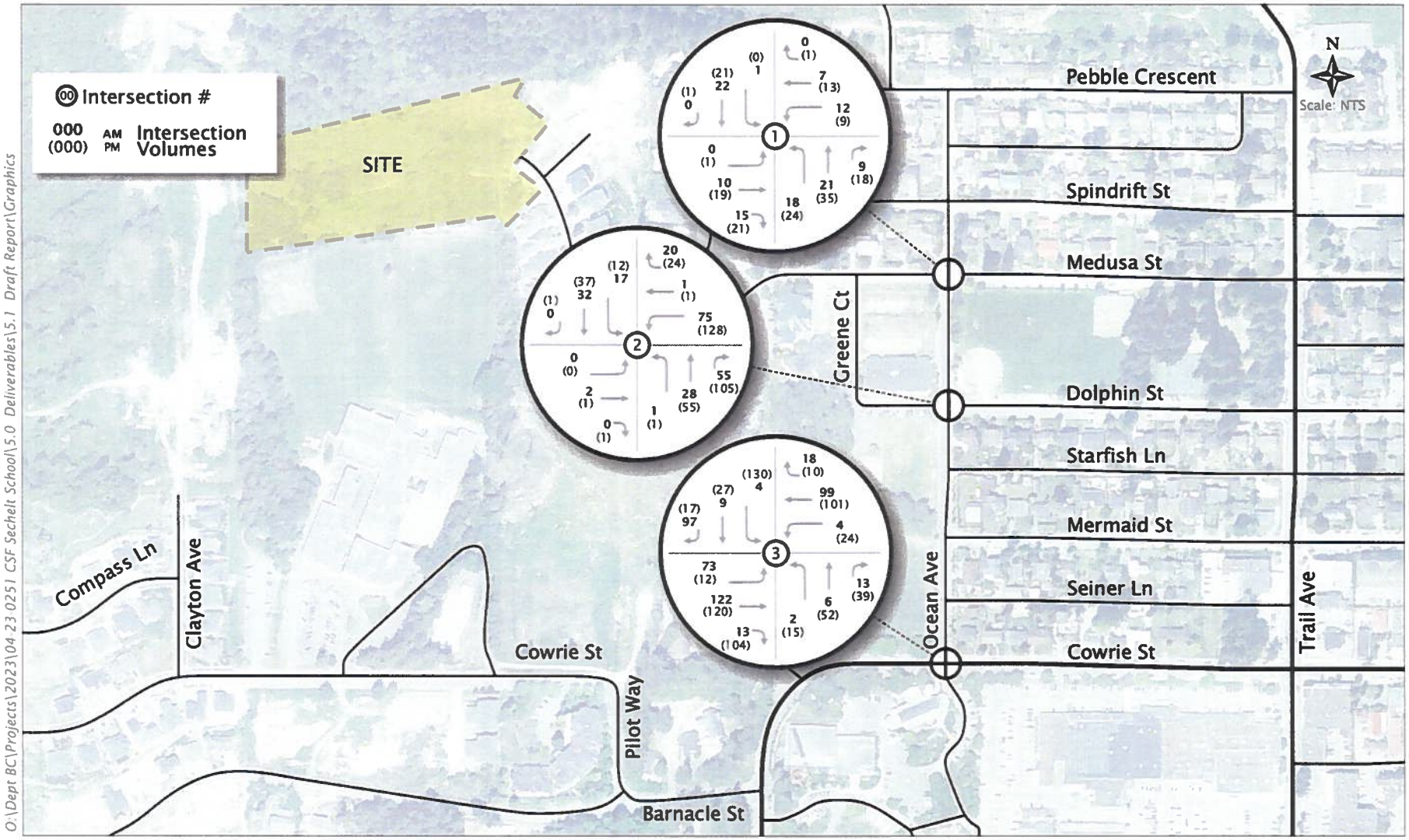

Exhibit 3.1

Opening Day Background Traffic Forecasts

04-23-0251

CSF Sechelt School
January 2024

bunt & associates

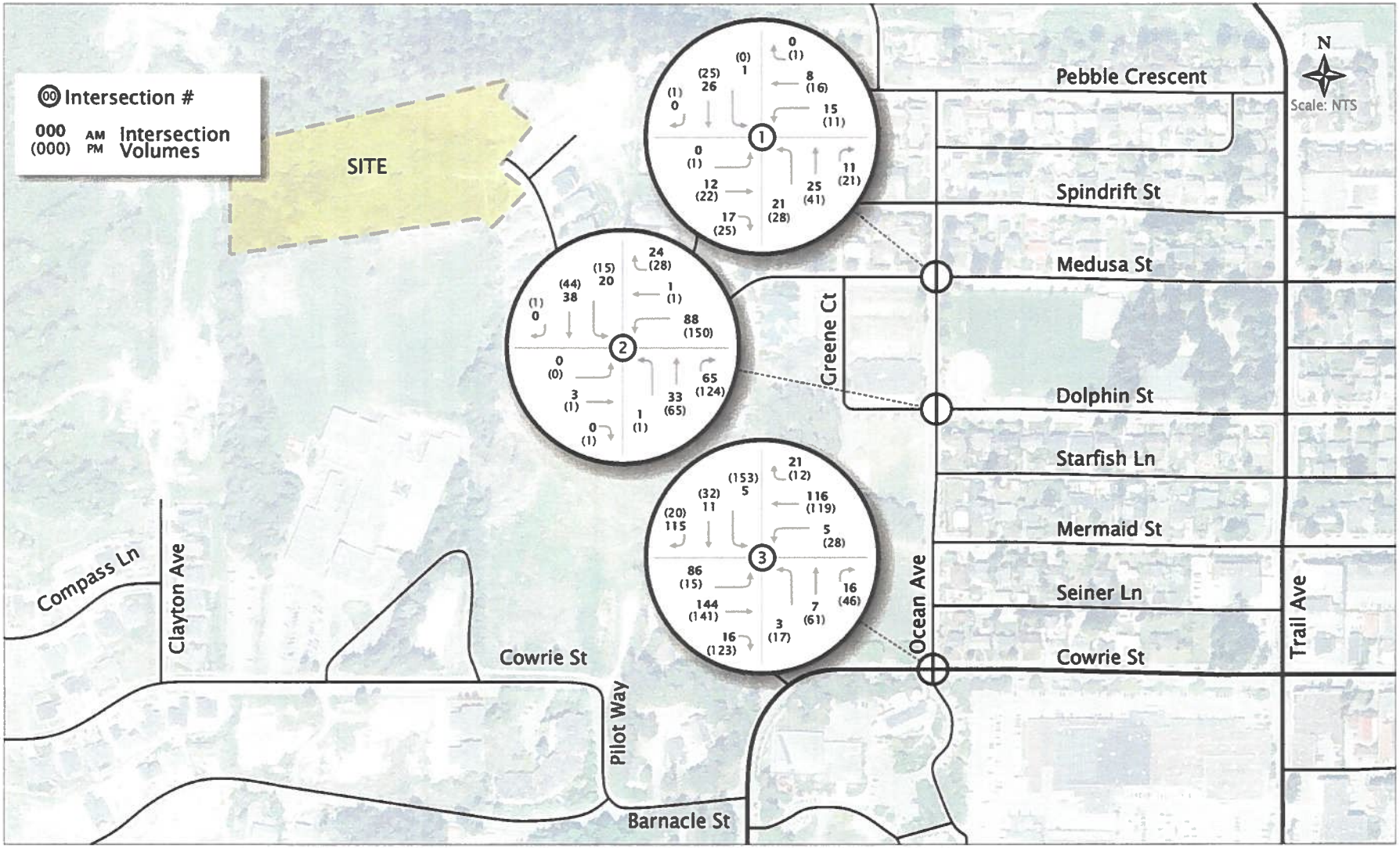

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Exhibit 3.2

Opening Day + 10 Background Traffic Forecasts

04-23-0251

CSF Sechelt School
January 2024

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Trip Distribution & Assignment

Trip distribution, a makeup of where inbound trips originate and outbound trips terminate, was estimated based on the data collected during the traffic counts on November 1st and 2nd, 2023 and is shown in **Table 3.3**. As this is based on real data, the AM and PM trip distributions vary.

Table 3.3: Estimated Trip Distribution

ORIGIN/DESTINATION	AM PEAK HOUR		PM PEAK HOUR	
	IN (%)	OUT (%)	IN (%)	OUT (%)
Ocean Avenue North	5	5	5	5
Medusa Street East	5	5	5	5
Dolphin Street East	20	15	20	15
Cowrie Street East	25	30	20	40
Cowrie Street West	40	40	35	15
Rosina Giles Way South	5	5	15	20
TOTAL	100%	100%	100%	100%

Using this trip distribution, and the estimated peak hour site traffic volumes, the site traffic has been assigned to the study network, and is shown at each of the study intersections in **Exhibit 3.3**. **Table 3.4** presents the net traffic impact of the proposed development on the study intersections relative to the expected background volumes on the opening day.

Table 3.4: Net Change in Future Intersection Vehicle Volumes with New Site Trips

INTERSECTION	AM PEAK HOUR VOLUMES			PM PEAK HOUR VOLUMES		
	BACK-GROUND	SITE	% CHANGE	BACK-GROUND	SITE	% CHANGE
Ocean Ave & Medusa St	115	37	32	164	69	42
Ocean Ave & Dolphin St	232	33	14	366	62	17
Ocean Ave & Cowrie St	524	26	5	792	50	6

This shows that the Ocean Ave & Cowrie Street intersection, which already carries a higher volume of traffic, experience smaller percent increases in traffic at 5% and 6% for the AM and PM peaks, respectively. This is more pronounced at Ocean Ave & Medusa Street as all site trips must pass through this intersection with 32% and 42% increase in the morning and afternoon peak, respectively.

3.1.3 Total Traffic

Total traffic is the sum of the background volumes and the forecasted site traffic volumes. The total traffic volumes for the opening day and opening day + 10 are illustrated in **Exhibits 3.4** and **3.5**, respectively.

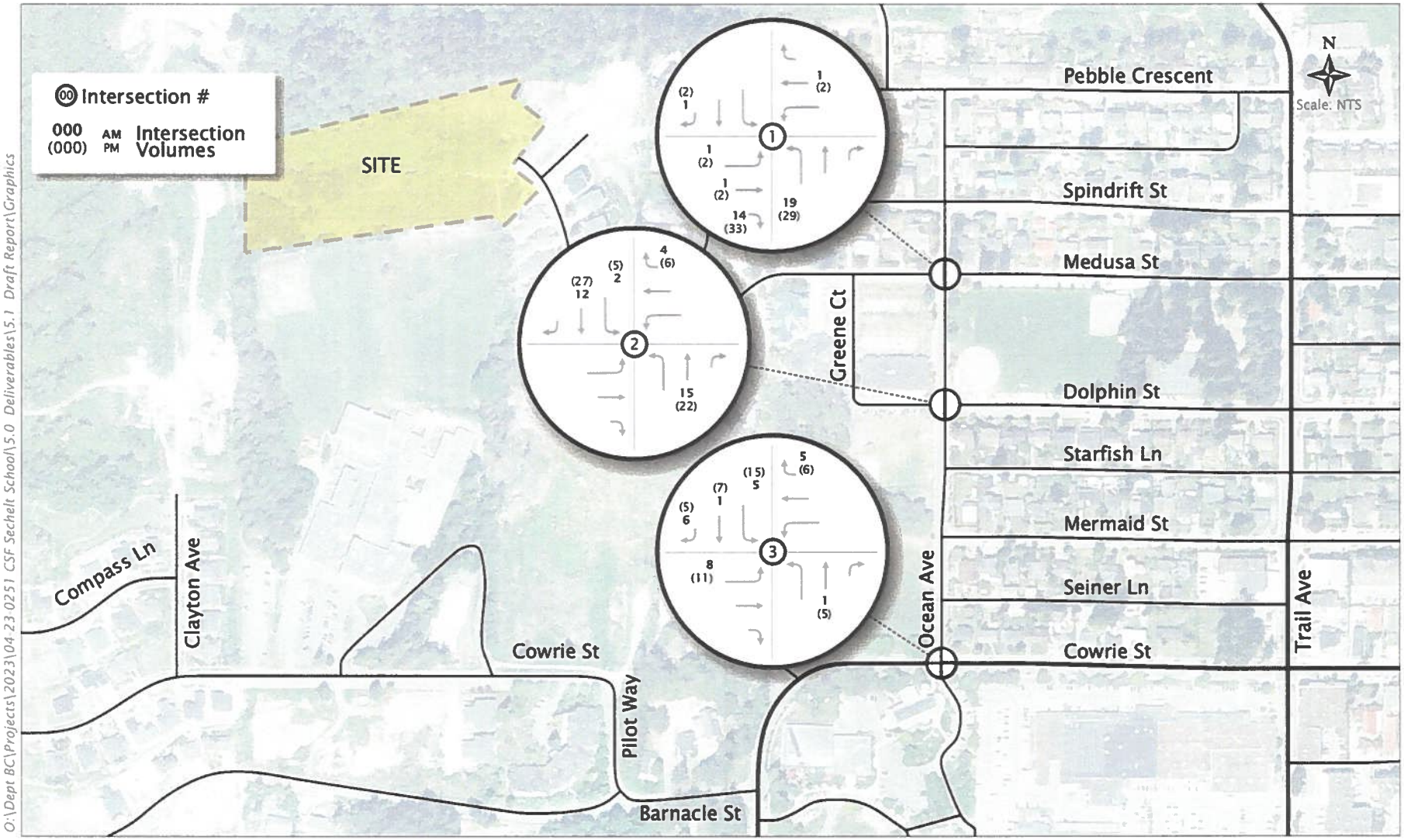

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Exhibit 3.3

Site Traffic Forecasts

CSF Sechelt School
January 2024

04-23-0251

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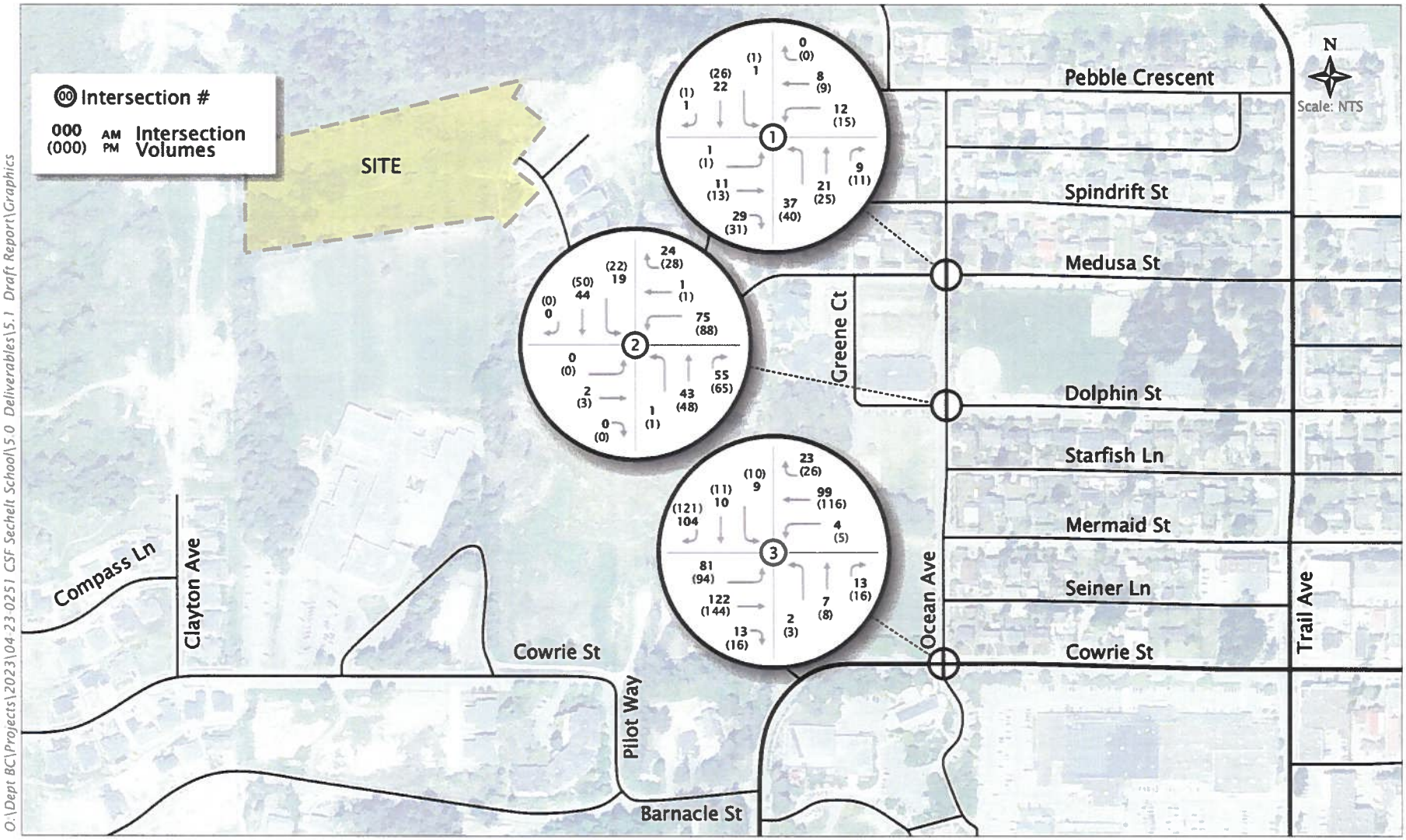

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Exhibit 3.4

Opening Day Total Traffic Forecasts

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CSF Sechelt School
January 2024

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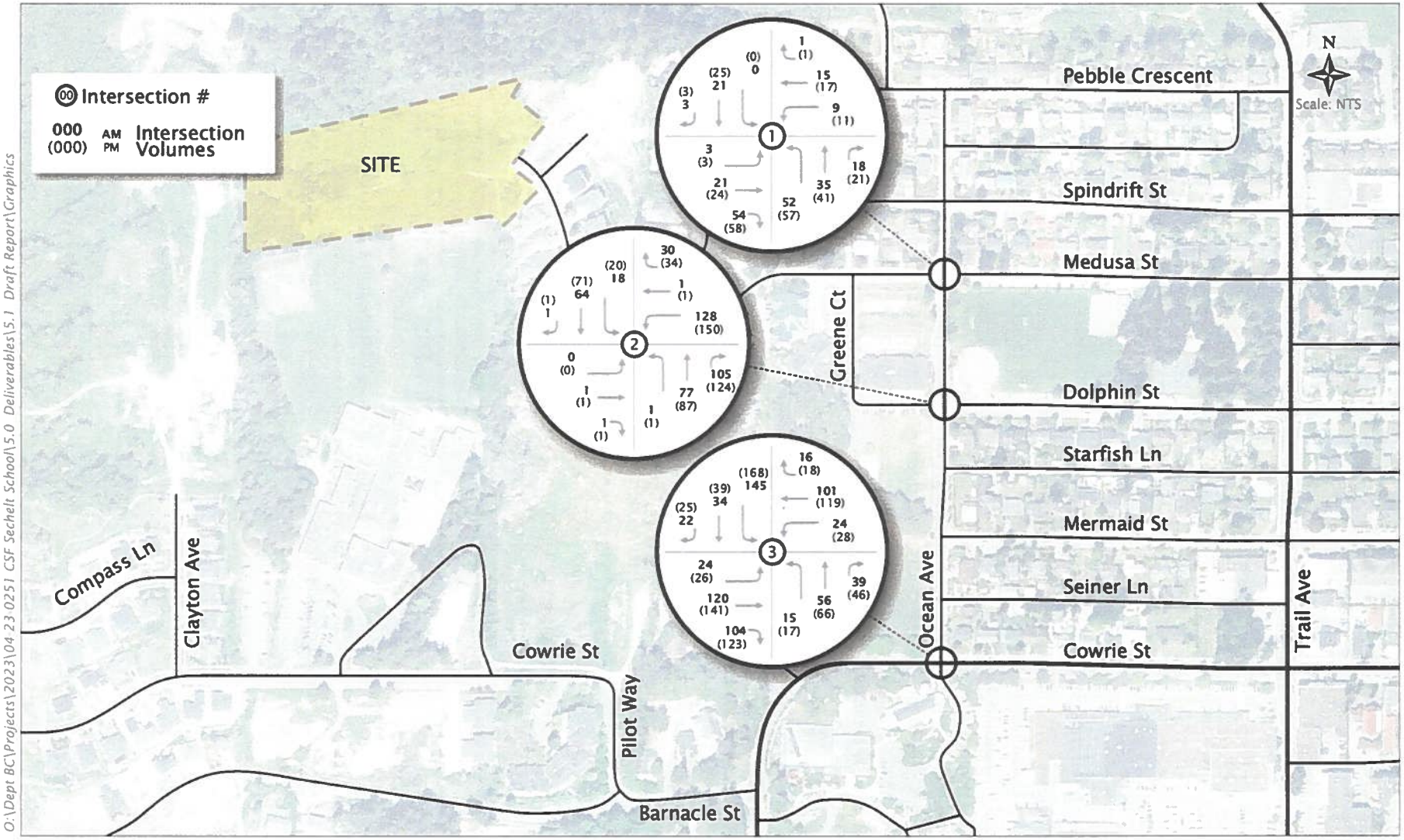

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Exhibit 3.5

Opening Day + 10 Total Traffic Forecasts

04-23-0251

CSF Sechelt School
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3.2 Future Traffic Operations

3.2.1 Future Conditions Analysis Assumptions

An adjustment to the default settings was made to maintain the integrity of the dataset for the PM count of the Ocean Avenue and Cowrie Street intersection. Only a total of four vehicles made a southbound left movement during the existing peak hour, with two of those being made by heavy vehicles. However, it would be unreasonable to assume such a high percentage of movements are typically made only by heavy vehicles as we scale these volumes to forecast future traffic conditions. Thus, the number of heavy vehicles making this movement was set at fixed value of two and not scaled in future forecasts. This should have a negligible impact on the accuracy of the results. Otherwise, Synchro settings per existing conditions were used.

3.2.2 Future Background Traffic Operations

For the opening day of 2029, the background conditions without the development traffic were analyzed for the AM and PM peak hours and the operation results are respectively presented in **Exhibits 3.6** and **3.7**.

Similarly, **Exhibits 3.8** and **3.9** show the operation results of the study intersections for the AM and PM peak hour of the horizon year in 2039 without the development in place. The detailed Synchro outputs are provided in Appendix C.

3.2.3 Future Total Traffic Operations

Exhibits 3.10 and **3.11** reflect the opening day AM and PM intersection conditions in 2029 with the forecasted trips to and from the planned school added to the background volumes.

Exhibits 3.12 and **3.13** similarly accounts for the total trips in the network, but in the horizon year of 2039.

3.2.4 Summary of Traffic Impacts & Recommended Mitigations

The site traffic is not anticipated to have a material impact on the traffic operations within the study area, with a LOS B or better for all lane movements and intersections in the long term 2039 horizon year. No mitigations to the existing road network are required to accommodate the background traffic growth, nor the addition of the development trips.

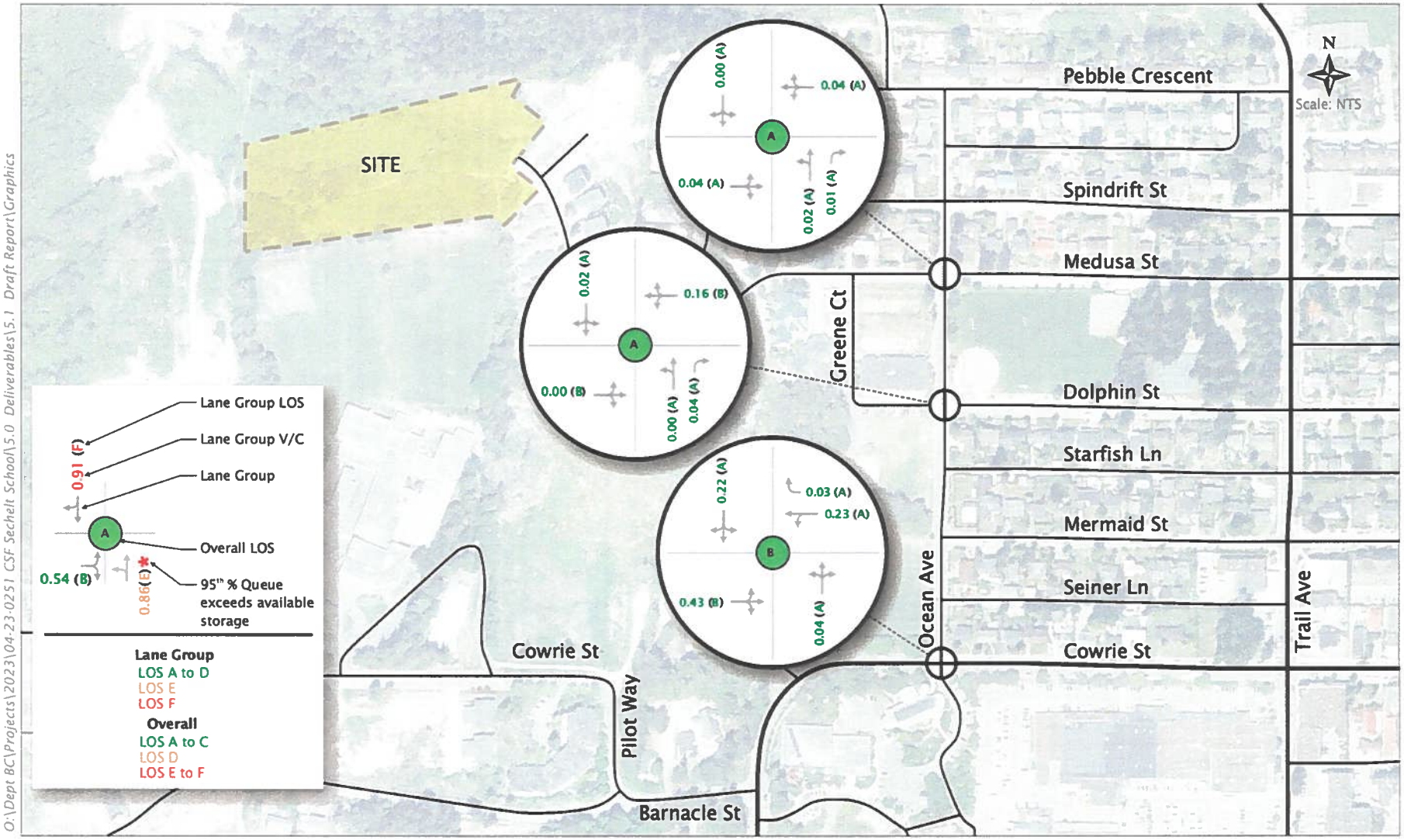

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Exhibit 3.6

Opening Day Background AM Peak Hour Performance

04-23-0251

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January 2024

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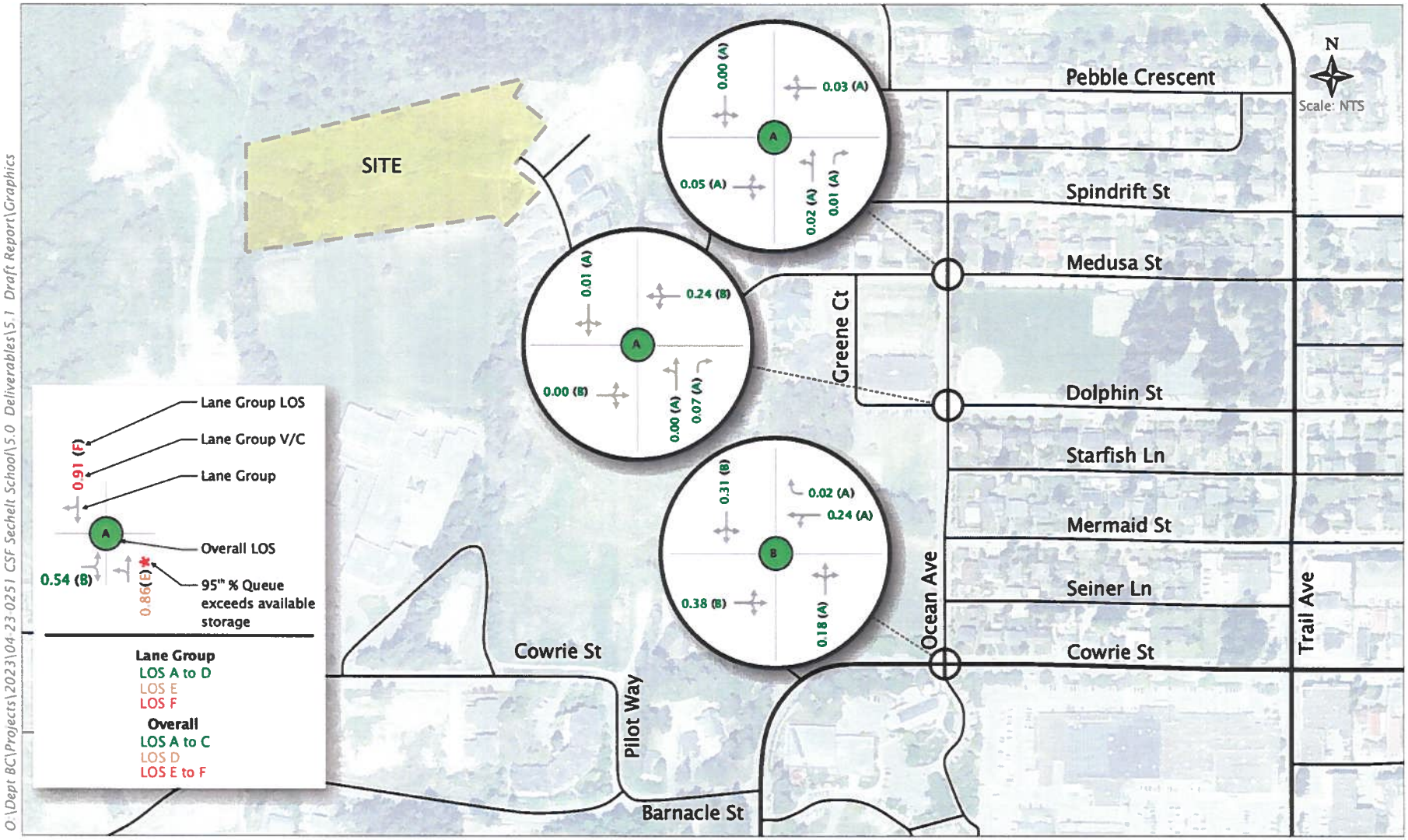

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Exhibit 3.7

Opening Day Background PM Peak Hour Performance

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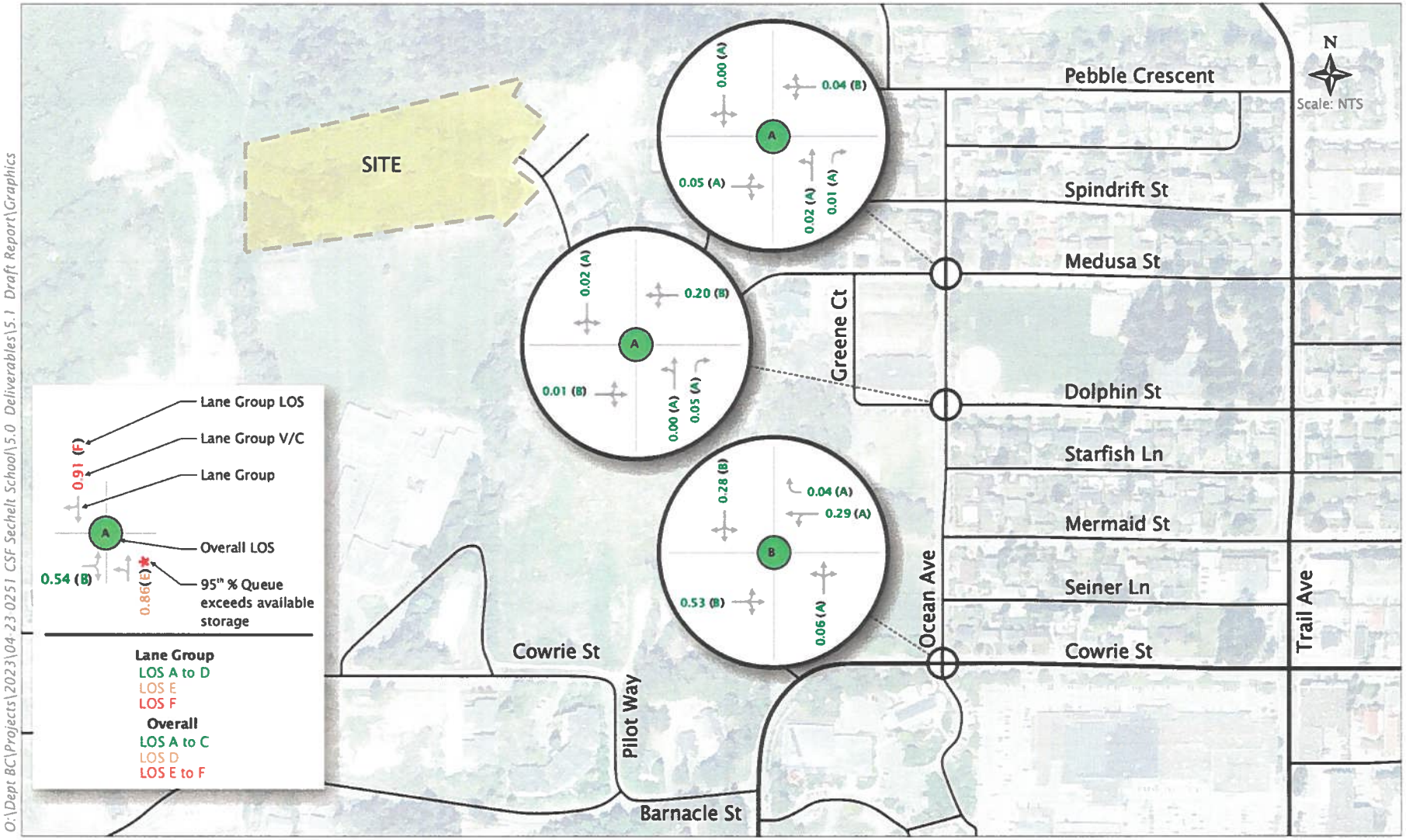

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Exhibit 3.8

Opening Day + 10 Years Background AM Peak Hour Performance

04-23-0251

CSF Sechelt School
January 2024

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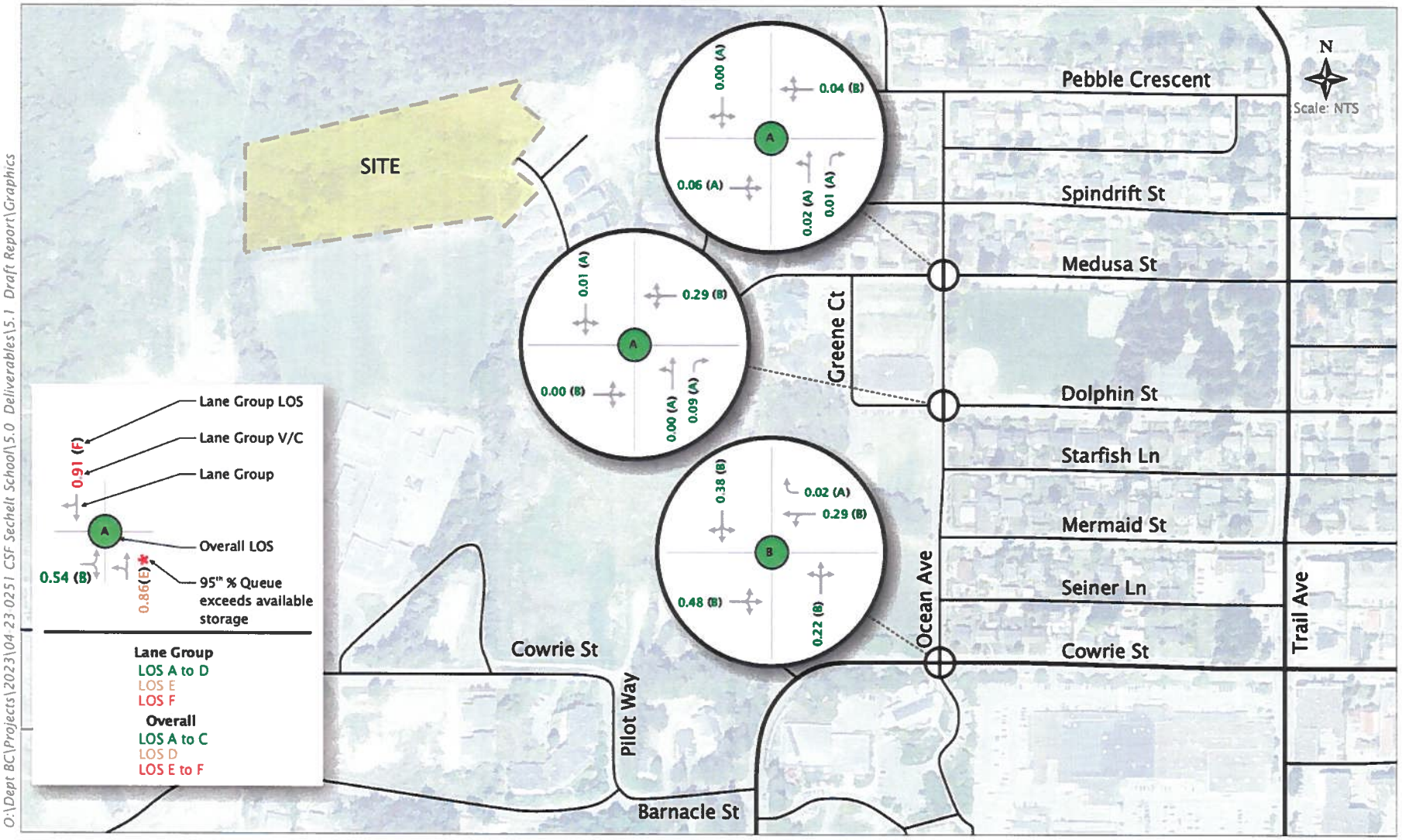

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Exhibit 3.9

Opening Day + 10 Years Background PM Peak Hour Performance

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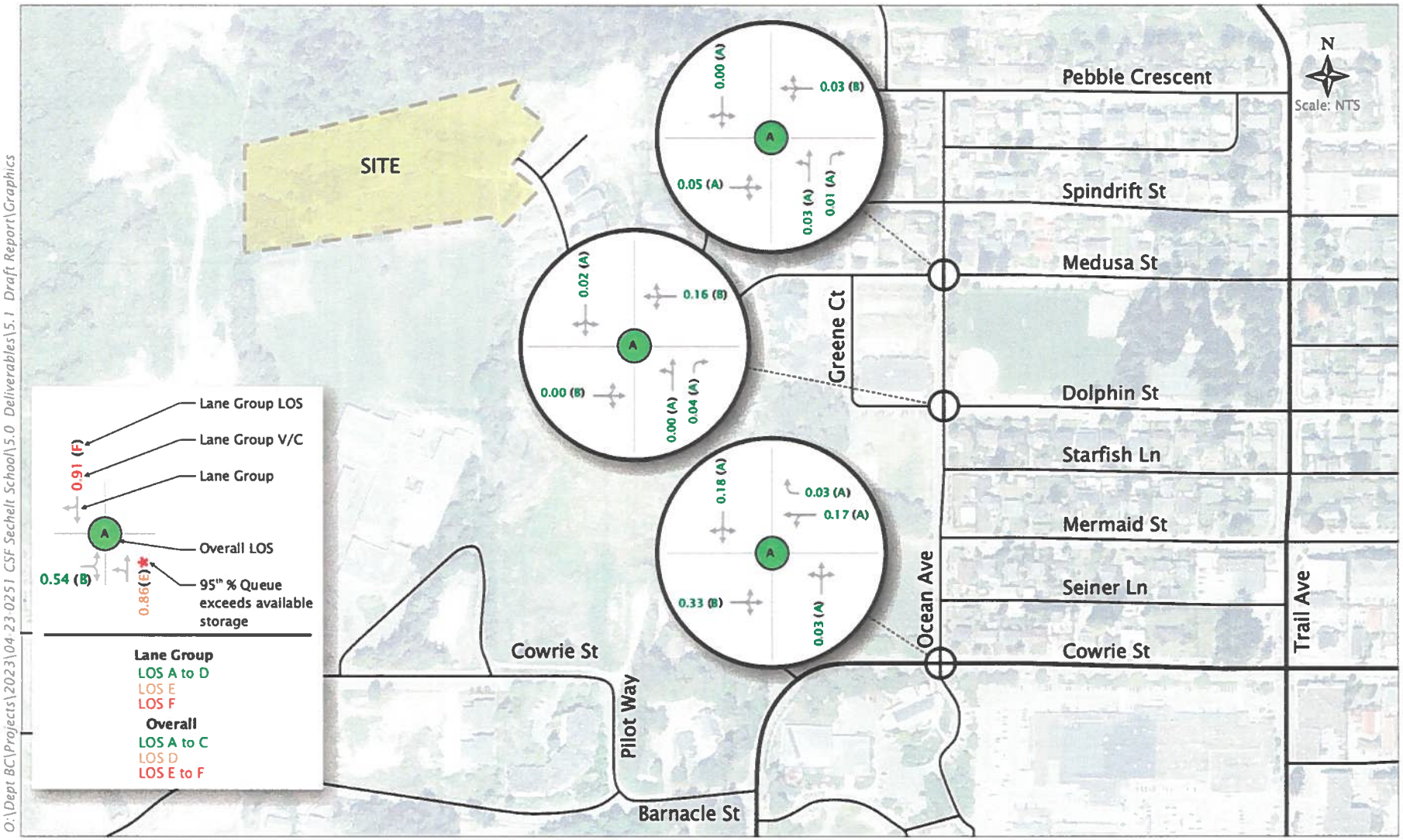

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Exhibit 3.10

Opening Day Total AM Peak Hour Performance

04-23-0251

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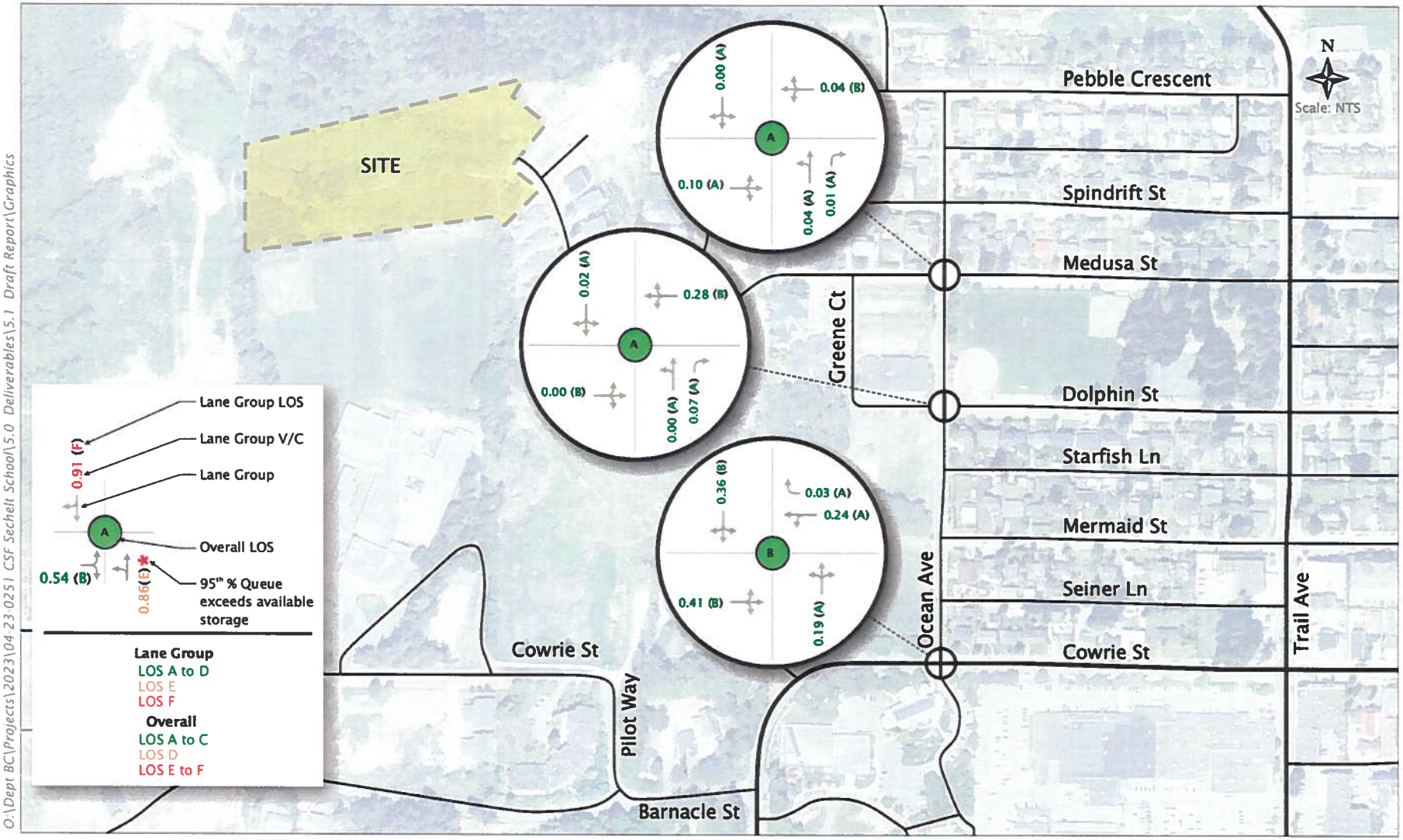

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Exhibit 3.11

Opening Day Total PM Peak Hour Performance

04-23-0251

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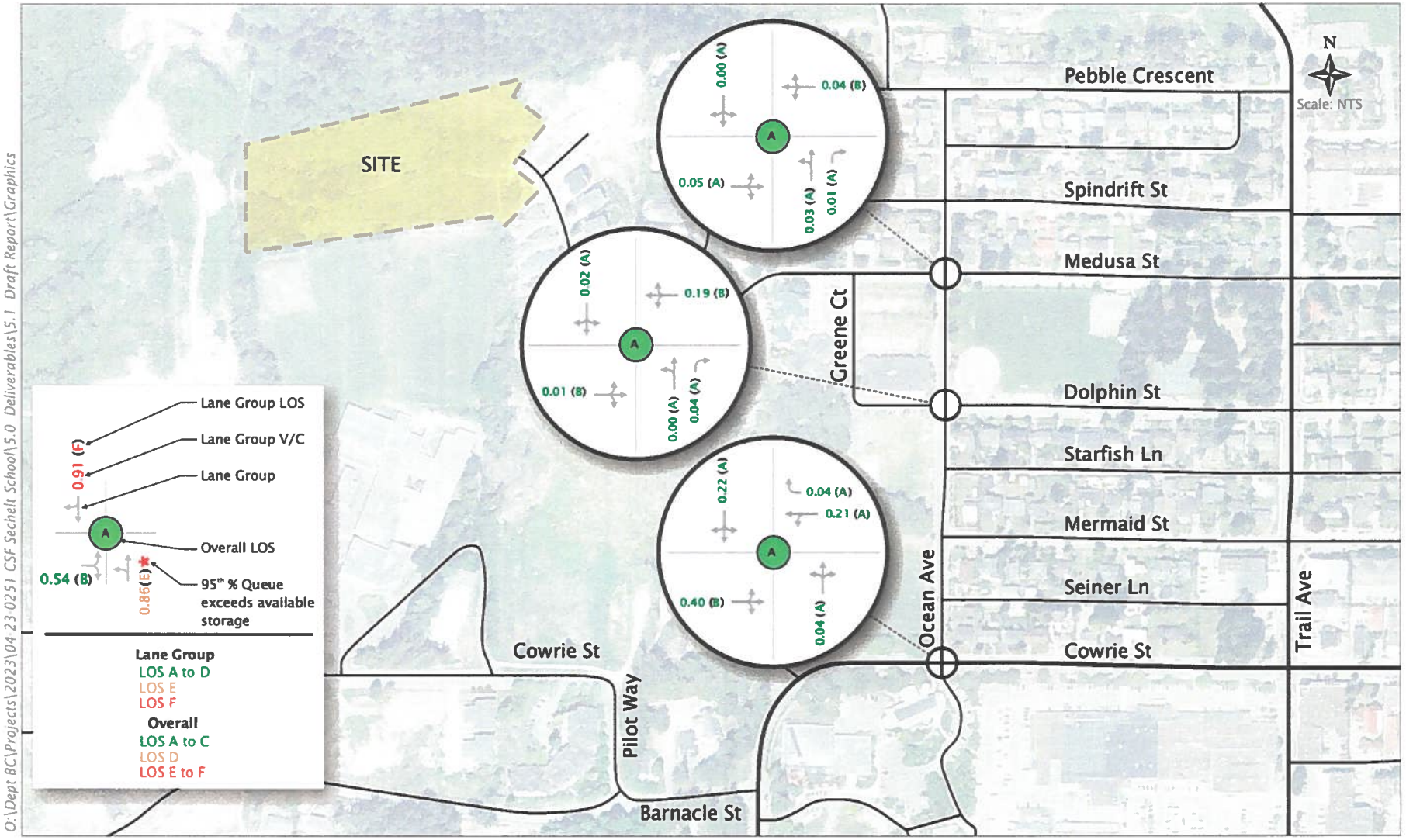

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Exhibit 3.12

Opening Day + 10 Years Total AM Peak Hour Performance

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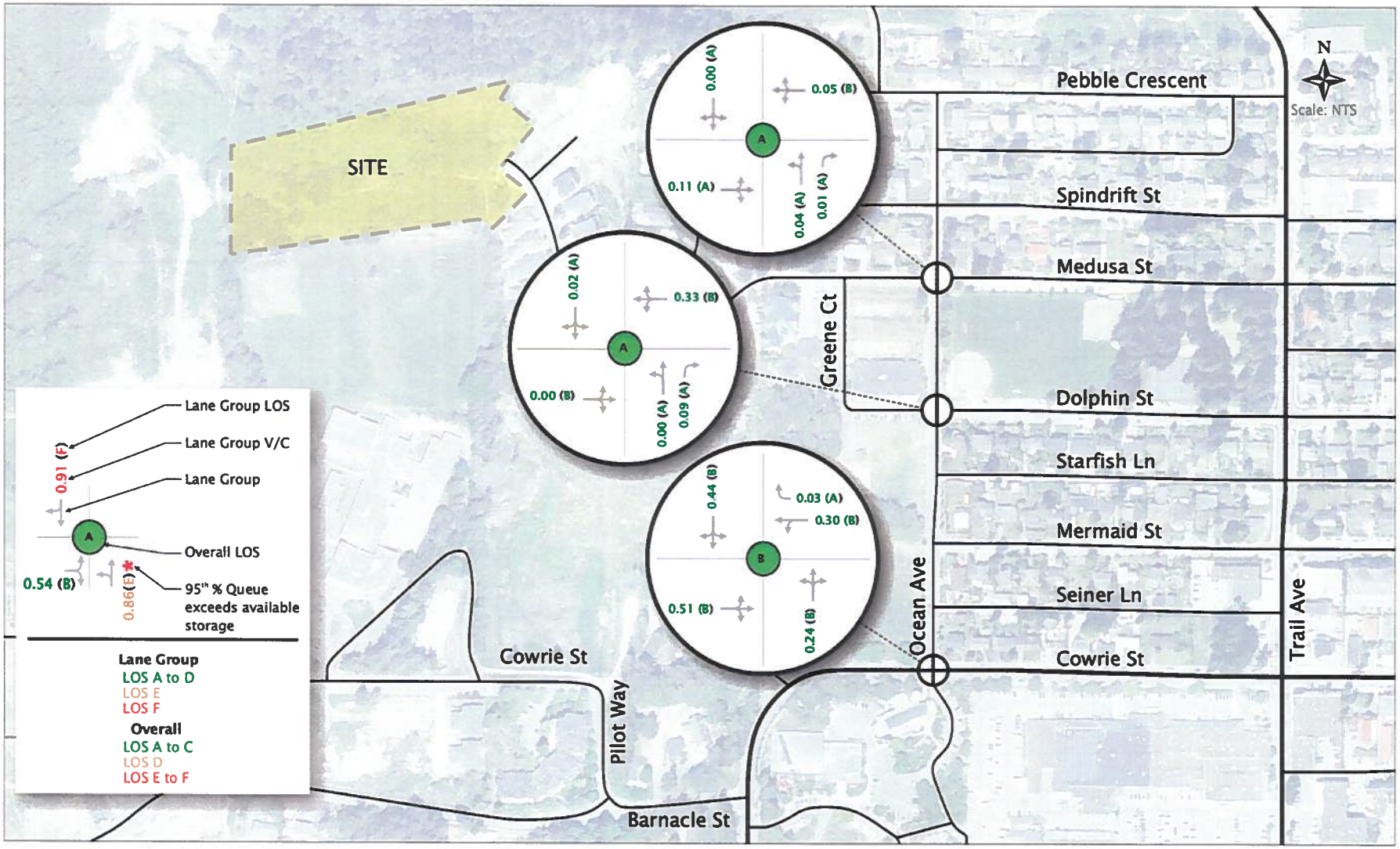

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Exhibit 3.13

Opening Day + 10 Years Total PM Peak Hour Performance

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4. SITE PLAN DESIGN REVIEW

4.1 Site Access Design

The location of the site access is at the western terminus of Medusa Street, which serves as the sole point of entry and egress to and from the site. A curving, two-way roadway leads to three separated parking pockets, and a one-way counterclockwise loop for pick-up/drop-off activities. The site currently provides layby spaces for pick-up/drop-off with the west portion reserved for school buses.

Creus Engineering has tested school bus ingress and egress routes that preserves two-way traffic flow along the site entrance, which are attached in **Appendix E**.

4.2 Parking Supply

4.2.1 Vehicle Parking

Table 4.1: Vehicle Parking Supply Requirement & Provision

LAND USE	DENSITY	BYLAW RATE	BYLAW SUPPLY REQUIREMENT	PROVIDED
Child Care Facility, Minor and Major	36 Students	1 space per 5 students	7	54
School - Elementary	1839.6 m²	1 space per 90 m² of GFA	20	
School - Secondary	628.2 m²	1 space per 65 m² of GFA	10	
TOTAL			37	54

The 36 students that make up the Child Care Facility land use consists of a planned 12 infant/toddlers, and 24 pre-kindergarteners. When determining GFA for the Elementary and Secondary uses, the total area of the site was split between dedicated child care, elementary, secondary, and shared spaces like hallways, the library, or the gym. As the planned 120 elementary and 50 secondary students made up approximately 60% and 20% of the total student population respectively, the area of the shared spaces (2,341 m²) were added to the dedicated GFA multiplied by these percentages.

20% of the minimum required parking is allowed to be designated as small car parking, which translates to 7 vehicles. These stalls must be clearly labeled for compact or small vehicles. As 36 full sized stalls are provided, only 3% of the stalls the development are required to provide are small car parking, and thus the parking lot is compliant despite providing a total of 18 small car spaces.

Two accessible parking spaces are provided which meets the Bylaw requirements.

Two electric charging stations are also required to be provided based on the 37 required parking spaces.

4.2.2 Bicycle Parking

As the sites land uses fall under institutional use, there are no requirements for bicycle parking spaces. Regardless, the site plan indicates a designated area at the entrance of the building for short-term bike parking.

4.3 Service Vehicle Requirements

As the sites land uses fall under institutional use, there are no requirements for loading spaces. Garbage is to be located at the northeast corner of the parking lot, accessed through the same ingress and egress point as the other vehicles.

5. TRANSPORTATION DEMAND MANAGEMENT

Transportation Demand Management (TDM) is defined as the "application of strategies and policies to reduce travel demand (specifically that of single-occupancy private vehicles), or to redistribute this demand in space or in time"[1]. A successful TDM program can influence travel behaviour away from Single Occupant Vehicle (SOV) travel during peak periods towards more sustainable modes such as High Occupancy Vehicle (HOV) travel, transit, cycling or walking.

The District of Sechelt does not require submission of a TDM plan, though the benefit of reducing vehicular traffic to and from the site is benefit enough to consider mitigation strategies. Unlike other public schools that typically draw most students from within a surrounding catchment area, as a French school, the planned development is more likely to attract specific students looking for this unique learning environment. More than the average public school, it is expected that students live farther from school and will be more reliant on auto mode.

CSF has been operating with school buses to transport students to/from school in all their school sites. There are currently eight (8) school buses serving Ecole du Pacifique and Ecole Chatelech Secondary School. The proposed school with 206 student capacity will be served with three (3) school buses where 80% of the students will likely use this service. This is an effective TDM measure for school as it reduces a high percentage of auto trips to/from the school.

In addition, as noted previously, the school will provide short-term bike parking near the building entrance to facilitate those who want to bike to school, even though it's not required per the Bylaw.

[1] http://ops.fhwa.dot.gov/tdm/index.htm FHWA Travel Demand Management home page

6. MEDUSA STREET HIGH-LEVEL SAFETY REVIEW

As part of the TIA, the District of Sechelt requested that a high-level safety review of Medusa Street from Ocean Avenue to the future school be conducted with regards to children walking and cycling. The following sections outline existing conditions, corresponding key concerns, and recommendations for improvement. These findings are based on a visit to the location on November 1st and 2nd, 2023.

6.1 Infrastructure Review

6.1.1 Lighting

There are 14 streetlights along Medusa Street between the site and Ocean Avenue as illustrated in **Exhibit 6.1**. Spacing of streetlights is dependent on the type of light fixture, type of bulb used, and height of the lamppost, among other factors. The distance between most lampposts measured along the roadway is approximately 25 to 35 meters, which is a sufficient spacing in providing lighting for comfortable walking experience. There is 70m - 100m gap between the lampposts along a portion of the roadway west and east of Medusa Place, which result in lack of lighting coupled with foliage further west obstructing the light.

6.1.2 Sidewalks

Approximately 125 meters west of the Medusa/Ocean intersection, the sidewalk on the north side of Medusa Street transitions into an at-grade, unpaved shoulder shared with parked vehicles. There are no crosswalks at any point along Medusa Street between the planned site access and the intersection with Ocean Avenue. This means that those who exit the site on this side of the street will have no opportunity to safely cross before this point.

6.2 Speed Review

6.2.1 Ocean Avenue

With the use of a radar speed gun, a sample of vehicle speeds was collected on Ocean Avenue at Medusa Street during the PM period. It was found that the average speed of a vehicle driving along Ocean Avenue northbound and southbound was 36.3 km/h with a sample size of 91 vehicles.

While vehicles driving northbound along Ocean Avenue are not obligated to stop, it was observed that several vehicles turning left or right onto Medusa Street did so without slowing down if no other vehicles were immediately present. Referring to Exhibit 2.5 for the existing traffic volumes, it can be calculated that these turning movements make up a significant 23.3% and 25.4% of existing AM and PM peak traffic.

6.2.2 Medusa Street

Vehicles were found to travel at an average speed of 34.3 km/h (travelling westbound and eastbound) along Medusa Street, though with a smaller sample of only 10 vehicles. The speed samples were taken during the AM peak period.

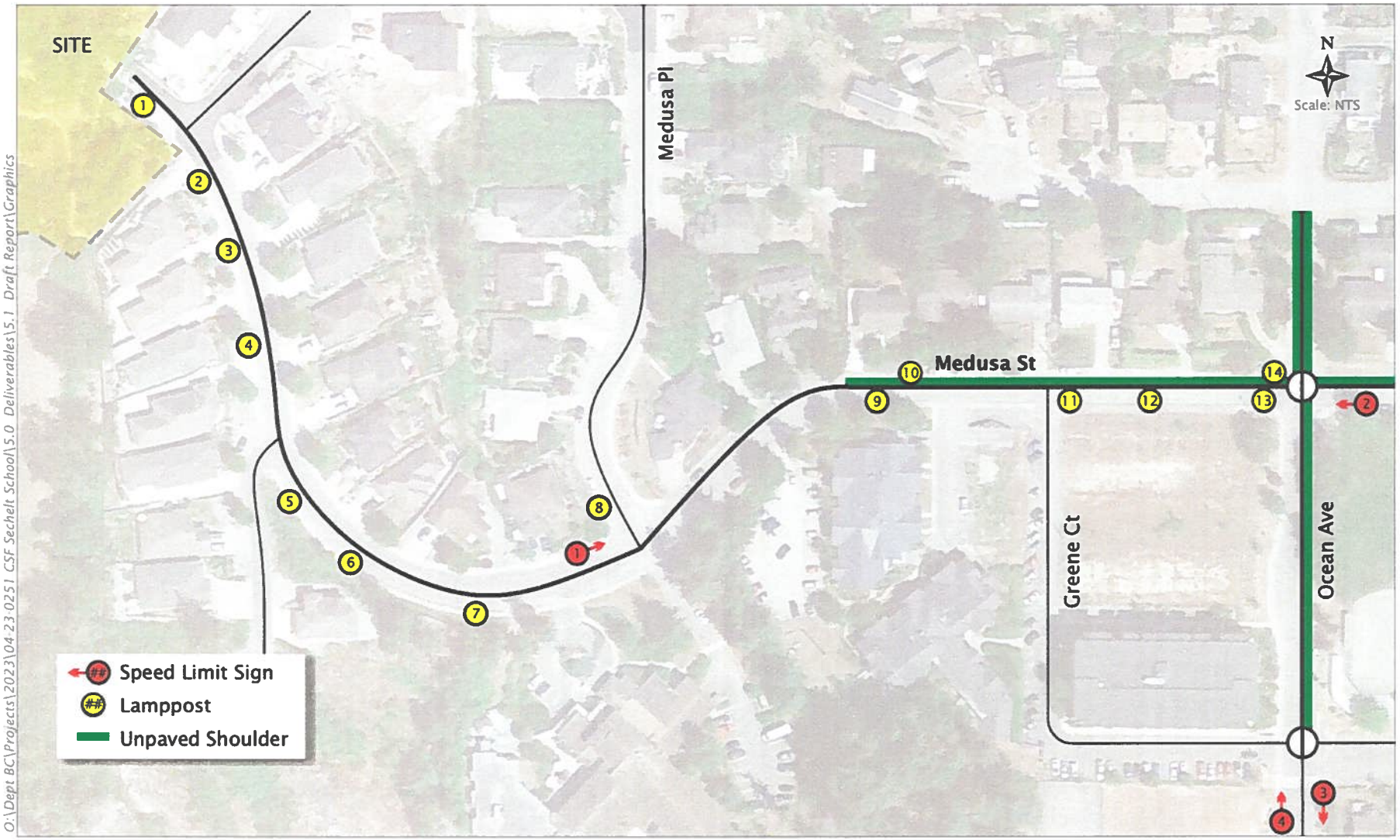

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Exhibit 6.1

Medusa Street Features

04-23-0251

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6.3 Sightline Review

It was observed that the vegetation on the southwest corner of Ocean Avenue and Medusa Street blocks the sightline visibility for vehicles heading north on Ocean Avenue approaching Medusa Street and vehicles heading eastbound on Medusa Street approaching Ocean Avenue.

Figure 6.1: Northbound View on Ocean Avenue Approaching Medusa Street

Figures 6.2 and **6.3** highlight the tall and thick foliage to the northwest of the Medusa Street and Medusa Place intersection that both obstruct the east facing speed limit sign, the north facing stop sign, and incoming vehicles around the curve of the road.

Figure 6.2: Obstructing Foliage Around Medusa Street/Medusa Place Intersection Speed Limit Sign

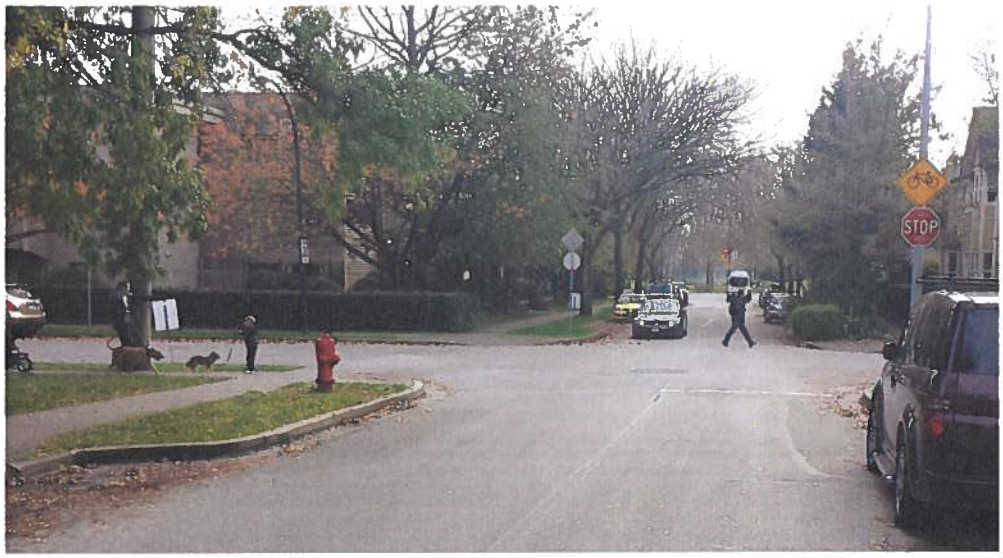
Figure 6.3: Obstructing Foliage Around Medusa Street/Medusa Place Intersection Stop Sign

6.4 Recommendations

Given the observations discussed above, Bunt recommends the following mitigations for consideration by the District of Sechelt, notwithstanding the proposed school development.

- Install more lights where there is a long gap between the existing light fixtures on the east and west of Medusa Place to increase visibility in the area.
- Regularly prune the foliage at the northwest corner of Medusa Street & Medusa Place intersection to ensure visibility at this location and relocate the obstructed speed limit sign further north of the foliage to improve visibility.
- Install sidewalk on the north side of Medusa Street west of Ocean Ave to improve pedestrian connectivity in the area.
- Install crosswalk on west leg of Ocean/Medusa intersection along with bulges at the northwest and southwest of the intersection to shorten pedestrian crossing and improve sight visibility around the corners.

Figure 6.4: Example of Curb Bulge

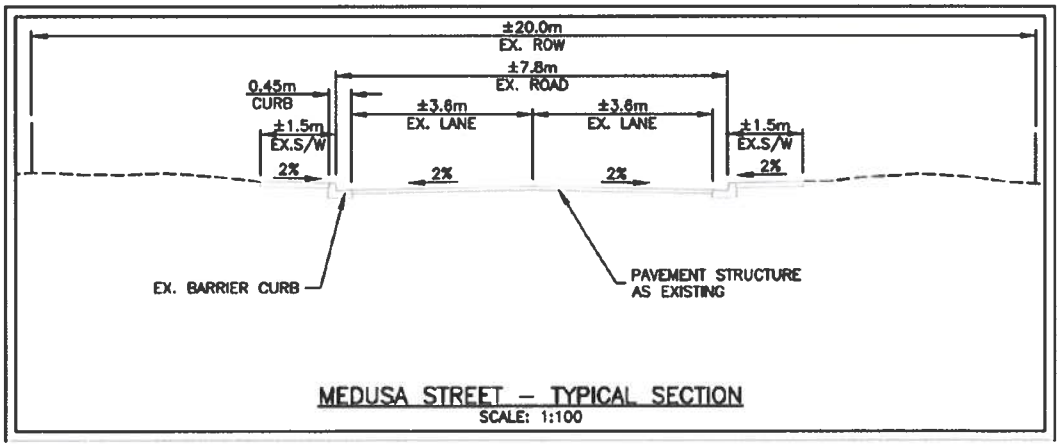


Source: Urban Reality, https://dnproulx.wordpress.com/2014/11/

Given the grade of the road (up to 8% at some portions), Medusa Street was not identified as a cycling route. There were 9 - 17 cyclists observed travelling on Medusa Street crossing Ocean Avenue during the AM and PM peak hour. As vehicle volumes on Medusa Street are low even with the future school traffic, sharrow marking can be considered to facilitate cycling on Medusa Street and put awareness to drivers that cyclists may be present.

In addition, an effective method of slowing traffic that could be broadly applied along Medusa Street would be the reduction of lane width. The minimum recommended lane width is 3 meters, and as **Figure 6.5** shows, the typical lane width along Medusa Street is 3.6 meters wide. Sidewalks along Medusa Street were measured to be 1.5-1.65 meters wide, which is the practical lower limit for a road this size as specified in Table 6.3.1 of the TAC Geometic Design Guide for Canadian Roads. Widening one or both sidewalks to the recommended range of 1.8-2.0 meters would provide sufficient space for two pedestrians to pass each other, a wheelchair to perform an about-turn, or at the upper end allow a pedestrian walking abreast with a child to pass another pedestrian. This widening simultaneously reducing lane width would result in vehicle speeds' reduction.

Figure 6.5: Medusa Street Typical Cross Section



Source: CREUS Engineering Ltd., CSF Sechelt Preliminary DP Design Brief, 2024

7. CONCLUSIONS & RECOMMENDATIONS

7.1 Conclusions

1. CSF plans to construct a new school at the west end of Medusa Street to support a total of 206 students including 36 infant/toddler and pre-kindergarten children.

2. CSF operates school buses for all their schools to transport approximately 80% of students to/from the school. For the new school with 206 students' capacity, three (3) school buses are planned, which contribute as a Transportation Demand Management (TDM) measure to reduce vehicle trips.

3. The school will have a single ingress/egress at the west end of Medusa Street with parking spaces and pick-up/drop-off layby provided west of the school building.

4. Sidewalk is currently provided on both sides of Medusa Street leading to the school, except for about 120m west of Ocean Avenue where there is no sidewalk on the north side.

5. The nearest bus stop is on Ocean Avenue between Dolphin Street and Mermaid Street, serving bus routes #1 and 90.

6. The school is expected to generate approximately 35 - 70 vehicles during a typical weekday morning and afternoon peak hour, which translates to an average of 1 vehicle every 1-2 minutes added onto the area network. This level of vehicle trips is not anticipated to have a material impact on the road network.

7. The study intersections were found to operate well in the current and future conditions with the additional school traffic; therefore, no mitigations are required.

8. The current site plan shows a total of 54 parking spaces, which is more than the minimum requirement of 37 spaces per Sechelt Zoning Bylaw. 36 of these stalls are full sized, and thus with only one of the required spaces being for small cars, this is compliant with the small car provision requirement. Two accessible parking spaces are planned, which meet the minimum requirement.

9. Bicycle parking and loading spaces are not required for institutional use; however, the school will provide short-term bicycle racks near the building entrance.

10. There is a long gap between streetlights along Medusa Street near Medusa Place coupled with thick vegetation which creates poor visibility along this stretch.

11. Vehicles were observed travelling 10-20% above the 30km/h speed limit along Medusa Street and Ocean Avenue. A couple locations were identified to have poor visibility due to overgrown foliage: at the southwest corner of Medusa Street and Ocean Avenue intersection and northwest corner of Medusa Street and Medusa Place intersection.

7.2 Recommendations

Bunt recommends the following mitigation for the school site:

- Provide two electric vehicle charging stations to meet the Zoning Bylaw.

The following recommendations to improve the broader area network include:

- Install a sidewalk on the north side of Medusa Street west of Ocean Ave to improve pedestrian connectivity in the area.
- Install crosswalk on west leg of Ocean/Medusa intersection along with bulges at the northwest and southwest of the intersection to shorten pedestrian crossing and improve sight visibility around the corners.
- Install more lights where there is a long gap between the existing light fixtures on the east and west of Medusa Place to increase visibility in the area.
- Regularly prune the foliage at the northwest corner of Medusa Street & Medusa Place intersection to ensure visibility at this location and relocate the obstructed stop sign further north of the foliage to improve visibility.
- Paint sharrow marking on Medusa Street to facilitate cycling and put awareness to vehicles that cyclists may be present.

APPENDIX A

Terms of Reference

MEMO

DATE:	October 11, 2023
PROJECT NO:	04-23-0251
PROJECT:	**CSF Sechelt School**
SUBJECT:	**Proposed CSF School – Sechelt, BC** **Terms of Reference – Transportation Impact Assessment**
TO:	Sven Koberwitz, Senior Development Planner District of Sechelt
PREPARED BY:	Ian Hancock, EIT; Hana Stoer, EIT;
REVIEWED BY:	Stuart Thornley, P.Eng. Yulia Liem, P.Eng., PTOE

Bunt & Associates Engineering Ltd. (Bunt) has been retained by Conseil Scolaire Francophone de la Colombie-Britannique (CSF), also referred to as School District No. 93, to produce a Traffic Impact Assessment (TIA) report for the proposed development of a school at the west end of Medusa Street, north of the existing Ecole Chatelech Secondary School in Sechelt, BC. The planned school would support 206 students from kindergarten to Grade 12, in addition to 36 in infant/toddler and pre-kindergarten childcare. **Figure 1** illustrates a potential site plan of the proposed school with a floor area of approximately 3,315 m^2.

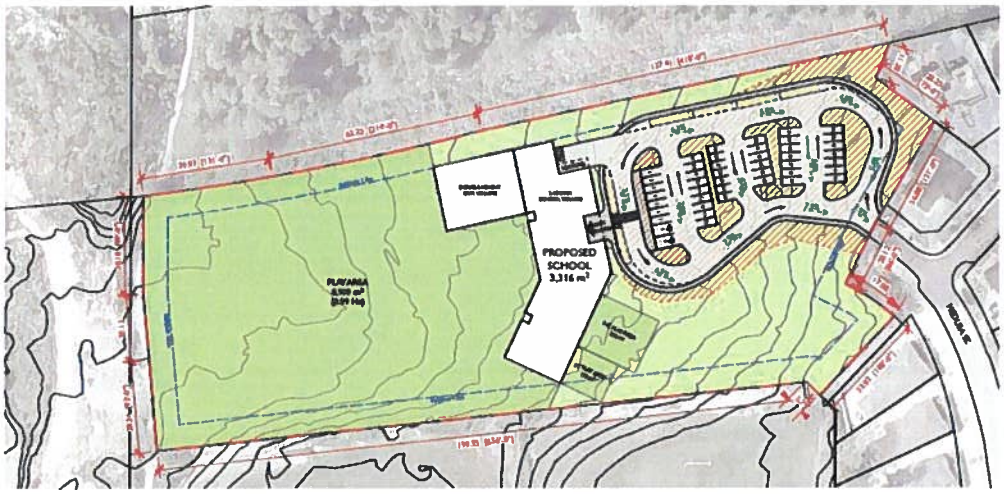


Figure 1: Potential School Site Plan

The proposed focus of this study will be to assess the transportation-related design elements of the proposed development (e.g., vehicle access, parking layout, vehicle circulation, waste collection strategy), review parking and loading supply requirements, and provide a Transportation Demand Management (TDM) Plan. This memo provides the outline of our proposed scope of work to be used as the Terms of Reference (ToR) for the study.

1. ANTICIPATED SCOPE OF WORK

1.1 Project Initiation & Data Collection

- Obtain signal timing plans and any relevant background information from the District of Sechelt.
- Collect weekday morning (7-9 AM) and afternoon (3-6 PM) pedestrian/cycling/vehicle peak traffic volume data at the following study area intersections:
    1. Medusa Street & Ocean Avenue.
    2. Cowrie Street & Ocean Avenue.
    3. Dolphin Street & Ocean Avenue.

1.2 Existing Conditions Review

- Assess existing transportation network features:
    - Pedestrian connections (trails, sidewalks, crosswalks).
    - Cycling connections (designated cycling routes, cycling infrastructure).
- Assess existing weekday morning and afternoon peak hour traffic operations using Synchro analysis software.

1.3 Future Conditions Review

- Based on CSF school travel characteristics, predict the future trip generation for the new school for all modes of travel (school bus, vehicle, walking, cycling, etc.).
- Forecast future traffic volumes for the study area network for two horizon years:
    - Opening Day (2029).
    - Opening Day + 10 years (2039).
- Obtain background traffic growth rate value(s) from the District of Sechelt.
- Assess background and total (background plus site) traffic operations using Synchro/SimTraffic and Highway Capacity Manual (HCM) 2000.

- Identify the anticipated transportation impact of the proposed school and possible mitigation measures if warranted (i.e. traffic laning, intersection traffic control, etc.) to provide safe and efficient movement of pedestrians, cyclists, and vehicles to and from the school.
- Bunt will estimate the vehicle trip generation using rates from the Institute of Transportation Engineers' (ITE) Trip Generation Manual (11th Edition). **Table 1** summarizes the trip generation rates.

Table 1: Peak Hour Vehicle Trip Rates

LAND USE	UNITS	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
		IN	OUT	AVERAGE RATE	IN	OUT	AVERAGE RATE
ITE 520 - Elementary School, General Urban/Suburban	Students	54%	46%	0.74	46%	54%	0.16
ITE 522 - Middle School, General Urban/Suburban	Students	54%	46%	0.67	48%	52%	0.15
ITE 525 - High School, General Urban/Suburban	Students	68%	32%	0.52	48%	52%	0.14
ITE 222 - Day Care Centre, General Urban/Suburban	Students	53%	47%	0.78	47%	53%	0.79

1.4 Site Plan Review

- Provide input on transportation features of the site plan (i.e., pick-up/drop-off layout, etc.) as it evolves through the development application and review process with the District.
- Review Zoning Bylaw requirements (parking/loading supply and configuration).
- AutoTURN vehicle turning path analysis of passenger vehicles, school bus, loading, and waste/recycling collection vehicle movements.
- Suitability of the proposed school bus loading design.
- Assist CSF with the development of a suitable TDM Strategy.

1.5 Reporting & Meetings

- Distribute TIA report to the District of Sechelt for review and comments.

The attached information is provided to support the agency's review process and shall not be distributed to other parties without written consent from Bunt & Associates Engineering Ltd.

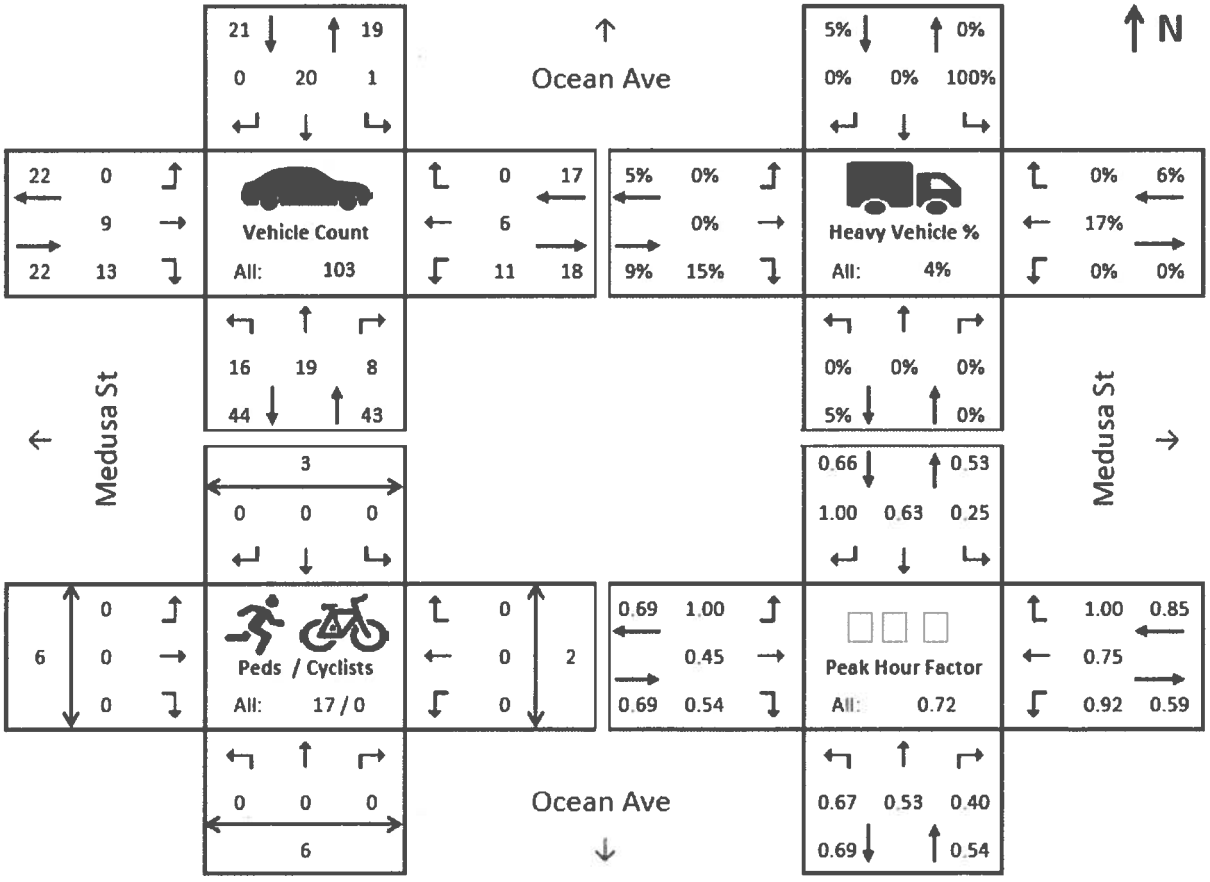
APPENDIX B

Traffic Data

Ocean Ave @ Medusa St – Sechelt, BC

Project#:	04-23-0251	**Weather:**		**Analysis Period:**	8:00 - 9:00
Date:	Nov 02, 2023 (Thu)	**Road Cond:**		**Intersection Peak:**	8:00 - 9:00
Notes:					

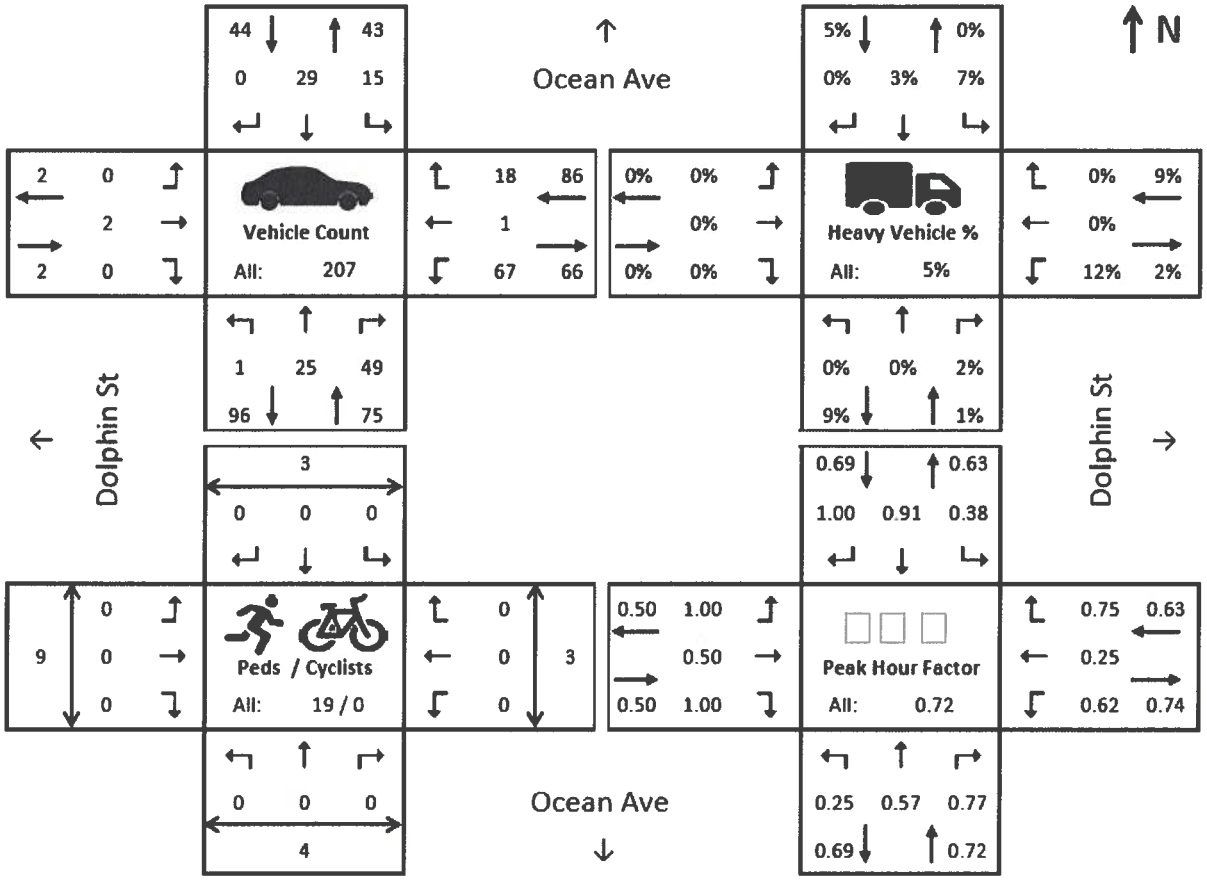
TIME INTERVAL	AUTOMOBILE COUNT											PEDESTRIANS			
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	N	S	E	W
7:00 - 7:15	1	1	0	0	2	0	0	0	3	0	0	0	0	0	0	0
7:15 - 7:30	1	0	1	0	1	0	0	0	2	0	1	0	0	0	1	1
7:30 - 7:45	2	3	0	1	2	0	0	2	4	0	3	0	0	0	0	0
7:45 - 8:00	4	1	1	0	0	0	0	2	0	2	4	0	0	0	1	0
8:00 - 8:15	5	2	1	0	3	0	0	5	1	3	0	0	1	1	1	2
8:15 - 8:30	3	2	1	0	8	0	0	2	6	2	2	0	0	0	1	2
8:30 - 8:45	2	6	1	0	4	0	0	1	2	3	2	0	1	3	0	1
8:45 - 9:00	6	9	5	1	5	0	0	1	4	3	2	0	1	2	0	1



Ocean Ave @ Dolphin St – Sechelt, BC

Project#:	04-23-0251	**Weather:**		**Analysis Period:**	8:00 - 9:00
Date:	Nov 02, 2023 (Thu)	**Road Cond:**		**Intersection Peak:**	8:00 - 9:00
Notes:					

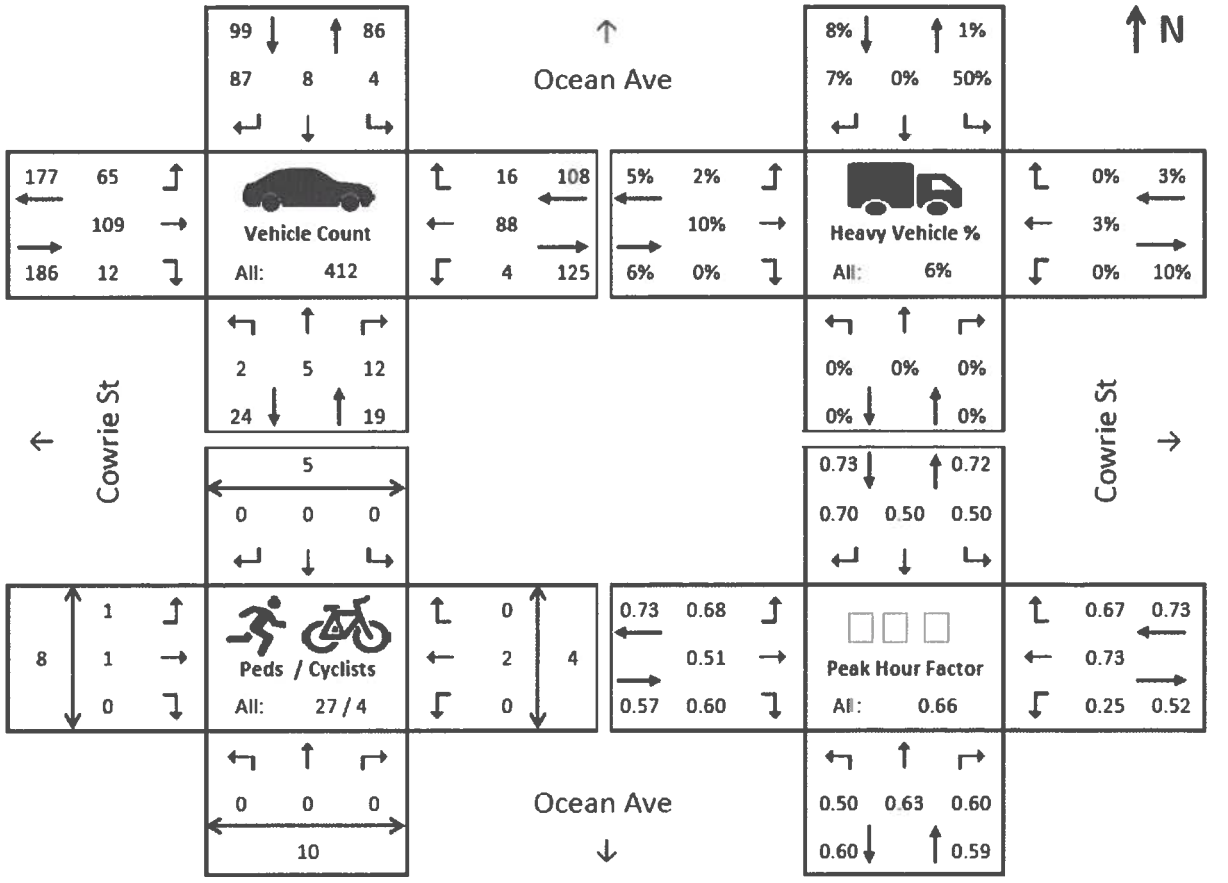
TIME INTERVAL	AUTOMOBILE COUNT												PEDESTRIANS			
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	N	S	E	W
7:00 - 7:15	0	1	1	2	4	0	0	1	0	4	0	1	0	0	0	0
7:15 - 7:30	0	0	1	2	0	0	0	0	0	6	0	2	0	0	0	2
7:30 - 7:45	0	3	8	5	1	0	0	0	0	6	0	2	0	0	0	0
7:45 - 8:00	0	6	6	2	3	0	0	1	0	8	0	3	0	0	0	0
8:00 - 8:15	**0**	**3**	**6**	**0**	**7**	**0**	**0**	**0**	**0**	**6**	**0**	**4**	**0**	**0**	**0**	**0**
8:15 - 8:30	**0**	**3**	**16**	**10**	**6**	**0**	**0**	**1**	**0**	**15**	**0**	**5**	**0**	**1**	**1**	**1**
8:30 - 8:45	**1**	**8**	**12**	**1**	**8**	**0**	**0**	**1**	**0**	**19**	**0**	**3**	**0**	**2**	**1**	**5**
8:45 - 9:00	**0**	**11**	**15**	**4**	**8**	**0**	**0**	**0**	**0**	**27**	**1**	**6**	**3**	**1**	**1**	**3**



Ocean Ave @ Cowrie St – Sechelt, BC

Project#:	04-23-0251	**Weather:**		**Analysis Period:**	8:00 - 9:00
Date:	Nov 02, 2023 (Thu)	**Road Cond:**		**Intersection Peak:**	8:00 - 9:00
Notes:					

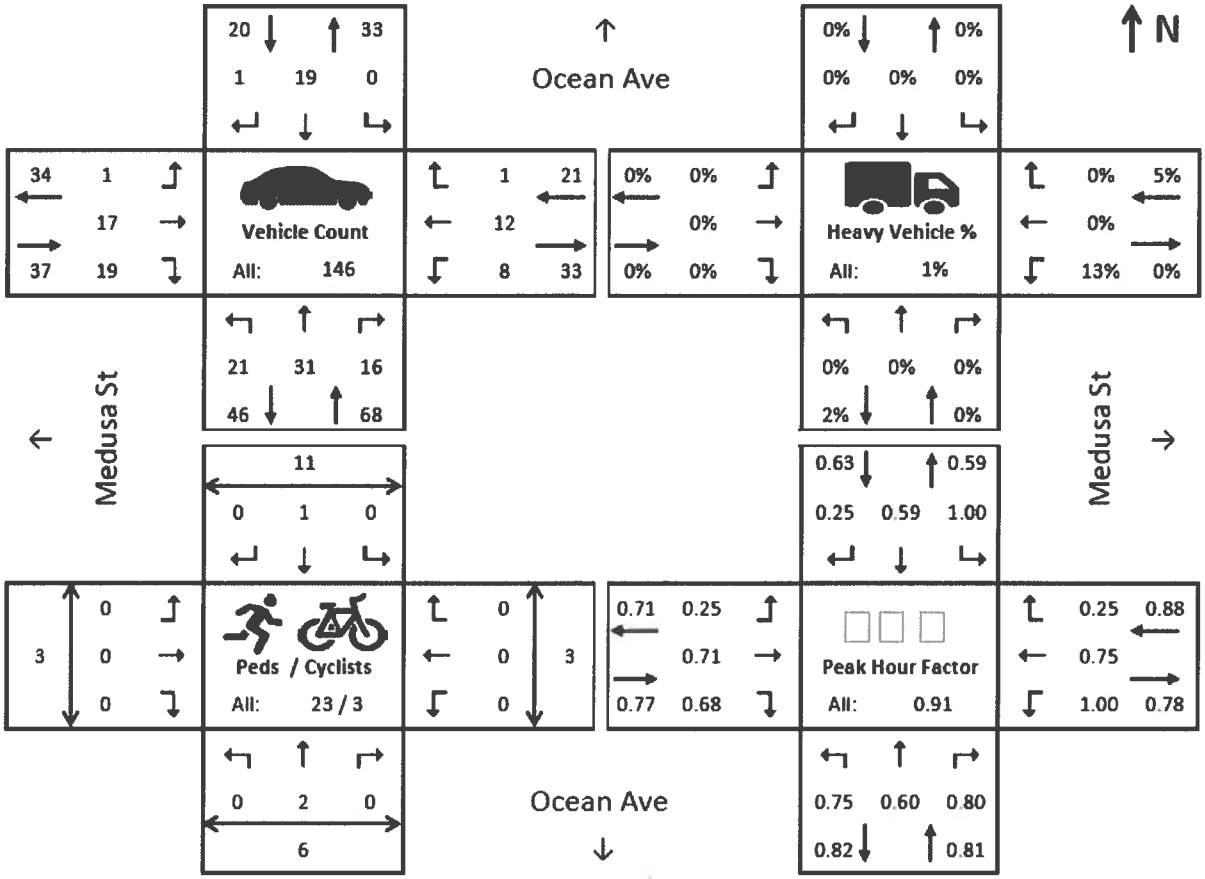
TIME INTERVAL	AUTOMOBILE COUNT												PEDESTRIANS			
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	N	S	E	W
7:00 - 7:15	0	1	0	1	2	5	2	4	1	0	8	0	0	1	0	0
7:15 - 7:30	1	0	0	2	2	6	4	7	1	0	7	3	0	3	0	2
7:30 - 7:45	0	3	0	0	0	6	8	12	0	0	2	5	0	0	0	0
7:45 - 8:00	0	1	1	1	0	11	11	15	2	1	6	3	0	1	0	0
8:00 - 8:15	0	0	1	2	1	10	10	10	1	0	10	3	0	2	1	2
8:15 - 8:30	1	2	5	0	1	21	17	11	5	0	18	6	0	2	0	2
8:30 - 8:45	1	1	1	1	4	25	14	35	2	4	30	3	4	4	3	4
8:45 - 9:00	0	2	5	1	2	31	24	53	4	0	30	4	1	2	0	0



Ocean Ave @ Medusa St – Sechelt, BC

Project#:	04-23-0251	**Weather:**		**Analysis Period:**	15:00 - 16:00
Date:	Nov 01, 2023 (Wed)	**Road Cond:**		**Intersection Peak:**	15:15 - 16:15
Notes:					

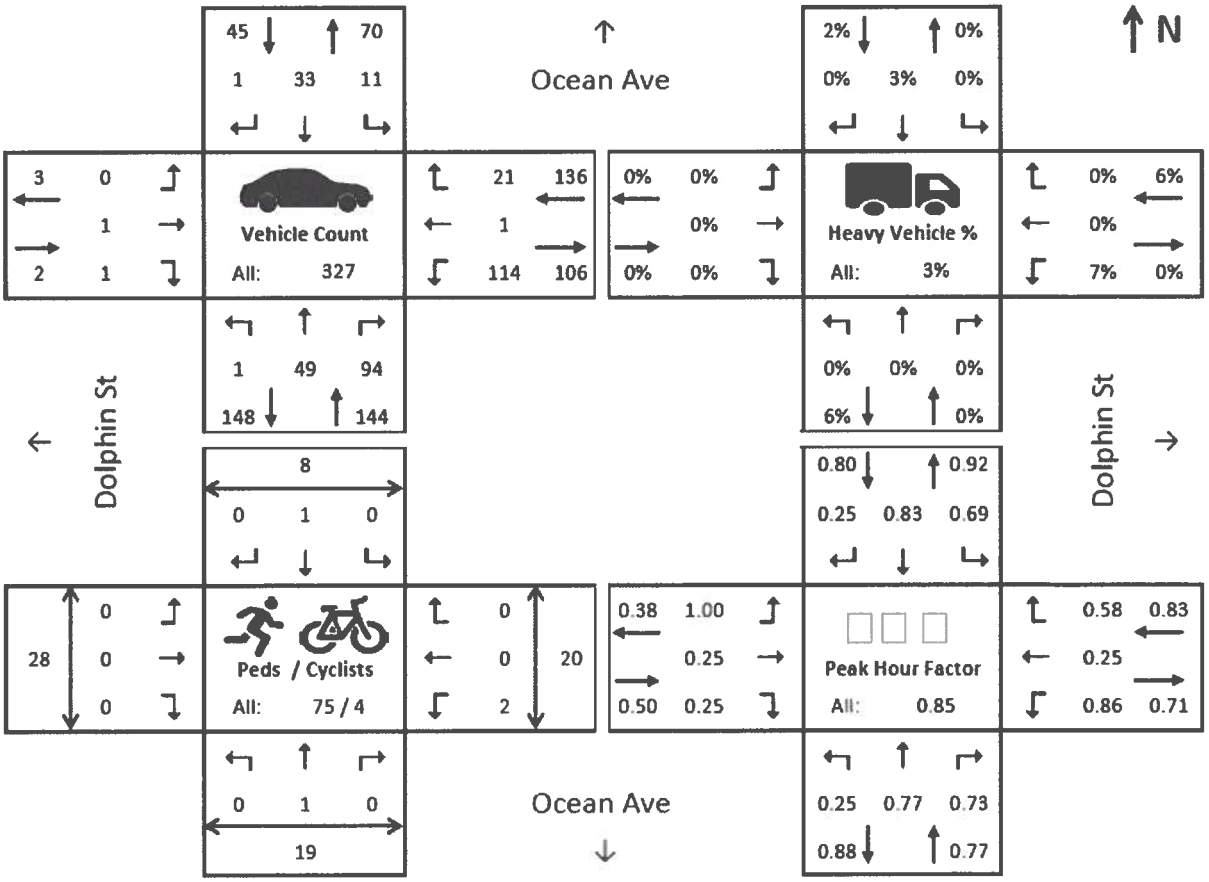
TIME INTERVAL	AUTOMOBILE COUNT												PEDESTRIANS			
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	N	S	E	W
15:00 - 15:15	7	7	2	0	5	1	0	5	7	2	4	0	1	0	0	0
15:15 - 15:30	4	13	4	0	3	0	0	6	3	2	3	1	2	6	2	0
15:30 - 15:45	5	4	5	0	8	0	0	2	2	2	1	0	6	0	1	2
15:45 - 16:00	5	7	5	0	3	0	1	4	7	2	4	0	2	0	0	1
16:00 - 16:15	3	13	4	0	3	0	0	4	7	7	1	1	2	0	0	0
16:15 - 16:30	5	4	7	1	4	1	1	3	3	2	2	0	1	0	0	3
16:30 - 16:45	4	4	6	0	6	0	0	4	4	3	2	0	1	2	1	1
16:45 - 17:00	4	8	2	0	1	0	0	3	7	2	0	0	0	0	0	0
17:00 - 17:15	4	4	2	0	2	0	0	2	4	0	1	1	1	1	0	0
17:15 - 17:30	1	4	2	0	1	0	1	0	1	2	1	0	0	0	0	0
17:30 - 17:45	4	1	0	0	0	0	0	3	5	0	2	0	0	0	0	0
17:45 - 18:00	5	4	1	0	3	0	1	0	1	1	1	0	0	0	0	0



Ocean Ave @ Dolphin St – Sechelt, BC

Project#:	04-23-0251	Weather:		Analysis Period:	15:00 - 16:00
Date:	Nov 01, 2023 (Wed)	Road Cond:		Intersection Peak:	15:00 - 16:00
Notes:					

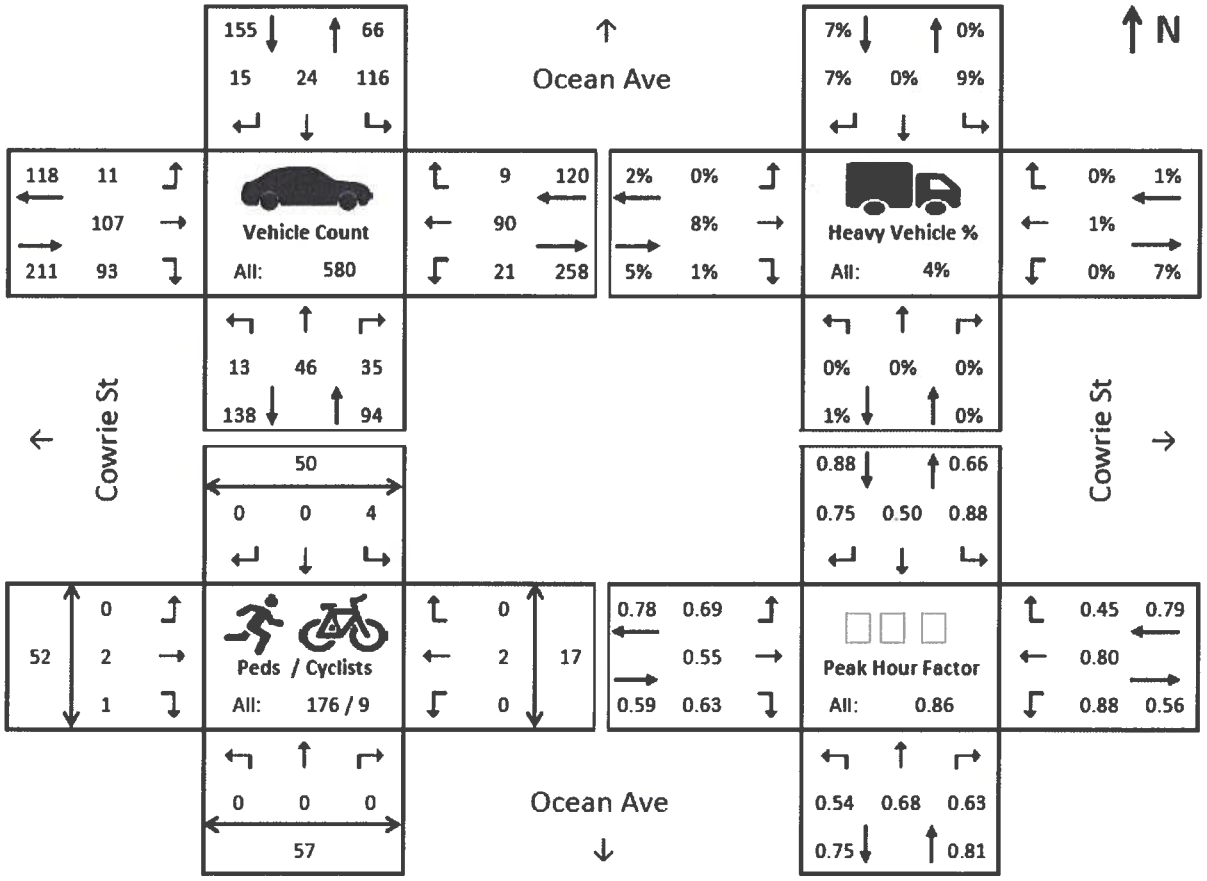
TIME INTERVAL	AUTOMOBILE COUNT												PEDESTRIANS			
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	N	S	E	W
15:00 - 15:15	0	8	32	4	10	0	0	1	0	32	0	9	2	13	13	9
15:15 - 15:30	1	16	30	1	7	0	0	0	0	26	0	3	1	5	2	6
15:30 - 15:45	0	14	18	4	7	1	0	0	0	33	1	3	3	1	5	7
15:45 - 16:00	0	11	14	2	9	0	0	0	1	23	0	6	2	0	0	6
16:00 - 16:15	0	11	16	10	9	0	0	1	0	25	1	8	1	2	0	6
16:15 - 16:30	1	10	14	0	9	0	0	0	0	31	0	7	2	2	0	0
16:30 - 16:45	0	14	8	3	10	0	0	0	0	24	0	6	2	2	1	1
16:45 - 17:00	1	10	11	4	7	0	1	0	1	19	1	4	3	1	1	3
17:00 - 17:15	1	7	11	2	4	0	0	0	0	19	0	3	0	2	0	0
17:15 - 17:30	0	5	9	0	3	1	0	0	0	11	0	2	0	1	0	0
17:30 - 17:45	0	2	11	2	3	0	0	0	0	20	0	3	2	2	0	1
17:45 - 18:00	0	5	5	1	5	0	0	0	0	15	0	5	2	0	0	1



Ocean Ave @ Cowrie St – Sechelt, BC

Project#:	04-23-0251	**Weather:**		**Analysis Period:**	15:00 - 16:00
Date:	Nov 01, 2023 (Wed)	**Road Cond:**		**Intersection Peak:**	15:00 - 16:00
Notes:					

TIME INTERVAL	AUTOMOBILE COUNT												PEDESTRIANS			
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	N	S	E	W
15:00 - 15:15	6	16	7	27	12	5	4	27	27	6	27	5	10	8	3	5
15:15 - 15:30	3	6	14	30	5	2	3	49	37	4	15	1	33	31	6	41
15:30 - 15:45	3	17	6	33	4	3	0	22	15	5	20	1	4	10	6	3
15:45 - 16:00	1	7	8	26	3	5	4	9	14	6	28	2	3	8	2	3
16:00 - 16:15	4	10	4	23	6	2	3	15	13	5	16	3	2	4	4	5
16:15 - 16:30	2	9	7	33	6	5	1	19	11	3	21	6	1	5	1	6
16:30 - 16:45	0	6	3	26	5	3	2	23	11	3	15	5	2	3	1	4
16:45 - 17:00	1	6	1	20	2	6	2	17	12	3	24	4	1	0	0	7
17:00 - 17:15	1	2	6	19	4	3	3	23	15	3	28	1	1	3	0	1
17:15 - 17:30	1	7	3	12	3	2	1	13	6	4	8	0	2	2	2	0
17:30 - 17:45	0	2	1	19	3	2	1	6	11	2	4	0	0	3	0	3
17:45 - 18:00	1	2	3	14	4	2	1	7	6	2	15	1	0	2	0	2



The attached information is provided to support the agency's review process and shall not be distributed to other parties without written consent from Bunt & Associates Engineering Ltd.

APPENDIX C

Synchro Reports

HCM Unsignalized Intersection Capacity Analysis
1: Ocean Ave & Medusa St 01-30-2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	9	13	11	6	0	16	19	8	1	20	0
Future Volume (Veh/h)	0	9	13	11	6	0	16	19	8	1	20	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	0	12	18	15	8	0	22	26	11	1	28	0
Pedestrians		6			2			6			3	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			0			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	113	119	40	132	108	31	34			39		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	113	119	40	132	108	31	34			39		
tC, single (s)	7.1	6.5	6.4	7.1	6.7	6.2	4.1			5.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.2	3.3	2.2			3.1		
p0 queue free %	100	98	98	98	99	100	99			100		
cM capacity (veh/h)	842	758	985	801	739	1045	1583			1116		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	30	23	48	11	29
Volume Left	0	15	22	0	1
Volume Right	18	0	0	11	0
cSH	880	778	1583	1700	1116
Volume to Capacity	0.03	0.03	0.01	0.01	0.00
Queue Length 95th (m)	0.8	0.7	0.3	0.0	0.0
Control Delay (s)	9.2	9.8	3.4	0.0	0.3
Lane LOS	A	A	A		A
Approach Delay (s)	9.2	9.8	2.8		0.3
Approach LOS	A	A			

Intersection Summary				
Average Delay	4.8			
Intersection Capacity Utilization	24.3%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	2	0	67	1	18	1	25	49	15	29	0
Future Volume (Veh/h)	0	2	0	67	1	18	1	25	49	15	29	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	0	3	0	93	1	25	1	35	68	21	40	0
Pedestrians		9			3			4			3	
Lane Width (m)		3.6			4.1			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	156	199	53	128	131	41	49			106		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	156	199	53	128	131	41	49			106		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.3		
p0 queue free %	100	100	100	88	100	98	100			99		
cM capacity (veh/h)	771	683	1009	800	744	1030	1559			1450		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	3	119	36	68	61
Volume Left	0	93	1	0	21
Volume Right	0	25	0	68	0
cSH	683	838	1559	1700	1450
Volume to Capacity	0.00	0.14	0.00	0.04	0.01
Queue Length 95th (m)	0.1	3.9	0.0	0.0	0.4
Control Delay (s)	10.3	10.0	0.2	0.0	2.7
Lane LOS	B	B	A		A
Approach Delay (s)	10.3	10.0	0.1		2.7
Approach LOS	B	B			

Intersection Summary				
Average Delay	4.8			
Intersection Capacity Utilization	28.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	65	109	12	4	88	16	2	5	12	4	8	87
Future Volume (vph)	65	109	12	4	88	16	2	5	12	4	8	87
Peak Hour Factor	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
Hourly flow rate (vph)	98	165	18	6	133	24	3	8	18	6	12	132

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	281	139	24	29	150
Volume Left (vph)	98	6	0	3	6
Volume Right (vph)	18	0	24	18	132
Hadj (s)	0.14	0.07	-0.70	-0.35	-0.38
Departure Headway (s)	4.8	5.3	4.5	4.8	4.6
Degree Utilization, x	0.37	0.20	0.03	0.04	0.19
Capacity (veh/h)	717	649	756	660	708
Control Delay (s)	10.6	8.4	6.4	8.0	8.7
Approach Delay (s)	10.6	8.1		8.0	8.7
Approach LOS	B	A		A	A

Intersection Summary				
Delay	9.4			
Level of Service	A			
Intersection Capacity Utilization	32.3%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
1: Ocean Ave & Medusa St 01-30-2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	17	19	8	12	1	21	31	16	0	19	1
Future Volume (Veh/h)	1	17	19	8	12	1	21	31	16	0	19	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	1	19	21	9	13	1	23	34	18	0	21	1
Pedestrians		3			3			6			11	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	123	126	30	141	108	48	25			55		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	123	126	30	141	108	48	25			55		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	100	97	98	99	98	100	99			100		
cM capacity (veh/h)	822	754	1042	756	771	1015	1599			1559		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	41	23	57	18	22
Volume Left	1	9	23	0	0
Volume Right	21	1	0	18	1
cSH	880	773	1599	1700	1559
Volume to Capacity	0.05	0.03	0.01	0.01	0.00
Queue Length 95th (m)	1.2	0.7	0.4	0.0	0.0
Control Delay (s)	9.3	9.8	3.0	0.0	0.0
Lane LOS	A	A	A		
Approach Delay (s)	9.3	9.8	2.3		0.0
Approach LOS	A	A			

Intersection Summary				
Average Delay	4.8			
Intersection Capacity Utilization	24.2%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1	1	114	1	21	1	49	94	11	33	1
Future Volume (Veh/h)	0	1	1	114	1	21	1	49	94	11	33	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	1	1	134	1	25	1	58	111	13	39	1
Pedestrians		28			20			19			8	
Lane Width (m)		3.6			4.1			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		2			2			2			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	187	284	86	166	174	86	68			189		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	187	284	86	166	174	86	68			189		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	82	100	97	100			99		
cM capacity (veh/h)	705	596	940	728	686	953	1510			1371		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	2	160	59	111	53
Volume Left	0	134	1	0	13
Volume Right	1	25	0	111	1
cSH	729	756	1510	1700	1371
Volume to Capacity	0.00	0.21	0.00	0.07	0.01
Queue Length 95th (m)	0.1	6.4	0.0	0.0	0.2
Control Delay (s)	10.0	11.0	0.1	0.0	1.9
Lane LOS	A	B	A		A
Approach Delay (s)	10.0	11.0	0.0		1.9
Approach LOS	A	B			

Intersection Summary				
Average Delay	4.9			
Intersection Capacity Utilization	37.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	11	107	93	21	90	9	13	46	35	116	24	15
Future Volume (vph)	11	107	93	21	90	9	13	46	35	116	24	15
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	13	124	108	24	105	10	15	53	41	135	28	17

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	245	129	10	109	180
Volume Left (vph)	13	24	0	15	135
Volume Right (vph)	108	0	10	41	17
Hadj (s)	-0.18	0.11	-0.70	-0.20	0.22
Departure Headway (s)	4.8	5.6	4.8	5.0	5.3
Degree Utilization, x	0.33	0.20	0.01	0.15	0.26
Capacity (veh/h)	703	594	689	659	633
Control Delay (s)	10.1	8.9	6.7	8.8	10.1
Approach Delay (s)	10.1	8.7		8.8	10.1
Approach LOS	B	A		A	B

Intersection Summary				
Delay	9.6			
Level of Service	A			
Intersection Capacity Utilization	44.5%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
1: Ocean Ave & Medusa St 01-30-2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	10	15	12	7	0	18	21	9	1	22	0
Future Volume (Veh/h)	0	10	15	12	7	0	18	21	9	1	22	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	0	14	21	17	10	0	25	29	12	1	31	0
Pedestrians		6			2			6			3	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			0			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	126	132	43	148	120	34	37			43		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	126	132	43	148	120	34	37			43		
tC, single (s)	7.1	6.5	6.4	7.1	6.7	6.2	4.1			5.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.2	3.3	2.2			3.1		
p0 queue free %	100	98	98	98	99	100	98			100		
cM capacity (veh/h)	822	745	982	776	726	1041	1579			1111		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	35	27	54	12	32
Volume Left	0	17	25	0	1
Volume Right	21	0	0	12	0
cSH	871	757	1579	1700	1111
Volume to Capacity	0.04	0.04	0.02	0.01	0.00
Queue Length 95th (m)	1.0	0.9	0.4	0.0	0.0
Control Delay (s)	9.3	9.9	3.5	0.0	0.3
Lane LOS	A	A	A		A
Approach Delay (s)	9.3	9.9	2.8		0.3
Approach LOS	A	A			

Intersection Summary				
Average Delay	4.9			
Intersection Capacity Utilization	24.3%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	2	0	75	1	20	1	28	55	17	32	0
Future Volume (Veh/h)	0	2	0	75	1	20	1	28	55	17	32	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	0	3	0	104	1	28	1	39	76	24	44	0
Pedestrians		9			3			4			3	
Lane Width (m)		3.6			4.1			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	174	221	57	142	145	45	53			118		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	174	221	57	142	145	45	53			118		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.3		
p0 queue free %	100	100	100	87	100	97	100			98		
cM capacity (veh/h)	748	662	1004	781	729	1025	1554			1436		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	3	133	40	76	68
Volume Left	0	104	1	0	24
Volume Right	0	28	0	76	0
cSH	662	822	1554	1700	1436
Volume to Capacity	0.00	0.16	0.00	0.04	0.02
Queue Length 95th (m)	0.1	4.6	0.0	0.0	0.4
Control Delay (s)	10.5	10.2	0.2	0.0	2.7
Lane LOS	B	B	A		A
Approach Delay (s)	10.5	10.2	0.1		2.7
Approach LOS	B	B			

Intersection Summary				
Average Delay	5.0			
Intersection Capacity Utilization	29.3%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	73	122	13	4	99	18	2	6	13	4	9	97
Future Volume (vph)	73	122	13	4	99	18	2	6	13	4	9	97
Peak Hour Factor	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
Hourly flow rate (vph)	111	185	20	6	150	27	3	9	20	6	14	147

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	316	156	27	32	167
Volume Left (vph)	111	6	0	3	6
Volume Right (vph)	20	0	27	20	147
Hadj (s)	0.14	0.07	-0.70	-0.36	-0.39
Departure Headway (s)	4.9	5.4	4.6	5.0	4.8
Degree Utilization, x	0.43	0.23	0.03	0.04	0.22
Capacity (veh/h)	703	634	735	627	683
Control Delay (s)	11.5	8.8	6.6	8.3	9.1
Approach Delay (s)	11.5	8.5		8.3	9.1
Approach LOS	B	A		A	A

Intersection Summary				
Delay	10.0			
Level of Service	B			
Intersection Capacity Utilization	34.0%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
1: Ocean Ave & Medusa St 01-30-2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	19	21	9	13	1	24	35	18	0	21	1
Future Volume (Veh/h)	1	19	21	9	13	1	24	35	18	0	21	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	1	21	23	10	14	1	26	38	20	0	23	1
Pedestrians		3			3			6			11	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	136	140	32	156	120	52	27			61		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	136	140	32	156	120	52	27			61		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	100	97	98	99	98	100	98			100		
cM capacity (veh/h)	805	739	1039	734	758	1010	1596			1551		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	45	25	64	20	24
Volume Left	1	10	26	0	0
Volume Right	23	1	0	20	1
cSH	869	756	1596	1700	1551
Volume to Capacity	0.05	0.03	0.02	0.01	0.00
Queue Length 95th (m)	1.3	0.8	0.4	0.0	0.0
Control Delay (s)	9.4	9.9	3.0	0.0	0.0
Lane LOS	A	A	A		
Approach Delay (s)	9.4	9.9	2.3		0.0
Approach LOS	A	A			

Intersection Summary				
Average Delay	4.9			
Intersection Capacity Utilization	25.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1	1	128	1	24	1	55	105	12	37	1
Future Volume (Veh/h)	0	1	1	128	1	24	1	55	105	12	37	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	1	1	151	1	28	1	65	124	14	44	1
Pedestrians		28			20			19			8	
Lane Width (m)		3.6			4.1			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		2			2			2			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	204	312	92	180	188	93	73			209		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	204	312	92	180	188	93	73			209		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	79	100	97	100			99		
cM capacity (veh/h)	685	575	934	713	673	945	1504			1348		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	2	180	66	124	59
Volume Left	0	151	1	0	14
Volume Right	1	28	0	124	1
cSH	712	741	1504	1700	1348
Volume to Capacity	0.00	0.24	0.00	0.07	0.01
Queue Length 95th (m)	0.1	7.6	0.0	0.0	0.3
Control Delay (s)	10.1	11.4	0.1	0.0	1.9
Lane LOS	B	B	A		A
Approach Delay (s)	10.1	11.4	0.0		1.9
Approach LOS	B	B			

Intersection Summary				
Average Delay	5.1			
Intersection Capacity Utilization	38.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	12	120	104	24	101	10	15	52	39	130	27	17
Future Volume (vph)	12	120	104	24	101	10	15	52	39	130	27	17
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	14	140	121	28	117	12	17	60	45	151	31	20

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	275	145	12	122	202
Volume Left (vph)	14	28	0	17	151
Volume Right (vph)	121	0	12	45	20
Hadj (s)	-0.18	0.11	-0.70	-0.19	0.22
Departure Headway (s)	5.0	5.9	5.0	5.2	5.5
Degree Utilization, x	0.38	0.24	0.02	0.18	0.31
Capacity (veh/h)	679	572	658	626	610
Control Delay (s)	11.0	9.4	6.9	9.3	10.8
Approach Delay (s)	11.0	9.3		9.3	10.8
Approach LOS	B	A		A	B

Intersection Summary				
Delay	10.3			
Level of Service	B			
Intersection Capacity Utilization	46.3%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
1: Ocean Ave & Medusa St 01-30-2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	12	17	15	8	0	21	25	11	1	26	0
Future Volume (Veh/h)	0	12	17	15	8	0	21	25	11	1	26	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	0	17	24	21	11	0	29	35	15	1	36	0
Pedestrians		6			2			6			3	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			0			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	146	154	48	172	139	40	42			52		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	146	154	48	172	139	40	42			52		
tC, single (s)	7.1	6.5	6.4	7.1	6.7	6.2	4.1			5.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.2	3.3	2.2			3.1		
p0 queue free %	100	98	98	97	98	100	98			100		
cM capacity (veh/h)	796	722	975	743	706	1033	1572			1101		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	41	32	64	15	37
Volume Left	0	21	29	0	1
Volume Right	24	0	0	15	0
cSH	852	730	1572	1700	1101
Volume to Capacity	0.05	0.04	0.02	0.01	0.00
Queue Length 95th (m)	1.2	1.1	0.5	0.0	0.0
Control Delay (s)	9.4	10.2	3.4	0.0	0.2
Lane LOS	A	B	A		A
Approach Delay (s)	9.4	10.2	2.8		0.2
Approach LOS	A	B			

Intersection Summary				
Average Delay	5.0			
Intersection Capacity Utilization	24.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	3	0	88	1	24	1	33	65	20	38	0
Future Volume (Veh/h)	0	3	0	88	1	24	1	33	65	20	38	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	0	4	0	122	1	33	1	46	90	28	53	0
Pedestrians		9			3			4			3	
Lane Width (m)		3.6			4.1			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	202	259	66	166	169	52	62			139		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	202	259	66	166	169	52	62			139		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.3		
p0 queue free %	100	99	100	84	100	97	100			98		
cM capacity (veh/h)	710	629	993	750	705	1016	1542			1410		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	4	156	47	90	81
Volume Left	0	122	1	0	28
Volume Right	0	33	0	90	0
cSH	629	794	1542	1700	1410
Volume to Capacity	0.01	0.20	0.00	0.05	0.02
Queue Length 95th (m)	0.2	5.8	0.0	0.0	0.5
Control Delay (s)	10.8	10.6	0.2	0.0	2.7
Lane LOS	B	B	A		A
Approach Delay (s)	10.8	10.6	0.1		2.7
Approach LOS	B	B			

Intersection Summary				
Average Delay	5.1			
Intersection Capacity Utilization	30.5%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	86	144	16	5	116	21	3	7	16	5	11	115
Future Volume (vph)	86	144	16	5	116	21	3	7	16	5	11	115
Peak Hour Factor	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
Hourly flow rate (vph)	130	218	24	8	176	32	5	11	24	8	17	174

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	372	184	32	40	199
Volume Left (vph)	130	8	0	5	8
Volume Right (vph)	24	0	32	24	174
Hadj (s)	0.14	0.07	-0.70	-0.33	-0.38
Departure Headway (s)	5.1	5.6	4.9	5.4	5.1
Degree Utilization, x	0.53	0.29	0.04	0.06	0.28
Capacity (veh/h)	677	604	696	561	642
Control Delay (s)	13.7	9.7	6.9	8.8	10.1
Approach Delay (s)	13.7	9.3		8.8	10.1
Approach LOS	B	A		A	B

Intersection Summary				
Delay	11.4			
Level of Service	B			
Intersection Capacity Utilization	37.1%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
1: Ocean Ave & Medusa St 01-30-2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	22	25	11	16	1	28	41	21	0	25	1
Future Volume (Veh/h)	1	22	25	11	16	1	28	41	21	0	25	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	1	24	27	12	18	1	31	45	23	0	27	1
Pedestrians		3			3			6			11	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	158	164	36	182	141	59	31			71		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	158	164	36	182	141	59	31			71		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	100	97	97	98	98	100	98			100		
cM capacity (veh/h)	772	715	1034	698	735	1001	1591			1538		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	52	31	76	23	28
Volume Left	1	12	31	0	0
Volume Right	27	1	0	23	1
cSH	853	727	1591	1700	1538
Volume to Capacity	0.06	0.04	0.02	0.01	0.00
Queue Length 95th (m)	1.6	1.1	0.5	0.0	0.0
Control Delay (s)	9.5	10.2	3.1	0.0	0.0
Lane LOS	A	B	A		
Approach Delay (s)	9.5	10.2	2.4		0.0
Approach LOS	A	B			

Intersection Summary				
Average Delay	5.0			
Intersection Capacity Utilization	26.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1	1	150	1	28	1	65	124	15	44	1
Future Volume (Veh/h)	0	1	1	150	1	28	1	65	124	15	44	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	1	1	176	1	33	1	76	146	18	52	1
Pedestrians		28			20			19			8	
Lane Width (m)		3.6			4.1			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		2			2			2			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	236	360	100	207	215	104	81			242		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	236	360	100	207	215	104	81			242		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	74	100	96	100			99		
cM capacity (veh/h)	647	538	924	682	648	932	1494			1311		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	2	210	77	146	71
Volume Left	0	176	1	0	18
Volume Right	1	33	0	146	1
cSH	680	712	1494	1700	1311
Volume to Capacity	0.00	0.29	0.00	0.09	0.01
Queue Length 95th (m)	0.1	9.8	0.0	0.0	0.3
Control Delay (s)	10.3	12.2	0.1	0.0	2.1
Lane LOS	B	B	A		A
Approach Delay (s)	10.3	12.2	0.0		2.1
Approach LOS	B	B			

Intersection Summary				
Average Delay	5.4			
Intersection Capacity Utilization	38.8%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	15	141	123	28	119	12	17	61	46	153	32	20
Future Volume (vph)	15	141	123	28	119	12	17	61	46	153	32	20
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	17	164	143	33	138	14	20	71	53	178	37	23

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	324	171	14	144	238
Volume Left (vph)	17	33	0	20	178
Volume Right (vph)	143	0	14	53	23
Hadj (s)	-0.18	0.11	-0.70	-0.19	0.22
Departure Headway (s)	5.3	6.2	5.4	5.6	5.8
Degree Utilization, x	0.48	0.29	0.02	0.22	0.38
Capacity (veh/h)	639	536	609	565	573
Control Delay (s)	13.0	10.6	7.3	10.2	12.3
Approach Delay (s)	13.0	10.3		10.2	12.3
Approach LOS	B	B		B	B

Intersection Summary				
Delay	11.8			
Level of Service	B			
Intersection Capacity Utilization	49.4%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
1: Ocean Ave & Medusa St 01-30-2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	11	29	12	8	0	37	21	9	1	22	1
Future Volume (Veh/h)	1	11	29	12	8	0	37	21	9	1	22	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	1	12	32	13	9	0	41	23	10	1	24	1
Pedestrians		3			3			6			11	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	150	148	34	178	138	37	28			36		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	150	148	34	178	138	37	28			36		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	100	98	97	98	99	100	97			100		
cM capacity (veh/h)	786	724	1038	704	733	1029	1595			1584		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	45	22	64	10	26
Volume Left	1	13	41	0	1
Volume Right	32	0	0	10	1
cSH	925	716	1595	1700	1584
Volume to Capacity	0.05	0.03	0.03	0.01	0.00
Queue Length 95th (m)	1.2	0.8	0.6	0.0	0.0
Control Delay (s)	9.1	10.2	4.8	0.0	0.3
Lane LOS	A	B	A		A
Approach Delay (s)	9.1	10.2	4.1		0.3
Approach LOS	A	B			

Intersection Summary				
Average Delay	5.7			
Intersection Capacity Utilization	26.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	2	0	75	1	24	1	43	55	19	44	0
Future Volume (Veh/h)	0	2	0	75	1	24	1	43	55	19	44	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	2	0	88	1	28	1	51	65	22	52	0
Pedestrians		28			20			19			8	
Lane Width (m)		3.6			4.1			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		2			2			2			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	214	262	99	189	197	79	80			136		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	214	262	99	189	197	79	80			136		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	87	100	97	100			98		
cM capacity (veh/h)	673	609	925	700	662	962	1495			1433		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	2	117	52	65	74
Volume Left	0	88	1	0	22
Volume Right	0	28	0	65	0
cSH	609	749	1495	1700	1433
Volume to Capacity	0.00	0.16	0.00	0.04	0.02
Queue Length 95th (m)	0.1	4.4	0.0	0.0	0.4
Control Delay (s)	10.9	10.7	0.1	0.0	2.3
Lane LOS	B	B	A		A
Approach Delay (s)	10.9	10.7	0.1		2.3
Approach LOS	B	B			

Intersection Summary				
Average Delay	4.7			
Intersection Capacity Utilization	36.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	81	122	13	4	99	23	2	7	13	9	10	104
Future Volume (vph)	81	122	13	4	99	23	2	7	13	9	10	104
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	94	142	15	5	115	27	2	8	15	10	12	121

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	251	120	27	25	143
Volume Left (vph)	94	5	0	2	10
Volume Right (vph)	15	0	27	15	121
Hadj (s)	0.12	0.04	-0.70	-0.34	-0.38
Departure Headway (s)	4.7	5.2	4.4	4.7	4.5
Degree Utilization, x	0.33	0.17	0.03	0.03	0.18
Capacity (veh/h)	731	663	771	687	734
Control Delay (s)	10.0	8.0	6.4	7.9	8.5
Approach Delay (s)	10.0	7.7		7.9	8.5
Approach LOS	A	A		A	A

Intersection Summary				
Delay	8.9			
Level of Service	A			
Intersection Capacity Utilization	42.6%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
1: Ocean Ave & Medusa St 01-30-2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	21	54	9	15	1	52	35	18	0	21	3
Future Volume (Veh/h)	3	21	54	9	15	1	52	35	18	0	21	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	3	23	59	10	16	1	57	38	20	0	23	3
Pedestrians		3			3			6			11	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	200	202	34	256	184	52	29			61		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	200	202	34	256	184	52	29			61		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	100	97	94	98	98	100	96			100		
cM capacity (veh/h)	718	669	1038	596	685	1010	1593			1551		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	85	27	95	20	26
Volume Left	3	10	57	0	0
Volume Right	59	1	0	20	3
cSH	891	657	1593	1700	1551
Volume to Capacity	0.10	0.04	0.04	0.01	0.00
Queue Length 95th (m)	2.5	1.0	0.9	0.0	0.0
Control Delay (s)	9.5	10.7	4.5	0.0	0.0
Lane LOS	A	B	A		
Approach Delay (s)	9.5	10.7	3.7		0.0
Approach LOS	A	B			

Intersection Summary				
Average Delay	6.0			
Intersection Capacity Utilization	26.0%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1	1	128	1	30	1	77	105	18	64	1
Future Volume (Veh/h)	0	1	1	128	1	30	1	77	105	18	64	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	1	1	151	1	35	1	91	124	21	75	1
Pedestrians		28			20			19			8	
Lane Width (m)		3.6			4.1			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		2			2			2			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	282	382	122	251	259	119	104			235		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	282	382	122	251	259	119	104			235		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	76	100	96	100			98		
cM capacity (veh/h)	601	522	898	637	611	914	1465			1319		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	2	187	92	124	97
Volume Left	0	151	1	0	21
Volume Right	1	35	0	124	1
cSH	660	675	1465	1700	1319
Volume to Capacity	0.00	0.28	0.00	0.07	0.02
Queue Length 95th (m)	0.1	9.0	0.0	0.0	0.4
Control Delay (s)	10.5	12.4	0.1	0.0	1.8
Lane LOS	B	B	A		A
Approach Delay (s)	10.5	12.4	0.0		1.8
Approach LOS	B	B			

Intersection Summary				
Average Delay	5.0			
Intersection Capacity Utilization	38.7%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	24	120	104	24	101	16	15	56	39	145	34	22
Future Volume (vph)	24	120	104	24	101	16	15	56	39	145	34	22
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	28	140	121	28	117	19	17	65	45	169	40	26

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	289	145	19	127	235
Volume Left (vph)	28	28	0	17	169
Volume Right (vph)	121	0	19	45	26
Hadj (s)	-0.16	0.11	-0.70	-0.19	0.20
Departure Headway (s)	5.2	6.0	5.2	5.4	5.5
Degree Utilization, x	0.41	0.24	0.03	0.19	0.36
Capacity (veh/h)	655	552	631	595	603
Control Delay (s)	11.8	9.7	7.2	9.6	11.6
Approach Delay (s)	11.8	9.4		9.6	11.6
Approach LOS	B	A		A	B

Intersection Summary				
Delay	10.9			
Level of Service	B			
Intersection Capacity Utilization	47.4%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
1: Ocean Ave & Medusa St 01-30-2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	13	31	15	9	0	40	25	11	1	26	1
Future Volume (Veh/h)	1	13	31	15	9	0	40	25	11	1	26	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	1	14	34	16	10	0	44	27	12	1	29	1
Pedestrians		3			3			6			11	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	166	164	38	196	153	41	33			42		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	166	164	38	196	153	41	33			42		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	100	98	97	98	99	100	97			100		
cM capacity (veh/h)	766	707	1031	681	718	1024	1588			1576		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	49	26	71	12	31
Volume Left	1	16	44	0	1
Volume Right	34	0	0	12	1
cSH	906	695	1588	1700	1576
Volume to Capacity	0.05	0.04	0.03	0.01	0.00
Queue Length 95th (m)	1.4	0.9	0.7	0.0	0.0
Control Delay (s)	9.2	10.4	4.6	0.0	0.2
Lane LOS	A	B	A		A
Approach Delay (s)	9.2	10.4	4.0		0.2
Approach LOS	A	B			

Intersection Summary				
Average Delay	5.6			
Intersection Capacity Utilization	26.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	3	0	88	1	28	1	48	65	22	50	0
Future Volume (Veh/h)	0	3	0	88	1	28	1	48	65	22	50	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	4	0	104	1	33	1	56	76	26	59	0
Pedestrians		28			20			19			8	
Lane Width (m)		3.6			4.1			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		2			2			2			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	238	293	106	210	217	84	87			152		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	238	293	106	210	217	84	87			152		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	100	85	100	97	100			98		
cM capacity (veh/h)	643	584	917	675	643	956	1486			1414		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	4	138	57	76	85
Volume Left	0	104	1	0	26
Volume Right	0	33	0	76	0
cSH	584	726	1486	1700	1414
Volume to Capacity	0.01	0.19	0.00	0.04	0.02
Queue Length 95th (m)	0.2	5.6	0.0	0.0	0.4
Control Delay (s)	11.2	11.1	0.1	0.0	2.4
Lane LOS	B	B	A		A
Approach Delay (s)	11.2	11.1	0.1		2.4
Approach LOS	B	B			

Intersection Summary				
Average Delay	5.0			
Intersection Capacity Utilization	37.2%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	94	144	16	5	116	26	3	8	16	10	11	121
Future Volume (vph)	94	144	16	5	116	26	3	8	16	10	11	121
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	109	167	19	6	135	30	3	9	19	12	13	141

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	295	141	30	31	166
Volume Left (vph)	109	6	0	3	12
Volume Right (vph)	19	0	30	19	141
Hadj (s)	0.11	0.04	-0.70	-0.35	-0.38
Departure Headway (s)	4.8	5.3	4.6	4.9	4.7
Degree Utilization, x	0.40	0.21	0.04	0.04	0.22
Capacity (veh/h)	712	643	742	644	699
Control Delay (s)	11.0	8.5	6.6	8.2	9.0
Approach Delay (s)	11.0	8.2		8.2	9.0
Approach LOS	B	A		A	A

Intersection Summary				
Delay	9.6			
Level of Service	A			
Intersection Capacity Utilization	43.6%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
1: Ocean Ave & Medusa St 01-30-2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	24	58	11	17	1	57	41	21	0	25	3
Future Volume (Veh/h)	3	24	58	11	17	1	57	41	21	0	25	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	3	26	64	12	19	1	63	45	23	0	27	3
Pedestrians		3			3			6			11	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	224	228	38	286	207	59	33			71		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	224	228	38	286	207	59	33			71		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	100	96	94	98	97	100	96			100		
cM capacity (veh/h)	687	645	1033	563	662	1001	1588			1538		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	93	32	108	23	30
Volume Left	3	12	63	0	0
Volume Right	64	1	0	23	3
cSH	872	627	1588	1700	1538
Volume to Capacity	0.11	0.05	0.04	0.01	0.00
Queue Length 95th (m)	2.9	1.3	1.0	0.0	0.0
Control Delay (s)	9.6	11.0	4.4	0.0	0.0
Lane LOS	A	B	A		
Approach Delay (s)	9.6	11.0	3.6		0.0
Approach LOS	A	B			

Intersection Summary				
Average Delay	6.0			
Intersection Capacity Utilization	27.4%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1	1	150	1	34	1	87	124	20	71	1
Future Volume (Veh/h)	0	1	1	150	1	34	1	87	124	20	71	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	1	1	176	1	40	1	102	146	24	84	1
Pedestrians		28			20			19			8	
Lane Width (m)		3.6			4.1			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		2			2			2			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	313	430	132	277	285	130	113			268		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	313	430	132	277	285	130	113			268		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	71	100	96	100			98		
cM capacity (veh/h)	568	489	887	611	590	901	1454			1283		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	2	217	103	146	109
Volume Left	0	176	1	0	24
Volume Right	1	40	0	146	1
cSH	631	650	1454	1700	1283
Volume to Capacity	0.00	0.33	0.00	0.09	0.02
Queue Length 95th (m)	0.1	11.7	0.0	0.0	0.5
Control Delay (s)	10.7	13.3	0.1	0.0	1.9
Lane LOS	B	B	A		A
Approach Delay (s)	10.7	13.3	0.0		1.9
Approach LOS	B	B			

Intersection Summary				
Average Delay	5.4			
Intersection Capacity Utilization	39.5%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	26	141	123	28	119	18	17	66	46	168	39	25
Future Volume (vph)	26	141	123	28	119	18	17	66	46	168	39	25
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	30	164	143	33	138	21	20	77	53	195	45	29

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	337	171	21	150	269
Volume Left (vph)	30	33	0	20	195
Volume Right (vph)	143	0	21	53	29
Hadj (s)	-0.16	0.11	-0.70	-0.19	0.20
Departure Headway (s)	5.5	6.4	5.6	5.8	5.9
Degree Utilization, x	0.51	0.30	0.03	0.24	0.44
Capacity (veh/h)	618	515	585	545	565
Control Delay (s)	14.1	11.0	7.6	10.6	13.5
Approach Delay (s)	14.1	10.6		10.6	13.5
Approach LOS	B	B		B	B

Intersection Summary				
Delay	12.7			
Level of Service	B			
Intersection Capacity Utilization	51.5%	ICU Level of Service		A
Analysis Period (min)	15			

The attached information is provided to support the agency's review process and shall not be distributed to other parties without written consent from Bunt & Associates Engineering Ltd.

APPENDIX D

Trip Generation Calculations

APPENDIX A Calculation Of Trip Generation Rates

This section documents the methodology used to adjust trip generation rates based on observed vehicle counts at the site access. In **Step 1**, the 37 observed site trips in the AM and 65 in the PM peak hours were then proportioned to each of the existing land uses based on the methodology from the ITE Trip Generation Manual 10th Edition. This is presented in **Table 1**.

Table 1: Step 1, Existing ITE Trip Rates used to Allocate Observed trips

Current Site Use	Capacity Students	ITE Land Use	ITE Independent Var.	ITE Trip Rates		Peak Trips (Generator)		% of ITE Total		Allocation of Observed	
				AM	PM	AM	PM	AM	PM	AM	PM
CSF Elementary School	70	Elementary School (520)	Students	0.65	0.34	46	24	33%	29%	12	19
Sechelt Learning Center	30	Daycare (565)		0.79	0.81	24	24	17%	29%	6	19
Alternative School	75	Middle School (522)		0.70	0.35	53	26	38%	32%	14	21
Youth Drop-in Center	25	Middle School (522)		0.70	0.35	18	9	13%	11%	5	7
	200					139	83	100%	100%	37	65

In **Step 2**, resulted vehicle trips from Table 1 were allocated to each land use to calculate the peak hour vehicle trip rates. Outputs from this exercise are presented in **Table 2**.

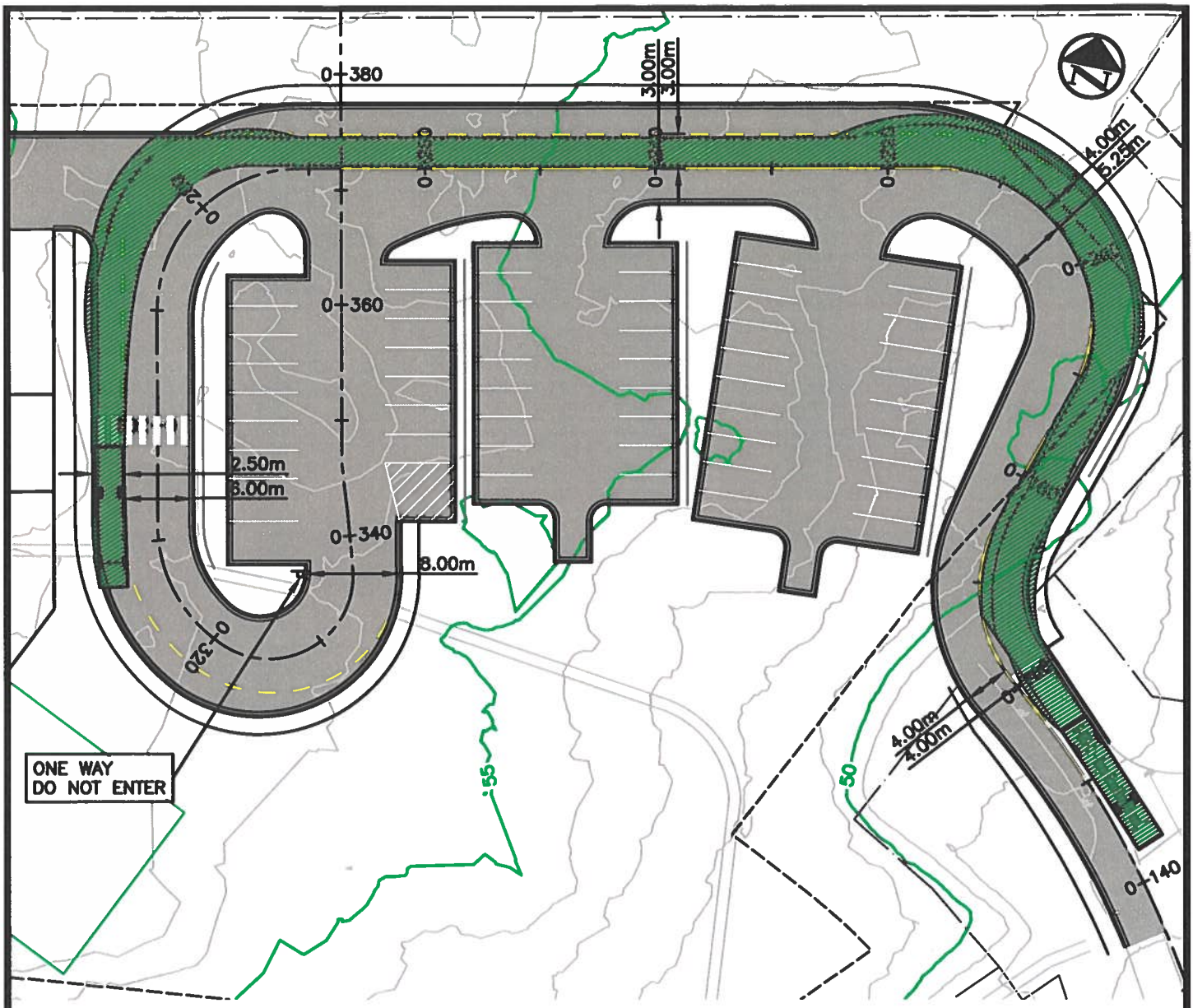
Table 2: Step 2, Allocation of Observed Trips to adjust Trip Generation Rates

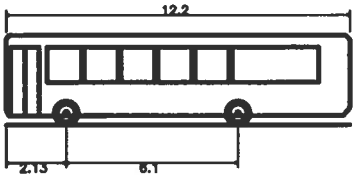
Current Site Use	Capacity Students	ITE Land Use	ITE Independent Var.	Peak Trips (Generator)		Resulting Observed Rates	
				AM	PM	AM	PM
CSF Elementary School	70	Elementary School (520)	Students	12	19	0.17	0.27
Sechelt Learning Center	30	Daycare (565)		6	19	0.21	0.63
Alternative School	75	Middle School (522)		14	21	0.19	0.27
Youth Drop-in Center	25	Middle School (522)		5	7	0.19	0.27
				37	65		

These adjusted rates were then applied to the increased student capacity numbers for the new school facilities to calculate the 'net new' school trips.

APPENDIX E

Creus AutoTurn Test





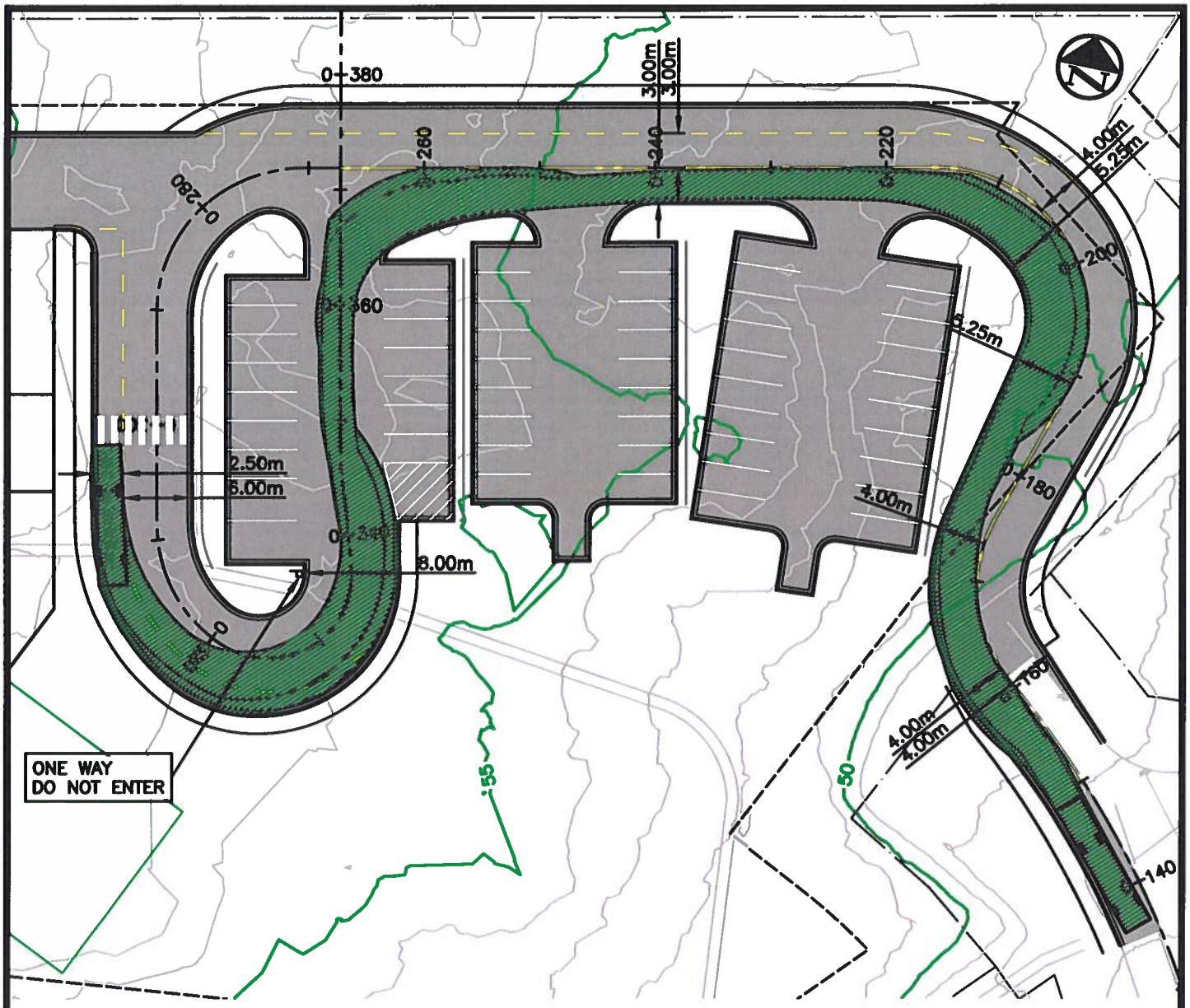
S-BUS-12 - Large School Bus (84 pass.)

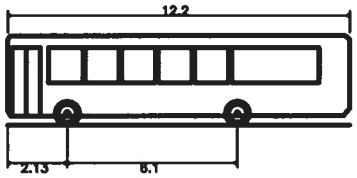
Overall Length	12.200m
Overall Width	2.440m
Overall Body Height	3.200m
Min Body Ground Clearance	0.326m
Track Width	2.440m
Lock-to-lock time	5.00s
Max Steering Angle (Virtual)	34.40°

AUTOTURN
CSF SECHELT
S-BUS-12 (84 PASSENGER)
ENTERING PATH

CREUS Engineering
Civil Engineers & Project Managers
PH: 604-987-9070 WEB: www.creus.ca

dwg by: CLW	scale: hor. 1:500
dwg date: 24-01-29	vert. -
dwg #: AT-2	proj #: 23310





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AUTOTURN
CSF SECHELT
S-BUS-12 (84 PASSENGER)
EXITING PATH

CREUS Engineering
Civil Engineers & Project Managers
PH: 604-987-9070 WEB: www.creus.ca

dwg by: CLW	scale: hor. 1:500
dwg date: 24-01-29	vert. -
dwg #: AT-3	proj #: 23310