



May 27, 2021  
04-21-0044

Rebecca Hurwitz, Executive Director  
Clayoquot Biosphere Trust  
316 Main Street  
Tofino, BC V0R 2Z0

VIA E-MAIL: [rebecca@clayoquotbiosphere.org](mailto:rebecca@clayoquotbiosphere.org)

Cc: Bob Prenovost, Propellor Advisors

Dear Ms. Hurwitz:

**Re: Clayoquot Biosphere Trust Centre, Olsen Road, Tofino BC  
Traffic Impact Assessment (TIA)**

Bunt & Associates Ltd. (Bunt) has prepared the following Traffic Impact Assessment (TIA) for the proposed Rezoning and Bylaw Amendment at 301 Olsen Road (Legal Description, Lot 1 District Lot 115) in Tofino BC, for the proposed Clayoquot Biosphere Trust Centre.

We trust this information will assist in the planning for the project. Please feel free to contact us should you have any question or comment.

Yours truly,  
**Bunt & Associates**

A handwritten signature in black ink, appearing to read "K. Brandstaetter".

Kyle Brandstaetter, MCIP RPP  
Transportation Planner

Simon Button, P.Eng.  
Transportation Engineer

## 1. INTRODUCTION

### 1.1 Project Summary

Clayoquot Biosphere Trust (CBT) is proposing to Rezone the corner property at 301 Olsen Road and build a new headquarters for future operations. The current Zoning is R2 (Two-Family Residential) and the proposal is for CD (Comprehensive Development) Zoning. CBT's headquarters is currently located at 316 Main Street in downtown Tofino.

The project has moved past First Reading at the District of Tofino (DoT) Council, and staff have requested that a Traffic Impact Assessment (TIA) be completed as part of the submission, prior Second Reading with Council.

The site is approximately 800m southeast of Tofino's town centre and is located on the northeast corner of the Campbell Street (Highway 4) & Olsen Road intersection. The site location, in the context of Tofino's Downtown Area, is illustrated in **Exhibit 1.1**. The project is located within short walking (5-10 min)/cycling distance (3-5 min) from the downtown area and the project will benefit from the Multi-Use Path (MUP) along the east side of Campbell Street. Based on recent correspondence with DoT, it is our understanding that the MUP will be upgraded between Olsen Road and Gibson Street, this improvement will greatly improve connectivity to/from the site.

### 1.2 Clayoquot Biosphere Trust

The Clayoquot Biosphere is a designated United Nations Educational, Scientific, and Cultural Organization (UNESCO) reserve (called Clayoquot Sound UNESCO Biosphere Region) and is one of eighteen in Canada. One of the main goals of biosphere reserves is to maintain and foster growth between people and nature through sustainable development practices, biodiversity conservation, and reconciliation (referenced: *CBT Zoning Bylaw Amendment Application*).

With partnerships across the region, the Clayoquot Biosphere Trust (CBT) has established itself as an on-the-ground support for the Clayoquot Sound UNESCO Biosphere Region, helping to bring the vision to reality through funding, research, education, and training support/initiatives (referenced: *CBT Zoning Bylaw Amendment Application*).

The proposed development is seeking to establish a new Biosphere Centre, which will:

“allow for improving and expanding space for engagement with the Clayoquot Biosphere communities, accommodating existing and future CBT office needs and providing living space for visiting professionals, researchers, and partners of the CBT in 2 collocated residences. Anchored by a community gathering space the new Biosphere Centre will be a welcoming place for sharing and learning, where cultural events and workshops can be held with the participation of the wider Biosphere communities” (referenced: *CBT Zoning Bylaw Amendment Application*).

### 1.3 Proposed Development

With approval, the project would see the completion of CBT's main headquarters, a community and flexible office space, and 2 one-bedroom dwelling units, meant to house visiting professionals, researchers, and partners. Parking on-site is planned with a total of 9 spaces, and the site driveway is proposed on Olsen Road at the maximum distance possible away from the intersection at Campbell Street & Olsen Road. The proposed site plan is presented in **Exhibit 1.2**.

### 1.4 Study Considerations

The following presents some of the main topics reviewed as part of this TIA:

- As Campbell Street is the only road in and out of Tofino, peak hour traffic volumes are considerable and therefore an operations analysis, with and without the proposed development, has been prepared to evaluate the impact of the proposed Rezoning on the Campbell Street & Olsen Road intersection;
- One of the key concerns of Olsen Road residents, coming out of the project's open houses, is related to the availability and ongoing use of street parking along Olsen Road, particularly during peak tourist months. Therefore, this study has provided an assessment of on-street parking and has offered some potential ways that the CBT project can limit its impact on a current issue, specifically during special events;
- Existing grades along Olsen Road are significant (10% slope fronting the site) and where the road intersects with Campbell Street, at a minor-stop control, vehicle sight lines are challenged. This is a result of the angle of the Olsen Road approach to Campbell Street, the topography of Campbell Street on the approaches to the intersection, and Campbell Street's slight curve at the intersection. This review has presented sight line analysis and explored opportunities to mitigate observed conditions.

The following points are the key transportation-related concerns from residents on Olsen Road, provided by the project team:

- Concerns of safety of Olsen/Campbell intersection and increased traffic;
- Concerns about parking demands on the neighbourhood.

### 1.5 Policy Context

DoT recently adopted (2019) a Multi-Modal Transportation Plan (MMTP), with the aim to "support a shift away from private automobiles by promoting sustainable, active, and efficient alternatives to enable residents and tourists to explore the community. In the context of this site, restaurants, services, shopping, and work are all concentrated in the Downtown area, which is within 800m of the site. The site location is illustrated in the following "Scale of Walking Convenience" map sourced from the MMTP in **Figure 1.1** and shows that the site is conveniently located for active modes. This will only improve in the future, as DoT continues to invest in active transportation infrastructure.

**Figure 1.1: Scale of Walking Convenience (MMTP online survey)**



**1.6 TIA Scope**

A scope of work was developed through consultation with DoT staff and forms the basis of this TIA: The approved scope is attached in **Appendix A**.

**1.7 Site Visit & Data Collection**

A site visit and transportation survey were conducted on Wednesday, April 14<sup>th</sup>, 2021 (afternoon/evening) and Thursday April 15<sup>th</sup>, 2021 (morning). Peak hour traffic counts were collected at the study intersections during this time, i.e. commuting peak periods (between 7-8am and 5-6pm).

Weather during field observations was sunny and dry. Importantly, data collection timing did not coincide with Highway 4 construction road closures which were planned daily between 11am-3pm,

approximately 40-50km south of Tofino. Also, it was observed that both vacation lodges on Olsen Road had 'No Vacancy' signs posted as well as parked vehicles in front of the accommodations. Therefore, traffic generation from these sites was assumed to capture typical demands of these land uses.

Later in the report, baseline traffic volumes were factored up to account for seasonality factors (i.e. spring counts versus peak summer) and to offset the impacts of the COVID on travel and visitors to the region. The methodology used in factoring up volumes is explained in greater detail further below.

## 1.8 Report Structure

This report is structured as follows:

- Existing Conditions;
- Intersection Design Review
- CBT Operations;
- Site Plan Review;
- Future Conditions;
- Conclusions & Recommendations.



## Exhibit 1.1 Site Location

Clayoquot Biosphere Centre TIA  
04-21-0044 May 2021





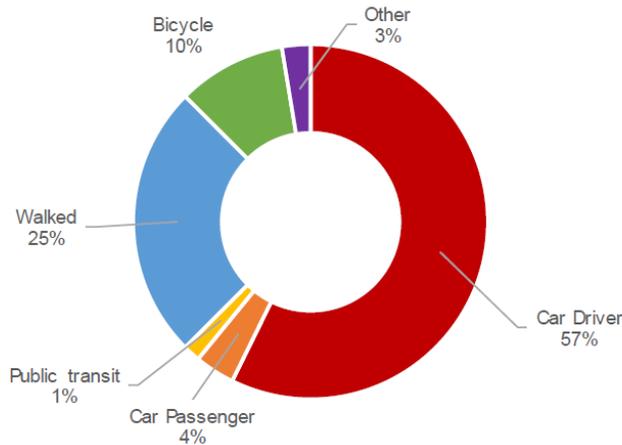
## 2. EXISTING SITE CONDITIONS

### 2.1 Regional Baseline Context

#### 2.1.1 Current Travel Mode Splits

The MMTP presented current travel mode splits of residents/visitors and this has been illustrated in **Figure 2.1** (*MMTP Discussion Paper #1 - pg. 10, source Statistics Canada 2016*). The results confirm that walking, cycling, and transit (the latter being currently limited in Tofino) represent approximately 36% of the overall mode share.

**Figure 2.1: Current Tofino Travel Mode**



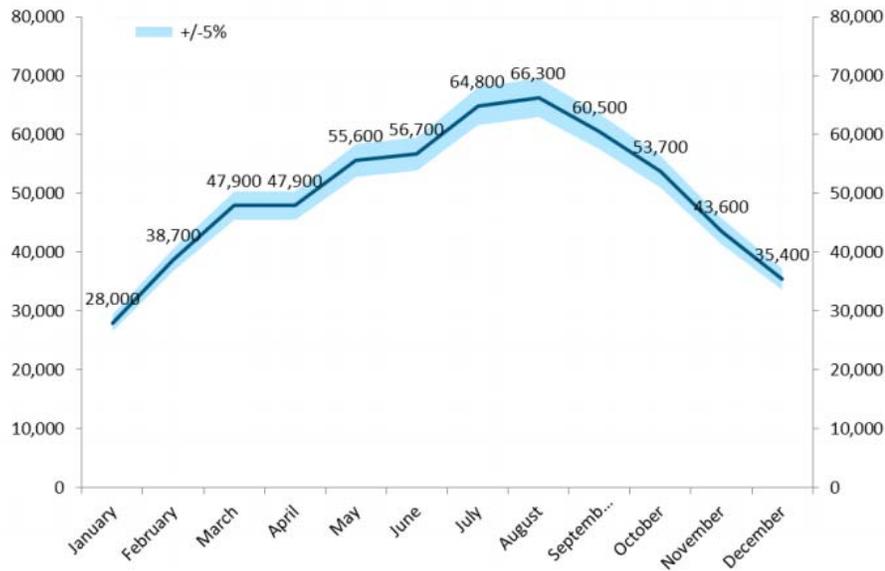
Weather plays a key role in how resident choose to travel. On a sunny/mild day the mode split for walking and cycling represents a significant portion of the overall mode share at 53% (*MMTP Discussion Paper #1 - pg. 9*). There are various factors that play a role in this active mode share, some of which include: proximity of respondents to Tofino’s downtown area, availability of active mode connections with existing trail network, and lifestyle choice.

Trip purpose and location was also documented and found that shopping, services, and restaurants trips were generally focused in the downtown area, while employment and personal/recreation trips were more spread across the District and around the beaches, illustrative of the tourism-based industry in Tofino (*MMTP Discussion Paper #1 - pg. 11*).

#### 2.1.2 Visitors to Tofino

Tofino is a resort community with a heavy influx of visitors at during the summer months and this is illustrated **Figure 2.2**, sourced from a 2019 report commissioned by Tofino Tourism.

**Figure 2.2: Estimated Annual (monthly) Visitors to Tofino 2018 (Overnight/Day)**



## 2.2 Local Context - Olsen Road

The site is a corner lot that currently sits vacant. Olsen Road is a short local street (no-thru) that connects to Bond Lane. Current land uses surrounding Olsen Road are: eight (8) single family lots (some of which we understand are vacation rentals), two (2) vacation lodges (total of 12 accommodation units), and the Crab Dock which has 3-4 houseboats, 5-6 fishing/sailing boats, and the Meares Island Water Taxi.

The topography of land and subsequently the study area streets have significant grade changes, where Campbell Street is at a high point and the Olsen Road intersection the road slopes down to the water.

Olsen Road has 22 marked on-street parking stalls on both sides of the street, with no time or permit restrictions. The following image was taken during the site visit and shows the on-street parking.



## 2.3 Site Accessibility

A person's willingness to walk is highly dependent on the purpose of the journey, although factors such as environment, traffic volumes, perceived safety, personal fitness, car ownership, parking availability, etc., are also influential. Research suggests that people are, on average, willing to walk up to 1,200 metres (15 minutes) to access town centre facilities and up to 2,000 metres (20 minutes) to access places of employment.

**Exhibit 2.1** presents the site location in the context of the site's accessibility, showing: walking distance (within 800m as the crow flies), adjacent pedestrian facilities, nearby trails, shuttle bus stops.

*The site benefits from direct access to the Multi-Use Path (MUP) along Campbell Street, as noted above, DoT has plans for the facility to be upgraded between Olsen Road and Gibson Street. Adjacent to site, the MUP is paved and approximately 2m wide with a low barrier, as shown in the image. Pedestrian/Cyclist crossing of Olsen Road is provided with pavement markings, this is also shown in the image.*



Currently no sidewalk or cycling facilities are present along Olsen Road, however, given the local nature of the street and low traffic volumes, this is not considered to be a major concern.

### 2.3.1 Transit

Currently public transit service is provided in the form of a free hourly shuttle ("Tofino Bus") during summer months (June – September), and this service also has contracts with the School District for student transport. **BC Transit has plans to expand service to the region, which is outlined in a service plan released in May 2020. Specific to this site, a bus stop location has been identified within 150-200m of the project. This future transit access will have a positive impact on how future employees and visitors travel to/from the site, with the additional travel option.**

## 2.4 Street Characteristics

Study network streets are Campbell Street and Olsen Road, and **Table 2.1** presents a summary each. The study intersection at Campbell Street & Olsen Road has single lane approaches with minor-stop

control for Olsen. Campbell Street is under provincial jurisdiction therefore any changes to the road must be designed and approved by Ministry of Transportation and Infrastructure (MoTI).

**Table 2.1: Study Area Street Characteristics**

STREET	POSTED SPEED LIMIT (KM/HR)	# OF TRAVEL LANES	APPROX. VEHICLE TRAVEL WIDTH (M)	STREET PARKING	PEDESTRIAN/ CYCLING FACILITES
Campbell Street	50	2	7.2	None	Multi-Use Path (2m with low barrier)
Olsen Road	50	2	5.5	Both sides (marked stalls, no restrictions)	None

### 2.5 Existing Peak Hour Traffic Volumes

Traffic volumes collected in April 2021 were factored up to align with pre-covid summertime volumes, this was done with reference to annual daily traffic volumes on Highway 4 (2018), summarized in the DoT’s MMTP and extracted from MoTI (*MMTP Discussion Paper #1 - pg. 48*). The volumes are presented below in **Figure 2.3**.

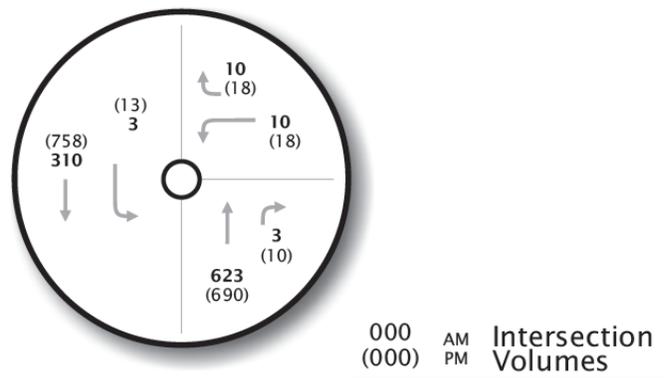
**Figure 2.3 – Average Daily Traffic Volume by Month on Highway 4 (MoTI 2018)**



Based on this, a factor of 2.5 was used to increase the observed counts from April 2021. This was done to all movements, including Olsen Road, and this is considered a conservative measure from an operations analysis perspective.

Adjusted (increased) existing morning (AM) and afternoon (PM) weekday peak hour traffic volumes at the Campbell Street & Olsen Road intersection are shown in **Figure 2.4**. Following this, **Table 2.2** presents a summary of the two-way peak-hour vehicle movements.

**Figure 2.4 – Existing (Adjusted) Peak Hour Traffic (Campbell Street & Olsen Road)**



**Table 2.2: Study Area Weekday Peak Hour Vehicle Link Volumes**

STREET	AM	PM
Campbell Street (north of Olsen)	945	1,480
Olsen Road (east of Campbell)	25	60

Pedestrian and cycling volumes were also collected along Campbell Street at the Olsen intersection, observed volumes were adjusted at the same rate as the vehicle volumes to represent peak summer conditions, pre-COVID. The following presents the peak hour pedestrian and cyclist volumes:

- Pedestrians: 35 (AM) / 55 (PM);
- Cyclists: 50 (AM) / 80 (PM).

## 2.6 Existing Traffic Operations

### 2.6.1 Performance Thresholds

Existing operations of study area intersections were assessed using the methods outlined in the 2000 Highway Capacity Manual (HCM), using the Synchro 9 / SimTraffic analysis software. Traffic operations were assessed using the performance measures of Level of Service (LOS), vehicle delay (seconds – rounded to the nearest 0.5), and 95<sup>th</sup> percentile queues (metres – rounded to the nearest

whole number) and are based on SimTraffic modelling outputs. All performance reporting conventions noted above have been consistently applied throughout this report.

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 2.3** below summarizes the LOS thresholds for the six Levels of Service for unsignalized intersections.

**Table 2.3: Unsignalized Intersection Level of Service Thresholds**

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

Source: Highway Capacity Manual

### 2.6.1 Existing Operational Analysis Results

Traffic operation results for existing conditions are presented in **Table 2.4**. Detailed outputs are provided in **Appendix B**.

**Table 2.4: Existing Weekday Peak Hour Operations**

INTERSECTION/ TRAFFIC CONTROL	MOVEMENT	AM			PM		
		LOS	DELAY (SEC)	95 <sup>TH</sup> QUEUE (M)	LOS	DELAY (SEC)	95 <sup>TH</sup> QUEUE (M)
Campbell Street & Olsen Rd (Minor Stop Control- Olsen)	WBLR	C	12	13	C	16	16
	NBTR	A	1	-	A	1	-
	SBLT	A	1	-	A	6	21

**Results confirm that the Campbell Street & Olsen Road currently operates within acceptable performance thresholds, this aligns with general observations at the intersection where no operational issues (significant delay and/or queuing) were recorded.**

## 2.7 On-Street Parking on Olsen Road

Through the planning process for this project, local residents have expressed concerns with on-street parking demands on Olsen Road. As part of this study, parking utilization counts were recorded to get a better understanding of current conditions. The results of the observations are presented in **Table 2.5**.

**Table 2.5: Existing Weekday Peak Hour Operations**

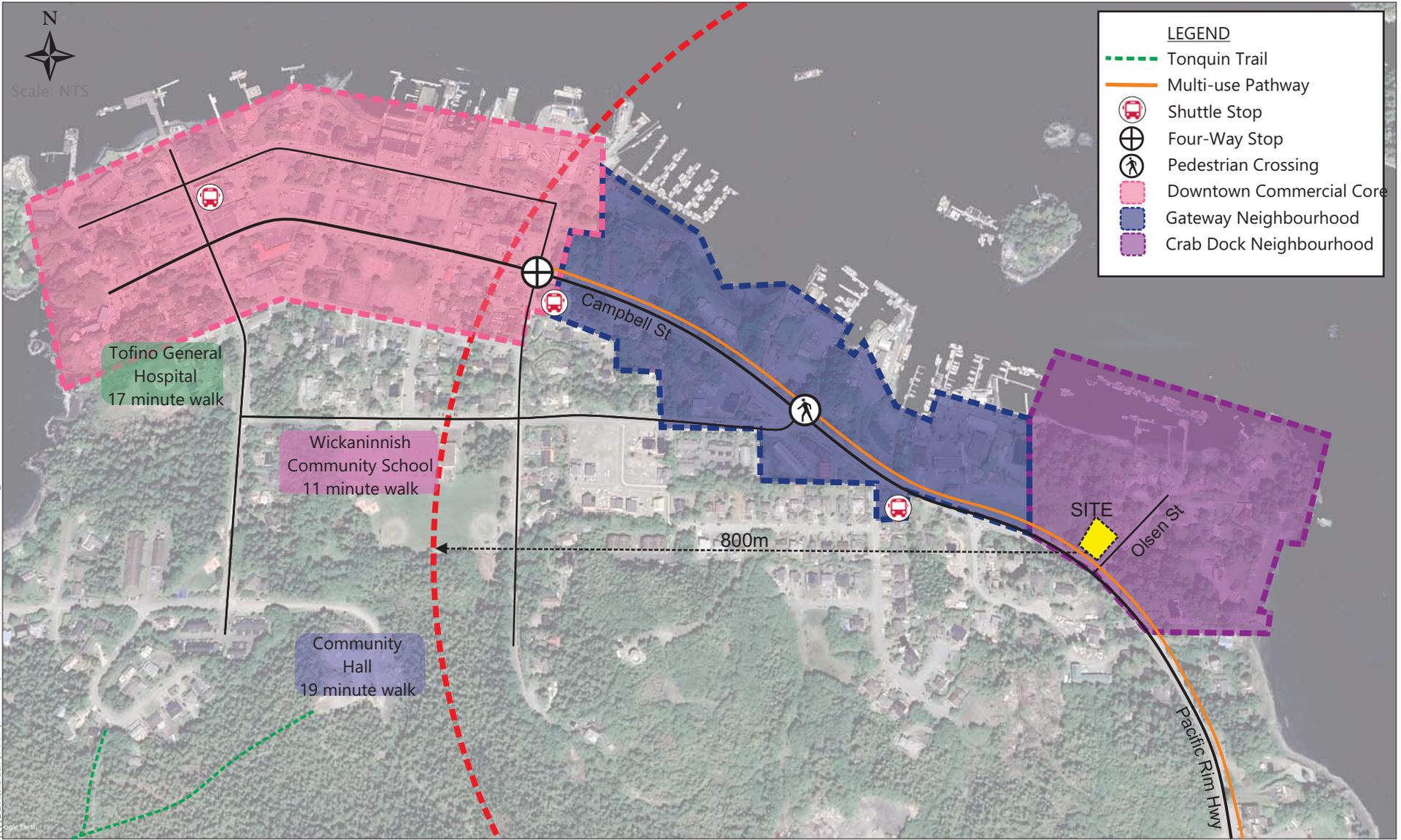
TIME	DEMAND	SUPPLY	UTILIZATION
07:30	10	22	45%
08:30	10	22	45%
09:30	13	22	59%
12:30	12	22	55%
13:30	11	22	50%
15:30	11	22	50%
20:30	10	22	45%
22:30	11	22	50%

**Observations confirmed that parking was approximately half utilized during the spring count, with not a lot of variation the demand profile.** Approximately 3-4 of the parked vehicles were noted to be parked throughout the day and through the night, suggesting that these vehicles are parked on a more permanent, or long-term, basis.

On-street parking very likely may reach capacity during busier summer months, especially with an increase in visitors to the Crab Dock and water taxi, where street parking for those who arrive by vehicle (and boat tow) is the only available spot to park - this would align local residents' concerns over street parking availability.

As this is an existing neighbourhood issue, **it is recommended that DoT explore implementing time restricted parking, or permit parking. CBT is committed to limiting its impact on street parking, especially during special events.** With this in mind CBT has proposed some transportation management strategies (outlined further below) to help mitigate future parking overflow onto Olsen Street.

\\Bunt.local\data\Shared\PROJECTS\BL\04-19-0348 Evergreen Lane Seniors Housing\5.0 Deliverables\Graphics



## Exhibit 2.1 Site Context

Clayoquot Biosphere Centre TIA  
04-21-0044 May 2021



### 3. INTERSECTION DESIGN REVIEW

This section presents a sight line review at the intersection of Campbell Street & Olsen Road, where sight lines were observed to be problematic due to the profile of Campbell Street and curvature of the road. It is noted that the approaches on Campbell Street do already have intersection warning signs. Prior to this review, the following summarizes ICBC crash data.

#### 3.1 ICBC Collision History

**Table 3.1** presents reported ICBC crash data at the Campbell Street & Olsen Road intersection. This was sourced online through the ICBC’s open-source dataset, for the last 5 years (i.e. to 2016). The information confirmed that ***a total of three (3) vehicle collisions have been reported at this intersection during the past 5 years, none of which were casualties.***

**Table 3.1: ICBC Reported Crashes at Campbell Street & Olsen Road**

YEAR	QUANTITY	SEVERITY	MONTH	TYPE
2016	1	Vehicle Damage	March	Rear-End
2016	1	Vehicle Damage	May	Undetermined
2019	1	Vehicle Damage	August	Rear-End

#### 3.2 Sight Line Review

Sight distance is provided at intersections to allow drivers of stopped vehicles a sufficient view of the intersecting roadway to decide when to enter the intersection roadway or to cross it.

The minimum sight distance criteria for vehicles approaching an intersection is called Stopping Sight Distance (SSD) based on design speed. If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate SSD for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. However, in some cases, a major road vehicle may need to stop or slow to accommodate the maneuver by a minor road vehicle. More generally, TAC recommends that SSD always be met while on a street (at an intersection or not).

To enhance traffic operations, Intersection Sight Distances (ISD) that exceed stopping sight distance are desirable along the major road. ISD is adequate when it allows the design vehicles to safely make all the manoeuvres that are permitted by the layout (e.g., left turns, right turns, through moves), without significantly affecting the speed of vehicles travelling on the main roadway.

**Table 3.2** indicates the sight distance requirements related to this access based on the procedures outlined in the Transportation Association of Canada’s Geometric Design Guidelines (TAC). The

design speed used in the calculations is consistent with the 50 km/h posted speed limit, i.e. Campbell Street.

**Table 3.2: Sight Distance Requirements**

SIGHT DISTANCE TYPE	CALCULATION PARAMETERS	SIGHT DISTANCE REQUIREMENT
Stopping Sight Distance (SSD)	2.5s perception-reaction time	65 m
Intersection Sight Distance (ISD) / Left Turning Passenger Car	7.5s time gap	105m WBR and 95m WBL (from stop) / 80m SBL (free or permissive)

The images below are sight distance photos from Olsen Road taken during the site visit and illustrate the available sight lines from Olsen Road and north – south along Campbell Street. The images illustrate the road undulations along Campbell Street and impact on sight lines. Available sight distances were measured in the field and have been used in this analysis.



*Olsen Road (WBL vehicle) – looking south on Campbell Street (85m available sight line)*



*Olsen Road (WBR vehicle) – looking north on Campbell Street (100m available sight line)*



*Olsen Road (SBL vehicle) – looking north on Campbell Street (90m available sight line)*

Attached in **Appendix C** is the sight line triangle review, and accompanying this, **Table 3.3** presents the key findings.

**Table 3.3: Sight Distance Findings**

SIGHT DISTANCE TYPE	OLSEN ROAD WB						CAMPBELL STREET SB		
	Looking North			Looking South			Looking South		
	Available Distance	Distance Required	Requirement Met?	Available Distance	Distance Required	Requirement Met?	Available Distance	Distance Required	Requirement Met?
Stopping Sight Distance (SSD)	100m	65m	YES	85m	65m	YES	90m	65m	YES
Intersection Sight Distance (ISD) + Left Turning Passenger Car	100m	105m	NO	85m	95m	NO	90m	80m	YES

Results from this analysis confirm that the SSD criteria is met for all cases at Olsen Road, confirming that sufficient sight distance is available to maintain safe traffic operations today.

ISD was not met for the westbound left turn looking north or south at Olsen Road, but was met for a southbound vehicle making a left onto Olsen Road. This indicates that north- and southbound vehicles on Campbell Street may occasionally need to slow for vehicles turning out of Olsen Road. While not a safety issue this is considered a minor operational issue. There are not significant sightline issues since the available sight distances exceeds the SSD and almost meets the ISD. Therefore, some cars on Campbell will need to slow down but not to a significant degree.

Given these findings, ***no immediate mitigation measures are recommended, however should DoT and MoTI be considering any major road works along this section of Campbell Street, it is recommended that potential grading solutions be explored to raise the Olsen Road approach and flatten the humps along Campbell Street, improving sight lines. Even a marginal increase of 0.5m would greatly improve visibility. It is recommended that any future road plans integrate with the MUP upgrades.***

## 4. CBT OPERATIONS

### 4.1 Existing Site

Currently CBT is located in downtown Tofino at 316 Main Street in a leased office space (with 5 allocated parking spaces). It is our understanding from the client that operations are focussed on administration and other desk work, small group meetings, archive material storage. Special events and program delivery take place off-site due to lack of suitable space within current building.

On a typical day (pre-COVID there are approximately four (4), but this can fluctuate depending on what activities are going on. Total staff numbers are nine (9). Due to the size of the space *no* full-time additional partner/co-located NPO organization staff, researchers, and/or First Nations Elders are in the building full-time.

Anecdotally, CBT has provided a snapshot of typical travel characteristics, these include:

- 3 to 4 staff drive and park at the office (including those who carpool);
- 2 staff walk, cycle, shuttle, or other;
- 1 to 2 staff carpool or are dropped off;
- 2 of the available 5 parking spaces are regularly used on a typical day;
- 2 visitors to the office on a typical day that use on-site parking, while others walk or bike to the office when visiting.

Currently CBT does not have specific Transportation Demand Management (TDM) measures aimed at lowering staff reliance on private vehicle use, however, more generally it is understood that staff are very conscious of the environmental impacts of private automobile travel and they do make conscious efforts to coordinate vehicle trips (carpool) and choose to walk or cycle is possible.

### 4.2 Future Site

With the new space the intent will be to use it for administration and other desk work, archives storage and viewing area, small and medium sized group meetings, educational programs delivery, teaching kitchen programs, First Nations Elders room, welcome and education centre for both visitors and local residents for UNESCO Clayoquot Sound Biosphere Region. With the new space staff numbers on a typical day are expected to be around six (6) and approximately 6 to 9 partner/co-located NPO organization staff, researchers, and First Nations Elders.

Anecdotally, CBT has provided a snapshot of anticipated travel patterns as it relates to current operations:

- +3 staff are expected to drive and park at the office;
- +1 staff are expected to walk, cycle, or (shuttle etc), however this could be more with the future transit service;

- The staff that carpool is not expected to change, but CBT is willing to explore ways to encourage carpooling to the future site;
- +3 visitors are estimated that could need an on-site parking space (expected higher visitor activity at the new building).

While CBT does not offer incentives for staff to not travel by private vehicle, they have indicated that they are considering transit pass subsidies for staff once public transit becomes available. The new site will also have dedicated (and secure) bike parking, as well as charging for e-bikes, to encourage both staff and visitors to ride to-from the centre.

### 4.3 Special Events

CBT special events vary in size, with smaller more regular function of anywhere between 10 and 50 people, to large scale events (very rare based on feedback from CBT, once a year maximum) that can see attendance reach between 100-200 guests – however these large events would not take place in the proposed headquarters. Understanding that on-site parking is designed to accommodate typical day-to-day activities, and acknowledging the neighbourhoods concerns regarding street parking, CBT is committed to a variety of measure and communication strategies aimed at lowering vehicle use and associated parking demands at special events, some of which are already done today. These include:

- Encouraging out-of-town visitors/attendees to stay in nearby accommodations;
- Hired shuttle service for special events to transport people to and from accommodations and off-site parking lots and dock pick-up drop offs (see **Appendix D** for an example of a Regional Gathering Event shuttle service);
- Communication strategies that are sent out in emails and in invitations to events, which encourage attendees to carpool, walk or cycle to the centre. A draft communications message has been attached in Appendix D;
- Traffic and parking management procedures in-place and personnel for special events at the new site. This will include on-street parking watch (to ensure that attendees do not park on Olsen Road, and traffic management during events to attendees do not park illegally and/or impede access to other residential and commercial properties on Olsen Road;
- A designated pick-up/drop off zone with convenient access to the building;
- Cycling and walking will be encouraged, and the new site will make space for temporary bike parking during special events, as well as charging stations;
- For larger events, CBT will send out an email to Olsen Road residents, well in advance of the event date to let them know of the upcoming event, dates and times etc.

***All of these measures are considered appropriate and will help to avoid any major traffic or parking issues during special events. Future transit service will also play an important role in getting attendees to and from the events.***

## 5. SITE PLAN REVIEW

### 5.1 Site Plan & Development Content

The project would see the completion a community and flexible office space, and 2 one-bedroom dwelling units, meant to house visiting professionals, researchers, and partners. Parking on-site is planned with a total of 9 spaces, and the site driveway is proposed on Olsen Road at the maximum distance possible away from the intersection at Campbell Street & Olsen Road. The proposed site plan is presented above in Exhibit 1.2, for reference.

**Table 5.1** presents the development which provided the basis for the future vehicle trip generation and traffic analysis, further below.

**Table 5.1: Proposed Development**

LAND USE	GFA	# OF UNITS
Community Space	254 m <sup>2</sup> / 2730 ft <sup>2</sup>	n/a
Office	187 m <sup>2</sup> / 2017 ft <sup>2</sup>	
Residential	258 m <sup>2</sup> / 2780 ft <sup>2</sup>	2
<b>TOTAL</b>	<b>699 M<sup>2</sup> / 7527 FT<sup>2</sup></b>	<b>2</b>

### 5.2 Off-Street Supply Provisions

#### 5.2.1 Vehicle Parking – 9 spaces

The development plans to exceed DoT parking requirement (per Part 6 of the Zoning Bylaw) of 8 spaces with the provision of 9. The total parking supply is considered acceptable for this form of development and known travel characteristics for typical conditions. As such, future parking demands are anticipated to be met on-site during non-event days (i.e the majority of the time).

#### 5.2.2 Bicycle Parking – 6 spaces

While there are no on-site bicycle storage requirements, the project plans to provide 6 spaces, some of which will have e-charging capability, to encourage this cycling to/from the centre.

#### 5.2.3 Loading – 1 space

The project will meet the District's loading supply requirement with 1 space; however, the space is intended for smaller courier-sized vehicles, not larger single-unit trucks, based on known operations at CBT.

### 5.3 Swept Path Review

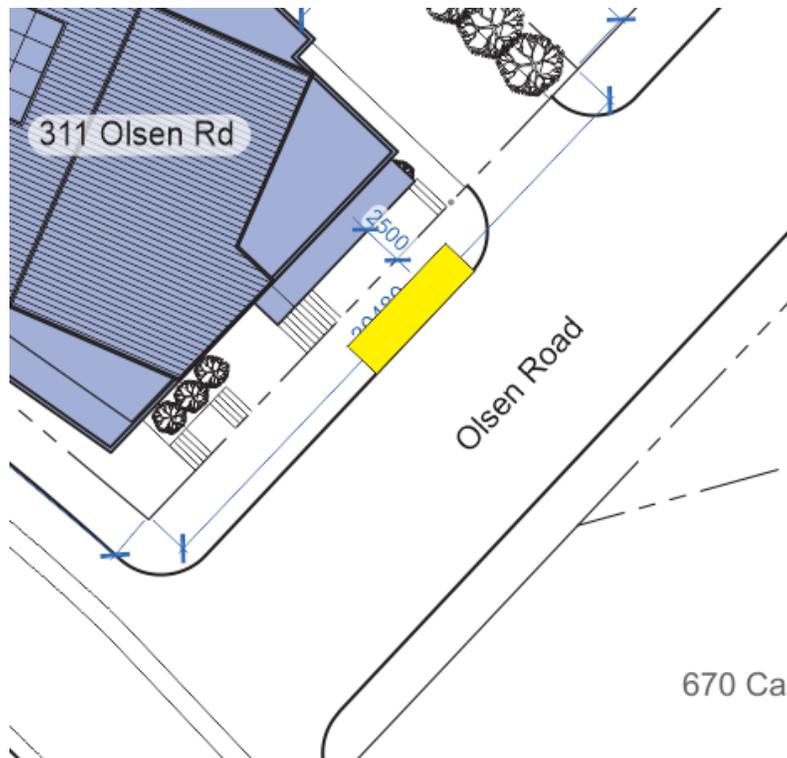
Using AutoTURN software, this review completed an on-site swept path analysis for passenger parking spaces, aisle circulation, access, and the loading space – this is presented in **Appendix E**. The findings confirmed that the site will accommodate the intended design vehicles.

### 5.4 Frontage Improvements

It is recommended that frontage improvements such as landscaping between the building and MUP would be beneficial, as well as smooth transitions between the site and the MUP. Landscaping may impact available sight triangles, between users on the MUP and people accessing the Centre, therefore consideration should be made to limiting any structures or vegetation with height in these areas.

Current drawings illustrate a build-out of frontage along Olsen Road, it is recommended that one (1) on-street parking space be designed for adjacent to the site access, and away from the intersection. This will benefit the project for short-term pick-up/drop-off activity and should be seen as a positive contribution to the on-street parking supply on Olsen Road. The approximate location of this on-street parking space is highlighted in **Figure 5.1**.

**Figure 5.1 – Recommended On-street Parking (Olsen Frontage)**



## 6. FUTURE CONDITIONS

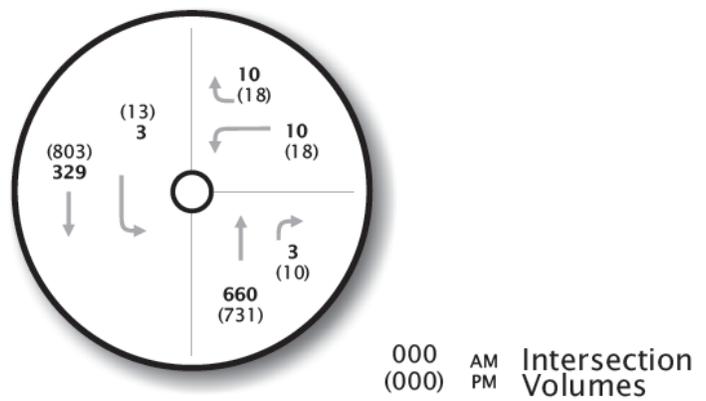
### 6.1 Future Peak Hour ‘Background’ Vehicle Volume Forecasts

For the purposes of this study the future horizon year of 2024 was selected as this is the estimated year the proposed site will be complete (‘Opening Day’). Prior to reviewing traffic operations with development site trips layered in, a future ‘background’ volumes forecast was done based on the following assumption:

- 2% compound annual growth rate (MoTI standard request) applied existing volumes and for arterial movements only – i.e. not for movements associated with Olsen Road, as the properties adjacent to Olsen Road are not expected to increase in scale. The annual growth rate was applied to horizon year 2024.

Figure 6.1 shows the estimated Background 2024 peak hour vehicle volumes at the Campbell Street & Olsen Road intersection, based on the methodology outlined above.

Figure 6.1: Background 2024 Traffic Forecasts (Campbell Street & Olsen Road)



### 6.2 Site Vehicle Trips

Estimated peak hour site trip estimates for the development was calculated using peak hour trips rates from Institute of Transportation Engineers (ITE) Trip Generation Manual. This is summarized in Table 6.1. Note, a residential “off-campus student” rate was considered applicable for this project and the intended uses for the small units. The volumes presented, represent typical weekday operations, i.e. not special events.

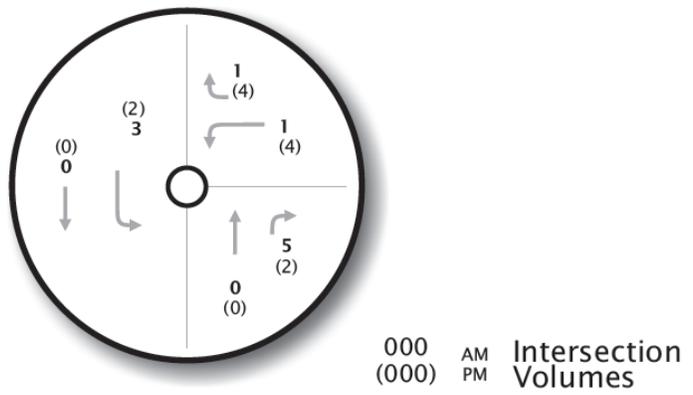
**Table 6.1: Vehicle Trip Generation Rates**

TYPE	LAND USE	ITE CODE	UNIT OF MEASURE	AM			PM		
				IN	OUT	TOTAL	IN	OUT	TOTAL
Community Space & Office	Small Office	712	GFA (SQ.FT.)	1.59	0.33	<b>1.92</b>	0.78	1.67	<b>2.45</b>
Residential	Off-Campus Student Apartment	225	Units	0.07	0.10	<b>0.17</b>	0.12	0.13	<b>0.25</b>

*Estimated peak hour two-way site vehicle trips for the proposed development, for a typical weekday peak hour is approximately 10 trips in the morning and 13 trips in the afternoon. Spread evenly across the hour, this is equal to approximately 1 vehicle entering or exiting the site every 5-6 minutes during the peak hours, which is not considered significant.*

Figure 6.2 shows the estimated site trips on the Campbell Street & Olsen Road intersection,

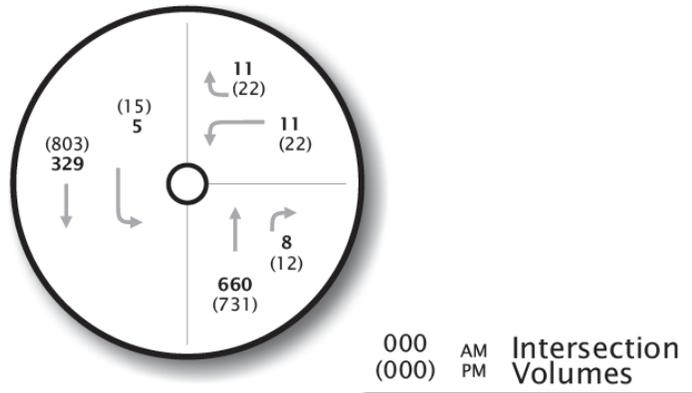
**Figure 6.2: Site Generated Trips (Campbell Street & Olsen Road)**



**6.3 Future Peak Hour ‘Total’ Vehicle Volume Forecasts**

Future ‘Total’ 2024 peak hour volume forecasts were then estimated by layering the site trips onto the future ‘Background’ 2024 volumes. The corresponding turning movements are illustrated in Figure 6.3 below.

Figure 6.3: Total 2024 Traffic Forecasts (Campbell Street & Olsen Road)



### 6.4 Future Traffic Operations

Using future Background 2024 peak hour volumes, SimTraffic was used to assess operations at Campbell Street & Olsen Road. Note the future laning was assumed to remain the same as it is currently, i.e. single lane approaches. Results of this analysis are summarized in **Table 6.2** and detailed outputs can be found in **Appendix F**.

Table 6.2: Future Background 2024 Weekday Peak Hour Operations

INTERSECTION/ TRAFFIC CONTROL	MOVEMENT	AM			PM		
		LOS	DELAY (SEC)	95 <sup>TH</sup> QUEUE (M)	LOS	DELAY (SEC)	95 <sup>TH</sup> QUEUE (M)
Campbell Street & Olsen St (unsignalized minor stop controlled)	WBLR	B	11	13	D	28	18
	NBTR	A	1	-	A	2	-
	SBLT	A	1	-	A	7	28

**The results confirmed that study intersection is expected to operate within acceptable performance thresholds for the future Background 2024 condition, therefore no interventions (or mitigations) to the current intersection control and layout are recommended.**

Similarly, and to measure the impact of the site volumes, operations were tested using future Total 2024 peak hour volumes, and the results of this are presented below in **Table 6.3**.

**Table 6.3: Future Total 2024 Weekday Peak Hour Operations**

INTERSECTION/ TRAFFIC CONTROL	MOVEMENT	AM			PM		
		LOS	DELAY (SEC)	95 <sup>TH</sup> QUEUE (M)	LOS	DELAY (SEC)	95 <sup>TH</sup> QUEUE (M)
Campbell Street & Olsen St <i>(unsignalized minor stop controlled)</i>	WBLR	A	9	13	D	28	20
	NBTR	A	1	-	A	2	-
	SBLT	A	7	12	A	5	25

The *results confirmed that site is not expected to have a material impact on operations at the study intersection and therefore no interventions have been proposed here.*

## 7. CONCLUSIONS & RECOMMENDATIONS

A summary of this study's findings:

- Clayoquot Biosphere Trust (CBT) is proposing to Rezone the corner property at 301 Olsen Road and build a new headquarters for future operations. The current Zoning is R2 (Two-Family Residential) and the proposal is for CD (Comprehensive Development) Zoning. CBT's headquarters is currently located at 316 Main Street in downtown Tofino;
- The project has moved past First Reading at the District of Tofino (DoT) Council, and staff have requested that this Traffic Impact Assessment (TIA) be completed as part of the submission, prior Second Reading with Council;
- The site is approximately 800m southeast of Tofino's town centre and is located on the northeast corner of the Campbell Street (Highway 4) & Olsen Road intersection;
- With approval, the project would see the completion of CBT's main headquarters, a community and flexible office space, and 2 one-bedroom dwelling units, meant to house visiting professionals, researchers, and partners.
- The following are the key transportation-related concerns from residents on Olsen Road:
  - safety of Olsen/Campbell intersection and increased traffic;
  - parking demands on the neighbourhood.
- The site is a corner lot that currently sits vacant. Olsen Road is a short local street (no-thru) that connects to Bond Lane.
- Current land uses surrounding Olsen Road are: eight (8) single family lots (some of which we understand are vacation rentals), two (2) vacation lodges (total of 12 accommodation units), and the Crab Dock which has 3-4 houseboats, 5-6 fishing/sailing boats, and the Meares Island Water Taxi.
- Olsen Road has 22 marked on-street parking stalls on both sides of the street, with no time or permit restrictions.
- Existing topography of land and subsequently the study area streets have significant grade changes, where Campbell Street is at a high point and the Olsen Road intersection the road slopes down to the water (10% slope fronting the site).
- The site benefits from direct access to the Multi-Use Path (MUP) along Campbell Street, as noted above, DoT has plans for the facility to be upgraded between Olsen Road and Gibson Street.
- BC Transit has plans to expand service to the region, which is outlined in a service plan released in May 2020. Specific to this site, a bus stop location has been identified within 150-200m of the project. This future transit access will have a positive impact on how future employees and visitors travel to-from the site, with the additional travel option.
- Existing traffic operations analysis results confirmed that the Campbell Street & Olsen Road currently operates within acceptable performance thresholds, this aligns with general observations at the intersection where no operational issues (significant delay and/or queuing) were recorded.

- Observations confirmed that parking was approximately half utilized during the spring count, with not a lot of variation the demand profile. Approximately 3-4 of the parked vehicles were noted to be parked throughout the day and through the night, suggesting that these vehicles are parked on a more permanent, or long-term, basis. However, summer peak demands could very likely push utilization up to capacity.
- As this is considered an existing neighbourhood issue, it was recommended that DoT explore implementing time restricted parking, or permit parking. From CBT's perspective, they have indicated commitment to limiting their impact on street parking, especially during special events.
- A sight line review was completed at the Campbell Street (Highway 4) & Olsen Road intersection. No immediate mitigation measures were recommended; however, it was stated: should DoT and MoTI be considering any major road works along this section of Campbell Street, it is recommended that potential grading solutions be explored to raise the Olsen Road approach and flatten the humps along Campbell Street, thus improving sight lines. Even a marginal increase of 0.5m would greatly improve visibility. It was also recommended that any future road plans integrate with the forthcoming MUP upgrades.
- The development plans to exceed DoT parking requirement (per Part 6 of the Zoning Bylaw) of 8 spaces with the provision of 9. The total parking supply is considered acceptable for this form of development and known travel characteristics for typical conditions. As such, future parking demands are anticipated to be met on-site during non-event days (i.e the majority of the time).
- CBT special events vary in size, with smaller more regular function of anywhere between 10 and 50 people, to large scale events (very rare based on feedback from CBT, once a year maximum) that can see attendance reach between 100-200 guests – however these large events would not take place in the proposed headquarters. Understanding that on-site parking is designed to accommodate typical day-to-day activities, and acknowledging the neighbourhoods concerns regarding street parking, CBT has committed to a variety of measure and communication strategies aimed at lowering vehicle use and associated parking demands at special events, some of which are already done today. These measures, outlined in the body of the report, are considered appropriate and will help to avoid any major traffic or parking issues during special events.
- Future BC Transit service will also play an important role in getting attendees to and from the events.
- While there are no on-site bicycle storage requirements for the development, the project plans to provide 6 spaces, some of which will have e-charging capability, to encourage this cycling to/from the centre.
- An on-site swept path analysis was completed for the passenger parking spaces, aisle circulation, access, and the loading space and the findings confirmed that the site will accommodate the intended design vehicles.

- Site frontage improvements, such as landscaping between the building and MUP would be beneficial, as well as smooth transitions between the site and the MUP. Landscaping may impact available sight triangles, between users on the MUP and people accessing the centre, therefore it was recommended that consideration be made to limiting any structures or vegetation with height in these areas.
- It was recommended that one (1) on-street parking space be designed for adjacent to the site access, and away from the intersection. This will benefit the project for short-term pick-up/drop-off activity and will be seen as a positive contribution to the on-street parking supply on Olsen Road.
- Estimated peak hour two-way site vehicle trips for the proposed development, for a typical weekday peak hour, was estimated to be approximately 10 trips in the morning and 13 trips in the afternoon. Spread evenly across the hour, this is equal to approximately 1 vehicle entering or exiting the site every 5-6 minutes during the peak hours, which is not considered significant.
- Traffic operation results confirmed that study intersection is expected to operate within acceptable performance thresholds for the future Background 2024 condition, therefore no interventions (or mitigations) to the current intersection control and layout were recommended.
- The results of the Total 2024 traffic operations confirmed that site is not expected to have a material impact on the study intersection, and therefore no interventions were proposed.

## APPENDIX A – SCOPE OF WORK

#### Project Start-Up & Data Collection

- Conduct a site visit to document current transportation infrastructure, carry out spot counts, observe current conditions/safety review of the Campbell Street & Olsen Road intersection, and document on-street parking and restrictions on Olsen Road;
- Data collection will be limited to weekday spot counts during site visit, where baseline travel data will be extracted from the District's Multi-Modal Transportation Plan (MMTP). Campbell Street & Olsen Road will be the focus of the TIA (*i.e. one study intersection*).
- Spot counts (1-2 hrs at peak times) along Campbell Street will be compared to the summer volumes available (pre-Covid) from the District's MMTP and an adjustment factor will be determined for minor-leg (Olsen Road) turning movements – *i.e. factored up*. While not exactly linear, this adjustment factor will also be used to estimate an increased presence in baseline street parking. In doing so, the adjustments will account for uses at the bottom of Olsen Road (offshore commuters, the two lodges, VRBOs).

#### Base Conditions Summary

- Brief description of any policy- or project-specific material for background information;
- Provide a site context map with location and key transportation elements;
- Summarize existing connections (street and trails) to-from the site, including facilities and transportation infrastructure adjacent to the site;
- Summarize existing sight lines at the Campbell Street & Olsen Road intersection to confirm if adequate sight lines are available for vehicles entering and leaving Olsen Road.

#### Site Plan Review

- Summarize the proposed vehicle and bicycle parking supply versus the District's Parking Bylaw requirement (it is assumed the project will meet the minimum requirements therefore no variance or supporting rationale is anticipated as part of this scope);
- Site plan design review to identify and provide feedback on potential transportation-related issues, e.g. site access visibility, waste collection, loading, and frontage improvements (including need for on-street parking on Olsen Road). This will include specific commentary/recommendations regarding the interface of the project landscaping with the MUP (Multi-Use Pathway) along Campbell Street;
- Using information from the client, summarize and present the anticipated transportation related operations of the Centre, including but not limited to: special events and parking management, staffing, overall activity on a typical day, and planned TDM measures to help lower private-vehicle use;
- On-street parking demands for project will also be estimated for typical conditions and, if enough information is available, for special events where the off-street parking is expected to overflow.

### Traffic Impact Assessment

- Summarize existing vehicle traffic data during the weekday morning and afternoon peak hour at the identified study intersection;
- Conduct an existing conditions traffic operations analysis using Synchro/Simtraffic software;
- Estimate the number of vehicle trips to be generated by the proposed development for typical weekday peak periods;
- Conduct a future traffic operations analysis at the study intersection for an 'Opening Day' of the development;
- Recommend mitigation measures required to address traffic operation issues identified by the analysis. The analysis will seek to have a clear understanding of whether the subject project "tips the scales" from a traffic operations perspective with specific recommendations that:
  - a) do not require any intervention;
  - b) recommend minor intervention;
  - c) recommend more major interventions.

## APPENDIX B – EXISTING TRAFFIC OPERATIONS OUTPUTS

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1: Campbell St & Olsen St Performance by movement

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Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.5	0.4		0.3	0.4
Total Del/Veh (s)	11.6	4.6	1.0	0.8		0.2	0.9

---

Intersection: 1: Campbell St & Olsen St

---

Movement	WB
Directions Served	LR
Maximum Queue (m)	11.0
Average Queue (m)	4.4
95th Queue (m)	12.5
Link Distance (m)	162.9
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	10	623	3	3	310
Future Volume (Veh/h)	10	10	623	3	3	310
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	11	677	3	3	337
Pedestrians	34					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	3					
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1056	712			714	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1056	712			714	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	97			100	
cM capacity (veh/h)	241	418			857	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	22	680	340			
Volume Left	11	0	3			
Volume Right	11	3	0			
cSH	306	1700	857			
Volume to Capacity	0.07	0.40	0.00			
Queue Length 95th (m)	1.8	0.0	0.1			
Control Delay (s)	17.7	0.0	0.1			
Lane LOS	C		A			
Approach Delay (s)	17.7	0.0	0.1			
Approach LOS	C					
<b>Intersection Summary</b>						
Average Delay			0.4			
Intersection Capacity Utilization			43.0%		ICU Level of Service	A
Analysis Period (min)			15			

---

1: Campbell St & Olsen St Performance by movement

---

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.7	0.6	1.3	0.7	0.7
Total Del/Veh (s)	16.3	7.2	1.3	1.1	5.5	0.8	1.3

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6: Neilson Pl/Driveway & Campbell St Performance by movement

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Movement	WBT	All
Denied Del/Veh (s)	0.0	0.0
Total Del/Veh (s)	0.4	0.4

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Total Network Performance

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Denied Del/Veh (s)	0.7
Total Del/Veh (s)	2.2

---

Intersection: 1: Campbell St & Olsen St

---

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	15.6	24.5
Average Queue (m)	6.5	4.4
95th Queue (m)	15.9	21.0
Link Distance (m)	162.9	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

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Intersection: 6: Neilson Pl/Driveway & Campbell St

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Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

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Network Summary

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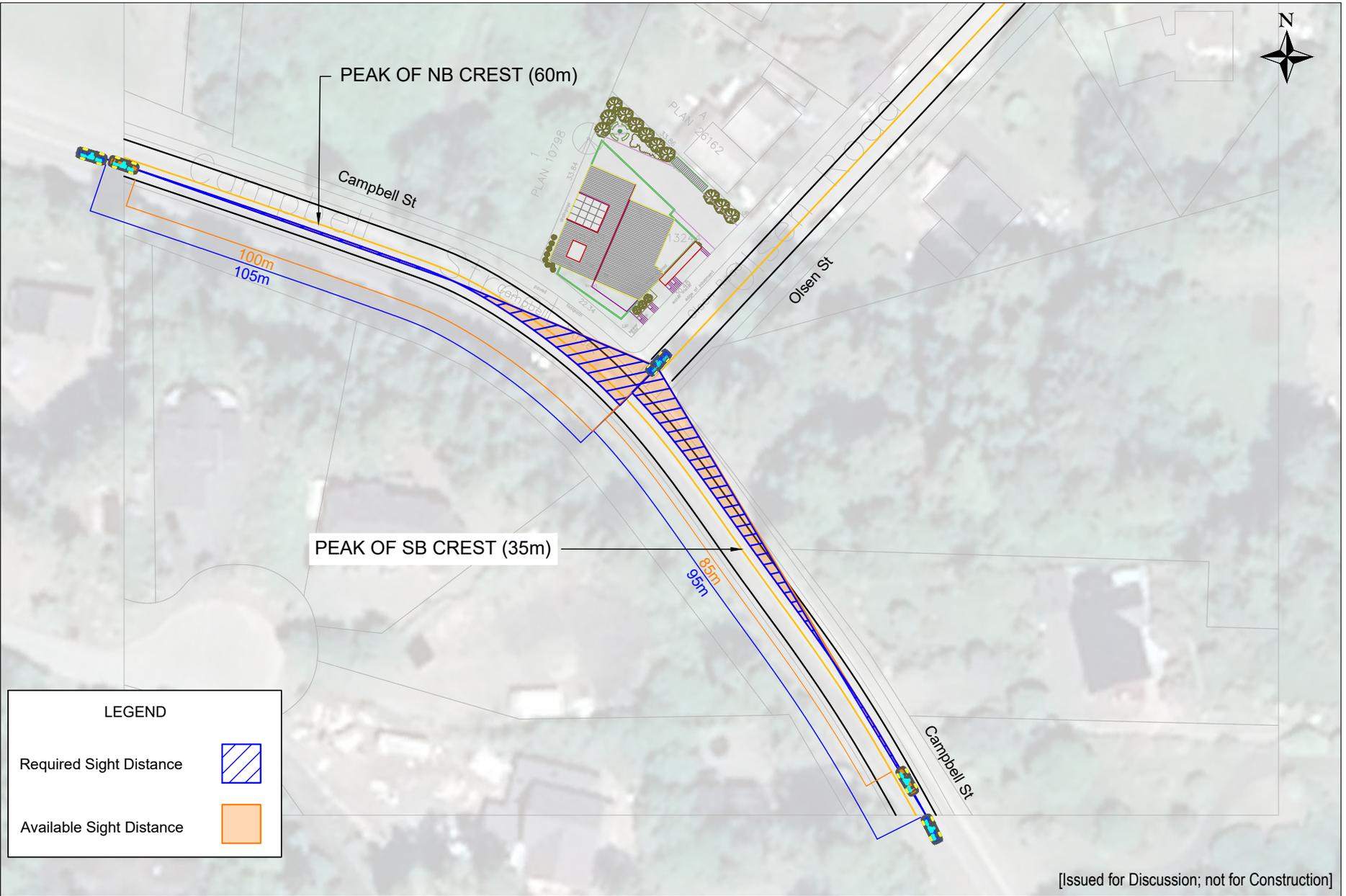
Network wide Queuing Penalty: 0
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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	18	18	690	10	13	758
Future Volume (Veh/h)	18	18	690	10	13	758
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	20	750	11	14	824
Pedestrians	53					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	5					
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1660	808			814	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1660	808			814	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	80	94			98	
cM capacity (veh/h)	100	361			772	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	40	761	838			
Volume Left	20	0	14			
Volume Right	20	11	0			
cSH	156	1700	772			
Volume to Capacity	0.26	0.45	0.02			
Queue Length 95th (m)	7.3	0.0	0.4			
Control Delay (s)	35.7	0.0	0.5			
Lane LOS	E		A			
Approach Delay (s)	35.7	0.0	0.5			
Approach LOS	E					
<b>Intersection Summary</b>						
Average Delay			1.1			
Intersection Capacity Utilization			60.3%	ICU Level of Service		B
Analysis Period (min)			15			

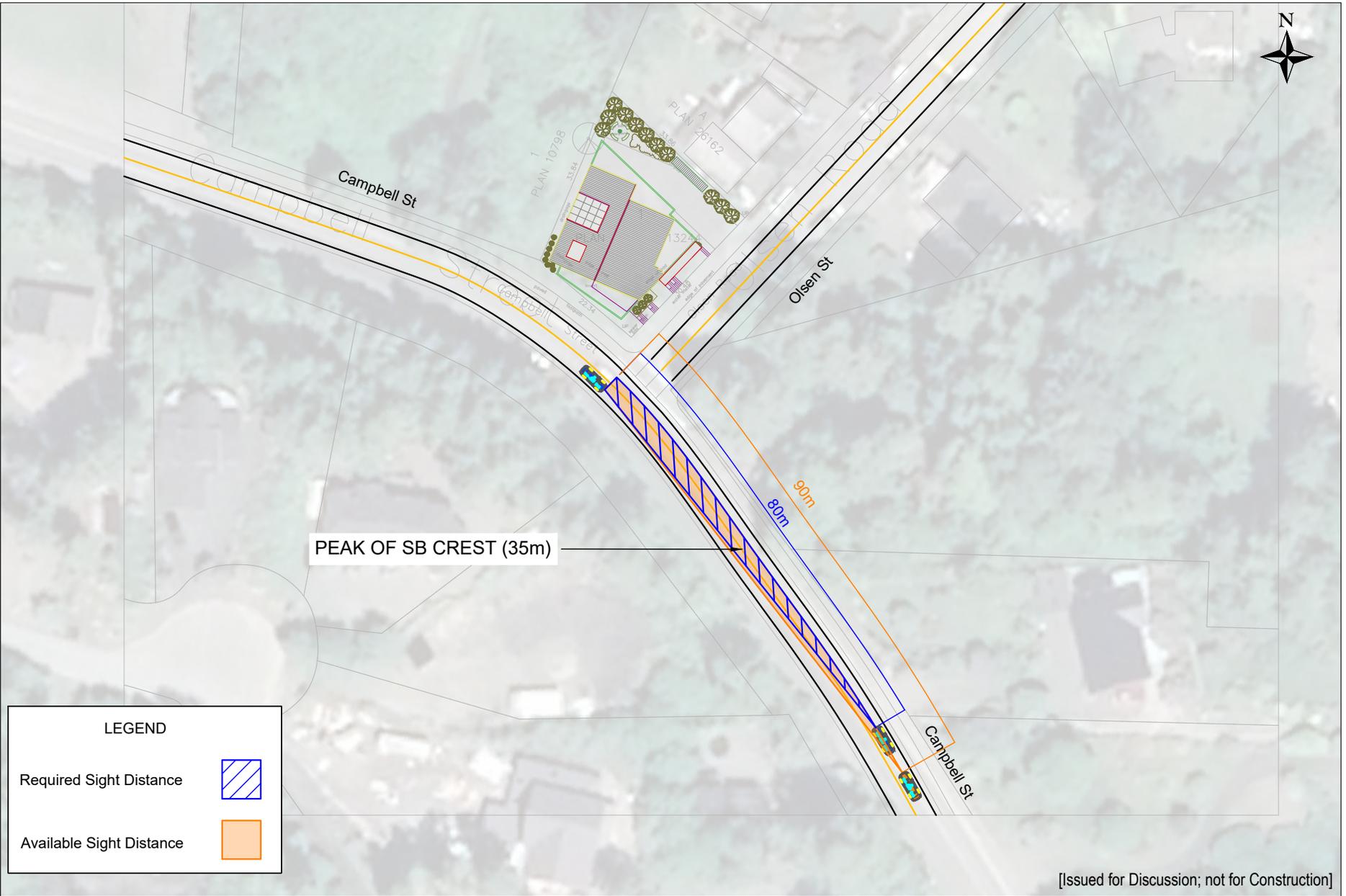
## APPENDIX C – INTERSECTION SIGHT LINE ANALYSIS

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2021/05/14 11:41, Plotted by Nathan Birk



## Exhibit C1 Olsen St Intersection Sight Distances

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2021/05/14 11:41, Plotted by Nathan Birk



## Exhibit C2 SB Cambell Street Left Turn Sight Distance

## APPENDIX D – CBT COMMUNICATIONS

# FREE SHUTTLE SERVICE THIS SUNDAY, SEPTEMBER 17, 2017 FOR THE **Regional Gathering**

**KWISITIS, PACIFIC RIM NATIONAL PARK**

## SHUTTLE SCHEDULE

### **To/From Ahousaht \* via boat**

\*more boats may be available  
Depart Ahousaht: 9am, 11am, 1pm  
Depart 1st St. Dock: 2pm, 4pm, 6pm

\*Look for the Rocky Pass, GI Charles,  
Carter Reign,  
and Cougar Island

### **To/From Tofino -Follow signs to Tofino Bus**

Depart Tofino Bus Depot: 10am, 12pm,  
2pm Depart Kwisitis: 1pm, 3pm, 4:30pm

### **To/From Port Alberni**

(Walmart) Depart: 9:30am  
Depart Kwisitis: 4pm

### **To/From Combers Parking Lot \* parking overflow from Wick.**

Depart: 10:30am, 12:30pm, 2:30pm  
Depart Kwisitis: 1pm, 3pm, 4:30pm



**BOAT AND SHUTTLE  
TRANSPORTATION TO GET  
YOU THERE AND BACK**

**Free!**

**\*space  
available on  
a first come/  
first serve  
basis**

**LIMITED EVENT PARKING!**

**BRING YOUR OWN WATER  
BOTTLE!**

## Welcome to The Biosphere Centre! Access & Parking

We look forward to your upcoming visit to the Biosphere Centre. Whether you are joining us for a meeting, education program or a special event, here is some important information about access and parking.

- 1- **Travelling to the Biosphere Centre** – we strongly encourage you to choose sustainable transportation options such as public transit, carpooling, cycling or walking to access the Centre. Using these options helps to protect the environment and aligns with CBT’s values and sustainability goals!
- 2- **Bicycle parking** - the Centre has bike racks immediately adjacent to the front entrance on Campbell Street and you can even charge the batteries for your e-bike while you are visiting the Centre.
- 3- **Pick up & Drop off** – there is a designated pick up and drop off zone on Campbell Street for visitors requiring mobility access and for buses. Please do not park your vehicle in this zone.
- 4- **On-site parking** - is located underneath the Centre and is accessible from Olsen Rd. Please do not park on Olsen Road or on Campbell Street, where signage indicates a no parking zone or in front of residential driveways.
- 5- **Groups arriving by bus** - buses can discharge (and pick up) their passengers in the designated pick-up and drop off zone and then proceed to the District of Tofino’s designated bus parking area (s). Bus parking along Campbell Street and Olsen Road is not permitted. If your group’s bus driver is not familiar with bus parking guidelines in Tofino, please contact us in advance of your visit for assistance.
- 6- **Leaving the Centre** – when leaving the Centre after events, particularly in the evening hours, please exit the building quietly and depart the area as soon as possible. We want to be respectful of our immediate neighbours who live in the Crab dock Neighbourhood.

To: (Crab Dock Neighbourhood Mailing List)  
From: The Biosphere Centre  
Re: **Special Event Name & Date**

Hello Neighbours,

On (date), (name of hosting organization) will be holding a/the (name of event) at The Biosphere Centre. Here is a bit more information about the event:

(Include event information from host/organizer here)

Event name:

Description:

Start time:

End time:

Event organizer's name & contact information:

There will be (no/limited) onsite parking for this event. Guests requiring vehicle parking will be directed to park at (location) and will be shuttled to the Centre and back to their vehicles, using the designated pick up and drop off zone on Campbell St. Guests will also be shuttled to and from dock(s) if arriving by boat.

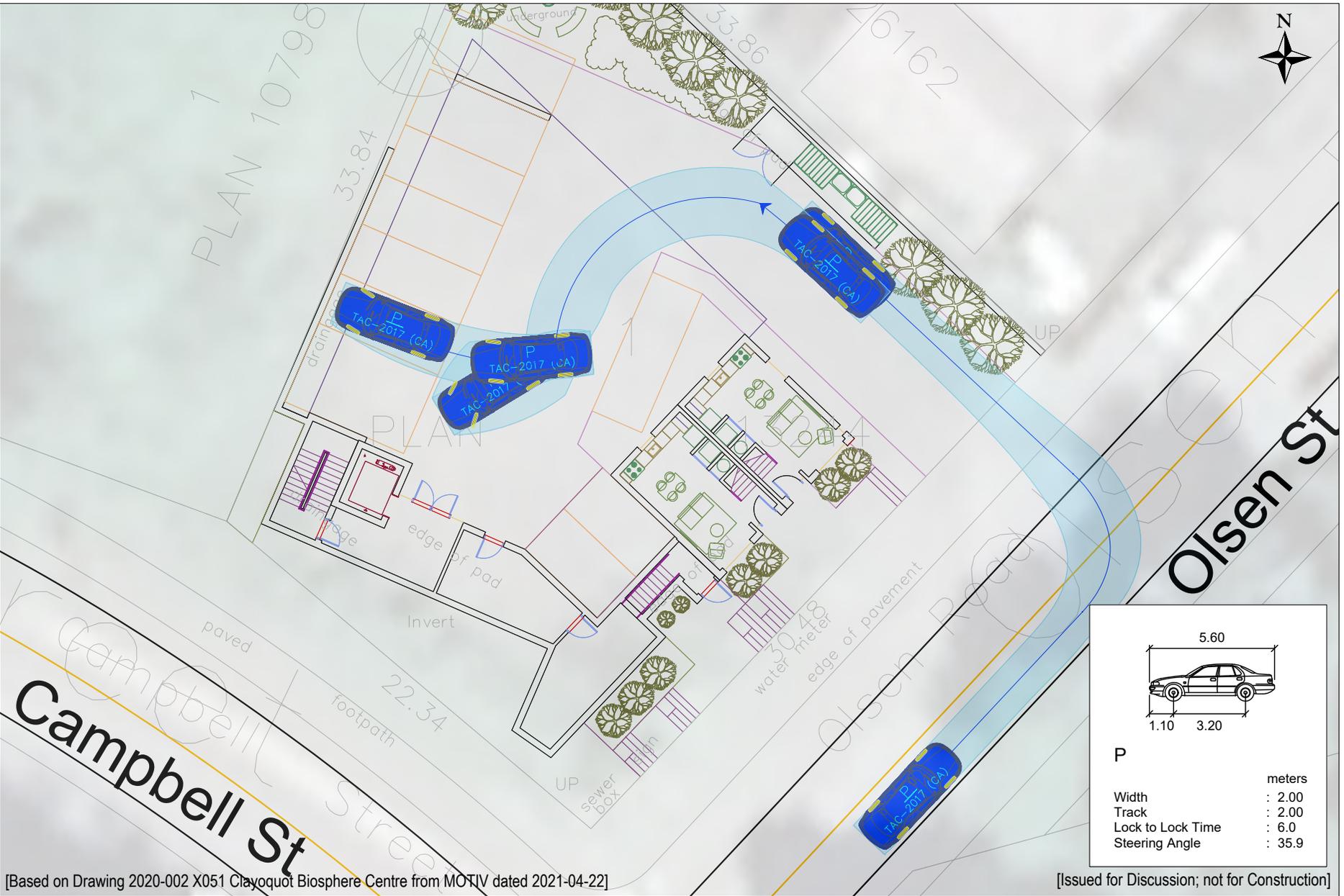
There will be no parking, pickup or drop off permitted on Olsen Road. Temporary "A Board" signs will be in place in advance of the event to communicate this information to Guests.

There will be a designated traffic management person on duty outside from (time) to (time) in order to ensure that Guests arrive and depart the Centre safely and in accordance with the Centre's traffic management and Good Neighbour guidelines.

If you have any questions or concerns regarding this event, please contact:  
Organizer name & contact details

## APPENDIX E – SITE DESIGN REVIEW

S:\PROJECTS\K8\04-21-0044 Clayoquot Biosphere Centre TIA\4.0 Analysis & Design\4.1 ACAD\Site Design Review\04-21-0044-Clayoquot Biosphere-Design Review\_V01-1.dwg  
 2021/05/14 11:39, Plotted by Nathan Birk



[Based on Drawing 2020-002 X051 Clayoquot Biosphere Centre from MOTIV dated 2021-04-22]

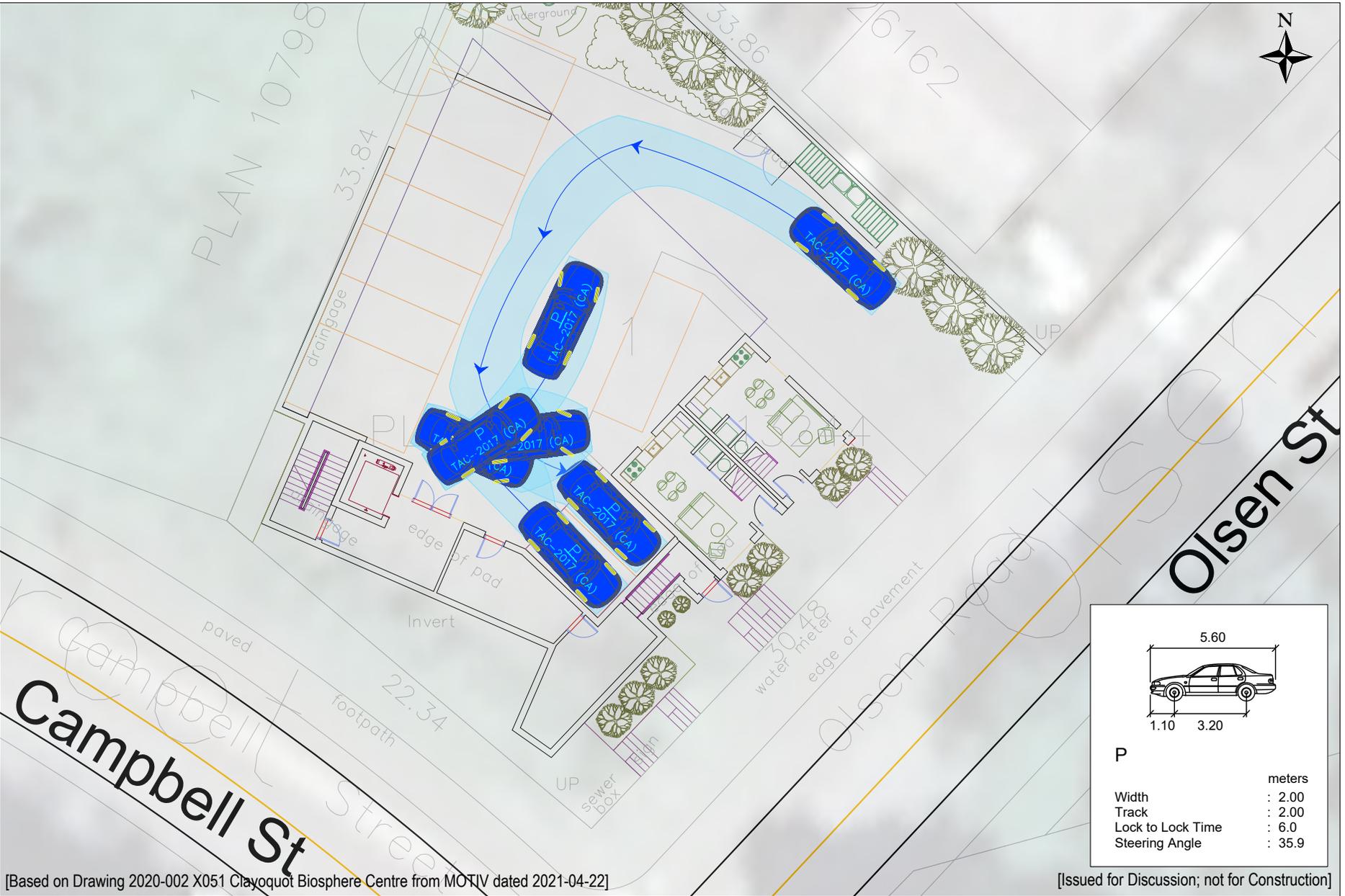
[Issued for Discussion; not for Construction]

## Exhibit E1 Inbound Passenger Vehicle Access and Parking Manoeuvres





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 2021/05/14 11:39, Plotted by Nathan Birk



[Based on Drawing 2020-002 X051 Clayoquot Biosphere Centre from MOTIV dated 2021-04-22]

[Issued for Discussion; not for Construction]

## Exhibit E3 Inbound Passenger Vehicle Parking Manoeuvres



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 2021/05/14 11:39, Plotted by Nathan Birk



[Based on Drawing 2020-002 X051 Clayoquot Biosphere Centre from MOTIV dated 2021-04-22]

[Issued for Discussion; not for Construction]

## Exhibit E4 Outbound Passenger Vehicle Parking Manoeuvres





## APPENDIX F – FUTURE TRAFFIC OPERATIONS OUTPUTS

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1: Campbell St & Olsen St Performance by movement

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Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.5	0.4		0.3	0.4
Total Del/Veh (s)	11.4	5.6	1.1	1.3		0.2	0.9

---

Intersection: 1: Campbell St & Olsen St

---

Movement	WB
Directions Served	LR
Maximum Queue (m)	11.0
Average Queue (m)	4.6
95th Queue (m)	12.8
Link Distance (m)	162.9
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	10	660	3	3	329
Future Volume (Veh/h)	10	10	660	3	3	329
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	11	717	3	3	358
Pedestrians	36					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	3					
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1118	754			756	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1118	754			756	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	97			100	
cM capacity (veh/h)	220	395			825	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	22	720	361			
Volume Left	11	0	3			
Volume Right	11	3	0			
cSH	283	1700	825			
Volume to Capacity	0.08	0.42	0.00			
Queue Length 95th (m)	1.9	0.0	0.1			
Control Delay (s)	18.8	0.0	0.1			
Lane LOS	C		A			
Approach Delay (s)	18.8	0.0	0.1			
Approach LOS	C					
<b>Intersection Summary</b>						
Average Delay			0.4			
Intersection Capacity Utilization			44.9%		ICU Level of Service	A
Analysis Period (min)			15			

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1: Campbell St & Olsen St Performance by movement

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Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.7	0.8	0.9	0.8	0.7
Total Del/Veh (s)	27.8	9.6	1.5	1.7	6.8	1.0	1.7

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6: Neilson Pl/Driveway & Campbell St Performance by movement

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Movement	WBT	All
Denied Del/Veh (s)	0.0	0.0
Total Del/Veh (s)	0.4	0.4

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Total Network Performance

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Denied Del/Veh (s)	0.7
Total Del/Veh (s)	2.7

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Intersection: 1: Campbell St & Olsen St

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Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	16.3	33.0
Average Queue (m)	7.3	7.2
95th Queue (m)	17.6	27.9
Link Distance (m)	162.9	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

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Intersection: 6: Neilson Pl/Driveway & Campbell St

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Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

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Network Summary

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Network wide Queuing Penalty: 0
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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	18	18	731	10	13	803
Future Volume (Veh/h)	18	18	731	10	13	803
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	20	795	11	14	873
Pedestrians	53					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	5					
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1754	854			859	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1754	854			859	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	77	94			98	
cM capacity (veh/h)	87	341			743	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	40	806	887			
Volume Left	20	0	14			
Volume Right	20	11	0			
cSH	139	1700	743			
Volume to Capacity	0.29	0.47	0.02			
Queue Length 95th (m)	8.5	0.0	0.4			
Control Delay (s)	41.1	0.0	0.5			
Lane LOS	E		A			
Approach Delay (s)	41.1	0.0	0.5			
Approach LOS	E					
<b>Intersection Summary</b>						
Average Delay			1.2			
Intersection Capacity Utilization			62.7%		ICU Level of Service	
Analysis Period (min)			15			
					B	

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1: Campbell St & Olsen St Performance by movement

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Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.6	0.4	0.3	0.3	0.5
Total Del/Veh (s)	9.1	4.1	1.1	0.2	7.3	0.3	1.0

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6: Neilson Pl/Driveway & Campbell St Performance by movement

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Movement	WBT	All
Denied Del/Veh (s)	0.0	0.0
Total Del/Veh (s)	0.3	0.3

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Total Network Performance

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Denied Del/Veh (s)	0.5
Total Del/Veh (s)	1.4

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Intersection: 1: Campbell St & Olsen St

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Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	9.8	10.8
Average Queue (m)	5.6	1.7
95th Queue (m)	12.8	11.2
Link Distance (m)	162.9	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

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Intersection: 6: Neilson Pl/Driveway & Campbell St

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Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

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Network Summary

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Network wide Queuing Penalty: 0

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1: Campbell St & Olsen St Performance by movement

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Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.6	0.4	0.3	0.3	0.5
Total Del/Veh (s)	9.1	4.1	1.1	0.2	7.3	0.3	1.0

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Intersection: 1: Campbell St & Olsen St

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Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	9.8	10.8
Average Queue (m)	5.6	1.7
95th Queue (m)	12.8	11.2
Link Distance (m)	162.9	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

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1: Campbell St & Olsen St Performance by movement

---

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.7	0.9	1.2	0.8	0.7
Total Del/Veh (s)	27.8	11.2	1.5	1.8	5.1	0.9	1.8

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6: Neilson Pl/Driveway & Campbell St Performance by movement

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Movement	WBT	All
Denied Del/Veh (s)	0.0	0.0
Total Del/Veh (s)	0.4	0.4

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Total Network Performance

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Denied Del/Veh (s)	0.7
Total Del/Veh (s)	2.7

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Intersection: 1: Campbell St & Olsen St

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Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	18.4	28.1
Average Queue (m)	8.5	6.3
95th Queue (m)	19.8	25.2
Link Distance (m)	162.9	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

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Intersection: 6: Neilson Pl/Driveway & Campbell St

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Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

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Network Summary

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Network wide Queuing Penalty: 0
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1: Campbell St & Olsen St Performance by movement

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Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.6	0.8	1.0	0.8	0.7
Total Del/Veh (s)	22.8	9.4	1.8	2.2	5.9	2.5	2.6

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Intersection: 1: Campbell St & Olsen St

---

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	19.1	25.5
Average Queue (m)	8.3	4.7
95th Queue (m)	19.5	24.6
Link Distance (m)	162.9	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	22	22	731	12	15	803
Future Volume (Veh/h)	22	22	731	12	15	803
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	24	795	13	16	873
Pedestrians	53					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	5					
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1760	854			861	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1760	854			861	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	72	93			98	
cM capacity (veh/h)	86	340			741	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	48	808	889			
Volume Left	24	0	16			
Volume Right	24	13	0			
cSH	138	1700	741			
Volume to Capacity	0.35	0.48	0.02			
Queue Length 95th (m)	10.8	0.0	0.5			
Control Delay (s)	44.5	0.0	0.6			
Lane LOS	E		A			
Approach Delay (s)	44.5	0.0	0.6			
Approach LOS	E					
<b>Intersection Summary</b>						
Average Delay			1.5			
Intersection Capacity Utilization			64.3%	ICU Level of Service		C
Analysis Period (min)			15			