October 17, 2019
04-18-0429

Ian Scott
Tofino Housing Corporation
1524 Pearl Street
Victoria, BC B8R 2Y9

VIA E-MAIL: execdirec@tofinohousingcorp.ca

Dear Mr Scott:

Re: Phase 1: District Lot 114 Rezoning, Tofino BC
Traffic Impact Assessment

As requested, Bunt & Associates has prepared Traffic Impact Assessment (TIA) for the proposed Phase 1 Rezoning of the "District Lot 114" affordable housing project in Tofino BC. This report is an updated version of a TIA that was submitted to the District of Tofino on February 20th, 2019; the reason for this update is to reflect updated development statistics.

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

Kyle Brandstaetter, MCIP RPP
Transportation Planner

Christephen Cheng, P.Eng., M.Eng
Associate

1. INTRODUCTION

1.1 Project Summary

Tofino Housing Corporation (THC) and Catalyst Community Developments Society are working towards a Phase 1 Rezoning and development of District of Tofino lands known as "District Lot 114".

The site is approximately 1km southwest of the town centre and vehicle access is planned via Leighton Way, which has road access from Arnet Road and First Street. The site location, in the context of Tofino's town centre, is illustrated in **Exhibit 1.1**.

Current zoning for the site is mainly a CD-THC1 (Low to Medium Multiple Family Residential District) with a small component zoned for RD-A2 (Rural District). It is our understanding that the proposed zoning would be a custom zone that would allow for up to 84 multi-family dwelling units (72 apartment units and 6 duplex homes with secondary suites), a portion of which would be affordable housing.

The proposed Phase 1 site plan (conceptual only) is presented in **Exhibit 1.2** and shows the main vehicle access via Leighton Way which connects to a private street on-site. At this time, future phase(s) of the project are unknown and therefore will be treated as separate studies, should they move forward.

Off-street parking supply for the development is proposed to meet the District of Tofino Zoning Bylaw requirement for a CD-THC1 zone. The project also plans to provide ample on-site bicycle parking to promote sustainable travel and healthy living.

1.2 Study Scope

Bunt & Associates has prepared the following Traffic Impact Assessment (TIA) with a focus on evaluating the impact of the proposed land development on the adjacent street network and quantifying the impact the proposed change in land use (current zoning vs. proposed) will have on traffic operations in the adjacent road network. The study area intersections are shown in Exhibit 1.1 and are:

- First Street & Neill Street;
- First Street & Arnet Road;
- Leighton Way & Arnet Road; and,
- Leighton Way & Peterson Drive (future site access).

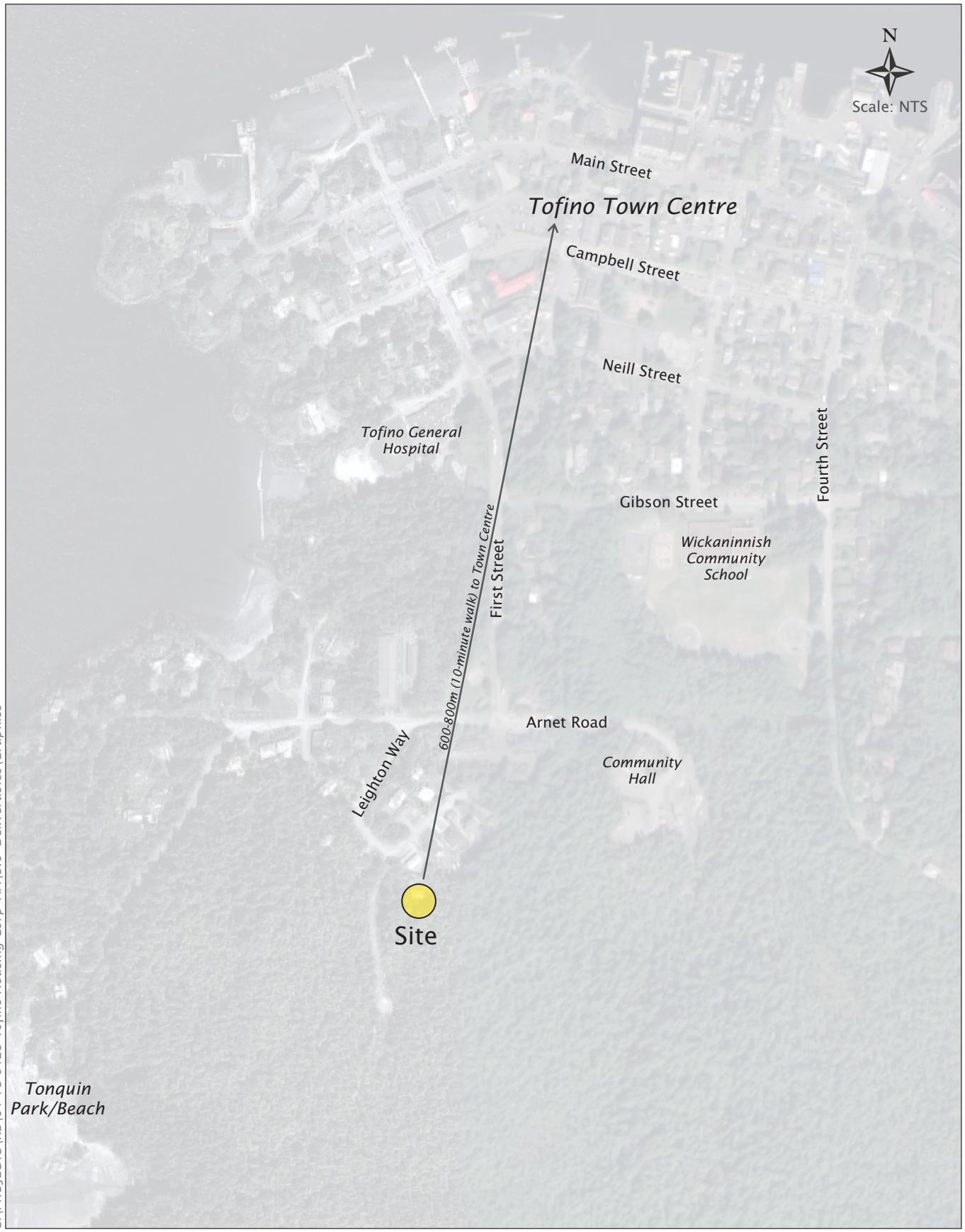

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Exhibit 1.1

Site Location & Context

Tofino Housing Corp TIA
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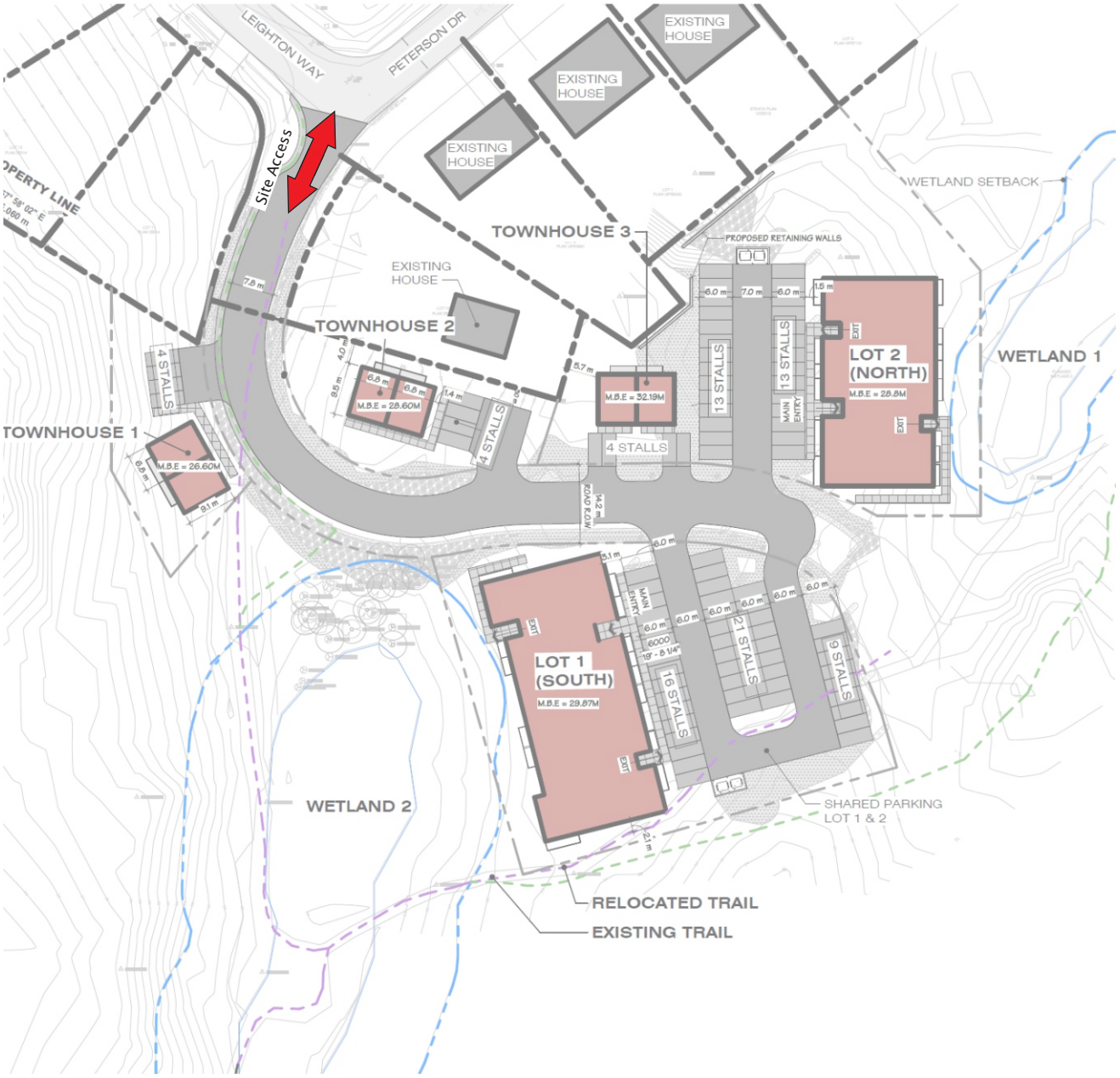

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Exhibit 1.2

Proposed Site Plan

Tofino Housing Corp TIA
04-18-0429 October 2019

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The following scope of work was developed through consultation with District of Tofino staff and it forms the basis of this TIA:

- Assess intersection performance and any warranted intersection improvements for intersections downstream of this development through to First and Neill;
- Recommended intersection configuration and traffic control for the Leighton Way / Peterson Drive / Site Access intersection. The District of Tofino has recommended consideration of a T-Junction, rather than the current "Y-like" configuration;
- The traffic analysis will be two-fold:
  i. Review of changes from current conditions to maximum density under the current zoning; and,
  ii. Changes from the estimated conditions under the maximum density of the current zoning to the estimated conditions under the proposed rezoning.
- Assess impact on pedestrian, cyclist and automobile safety and identify any recommended improvements required to maintain current performance levels, with particular attention to Leighton Way.

Another important aspect of this study was to present the local trail networks and pedestrian/bicycle facilities adjacent to the site and demonstrate how they will be enhanced with the proposed development.

1.3 Report Structure

This report presents key findings of the analysis and is structured as follows:

- *Existing Conditions* – current zoning, policy context, site accessibility, street characteristics, current peak hour traffic volumes and operations;
- *Development Plan* – present the Phase 1 site plan and development statistics, vehicle access parking supply, and trail connections;
- *Future Conditions* – review anticipated future traffic operations on study road network under the development scenarios outlined above, and assess the site impact on Leighton Way for all users; and,
- *Conclusions & Recommendations* –summary of key findings and recommendations.

2. EXISTING CONDITIONS

2.1 Site & Zoning

The site is currently undeveloped and forested with trail connecting to different neighbourhoods nearby, including: a Tonquin Beach trailhead to-from Leighton Way, Arnet Road / Community Hall, and Industrial Way (to the southeast).

Current zoning for the site is mainly a CD-THC1 (Low to Medium Multiple Family Residential District), with a small component zoned for RD-A2 (Rural District). Assuming this zoning, the site could be developed to an average net density of 22 units per hectare. Based on information provided by the client the site would be able to accommodate either:

- 15 single family dwellings (max 3,160 ft² per unit), which could include secondary suites, equivalent to a total of 30 dwelling units for trip generation purposes; or,
- 23 multi-family dwelling (up to an average of 2,000 ft² per unit).

This density has been referenced below (Section 4) in the traffic analysis section to compare trip generation and future traffic operations under the 'Current Zoning' versus the 'Proposed Zoning'. For the purposes here, the development scenario summarized in the first bullet point (i.e. 15 single family homes, all with secondary suites) was used since the total dwelling unit count is larger, and this is what trip generation estimates are based on.

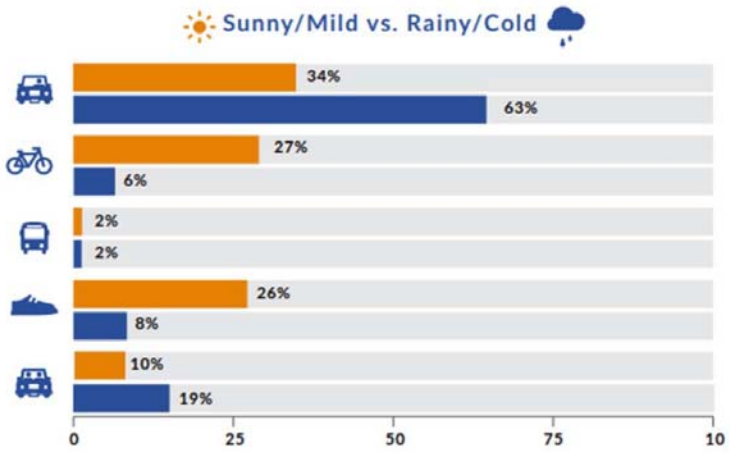
2.2 Tofino Multi-Modal Transportation Plan

The District of Tofino is currently in the process of developing its 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"[1]. The adoption of the MMTP is targeted for spring of 2019.

For context, and to give a better understanding of how people travel in Tofino, the MMTP – Discussion Paper #1 presents current travel mode splits of local residents. This is illustrated below in **Figure 2.1**, which was extracted from the report (MMTP Discussion Paper #1 - pg 10).

[1] *District of Tofino Multi-Modal Transportation Plan – Discussion Paper #1, December 15, 2018 – page 1)*

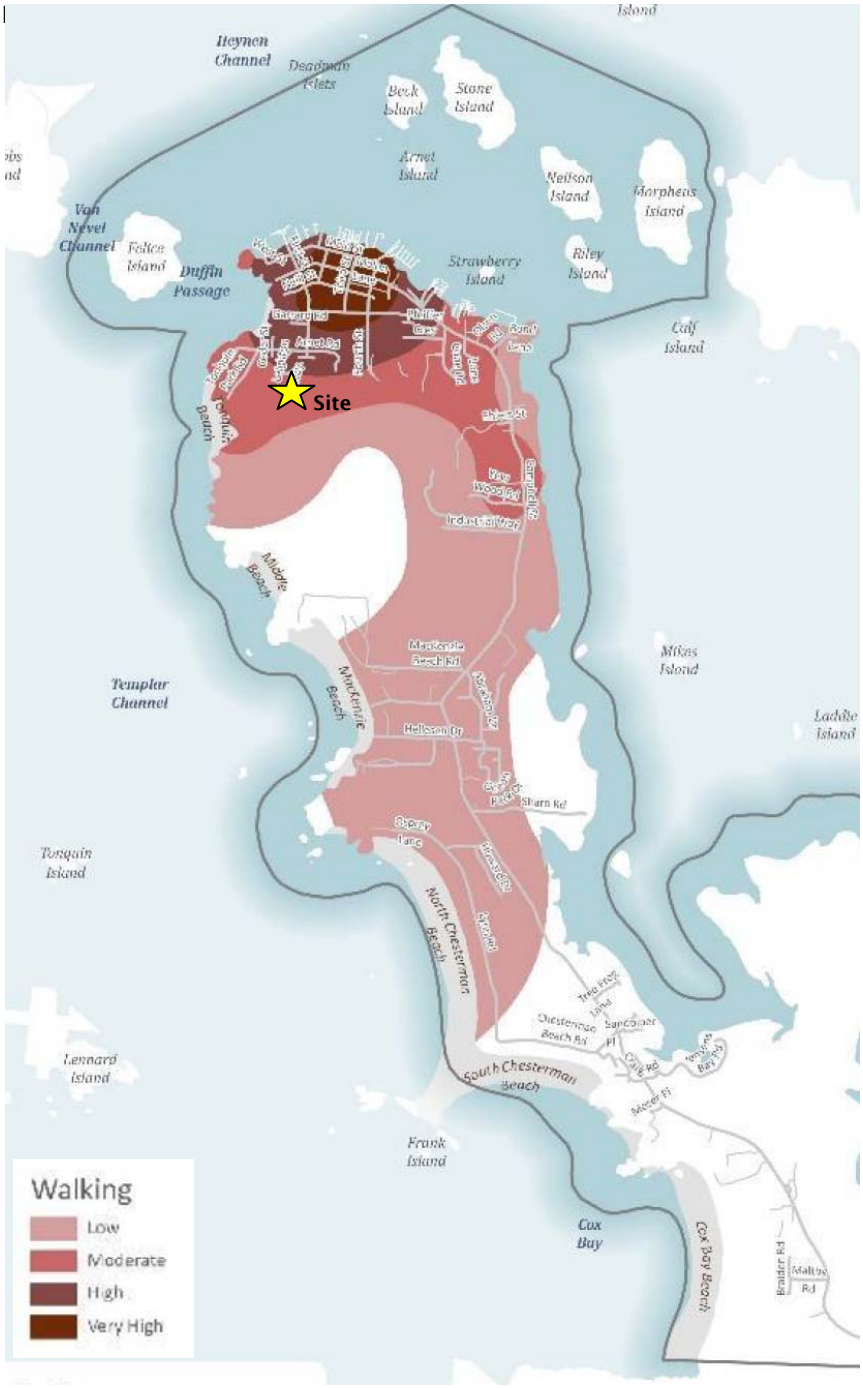
Figure 2.1: Current Travel Mode Share (Tofino Residents)



As shown in Figure 2.1, 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, at 53%. There are various factors that play a role in this active mode share, some of which include: proximity of homes to the Town Centre, good connections provided by the existing trail network, and lifestyle choice.

In the context of this site, restaurants, services, shopping, and work are all concentrated in the Town Centre, in close proximity to the site. However, work locations do spread out further to the south[2]. This is illustrated in the following "Walking Destinations" map of MMTP survey results for walking trips (MMTP Discussion Paper #1 - pg 19) in **Figure 2.2** below.

[2] *District of Tofino Multi-Modal Transportation Plan – Discussion Paper #1, December 15, 2018 – page 12)*


Heynen Channel
Deadman Islets
Beck Island
Stone Island
Arnet Island
Nelson Island
Morpheus Island
Van Nevel Channel
Felice Island
Duffin Passage
Strawberry Island
Riley Island
Calf Island
Site
Templar Channel
Mikas Island
Lodbe Island
Tonquin Island
Lennard Island
Frank Island
Cox Bay
Walking
Low
Moderate
High
Very High

2.3 Site Accessibility

Exhibit 2.1 presents the site location in the context of the site's accessibility, showing: walking distance (600-800m as the crow flies) to the town centre, adjacent pedestrian facilities, and nearby trails. 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.

A paved sidewalk is present along the west side of First Street and an trail cuts through the park on the northwest corner of Arnet Road & First Street, and intersects with the north side of Arnet Road near the Leighton Way intersection. Paved facilities are not provided along Arnet Road or Leighton Way, where gravel/grass shoulders are present. Pedestrian crossings are located at:

- First Street & Arnet Road Intersection (west and north leg);
- First Street & Gibson Street Trail Segment (mid-block zebra crossing with curb extension); and,
- First Street & Neill Street Intersection (east, west, and south legs).

Currently, there are no designated bicycle facilities near to the site on the road network, however this is not surprising given the relatively low vehicle volumes observed and local nature of the study network roads.

There are various formal and informal trail connections adjacent to the site, these include:

- from Leighton Way / Peterson Road to Tonquin Beach;
- from the Tonquin Beach trail through to the Community Hall on Arnet Road;
- from the Community Hall on Arnet Road to Industrial Way;
- from the school on Gibson Street through to Arnet Road; and,
- through 295 / 301 Arnet Road to Peterson Drive (unofficial trail).

2.4 Site Visit & Data Collection

A site visit and transportation surveys were conducted on Tuesday December 13, 2018. Weekday traffic counts were collected at the study intersections during this time, i.e. commuting peak periods (between 7-9am and 4-6pm). Observed traffic volumes were factored up to account for seasonality factors and to reflect busier spring/summer months. The methodology used in factoring up volumes is explained in greater detail below.

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Exhibit 2.1

Site Accessibility (within Study Area)

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2.5 Street Characteristics

Key streets in study road network are: Leighton Way, Arnet Road, and First Street. **Table 2.1** presents a brief summary of each street and also includes reference photographs from the site visit (**Appendix A**). Following this, **Exhibit 2.2** illustrates the road network laning and intersection control.

Table 2.1: Study Area Street Characteristics

STREET	POSTED SPEED LIMIT (KM/HR)	# OF TRAVEL LANES	APPROX. ROADWAY WIDTH (M)	STREET PARKING	PEDESTRIAN FACILITES	IMAGE REFERENCE - APPENDIX A
Leighton Way *	30	2	7	West side (informal)	Gravel Shoulder (west side/shared with parking)	A.1 to A.5
Arnet Street	30	2	8	Both sides (4hr parking & Permit Only)	Gravel Shoulder (both sides/shared with parking)	A.6 to A.7
First Street	30	2	8	Both sides (4hr parking, 2hr parking & Permit Only)	Paved Sidewalk (west side)	A.8 to A.10

**Number of driveways – west side = 6, east side = 3*

Leighton Way is a local two-lane street the runs south of Arnet Road (approx 150m in length) and connects to Peterson Drive, which is a no-through road. The street provides access to single family homes. Leighton Way will provide the only vehicle access route to the site. The site access will form the west leg of the Leighton Way & Peterson Drive intersection.

Arnet Road is a two-lane collector street that runs east-west (approx 500m in length) and provides local access to residential homes on Cedar Street, Arnet Lane, Tonquin Park Road (to the west), and the existing community centre and future recreation centre (to the east). Besides local access, Arnet Road is used by locals and tourists going to Tonquin Beach.

First Street is two-lane collector-type street providing the only north-south vehicle access for lands south of Neill Street to and from Tofino's town centre. The street is approximately 375m in length (between Neill Street and Arnet Road). At the First Street & Neill Street intersection, the north and east leg are the main routes to and from the town centre, while the west leg is the primary access to the Tofino General Hospital.

2.6 Existing Peak Hour Traffic Volumes

Current traffic volumes have been factored up (key movements only) to account for the seasonality of the counts, which were collected in early Decemeber, and to represent a more typical time of year when there are more visitors to Tofino. The rate at which the volumes were increased was based on seasonal visitation statistics contained in the District of Tofino's *Tourism Masterplan* (August 2014) and illustated in the extracted graph below (**Figure 2.3**).

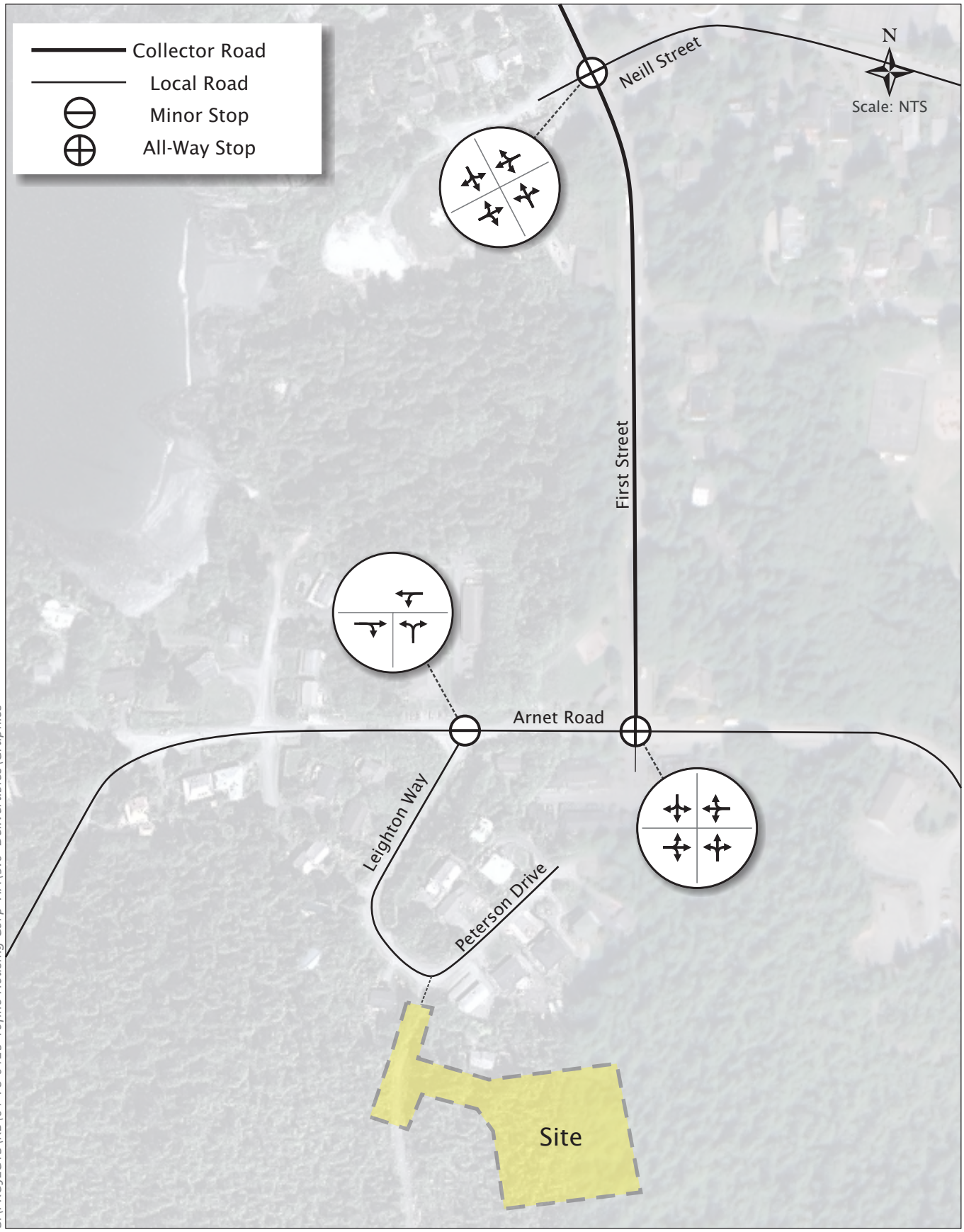

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Exhibit 2.2

Current Road Network & Laning (Study Area)

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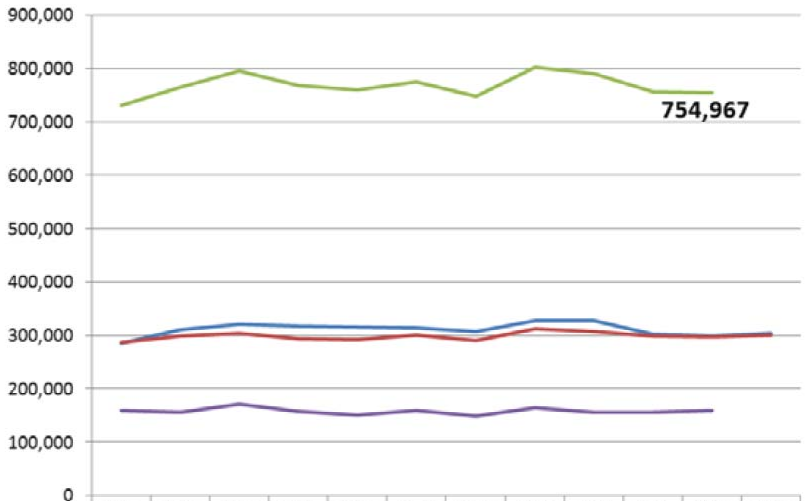
Figure 2.3: Visitor Trends at Long Beach Pacific Rim National Park



	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-13	2013-14
Total year end L.B.U.	731,065	764,435	795,608	768,631	759,462	774,157	747,001	802,566	790,579	757,039	754,967	
April-July	284,837	310,751	320,927	316,995	316,198	314,344	307,645	326,893	327,628	301,489	298,738	303,749
August-November	286,423	297,892	303,149	293,711	292,168	300,317	290,823	311,788	306,948	299,410	297,553	300,818
December-March	159,805	155,792	171,532	157,925	151,096	159,496	148,533	163,885	156,003	156,140	158,676	

The results confirm that the December-to-March months see approximaltey half as many visitors to Long Beach compared to the spring and summer months. Therefore the volumes that were collected in December were doubled (on key movments) to account for this.

Existing AM and PM weekday peak hour traffic (adjusted) volumes within the study area are shown in **Exhibit 2.3**. **Table 2.2** presents a summary of the two-way peak-hour vehicle movements for study network streets below.

Table 2.2: Study Area Weekday Peak Hour Vehicle Link Volumes

STREET (LOCATION)	AM	PM
Leighton Way (south of Arnet Rd)	10	10
Arnet Road (west of First St)	45	140
First Street (south of Neill St)	65	175

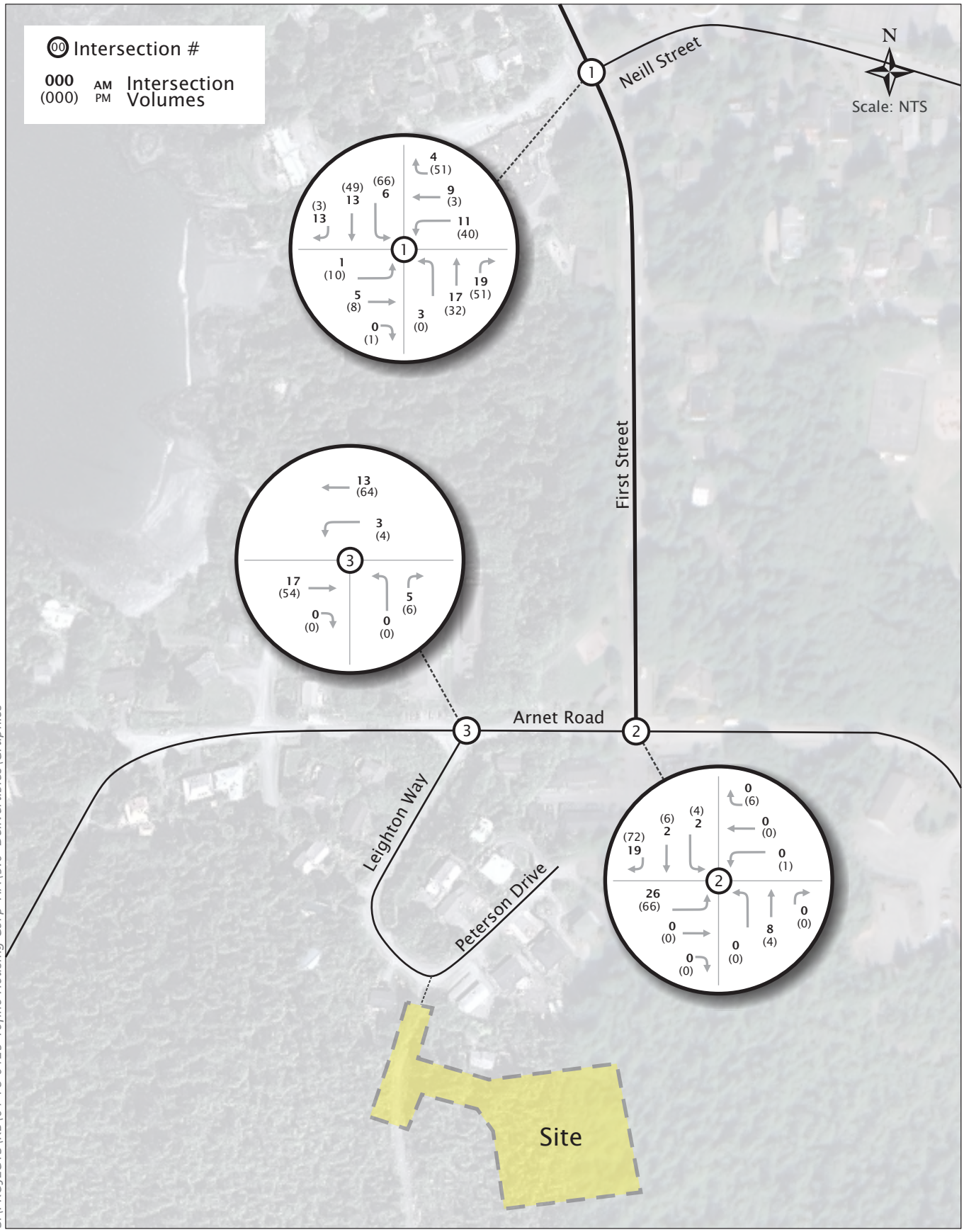


Exhibit 2.3

Existing Peak Hour Traffic Volumes

Tofino Housing Corp TIA
04-18-0429 January 2019

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The peak hour link volumes confirm that morning volumes are considerably lower than in the afternoon. They also illustrate the hierarchy of the streets, with the level of vehicle volumes they carry. Leighton Way carries a very low number of vehicles, 10 vehicles per hour at peak times, and this is representative of the fact that this is a no-through street only providing access to single family homes. The volumes that currently use Arnet Road and First Street are significantly higher than Leighton Way but are not at a level that raises concern for a two-lane street.

Pedestrian crossing volumes and cyclist movements were also collected during the peak hour counts. The observed volumes were as follows (noting these are December counts so it is expected that spring / summer volumes would be more substantial):

- Leighton Way & Arnet Road - no volumes;
- First Street & Arnet Road – no volumes in the morning, 4 pedestrians / 2 cyclists in the afternoon peak hour; and,
- First Street & Neill Street – 3 pedestrians / 0 cyclists in the morning peak and 12 pedestrians / 1 cyclist in the afternoon.

2.7 Existing Traffic Operations

2.7.1 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), vechicle delay (seconds – *rounded to the nearest 0.5*), and 95th 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

2.7.1 Existing Operational Analysis Results

Traffic operation results for the existing conditions are shown 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)	95TH QUEUE (M)	LOS	DELAY (SEC)	95TH QUEUE (M)
Leighton Way & Arnet Rd *(Minor Stop Control-Leighton)*	***Overall***	***A***	***0.5***	-	***A***	***0.0***	-
	EBTR	A	0.0	0	A	0.0	0
	WBLT	A	1.5	-	A	2.0	2
	NBLR	A	2.0	6	A	2.0	8
First St & Arnet Rd *(4-Way Stop)*	***Overall***	***A***	***2.5***	-	***A***	***3.0***	-
	EBLTR	A	3.0	13	A	3.5	16
	WBLTR	A	-	-	A	2.5	8
	NBLTR	A	3.0	8	A	3.0	6
	SBLTR	A	3.0	12	A	4.0	16
First St & Neill St *(4-Way Stop)*	***Overall***	***A***	***3.0***	-	***A***	***3.5***	-
	EBLTR	A	5.5	8	A	5.0	12
	WBLTR	A	5.5	13	A	7.0	16
	NBLTR	A	3.0	15	A	3.5	17
	SBLTR	A	3.5	14	A	3.5	17

The results confirmed that study intersections currently operate within acceptable performance thresholds, which is not suprising given the relativley low volumes observed at the study intersections.

3. PROPOSED DEVELOPMENT PLAN

3.1 Site Plan & Development Content

The Phase 1 site plan, illustrated above in Exhibit 1.2, is currently in early design stages; the current plan is for two separate buildings (3 and 3.5 storeys) including 72 residential rental units and 6 duplex homes with secondary suites.

Table 3.1 presents the most current development statistics provided by the client, which provided the basis for the future 'proposed zoning' vehicle trip generation and traffic analysis in Section 4.

Table 3.1: Proposed Zoning Development Content (Phase 1)

LAND USE	TYPE	# OF UNITS
Multi-Family Residential	Duplex (6)	12
	Secondary Suites (6)	
	Mid-Rise Apartment (Rental_	72
TOTAL		84

Vehicle access to the proposed project will form the west leg of the Leighton Way & Peterson Drive intersection. This is illustrated in the attached intersection layout (prepared by the project's civil consultant – see **Appendix C**) which was used as a basis for this analysis.

Once on-site, an internal two-lane street will route vehicles to/from different buildings with at-grade parking areas adjacent to each building. With the development of the site, some portions of the exiting walking trails will be relocated; however the connections will remain intact.

3.2 Parking Supply

3.2.1 Vehicle Parking

The development plans to meet current CD-THC1 zoning parking requirements for the residential component which is 1 parking stall per dwelling unit or 84 stalls, current plans show a parking supply meeting this requirement. The total parking supply is acceptable for this form of development and parking demands are anticipated to be met on-site.

3.2.2 Bicycle Parking

While there are no on-site bicycle storage requirements the project will be providing some to encourage this form of travel. We recommend that each dwelling unit have access to one secured bike stall and that visitor bike racks (typically fit six bikes) be placed at the entrance of the two apartment buildings.

4. FUTURE CONDITIONS

4.1 Future 'Background 2022' Conditions

4.1.1 Vehicle Volume Forecasts

For the purposes of this study the future horizon year of 2022 was selected as this is the estimated year the proposed site will be complete. Prior to reviewing traffic operations with the development site trips, future 'background' volumes were forecasted based on the following assumptions:

- A 1% linear growth rate was applied existing volumes (key movements only – i.e. not driveways or local residential streets that dead end) to horizon year 2022; and,
- Peak hour site vehicle trips were layered in for a future Community Recreation Centre (development application – approximately 15,000ft²) on Arnet Road, east of First Street. Trips for this site were estimated using Institute of Transportation Engineers (ITE) Trip Generation Manual 10th Ed. – Land Use Code 495.

Exhibit 4.1 shows estimated Background 2022 peak hour vehicle volumes based on the methodology outlined above.

4.1.2 Road Network Operations

Using future background peak hour volumes, SimTraffic was used to assess operations. Results of this analysis are summarized in **Table 4.1**; detailed outputs can be found in **Appendix D**.

Table 4.1: Future Background 2022 Weekday Peak Hour Operations

INTERSECTION/ TRAFFIC CONTROL	MOVEMENT	AM			PM		
		LOS	DELAY (SEC)	95TH QUEUE (M)	LOS	DELAY (SEC)	95TH QUEUE (M)
Leighton Way & Arnet Rd *(Minor Stop Control-Leighton)*	***Overall***	***A***	***0.5***	-	***A***	***0.0***	-
	EBTR	A	0.4	0	A	0.0	0
	WBLT	A	1.5	1	A	1.5	2
	NBLR	A	2.0	7	A	2.5	7
First St & Arnet Rd *(4-Way Stop)*	***Overall***	***A***	***3.0***	-	***A***	***3.0***	-
	EBLTR	A	3.0	13	A	3.5	15
	WBLTR	A	2.5	9	A	3.0	13
	NBLTR	A	3.0	8	A	3.0	6
	SBLTR	A	3.0	14	A	3.5	17
First St & Neill St *(4-Way Stop)*	***Overall***	***A***	***3.0***	-	***A***	***3.5***	-
	EBLTR	A	5.0	7	A	5.5	11
	WBLTR	A	6.0	13	A	6.0	16
	NBLTR	A	3.5	15	A	3.5	17
	SBLTR	A	3.0	14	A	3.5	18

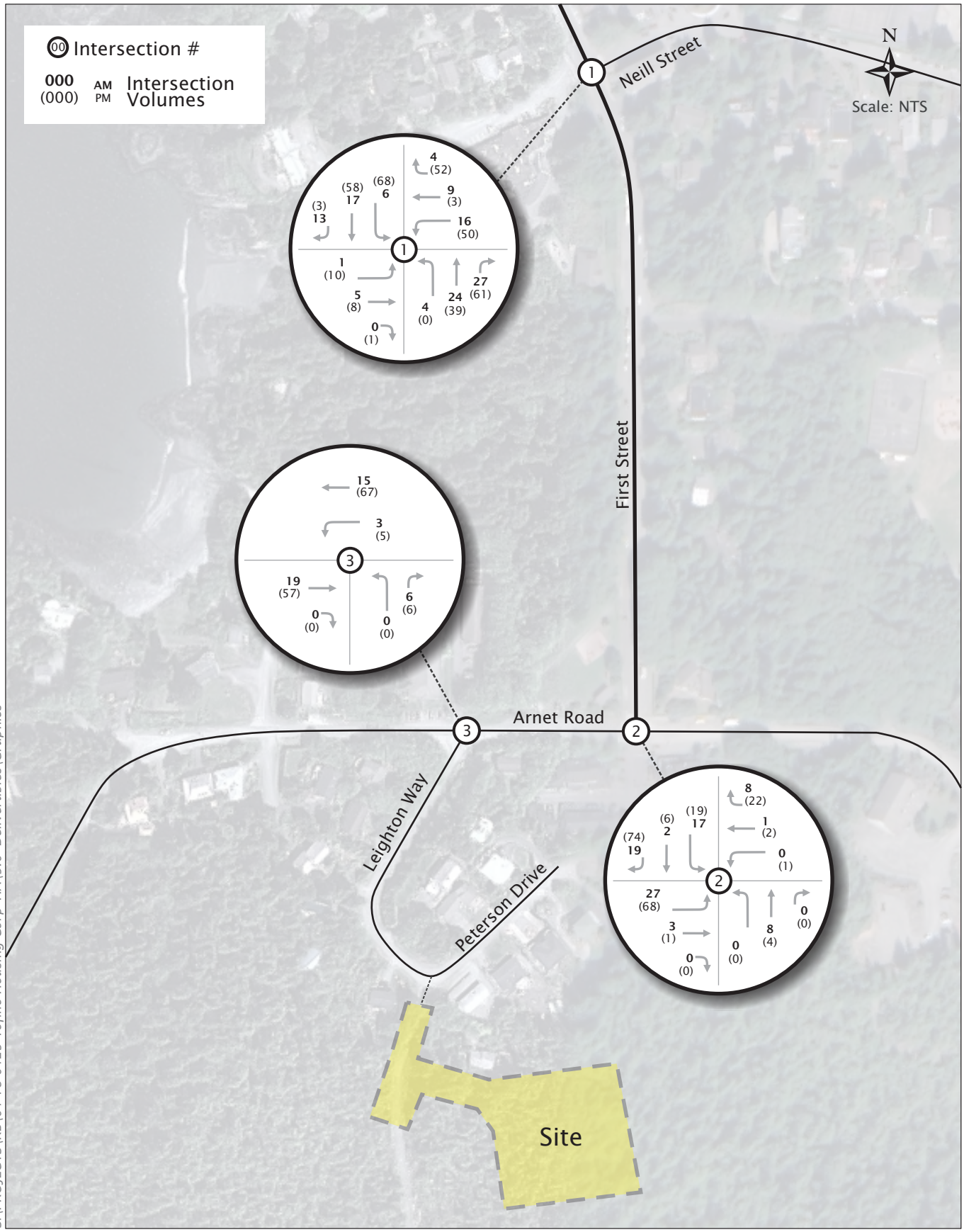

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Exhibit 4.1

Background 2022 Peak Hour Traffic Volumes

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04-18-0429 January 2019

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The results confirmed that study intersections are expected to operate within acceptable performance thresholds for the future Background 2022 condition, therefore no changes to the current intersection control are required.

4.2 Site Vehicle Trip Generation

As part of this analysis, the scope of work was to review and compare future traffic operations to measure how different operations would be if the Phase 1 site were built under 'Current Zoning' versus the 'Proposed Zoning'. Estimated peak hour site trip estimates for the two development scenarios were calculated using the following (**Table 4.2**) peak hour trips rates from ITE's Trip Generation Manual.

Table 4.3: Current VS Proposed Zoning Vehicle Trip Generation Rates

DEVELOPMENT SCENARIO	TYPE	ITE CODE	UNIT OF MEASURE	AM			PM		
				IN	OUT	TOTAL	IN	OUT	TOTAL
Current Zoning	Single Family	210	Dwelling Units	25%	75%	**0.74**	63%	37%	**0.99**
Proposed Zoning	Multi-Family Housing	220	Dwelling Units	23%	77%	**0.46**	63%	37%	**0.56**

Table 4.3 provides a comparative summary of the estimated peak hour site trips for the Current and Proposed Zoning, based on the rates above. Current Zoning density assumed 30 single family units (described in Section 2.1) and the Proposed Zoning assumes 84 multi-family dwelling units.

It is noted that the analysis herein was based on previous trip generation estimates (from February 2091 TIA) that had assumed 55 residential units and a Community Resource Centre. However, since the difference in trip generation estimates were negligible (5 more two-way trips in the AM peak hour and 1 trip in the PM), the volumes and operations in the following sections *were not updated* as the previous results are consistent with the trip generation estimates summarized below.

Table 4.3: Current VS Proposed Zoning Vehicle Trip Generation Comparison

DEVELOPMENT SCENARIO	DEVELOPMENT CONTENT	AM			PM		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Current Zoning	30 units	6	17	**22**	19	11	**30**
Proposed Zoning	84 units	9	30	**39**	30	12	**42**
	DIFFERENCE	+3	+13	+16	+11	+1	+12

Estimated peak hour two-way site vehicle trips for the proposed development are approximately 39 in the morning and 42 in the afternoon. Spread evenly across an hour, this is equal to approximately 1 additional vehicle on the road network every 1 ½ minutes on average.

Based on this review the Proposed Zoning is estimated to generate 12-16 *additional* two-way peak hour trips than if the site was developed under the Current Zoning. Spread across the peak hour; this is equivalent to around 1 additional vehicle on the street network every 4 minutes at peak times.

Site trips were assigned to the network based on existing traffic distributions and vehicle routing to/from the site. **Exhibit 4.2a** and **4.2b** present Current and Proposed Zoning peak hour trips, respectively.

4.3 Future 'Total 2022' Conditions

4.3.1 Vehicle Volume Forecasts

Exhibit 4.3a and **4.3b** shows estimated 'Total 2022' peak hour vehicle volumes for Current and Proposed Zoning, respectively. This was estimated by layering the site trips onto the Background 2022 volumes. **Table 4.4** summarizes the anticipated net new trips (link volume) onto the study road network for the future 2022 horizon year.

Table 4.4: Future 2022 Study Area Weekday Peak Hour

STREET (LOCATION)	BACKGROUND 2022		PROPOSED ZONING TRIPS	
	AM	PM	AM	PM
Leighton Way (south of Arnet Rd)	10	10	+39	+42
Arnet Road (west of First St)	50	145		
First Street (south of Neill St)	90	210		

As shown, the new site trips will be more noticeable for residents along Leighton Way during peak times, where anticipated volumes would see an increase of 35-45 trips. But as noted above, in Table 4.3, the increase in volumes would be relatively similar if the project were to be developed under the property's current zoning.

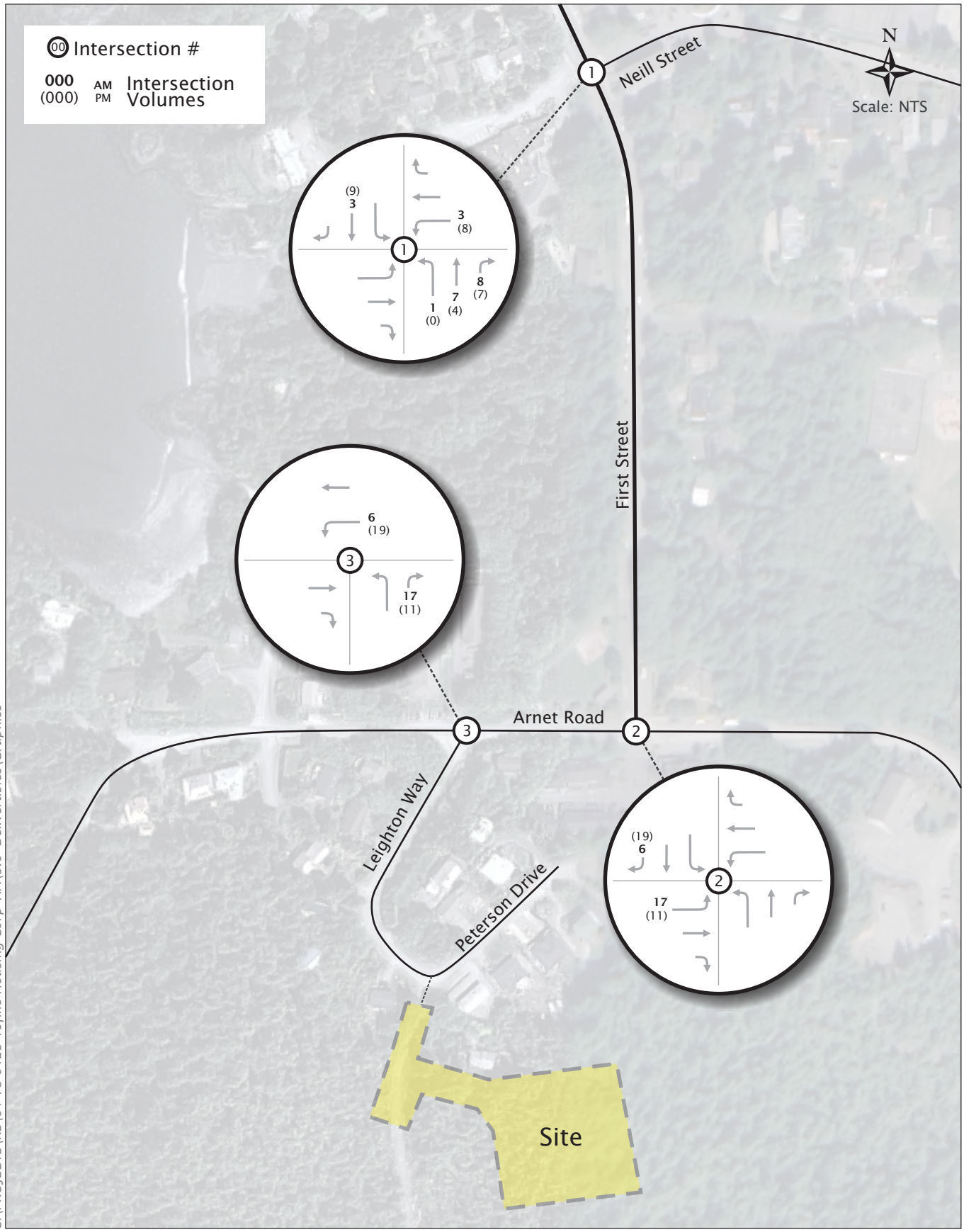

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Exhibit 4.2a

Current Zoning Peak Hour Site Traffic

Tofino Housing Corp TIA
04-18-0429 January 2019

bunt & associates

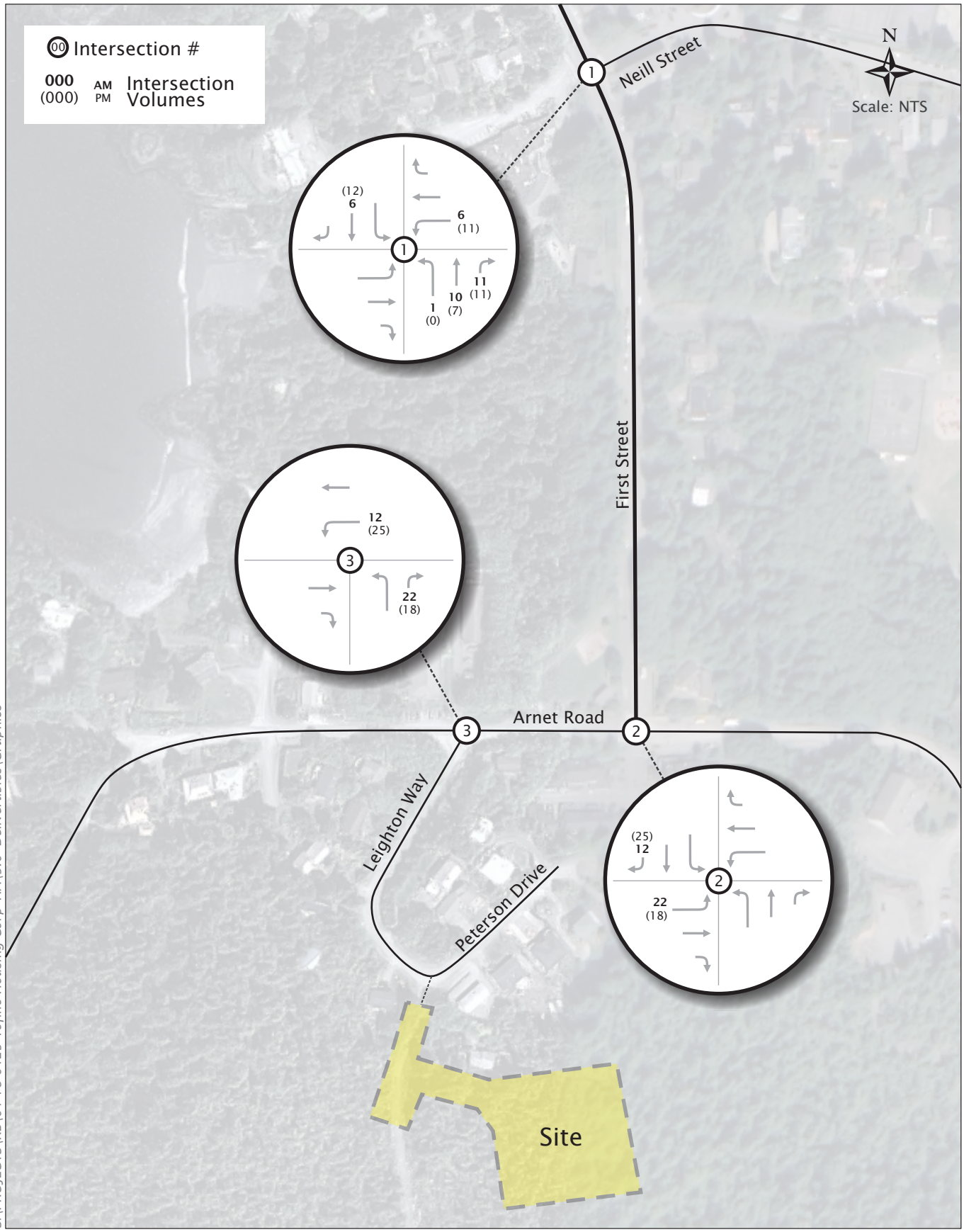

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Exhibit 4.2b

Proposed Zoning Peak Hour Site Traffic

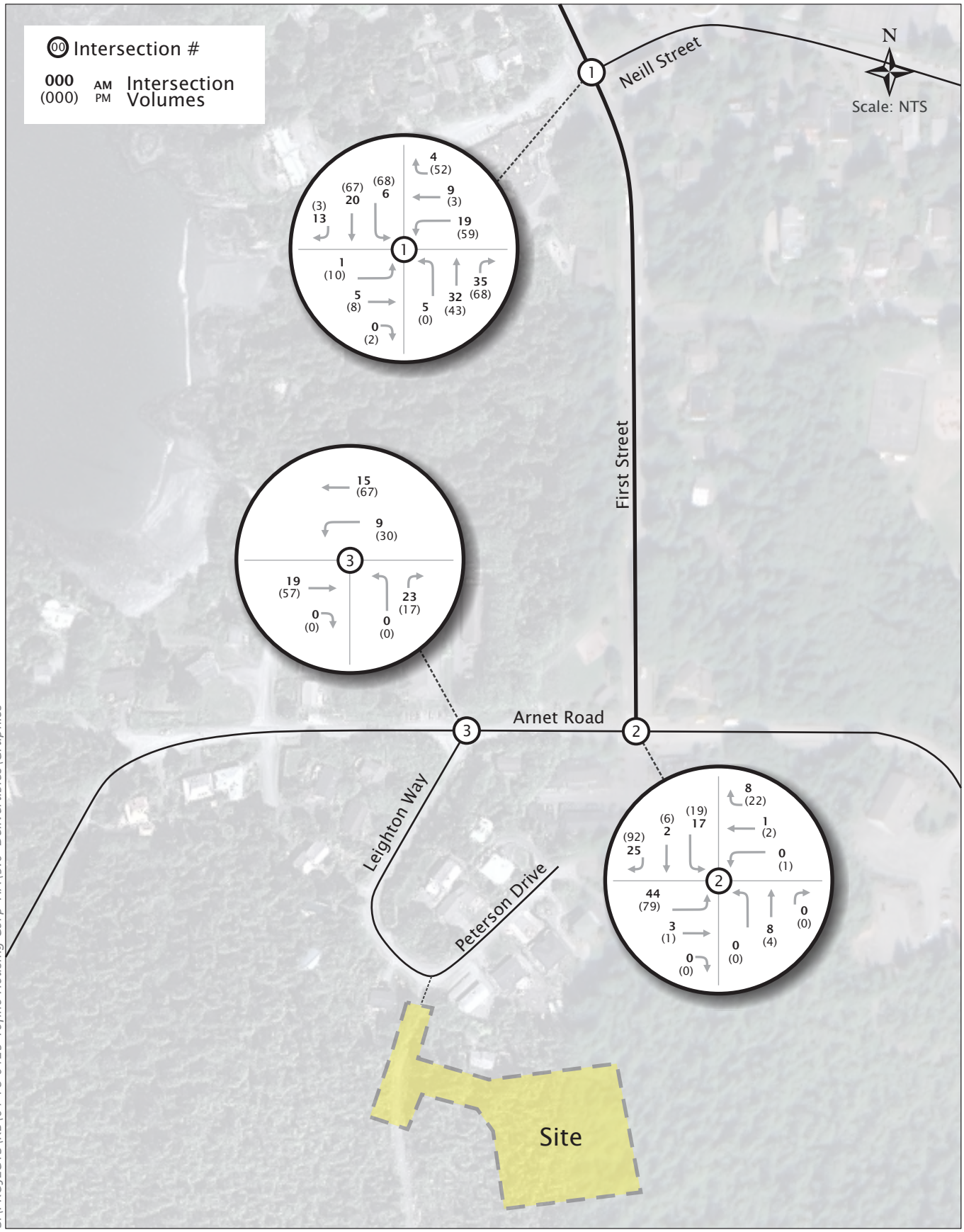

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Exhibit 4.3a

Current Zoning Total 2022 Traffic Volumes

Tofino Housing Corp TIA
04-18-0429 January 2019

bunt & associates

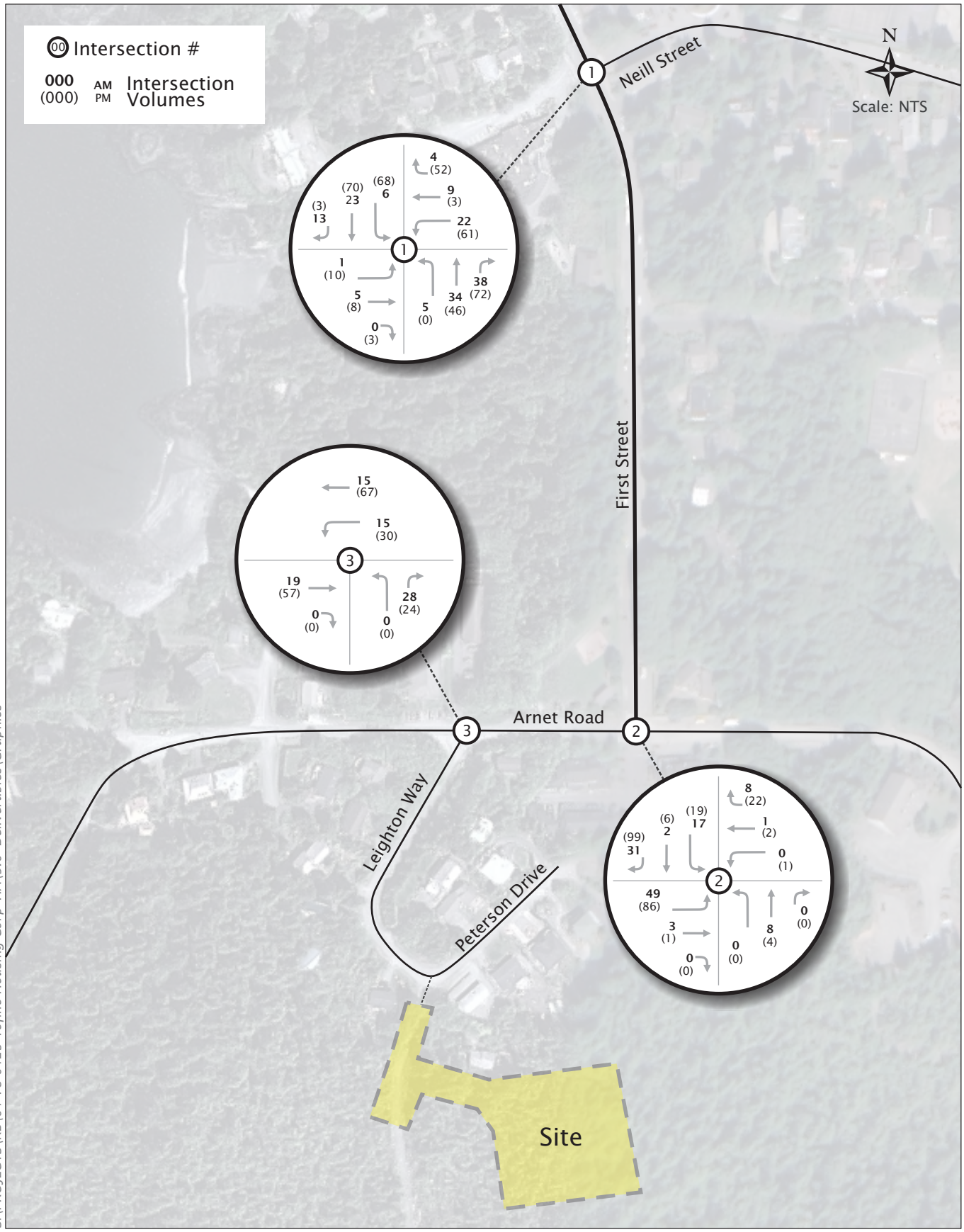

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Exhibit 4.3b

Proposed Zoning Total 2022 Traffic Volumes

Tofino Housing Corp TIA
04-18-0429 January 2019

bunt & associates

4.3.1 Road Network Operations

Using the future total peak hour volumes presented above, SimTraffic was used to assess traffic operations for the Current and Proposed Zoning 'Total 2022' developement scenarios.

This analyis includes the site access intersection at Leighton Way & Peterson Drive, based on the proposed layout prepared by the project's civil consultant (see Appendix C). As a base intersection control it was assumed that the intersection would be unsignalized with minor-stop contol on the east and west leg (i.e. Peterson Drive and the site access). A 3-way stop could also be considered at this location and is not expected to negativley impact operations due to relatively low volumes.

The results have been divided into the morning and afternoon peak hours to provide a comparison of the results under the Current Zone versus the Proposed Zoning. Operations are summarized in **Table 4.5a** and **4.5b**; and detailed outputs have been included in **Appendix E**.

Table 4.5a: Total AM 2022 Peak Hour Operations – Current vs. Proposed Zoning

INTERSECTION/ TRAFFIC CONTROL	MOVEMENT	CURRENT			PROPOSED		
		LOS	DELAY (SEC)	95TH QUEUE (M)	LOS	DELAY (SEC)	95TH QUEUE (M)
Leighton Way & Arnet Rd *(Minor Stop Control-Leighton)*	***Overall***	***A***	***1.0***	-	***A***	***1.0***	-
	EBTR	A	0.0	0	A	0.0	0
	WBLT	A	1.0	1	A	1.0	3
	NBLR	A	2.5	12	A	2.5	13
First St & Arnet Rd *(4-Way Stop)*	***Overall***	***A***	***3.0***	-	***A***	***3.0***	-
	EBLTR	***A***	3.5	15	***A***	3.5	15
	WBLTR	A	4.0	9	A	3.5	9
	NBLTR	A	3.0	8	A	3.0	8
	SBLTR	A	3.5	15	A	3.5	15
First St & Neill St *(4-Way Stop)*	***Overall***	***A***	**3.0**	-	***A***	**3.0**	-
	EBLTR	A	5.0	7	A	5.0	7
	WBLTR	A	4.0	13	A	5.5	13
	NBLTR	A	3.5	17	A	3.0	17
	SBLTR	A	3.5	14	A	3.5	14
Leighton Way / Peterson Drive & Site Access *(Minor Stop Control-Peterson & Site Access)*	***Overall***	**A**	**2.0**	-	**A**	**2.0**	-
	EBTR	A	3.0	12	A	3.0	12
	WBLT	A	2.0	5	A	2.0	5
	SBLR	A	0.0	0	A	0.0	0

Table 4.5b: Total PM 2022 Peak Hour Operations – Current vs Proposed Zoning

INTERSECTION/ TRAFFIC CONTROL	MOVEMENT	CURRENT			PROPOSED		
		LOS	DELAY (SEC)	95TH QUEUE (M)	LOS	DELAY (SEC)	95TH QUEUE (M)
Leighton Way & Arnet Rd *(Minor Stop Control-Leighton)*	***Overall***	***A***	***0.5***	-	***A***	***1.0***	-
	EBTR	A	0.0	0	A	0.0	0
	WBLT	A	1.5	5	A	1.5	4
	NBLR	A	2.5	12	A	2.5	12
First St & Arnet Rd *(4-Way Stop)*	***Overall***	***A***	***3.0***	-	***A***	***3.0***	-
	EBLTR	A	3.5	16	A	3.5	16
	WBLTR	A	3.0	13	A	3.0	14
	NBLTR	A	3.5	6	A	3.0	6
	SBLTR	A	4.0	18	A	3.5	18
First St & Neill St *(4-Way Stop)*	***Overall***	***A***	***4.0***	-	***A***	***4.0***	
	EBLTR	A	6.0	12	A	6.0	11
	WBLTR	A	7.0	16	A	6.0	17
	NBLTR	A	3.5	18	A	3.5	19
	SBLTR	A	4.0	18	A	4.0	19
Leighton Way / Peterson Drive & Site Access *(Minor Stop Control-Peterson & Site Access)*	***Overall***	**A**	**1.0**	-	**A**	**1.5**	-
	EBTR	A	3.0	10	A	3.0	12
	WBLT	A	2.0	5	A	2.5	6
	SBLR	A	0.0	0	A	0.0	0

The results of this comparative analysis confirm that the marginal increase in peak hour vehicle volumes, i.e. going from the Current to Proposed Zoning scenario, does not impact anticipated future road network operations. Furthermore, the study road layout and current intersection controls are not expected to require any improvements to accommodate the proposed development site vehicle trips, therefore no mitigation is being recommended.

4.4 Leighton Way Review

The operations analysis above concluded that the Leighton Way & Peterson Drive / Site Access intersection will function well with a minor stop control on the east and west legs (unsignalized). Therefore it is recommended that the future intersection be designed with this layout.

In light of the relatively low volumes anticipated on Leighton Way in the future (45 AM peak hour, and 55 PM peak hour), equivalent to approximately 1 vehicle on the street every 1to 1½ minutes at peak times, improvements to the road are not recommended at this time to accommodate volumes. Pedestrians are expected to continue to use the gravel shoulder to travel to and from Arnet Road, and this does not pose a concern based on the combination of low volume and vehicle speeds.

However, if the District of Tofino is looking further into the future on potential improvements that align with the MMTP vision to improve pedestrian and cycling connectivity, a 1.0m paved shoulder (painted line) would be suitable for this location[3] and could be implemented within the current 7.0m road width, leaving 6.0m for the two travel lanes. The east side of the street would be preferred location for the painted shoulder, due to the lower number of driveway crossings.

An improved connection to the trail on the north side Arnet Road, near the Leighton Way intersection, may also be considered. This could be in the form of a wider gravel shoulder on Arnet Road and potentially a pedestrian crossing of the east leg of the Arnet Road & Leighton Way intersection.

[3] *Transportation Association of Canada (TAC), Geometric Design Guide for Canadian Roads – Table 4.4.1*

5. CONCLUSIONS & RECOMMENDATIONS

Key pieces of information and a summary of this study's findings are:

- Tofino Housing Corporation (THC) and Catalyst Community Developments are working towards a Phase 1 Rezoning and development of District of Tofino lands known as "District Lot 114". Current zoning for the site is mainly a CD-THC1 (Low to Medium Multiple Family Residential District) with a small component zoned for RD-A2 (Rural District).

- The proposed project is seeking to a custom zone that would allow for 84 multi-family dwelling units, a portion of which would be affordable housing. Vehicle access to the proposed project will form the west leg of the Leighton Way & Peterson Drive intersection;

- The project plans to meet current CD-THC1 zoning parking requirements for the residential component which is 1 parking stall per dwelling unit or 84 stalls.

- Currently there are no on-site bicycle storage requirements however the project will be providing some to encourage this form of travel. We recommend that each dwelling unit have access to one secured bike stall and that visitor bike racks (typically fit six bikes) be placed at the entrance the two apartment buildings;

- The site is reasonably accessible for non-automobile travel, surrounded by local streets and a trail network. The site is approximately 600-800m walking distance to Tofino's town centre and there a paved sidewalk running the length of First Street to the local amenities in Toifno;

- Peak hour traffic link volumes confirmed that morning volumes are considerably lower than in the afternoon. They also illustrated the hierarchy of the streets, with the level of vehicle volumes they carry. Leighton Way carries a very low number of vehicles, 10 vehicles per hour at peak times, and this is representative of the fact that this is a no-through street only providing access to single family homes. Volumes that currently use Arnet Road and First Street are significantly higher than Leighton Way but are not at a level that raises concern for a two-lane street;

- Results of the exisitng traffic operations confirmed that study intersections currently operate within acceptable performance thresholds, which was not suprising given the relativley low volumes observed at the study intersections;

- The focus of this report was to assess the traffic impacts of the Proposed Zoning on the adjacent street network, compared to the impacts that would be anticipated if the site were developed under the Current Zoning (equivalent to approximately 30 dwelling units).

- Estimated peak hour two-way site vehicle trips for the proposed development/zoning are approximately 39 in the morning and 42 in the afternoon. Spread evenly across an hour, this is

equal to approximately 1 additional vehicle on the road network every 1 ½ minutes on average. The Proposed Zoning was estimated to generate 12-16 *additional* two-way peak hour trips than Current Zoning, equivalent to 1 additional vehicle on the street network every 4 minutes at peak times;

- Results of the future traffic comparative scenarios confirmed, i.e. going from the Current to Proposed Zoning scenario, will not have an impact on anticipated future road network operations. The analysis also concluded that the study road layout and current intersection controls do not any improvements to accommodate the proposed development site vehicle trips, or future background volumes, therefore no mitigations were recommended;

- Leighton Way & Peterson Drive / Site Access intersection will function with a minor stop control on the east and west legs (unsignalized), which was recommended layout based on the traffic assessment. In addition no improvements to Leighton Way were proposed due to the relatively low volume and local nature of the street. Pedestrians would be expected to continue to use the gravel shoulder to travel to and from Arnet Road, and this does not pose a concern based on the combination of low volume and vehicle speeds;

- If the District of Tofino were looking for potential improvement recommendations (that align with the MMTP vision) to improve pedestrian and cycling connectivity, a 1.0m paved shoulder (painted line on east side) was suggestion as a potential improvement for this street. This could be implemented within the current 7.0m road width, leaving 6.0m for the two travel lanes.

Appendix A.1 – Existing Site Access (trail head) @ Leighton Way / Peterson Dr

Appendix A.2 – Leighton Way / Peterson Dr (facing west)

Appendix A.3 – Leighton Way (facing southeast) towards Peterson Dr Intersection

Appendix A.4 – Leighton Way (facing southwest)

Appendix A.5 – Leighton Way / Arnet Rd (south leg facing north)

Appendix A.6 –Arnet Rd (facing east) @ Leighton Way

Appendix A.7 –Arnet Rd / First St (west leg facing east)

Appendix A.8 –First St (facing south) @ Gibson St

Appendix A.9 –First St (facing south) towards Gibson St Ped Xing

Appendix A.10 –First St / Neill St (north leg facing south)

1: Leighton Way & Arnet Rd. Performance by movement

Movement	EBT	WBL	WBT	NBR	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.1	0.1
Total Del/Veh (s)	0.0	1.3	0.2	2.0	0.4

2: Private Access/First St. & Arnet Rd. Performance by movement

Movement	EBL	NBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	3.2	3.0	3.1	0.6	2.3	2.6

3: First St. & Neill St. Performance by movement

Movement	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1
Total Del/Veh (s)	2.4	5.4	4.2	5.4	2.3	2.8	2.6	2.4	3.4	3.4	2.2	3.2

Total Network Performance

Denied Del/Veh (s)	0.1
Total Del/Veh (s)	5.5

Intersection: 1: Leighton Way & Arnet Rd.

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	0.9	9.1
Average Queue (m)	0.0	1.0
95th Queue (m)	0.0	5.8
Link Distance (m)	79.6	108.9
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Private Access/First St. & Arnet Rd.

Movement	EB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (m)	12.6	9.2	12.2
Average Queue (m)	4.9	2.0	4.5
95th Queue (m)	12.9	8.2	12.2
Link Distance (m)	79.6	31.4	279.2
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: First St. & Neill St.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	9.5	10.0	15.0	14.1
Average Queue (m)	1.7	4.9	7.1	6.1
95th Queue (m)	7.5	12.4	14.6	13.7
Link Distance (m)	67.8	149.0	39.6	90.5
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

1: Leighton Way & Arnet Rd. Performance by movement

Movement	EBT	WBL	WBT	NBR	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.1	0.1
Total Del/Veh (s)	0.1	1.8	0.3	2.2	0.3

2: Private Access/First St. & Arnet Rd. Performance by movement

Movement	EBL	WBL	WBR	NBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0		0.1	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	3.4		2.4	3.2	3.9	1.3	2.7	2.8

3: First St. & Neill St. Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.1	0.2	0.2	0.0	0.0	0.2	0.1	0.1	0.1
Total Del/Veh (s)	4.0	5.2	1.7	4.7	6.9	2.8	3.5	2.7	3.5	3.6	2.2	3.5

Total Network Performance

Denied Del/Veh (s)	0.1
Total Del/Veh (s)	6.0

Intersection: 1: Leighton Way & Arnet Rd.

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	4.0	9.2
Average Queue (m)	0.1	1.8
95th Queue (m)	2.1	7.7
Link Distance (m)	79.4	108.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Private Access/First St. & Arnet Rd.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	18.6	9.1	9.1	17.3
Average Queue (m)	9.2	1.8	1.2	9.6
95th Queue (m)	16.2	7.7	6.3	15.7
Link Distance (m)	79.4	128.8	31.3	279.0
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: First St. & Neill St.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	10.3	20.4	20.9	18.8
Average Queue (m)	4.1	9.6	10.4	10.6
95th Queue (m)	11.4	16.1	17.0	16.7
Link Distance (m)	67.7	148.9	39.5	95.5
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

PETERSON DRIVE

LEIGHTON WAY

LOT A PLAN VIP53861

LOT 10 PLAN 35014

LOT 11 PLAN 35014

EXISTING HOUSE

TOWNHOUSE 3
M.B.E. = 28.60M

TOWNHOUSE 2
M.B.E. = 28.60M

TOWNHOUSE 1
M.B.E. = 30.40M

ROAD B

2+000 2+020 2+040 2+060 2+080 2+100 2+120 2+140 2+160 2+180 2+200 2+220

ACCESS TO FUTURE DEVELOPMENT

13 STALLS
2 STALLS
2 STALLS
4 STALLS
9 STALLS
22 STALLS
16 STALLS
4 STALLS

1.0m SHLDR
2.8m LANE
2.8m LANE
7.1m PARKING
0.6m SHLDR
1.4m ROW
14.2m ROW

APPROXIMATE TOE OF FILL (2:1) (TYPICAL)

APPROXIMATE TOP OF CUT (2:1) (TYPICAL)

RIPARIAN SETBACK (TYPICAL)

FUTURE 14.2m ROW

LEGEND:

- APPROXIMATE TOP OF CUT (2H:1V)
- APPROXIMATE TOE OF FILL (2H:1V)
- PROPOSED DITCH/SWALE
- D — PROPOSED STORM DRAIN
- S — PROPOSED SANITARY SEWER
- W — PROPOSED WATERMAIN
- 50mm ASPHALT (SEE TYPICAL SECTION DWG 301)
- 100mm GRAVEL (SEE TYPICAL SECTION DWG 301)
- APPROXIMATE AREA OF FILL
- APPROXIMATE AREA OF CUT

RIM=30.77±
SSMH D

RIM=31.77±
SDMH 1

RIM=30.81±
SSMH E

RIM=27.84±
SSMH C

RIM=24.86±
SSMH B

RIM=22.87±
SSMH A

EXISTING GRADE ROAD ℄

PROPOSED GRADE ROAD ℄

HIGH PT STA: 2+143.60
HIGH PT ELEV: 31.84
PVI STA: 2+146.00
PVI ELEV: 33.72
K: 3.00
LVC: 67.20

LOW PT STA: 2+029.09
LOW PT ELEV: 22.65
PVI STA: 2+043.89
PVI ELEV: 23.10
K: 4.00
LVC: 29.60

BVCS: 2+112.40
BVCE: 30.22

BVCS: 2+179.60
BVCE: 29.86

EVCS: 2+058.69
EVCE: 24.64

BVCS: 2+029.09
BVCE: 22.65

FUTURE ROAD ℄ 2+087.30

INVERT ±30.64 CROSSING PROPOSED CULVERT

LIMIT OF ROAD WORKS STATION 2+180

10.40%
3.00%

SANITARY INVERT ELEVATIONS	LEIGHTON ROAD ℄ 2+015
	21.75 SW
	INV. ±22.74 CROSSING PROPOSED CULVERT
	23.14 NE
	23.17 S
	26.11 N
	26.14 E
	29.03 W
	29.06 E
	29.98 E
	29.36 W
	28.87 W
℄ ROAD ELEVATIONS	22.35
	22.39 22.381
	22.55 22.682
	22.47 23.130
	23.35 23.827
	24.19 24.773
	24.92 25.813
	26.38 26.853
	27.37 27.893
	27.26 28.933
	27.71 29.973
	30.12 30.917
	31.89 31.537
	32.50 31.823
	32.12 31.777
	32.82 31.397
	31.46 30.683
	29.67 29.637
	28.15 28.617
	27.51 27.930
℄ ROAD STATIONING	2+010
	2+020
	2+030
	2+036.34
	2+040
	2+050
	2+060
	2+060.94
	2+070
	2+080
	2+089.67
	2+100
	2+110
	2+118.44
	2+120
	2+130
	2+140
	2+149.39
	2+150
	2+160
	2+168.26
	2+170
	2+178.03
	2+180
	2+190
	2+200

Rev	Date	Description	Drawn	Design	App'd
PD	19-08-29	PRELIMINARY LAYOUT - ISSUED FOR DISCUSSION	KB	KB	CP
PC	19-02-06	PRELIMINARY LAYOUT - ISSUED FOR DISCUSSION	KB	KB	CP
PB	19-01-08	PRELIMINARY LAYOUT - ISSUED FOR DISCUSSION	KB	KB	CP
PA	18-05-28	PRELIMINARY LAYOUT - ISSUED FOR DISCUSSION	KB	KB	ML

PRELIMINARY
NOT FOR CONSTRUCTION

0 H 1:250 10
0 V 1:50 2

ORIGINAL DWG SIZE: ANSI D (22" x 34")

McElhanney
1351 Estevan Road
Suite 1
Nanaimo BC
Canada V9S 3Y3
Tel 250 716 3336

Approved Sealed

TOFINO HOUSING CORPORATION
TOFINO, B.C.

DISTRICT LOT 114
ROAD B
PLAN & PROFILE

STATION 2+000 TO 2+200

Drawing No. 102

Project Number 2231-45500-03

Rev. PD

DESTROY ALL PRINTS BEARING PREVIOUS REVISION

1: Leighton Way & Arnet Rd. Performance by movement

Movement	EBT	WBL	WBT	NBR	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.1	0.1
Total Del/Veh (s)	0.0	1.5	0.2	2.1	0.4

2: Private Access/First St. & Arnet Rd. Performance by movement

Movement	EBL	EBT	WBT	WBR	NBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0		0.1	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	3.1	3.1		2.5	3.1	3.1	1.3	2.4	2.8

3: First St. & Neill St. Performance by movement

Movement	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)		0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1
Total Del/Veh (s)		5.0	4.2	5.9	2.0	3.5	2.9	2.3	3.3	3.3	2.2	3.2

Total Network Performance

Denied Del/Veh (s)	0.1
Total Del/Veh (s)	5.6

Intersection: 1: Leighton Way & Arnet Rd.

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	0.8	9.0
Average Queue (m)	0.0	1.5
95th Queue (m)	0.9	7.2
Link Distance (m)	79.6	108.9
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Private Access/First St. & Arnet Rd.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	14.4	9.2	9.1	14.2
Average Queue (m)	5.2	2.3	2.1	5.9
95th Queue (m)	13.2	8.8	8.4	13.7
Link Distance (m)	79.6	128.9	31.4	279.2
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: First St. & Neill St.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	8.9	11.3	16.9	14.2
Average Queue (m)	1.4	5.8	8.1	6.3
95th Queue (m)	6.6	13.1	14.7	13.8
Link Distance (m)	67.8	149.0	39.6	90.5
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

1: Leighton Way & Arnet Rd. Performance by movement

Movement	EBT	WBL	WBT	NBR	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.1	0.1
Total Del/Veh (s)	0.1	1.4	0.3	2.6	0.3

2: Private Access/First St. & Arnet Rd. Performance by movement

Movement	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	3.4	2.4	2.3	2.9	2.5	3.2	3.6	1.3	2.8	2.9

3: First St. & Neill St. Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.2	0.2	0.2	0.0	0.0	0.2	0.2	0.1	0.1
Total Del/Veh (s)	4.2	5.6	3.7	4.7	6.0	3.0	3.5	2.7	3.6	3.7	2.7	3.6

Total Network Performance

Denied Del/Veh (s)	0.2
Total Del/Veh (s)	6.2

Intersection: 1: Leighton Way & Arnet Rd.

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	2.7	9.2
Average Queue (m)	0.1	1.6
95th Queue (m)	1.6	7.4
Link Distance (m)	79.4	108.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Private Access/First St. & Arnet Rd.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	15.7	12.7	9.1	18.0
Average Queue (m)	8.6	5.7	1.2	10.3
95th Queue (m)	15.0	13.3	6.1	17.0
Link Distance (m)	79.4	128.8	31.3	279.0
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: First St. & Neill St.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	10.3	18.1	19.0	21.2
Average Queue (m)	3.9	9.9	10.8	11.7
95th Queue (m)	11.2	16.0	17.1	18.3
Link Distance (m)	67.7	148.9	39.5	95.5
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

1: Leighton Way & Arnet Rd. Performance by movement

Movement	EBT	WBL	WBT	NBR	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.1	0.1
Total Del/Veh (s)	0.0	1.5	0.2	2.1	0.4

2: Private Access/First St. & Arnet Rd. Performance by movement

Movement	EBL	EBT	WBT	WBR	NBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0		0.1	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	3.1	3.1		2.5	3.1	3.1	1.3	2.4	2.8

3: First St. & Neill St. Performance by movement

Movement	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)		0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1
Total Del/Veh (s)		5.0	4.2	5.9	2.0	3.5	2.9	2.3	3.3	3.3	2.2	3.2

Total Network Performance

Denied Del/Veh (s)	0.1
Total Del/Veh (s)	5.6

Intersection: 1: Leighton Way & Arnet Rd.

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	0.8	9.0
Average Queue (m)	0.0	1.5
95th Queue (m)	0.9	7.2
Link Distance (m)	79.6	108.9
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Private Access/First St. & Arnet Rd.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	14.4	9.2	9.1	14.2
Average Queue (m)	5.2	2.3	2.1	5.9
95th Queue (m)	13.2	8.8	8.4	13.7
Link Distance (m)	79.6	128.9	31.4	279.2
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: First St. & Neill St.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	8.9	11.3	16.9	14.2
Average Queue (m)	1.4	5.8	8.1	6.3
95th Queue (m)	6.6	13.1	14.7	13.8
Link Distance (m)	67.8	149.0	39.6	90.5
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

1: Leighton Way & Arnet Rd. Performance by movement

Movement	EBT	WBL	WBT	NBR	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.1	0.1
Total Del/Veh (s)	0.1	1.4	0.3	2.6	0.3

2: Private Access/First St. & Arnet Rd. Performance by movement

Movement	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	3.4	2.4	2.3	2.9	2.5	3.2	3.6	1.3	2.8	2.9

3: First St. & Neill St. Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.2	0.2	0.2	0.0	0.0	0.2	0.2	0.1	0.1
Total Del/Veh (s)	4.2	5.6	3.7	4.7	6.0	3.0	3.5	2.7	3.6	3.7	2.7	3.6

Total Network Performance

Denied Del/Veh (s)	0.2
Total Del/Veh (s)	6.2

Intersection: 1: Leighton Way & Arnet Rd.

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	2.7	9.2
Average Queue (m)	0.1	1.6
95th Queue (m)	1.6	7.4
Link Distance (m)	79.4	108.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Private Access/First St. & Arnet Rd.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	15.7	12.7	9.1	18.0
Average Queue (m)	8.6	5.7	1.2	10.3
95th Queue (m)	15.0	13.3	6.1	17.0
Link Distance (m)	79.4	128.8	31.3	279.0
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: First St. & Neill St.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	10.3	18.1	19.0	21.2
Average Queue (m)	3.9	9.9	10.8	11.7
95th Queue (m)	11.2	16.0	17.1	18.3
Link Distance (m)	67.7	148.9	39.5	95.5
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

1: Leighton Way & Arnet Rd. Performance by movement

Movement	EBT	WBL	WBT	NBR	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.1	0.1
Total Del/Veh (s)	0.0	1.1	0.3	2.3	1.0

2: Private Access/First St. & Arnet Rd. Performance by movement

Movement	EBL	EBT	WBT	WBR	NBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	3.3	3.7	3.6	2.5	3.1	3.3	0.9	2.6	2.9

3: First St. & Neill St. Performance by movement

Movement	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)		0.1	0.1	0.2	0.2	0.0	0.0	0.0	0.1	0.1	0.1	0.1
Total Del/Veh (s)		5.2	4.2	5.3	2.4	3.4	2.9	2.3	3.5	3.4	2.3	3.2

Total Network Performance

Denied Del/Veh (s)	0.1
Total Del/Veh (s)	6.1

Intersection: 1: Leighton Way & Arnet Rd.

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	1.8	12.1
Average Queue (m)	0.0	4.3
95th Queue (m)	0.9	12.2
Link Distance (m)	79.6	108.9
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Private Access/First St. & Arnet Rd.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	16.6	9.9	9.2	17.4
Average Queue (m)	6.9	2.2	2.1	6.6
95th Queue (m)	14.3	8.6	8.3	14.8
Link Distance (m)	79.6	128.9	31.4	279.2
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: First St. & Neill St.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	8.8	11.3	19.4	15.0
Average Queue (m)	1.4	5.8	9.5	6.5
95th Queue (m)	6.7	13.2	16.5	14.0
Link Distance (m)	67.8	149.0	39.6	90.5
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

4: Site Access/Peterson & Leighton Way Performance by movement

Movement	EBL	WBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.0	0.1
Total Del/Veh (s)	3.1	1.9	0.0	0.0	0.1	2.0

Intersection: 4: Site Access/Peterson & Leighton Way

Movement	EB	WB
Directions Served	LT	TR
Maximum Queue (m)	12.1	9.2
Average Queue (m)	4.3	0.8
95th Queue (m)	12.2	5.1
Link Distance (m)	133.8	151.7
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

1: Leighton Way & Arnet Rd. Performance by movement

Movement	EBT	WBL	WBT	NBR	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.1	0.1
Total Del/Veh (s)	0.0	1.2	0.2	2.4	1.1

2: Private Access/First St. & Arnet Rd. Performance by movement

Movement	EBL	EBT	WBT	WBR	NBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.2	0.1	0.0	0.1	0.0	0.0
Total Del/Veh (s)	3.4	3.2	3.3	2.3	3.2	3.6	0.9	2.5	3.0

3: First St. & Neill St. Performance by movement

Movement	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1
Total Del/Veh (s)	2.7	5.0	4.3	5.4	2.1	3.2	2.9	2.5	3.5	3.4	2.4	3.2

Total Network Performance

Denied Del/Veh (s)	0.1
Total Del/Veh (s)	6.4

Intersection: 1: Leighton Way & Arnet Rd.

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	5.3	13.3
Average Queue (m)	0.3	5.6
95th Queue (m)	3.1	13.4
Link Distance (m)	79.6	108.9
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Private Access/First St. & Arnet Rd.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	18.4	10.6	9.2	15.9
Average Queue (m)	7.8	2.4	2.0	7.2
95th Queue (m)	15.2	9.0	8.3	14.7
Link Distance (m)	79.6	128.9	31.4	279.2
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: First St. & Neill St.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	8.7	11.9	20.0	14.9
Average Queue (m)	1.3	6.0	10.3	6.9
95th Queue (m)	6.5	13.4	17.0	14.3
Link Distance (m)	67.8	149.0	39.6	90.5
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

4: Site Access/Peterson & Leighton Way Performance by movement

Movement	EBL	WBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.0	0.1
Total Del/Veh (s)	3.1	1.9	0.0	0.2	0.1	1.9

Intersection: 4: Site Access/Peterson & Leighton Way

Movement	EB	WB
Directions Served	LT	TR
Maximum Queue (m)	12.4	8.4
Average Queue (m)	4.9	0.7
95th Queue (m)	12.8	4.8
Link Distance (m)	132.6	161.4
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

1: Leighton Way & Arnet Rd. Performance by movement

Movement	EBT	WBL	WBT	NBR	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.1	0.1
Total Del/Veh (s)	0.1	1.4	0.3	2.5	0.6

2: Private Access/First St. & Arnet Rd. Performance by movement

Movement	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	3.5	3.6	1.8	3.0	2.5	3.6	3.9	1.7	2.9	3.0

3: First St. & Neill St. Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.2	0.2	0.1	0.2	0.0	0.0	0.2	0.2	0.2	0.1
Total Del/Veh (s)	4.4	5.7	2.9	5.0	6.8	3.0	3.5	2.7	3.7	3.8	2.4	3.7

Total Network Performance

Denied Del/Veh (s)	0.2
Total Del/Veh (s)	6.6

Intersection: 1: Leighton Way & Arnet Rd.

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	8.8	11.6
Average Queue (m)	0.6	4.3
95th Queue (m)	4.6	12.0
Link Distance (m)	79.4	108.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Private Access/First St. & Arnet Rd.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	18.7	12.0	9.0	20.2
Average Queue (m)	9.1	5.1	1.2	11.2
95th Queue (m)	15.3	12.8	6.2	17.9
Link Distance (m)	79.4	128.8	31.3	279.0
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: First St. & Neill St.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	10.3	20.0	22.9	22.7
Average Queue (m)	4.3	10.2	11.3	11.4
95th Queue (m)	11.6	16.4	18.1	18.2
Link Distance (m)	67.7	148.9	39.5	95.5
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

4: Site Access/Peterson & Leighton Way Performance by movement

Movement	EBL	WBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	3.1	2.2	0.2	0.1	0.2	1.2

Intersection: 4: Site Access/Peterson & Leighton Way

Movement	EB	WB
Directions Served	LT	TR
Maximum Queue (m)	10.7	9.2
Average Queue (m)	2.7	0.8
95th Queue (m)	9.7	5.0
Link Distance (m)	149.9	153.5
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

1: Leighton Way & Arnet Rd. Performance by movement

Movement	EBT	WBL	WBT	NBR	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.1	0.1
Total Del/Veh (s)	0.1	1.3	0.3	2.5	0.7

2: Private Access/First St. & Arnet Rd. Performance by movement

Movement	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	3.5	2.6	2.6	3.0	2.5	3.0	3.5	1.6	3.1	3.1

3: First St. & Neill St. Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.2	0.1	0.2	0.0	0.0	0.2	0.2	0.1	0.1
Total Del/Veh (s)	4.2	5.8	2.6	5.0	6.1	3.1	3.6	2.7	3.9	3.8	2.7	3.7

Total Network Performance

Denied Del/Veh (s)	0.2
Total Del/Veh (s)	6.8

Intersection: 1: Leighton Way & Arnet Rd.

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	8.2	11.8
Average Queue (m)	0.6	4.6
95th Queue (m)	4.2	12.2
Link Distance (m)	79.4	108.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Private Access/First St. & Arnet Rd.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	17.2	15.8	8.2	21.0
Average Queue (m)	9.4	5.5	1.0	11.6
95th Queue (m)	15.5	13.7	5.7	18.4
Link Distance (m)	79.4	128.8	31.3	279.0
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: First St. & Neill St.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	9.5	21.2	22.3	22.9
Average Queue (m)	4.1	10.5	11.5	11.3
95th Queue (m)	11.3	17.0	18.7	18.6
Link Distance (m)	67.7	148.9	39.5	95.5
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

4: Site Access/Peterson & Leighton Way Performance by movement

Movement	EBL	WBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	3.1	2.4	0.1	0.1	0.1	1.4

Intersection: 4: Site Access/Peterson & Leighton Way

Movement	EB	WB
Directions Served	LT	TR
Maximum Queue (m)	10.0	9.2
Average Queue (m)	4.1	1.1
95th Queue (m)	11.7	5.8
Link Distance (m)	154.8	161.0
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		