

# Traffic Impact Assessment

Truman Road Land Development

Sunshine Coast, BC

PID 013-272-047



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## 1.0 INTRODUCTION

Retained by HALFMOON BAY LIVING LTD, this traffic impact assessment (TIA) is for the proposed development parcel (the Parcel, PID: 013-272-047) in Halfmoon Bay community in Sunshine Coast Regional District (the district).

## 2.0 THE STUDY AREAS

Reference to the site plan, the parcel is in a rural area and surrounded by the Truman Road on the west, a developed land (the adjacent land) on the south and east, and bounded by a community recreation and conservation land (according to the Halfmoon Bay Official Community Plan, the OCP) on the north.

To assess how the attracted/generated traffic (to/from the parcel), will impact the surrounding public roads and intersections, as well as the Sunshine Coast Highway (Hwy 101), we reviewed the streets by and adjacent to the parcel, as well as the nearby major public roads with their concurrent volumes, to determine the most critical case for each traffic movement. Accordingly, the study areas are determined as:

- **The Area:** along the Truman Road and the north edge of the Parcel, See Figure 2.1, and
- **The Intersection:** on Brooks Road at the Hwy 101 (the Intersection), see Figure 2.2.



Figure 2.1 The Study Area

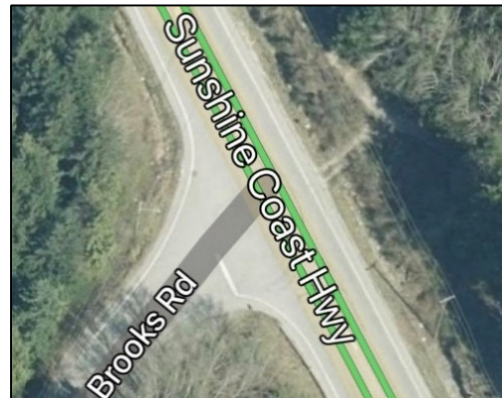


Figure 2.2 The Intersection

## 3.0 EXISTING CONDITIONS

### 3.1 CURRENT LAND USE AND DWELLINGS

Currently, the parcel is vacant land. The adjacent land contains 85 dwellings.

### 3.2 EXISTING ROAD NETWORK AND CONDITIONS

**Within the Area,** the Truman Road is a two-lane local road as the major public road. The other roads (including Natalie Lane, Taylor Cres, Ross Road, Susan Way, and Crab Way) are local roads for the adjacent land and connect to the Truman Road.

**At the Intersection,** Brooks Road is a two-lane collector and provides access to Hwy 101, for the residents, and a stop sign controls the traffic approaching the Intersection. Hwy 101 is the only provincial highway through the Sunshine Coast Region. It provides the connection between the

Halfmoon Bay community and other communities, as well as the Langdale Ferry terminal. The Brooks Road is the only connection between the Truman Road and Hwy 101.

### 3.3 EXISTING TRANSPORTATION MODES, TRAFFIC VOLUMES, AND LEVEL OF SERVICE

- **Transportation Modes**

A site visit was conducted by an engineer. By observation, the following facts were recognized: **Within the Area**, as a typical rural community, all the traffic was passenger vehicles.

Pedestrians were found to/from the nearby trail with low volume. Transit vehicles were not found, nor were large commercial vehicles.

**At the Intersection**, most traffic was passenger vehicles, and about 5% of traffic was found as large commercial vehicles. No transit vehicles were found, neither bicycles nor pedestrians.

- **Traffic Volume**

**Within the Area**, since there was fairly little traffic found, the intersections were not of concern.

**At the Intersection**, the AM peak traffic was found around 11:00 AM. Therefore, we determined to conduct weekday and weekend traffic counts on October 21st and 24th, 2021, between 11:00 AM and 12:15 PM, for 30 minutes on each collecting date. To estimate the daily traffic volume, we reviewed the traffic data records with the Ministry of Transportation and Infrastructure's Traffic Data Program (at the station of Sechelt P-15-9NS – NY) and adopted 0.085 as the AM peak hour factor for the weekday and 0.1 for the weekend. As a result, the existing traffic volume is estimated as Table 3.1 and Table 3.2 below:

Table 3.1 Weekday AM Peak and Daily Traffic Volume on Brooks Rd at Hwy 101

Entrance Road	Left-Turning (Hourly/Daily)	Straight (Hourly/Daily)	Right-Turning (Hourly/Daily)
Hwy 101 (N)	N/A	218/2565	6/71
Brooks Rd (W)	10/118	N/A	18/214
Hwy 101 (S)	16/188	100/1176	N/A

Table 3.2 Weekend AM Peak and Daily Traffic Volume on Brooks Rd at Hwy 101

Entrance Road	Left-Turning (Hourly/Daily)	Straight (Hourly/Daily)	Right-Turning (Hourly/Daily)
Hwy 101 (N)	N/A	102/1020	6/60
Brooks Rd (W)	4/40	N/A	14/140
Hwy 101 (S)	18/180	92/920	N/A

- **Level of Service (LOS)**

A simplified calculation method is adopted in evaluating the LOS. Given the road conditions at the Intersection and the traffic modes, the capacity is estimated as 1117 vehicles per hour.

Therefore, the v/c ratio is 0.33 for weekdays and 0.21 for weekends. The LOS at the Intersection is ranked as A.

## 4.0 PROPOSED DEVELOPMENT

### 4.1 PROPOSED LAND USE

The parcel is proposed for residential development that has waterfront accesses and trail dedications in a rural residential designation. It is planned to have 44 single houses to provide a rural/healthy lifestyle for the full-time (type of retirement and/or home-occupational employment) residents and vocational/recreational lifestyle for the part-time residents. This development will help to promote local community growth, both socially and economically. Taking the seasonal and rental resident potential into consideration, in the traffic demand forecast (see section 5.1), a conservative number of the total dwelling of 60 is used for analysis.

### 4.2 PROPOSED INTERNAL/EXTERNAL ACCESS

Referring to the site plan, there is one (1) unnamed road proposed to be an internal access. The external accesses are Truman Road and Ross Road. These accesses will provide sufficient capacity for future traffic to/from the 60 dwellings in the Parcel.

### 4.3 PROPOSED NEW ROAD AND EXITING ROAD IMPROVEMENT

Refer to the site plan, there is one (1) new proposed road to be built and one (1) road improvement, as the following:

- An unnamed road (horizontally across the Parcel) to be built, which will provide a major internal access to the Area.
- The Ross Road on the south side to be improved to accommodate the local traffic maneuver, and to act as an external access.

## 5.0 TRAFFIC IMPACT ASSESSMENT

### 5.1 POST-DEVELOPMENT TRAFFIC DEMAND ANALYSIS

Full traffic demand will occur upon the completion of the proposed development (post-development). Therefore, this traffic demand forecast is based on the post-development and adopts the worst scenario analysis methodology.

- Trip generation from the parcel

Referring to the ITE Trip generation rate (the 10th edition), the rate of 0.69 (land use code 270) and 0.99 (land use code 210) are both tested. Taking the community characters (rural, far away from shopping/commercial centers) as consideration, the rate of 0.69 is adopted to evaluate the traffic demand that generate from the parcel. Meanwhile, a PHF of 0.45 is also adopted in daily volume calculation, given the community characters (such as: in a rural area, far away from shopping/business centers, etc.).

Hence, upon the parcel completion, the total generated traffic volume would be as the Table 5.1.

Table 5.1 Traffic Generation from the Parcel

# Of Units	AM Peak Hourly Volume	Daily Volume
60	42	92

- Traffic assignment

With the worst scenario analysis, assign all the above amount of AM peak hourly volume to the Intersection, the resulted assignments are shown in Table 5.2 and Table 5.3. The internal traffic assignments (without adding the background traffic) are shown in Fig. 5.1.

Table 5.2 Weekday Traffic Assignment

Entrance Road	Left-Turning (AM Peak/Daily)	Straight (AM Peak/Daily)	Right-Turning (AM Peak/Daily)
Hwy 101 (N)	N/A	218/2565	6/71
Brook (W)	23/146	N/A	48/279
Hwy 101 (S)	16/189	100/1177	N/A

Table 5.3 Weekend Traffic Assignment

Entrance Road	Left-Turning (AM Peak/Daily)	Straight (AM Peak/Daily)	Right-Turning (AM Peak/Daily)
Hwy 101 (N)	N/A	1020	60
Brook (W)	68	N/A	205
Hwy 101 (S)	180	920	N/A

Based on the above assignment, the v/c ratios, combined with background volume and the generated volume, will be 0.38 for weekdays and 0.25 for weekends. Therefore, the LOS at the Intersection will be ranked as A.

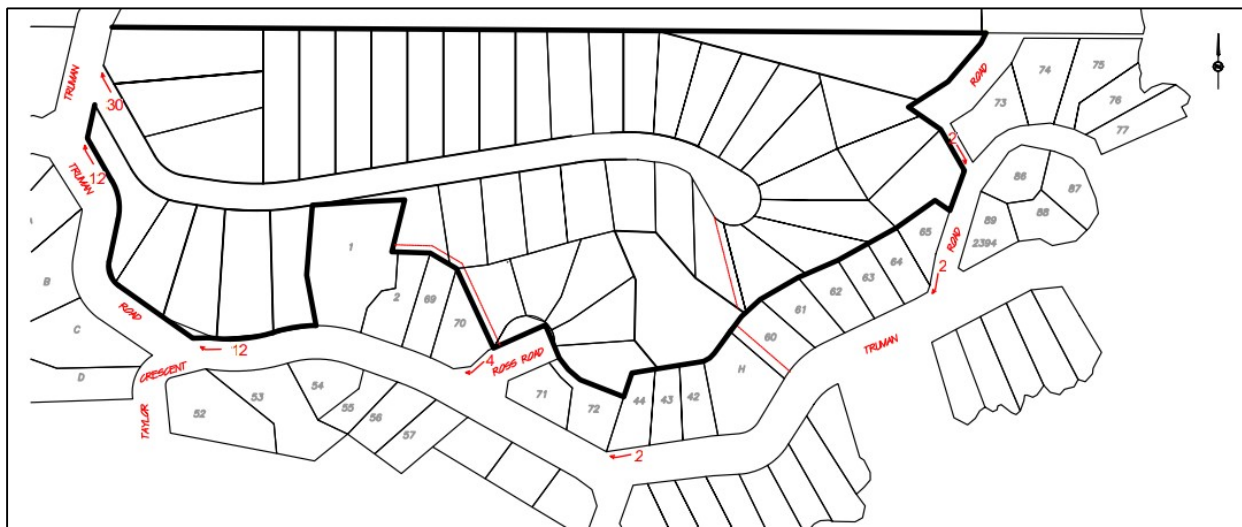


Fig. 5.1 Traffic Assignment

## 5.2 TRAFFIC IMPACT ASSESSMENT

A sensitivity analysis is conducted to evaluate the LOS variation in the future at the Intersection, by assigning the full amount of the demanding traffic from the parcel into the intersection. Different percentages of background traffic incremental have been tested. The results are shown in Table 6.1, and all the v/c ratios are less than 60% of the capacity. The Intersection’s LOS remains at level A.

Thus, the proposed development will not have an impact to the study areas.

Table 6.1 Sensitivity Analysis on Brooks Rd at Hwy 101 (weekday AM Peak)

Parameter		Background Volume	v/c Ratio	Add Traffic from Parcel	v/c Ratio
Existing		368	0.33	411	0.37
Background Traffic Growth	376	0.34	420	0.38	0.38
	405	0.36	453	0.41	0.41
	442	0.40	494	0.44	0.44
	552	0.49	617	0.55	0.55

## 6.0 TRAFFIC SAFETY ANALYSIS

Judging the geometry conditions along the roads and intersections in the Area, the narrow section shaped like an “S” curve (the S Curve) on the existing Truman Road (shown in Figure 6.1) became a concern due to its limited road width and insufficient sight distance. Potential incidents exist when pedestrians use this section as access to the crown land trail.

A site visit was conducted by an associated engineer and found that the narrowest part of the S Curve is about 21 feet wide with huge rocks on both sides, shown in Figure 6.2. Taking the existing dwellings into consideration, it would be difficult to widen this section by blasting the rocks. A possible mitigation measure is to keep the current road condition, apply a signalized single-lane traffic control device and combine it with other traffic management methodologies, such as rumble strips on the road surface and advisory speed sign, etc. A further study is needed for more details if it is necessary.

If the current road condition is kept and signalized single-lane traffic control is applied, the capacity on the S Curve would be reduced by 55% to 60%, but the capacity at the Intersection would not be impacted.

Based on the evaluation and assignment on Section 5.1 in this report, even if the capacity on the S Curve is reduced by 60%, it would still feasibly reach 240 vehicles per hour. Given the total number of dwellings (combined the existing and planned with this development), the v/c ratio would not exceed 60% of its capacity. Therefore, the LOS would remain at level A.



Figure 6.1 S Curve on Truman Road



Figure 6.2 S Curve Road Conditions

**Except for the above concern, we suggest to combine traffic control methodologies in the detail design stage on the surrounding roads, in terms of road safety management.**

## 7.0 CONCLUSIONS AND RECOMMENDATIONS

### 7.1 CONCLUSION

Upon completion, the full traffic demand generated from the Parcel is estimated. The ITE generation rate (the 10th edition) is adopted in the estimation, and the worst scenario analysis methodology is applied when the traffic demand is assigned to the road network in the Area and at the Intersection. To test the result, a sensitivity analysis is also applied to examine the LOS variation at the Intersection.

It is found that even if the background (current) traffic volume increases 50% in the future, the total traffic demand will be less than 60% of the road/intersection capacities. Therefore, we conclude that the parcel development will not have an impact on the surrounding roads and their intersections, nor on Hwy 101.

### 7.2 RECOMMENDATIONS

The following recommendations are made to address the concerns raised in section 6.0 Traffic Safety Analysis in this report, and to provide suggestions for the proposed new road and Ross Road improvement:

- The proposed new road at Truman Road  
The proposed new road will form a staggered intersection with Truman Road at Natalie Lane. To reduce potential incidents, the STOP and YIELD signs should be installed on the approaches on Natalie Lane and the proposed road.
- For the proposed new road, the following elements should be carefully considered during the roadway design:
  - ✓ Intersection alignment,
  - ✓ Stop Sight Distance at the intersection,
  - ✓ Sight Triangle on each approaching leg,
  - ✓ Design speed,
  - ✓ Traffic control signs and pavement marking, and
  - ✓ Traffic channelization.