



VEYANESS CHILD CARE CENTRE

Transportation Impact Assessment

PERMIT TO PRACTICE
WATT CONSULTING GROUP LTD.
SIGNATURE _____
DATE _____
PERMIT NUMBER 1001432
ENGINEERS & GEOSCIENTISTS
BRITISH COLUMBIA

Tanner Vollema, EIT

Author

Andy Kading, P.Eng., P.E.

Reviewer

Prepared For: Saanich School District (SD 63)

Date: June 15, 2022

Our File No: 3316.B01

WATT VICTORIA

302 – 740 Hillside Ave

Victoria, BC V8T 1Z4

250-388-9877



TABLE OF CONTENTS

TABLE OF CONTENTS.....	1
LIST OF FIGURES.....	2
LIST OF TABLES	2
APPENDICES	3
1.0 INTRODUCTION.....	4
1.1 Study Area	4
2.0 EXISTING CONDITIONS	6
2.1 Current Land Use.....	6
2.2 Road Network	6
2.3 Traffic Modelling – Background Information.....	7
2.4 Existing Traffic Conditions (2022)	7
2.4.1 Data Collection.....	7
2.4.2 Analysis Results.....	8
3.0 POST DEVELOPMENT	10
3.1 Proposed Land Use.....	10
3.2 Trip Generation	10
3.3 Trip Assignment	11
3.4 Post Development Conditions.....	13
4.0 LONG-TERM CONDITIONS (2032).....	16
4.1 2032 Background Conditions.....	16
4.2 2032 Post Development Conditions.....	19
5.0 ACCESS REVIEW.....	20



5.1	Spacing	20
5.2	Sightlines	21
6.0	WHITE ROAD INTERSECTION AT VEYANESS ROAD	21
7.0	ACTIVE TRANSPORTATION.....	21
7.1	Pedestrians	21
7.2	Cyclists	22
7.3	Transit	23
8.0	CONCLUSIONS	23
8.1	Recommendations.....	24

LIST OF FIGURES

Figure 1: Development Site and Key Intersections	5
Figure 2: 2022 Existing Volumes	8
Figure 3: Site Plan	10
Figure 4: Trip Assignment	13
Figure 5: 2022 Post Development Volumes.....	14
Figure 6: 2032 Background Volumes	17
Figure 7: 2032 Post Development Volumes.....	19

LIST OF TABLES

Table 1: 2022 Existing Conditions	9
Table 2: Trip Generation Summary – AM and PM Peak Hour	11
Table 3: 2022 Post Development Conditions.....	15
Table 4: 2032 Background Conditions	18



Table 5: 2032 Post Development Conditions.....	20
--	----

APPENDICES

Appendix A: Synchro Background



1.0 INTRODUCTION

Watt Consulting Group was retained by Saanich School District (SD 63) to undertake a Transportation Impact Assessment (TIA) of the proposed Veyaness Child Care Centre in Central Saanich. This TIA examines the existing conditions as well as the opening day post development and long-term (10-year post development) conditions, including identifying potential mitigation measures (where necessary). The TIA also includes a site access review and a review of the active transportation networks within the vicinity of the site.

1.1 Study Area

The development is located at 7420 Veyaness Road in the District of Central Saanich. The study area includes the following key intersections:

- East Saanich Road / Veyaness Road
- Veyaness Road / White Road

Figure 1 shows the study intersections and site location.



Figure 1: Development Site and Key Intersections



2.0 EXISTING CONDITIONS

2.1 Current Land Use

The development site is currently undeveloped. The surrounding land use is primarily residential (single family detached housing) and agricultural.

2.2 Road Network

There are three (3) roadways within the study area, as described below:

- **East Saanich Road** is a two-lane collector road that runs roughly north / south near the development site. East Saanich Road has bike lanes on both sides and a sidewalk on the west side of the road; there is also a sidewalk on the east side of the road north of Veyaness Road. East Saanich Road has a posted speed limit of 50 km/h.
- **Veyaness Road** is a two-lane local road that runs north / south from East Saanich Road to Keating Cross Road. North of the development site, there is a gravel pedestrian pathway that continues north to East Saanich Road. There is no additional pedestrian infrastructure and no bike infrastructure on Veyaness Road. There is a wide shoulder on the east side of road that is used for parking and is therefore not suitable for pedestrian use. Veyaness Road has a posted speed limit of 35 km/h.
- **White Road** is a two-way unmarked local road. White Road runs west from Veyaness Road for 175m before turning 90 degrees to the south and becoming Seabrook Road. White Road is narrow (~5.5m in width) with no shoulders and has no pedestrian / bicycle infrastructure. The posted speed limit on White Road is 35 km/h.

Two (2) key intersections were identified within the study area:

- **East Saanich Road / Veyaness Road** is a four-legged intersection with stop-control on the north and south leg. The intersection is highly skewed, with Veyaness Road running roughly north / south and East Saanich Road (which generally runs north / south) running northwest / southeast at the intersection. For the purposes of this TIA, East Saanich Road will be considered to run east /



- west at this intersection. The north leg of the intersection is the Michell Excavating driveway. There is a short channelized eastbound right-turn lane (yield-controlled). There are crosswalks across the eastbound and northbound approaches of the intersection.
- **Veyaness Road / White Road** is a three-legged T-intersection with stop-control on the eastbound approach (on White Road). The eastbound approach has separate left- and right-turn lanes separated by a grass ‘porkchop’ island.

2.3 Traffic Modelling – Background Information

Analysis of the traffic conditions at the study intersections was undertaken using Synchro Studio (Version 11). Synchro / SimTraffic is a two-part traffic modelling software that provides analysis of the traffic conditions based on the Highway Capacity Manual (2010) evaluation methodology. A detailed description is provided in **Appendix A**.

Synchro was used to determine the LOS, delays, and 95th percentile queue lengths of each intersection movement. The LOS are broken down into six letter grades, with LOS A being excellent operations and LOS F being unstable / failure operations. LOS C is typically considered acceptable, while LOS D is generally considered to be on the threshold between acceptable and unacceptable operations.

2.4 Existing Traffic Conditions (2022)

2.4.1 Data Collection

Traffic turning movement counts were conducted at the study intersections during the AM and PM peak hours (8-9AM and 4-5PM respectively) on Tuesday May 31, 2022. The resulting volumes are shown in **Figure 2**.

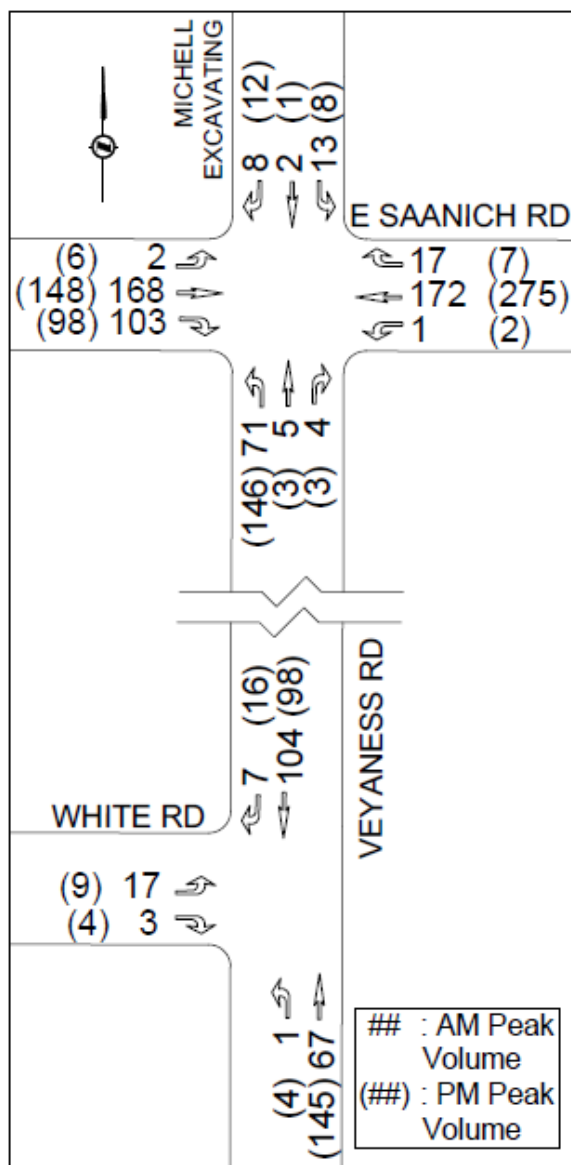


Figure 2: 2022 Existing Volumes

2.4.2 Analysis Results

The existing 2022 volumes were analyzed in Synchro software to determine the existing 2022 conditions during the AM and PM peak hours. The analysis results are summarized in **Table 1**.



Table 1: 2022 Existing Conditions

Intersection (EW / NS)	Movement	AM Peak			PM Peak		
		LOS	Delay (s)	95 th % Queue (m)	LOS	Delay (s)	95 th % Queue (m)
East Saanich Rd / Veyaness Rd	EB L/T	A	7.7	0.0	A	8.0	0.7
	EBR	A	0.0	0.0	A	0.0	0.0
	WB L/T/R	A	0.1	0.0	A	0.1	0.0
	NB L/T/R	B	13.9	6.3	C	21.2	18.2
	SB L/T/R	B	11.8	1.4	B	12.6	2.1
Veyaness Rd / White Rd	EBL	A	9.8	0.7	B	10.6	0.7
	EBR	A	8.9	0.0	A	8.9	0.0
	NB L/T	A	0.1	0.0	A	0.3	0.0
	SB R/T	A	0.0	0.0	A	0.0	0.0

Both study intersections operate acceptably under existing 2022 existing conditions, with all movements at LOS A/B in the AM peak hour and LOS C or better in the PM peak hour. No queueing issues were observed.



3.0 POST DEVELOPMENT

3.1 Proposed Land Use

The proposed development is a child care centre with a maximum capacity of 60 students. The site will be accessed via a single access on Veyaness Road. The site plan is shown in **Figure 3**.

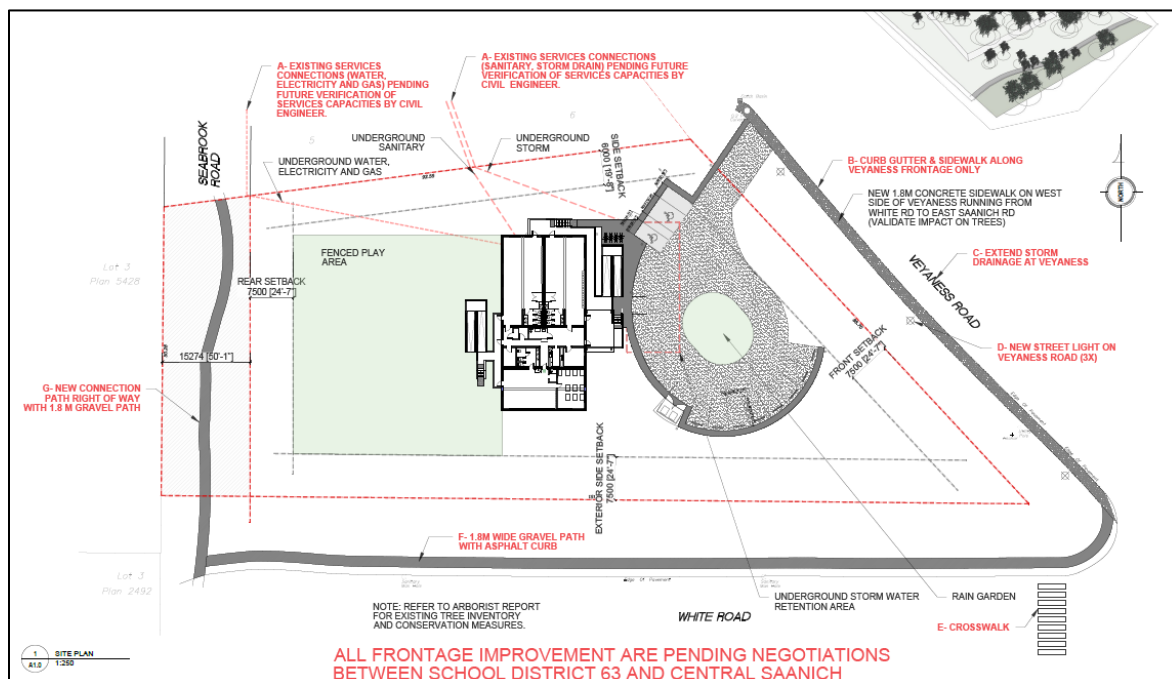


Figure 3: Site Plan

3.2 Trip Generation

The number of site trips expected to be generated from the proposed development were calculated using the Institute of Transportation Engineers' (ITE) Trip Generation Manual (11th Edition). The Trip Generation Manual provides trip rates for a wide variety of land uses gathered from actual sites across North America over the past 40 years.



The results of the trip generation are summarized in **Table 2**. The development is expected to generate 47 trips (25 inbound / 22 outbound) during the AM peak hour and 47 trips (22 inbound / 25 outbound) during the PM peak hour.

It should be noted that this estimate is high as the pickup/drop off will occur over many hours (centre will be open after 5PM, and different aged children will arrive and depart at different times), not just the one peak hour as is assumed here; the results of this study should therefore be considered conservative.

Table 2: Trip Generation Summary – AM and PM Peak Hour

ITE Code	Land Use	Units	Trip Rate	Trips In	Trips Out	Total Trips
AM Peak Hour						
565	Day Care Centre	60 students	0.78 / student	25	22	47
Total (AM Peak):				25	22	47
PM Peak Hour						
565	Day Care Centre	60 students	0.79/ student	22	25	47
Total (PM Peak):				22	25	47

3.3 Trip Assignment

The trip assignment for the primary trips were based on the existing traffic patterns and the key origins and destinations for traffic in the area. The trips generated by the development during the AM and PM peak hours were assigned based on the following distribution ratios:

AM Peak Hour



- Inbound Trips:
 - 55% of inbound trips come from the north via East Saanich Road;
 - 40% of inbound trips come from the south via Veyaness Road; and
 - 5% of inbound trips come from the southwest via White Road.

- Outbound Trips:
 - 40% of outbound trips are heading to the north via East Saanich Road;
 - 55% of outbound trips are heading to the south via Veyaness Road; and
 - 5% of outbound trips are heading to the southwest via White Road.

PM Peak Hour

- Inbound Trips:
 - 40% of inbound trips come from the north via East Saanich Road;
 - 55% of inbound trips come from the south via Veyaness Road; and
 - 5% of inbound trips come from the southwest via White Road.

- Outbound Trips:
 - 55% of outbound trips are heading to the north via East Saanich Road;
 - 40% of outbound trips are heading to the south via Veyaness Road; and
 - 5% of outbound trips are heading to the southwest via White Road.

The resulting trip assignment is shown in **Figure 4**.

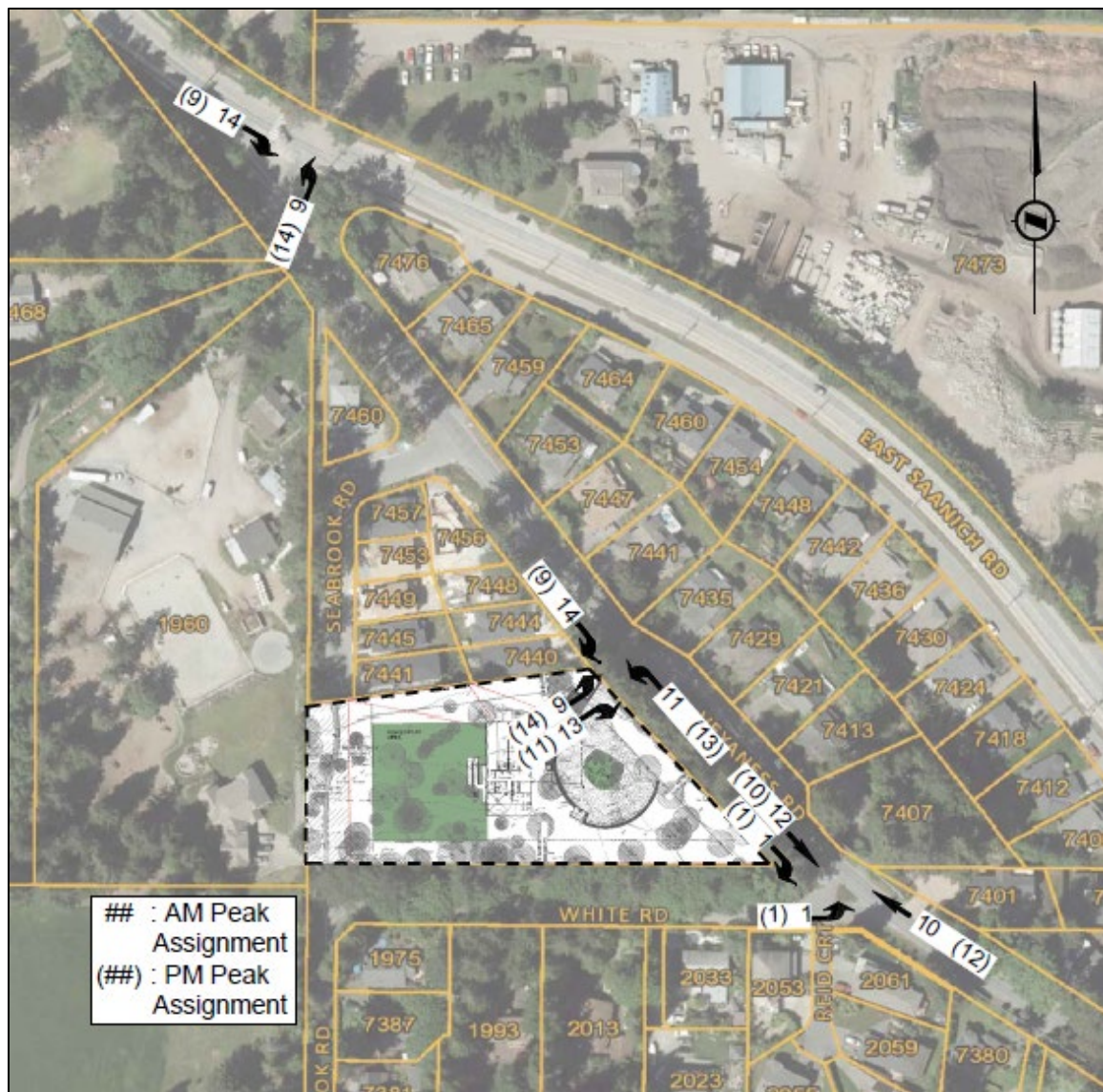


Figure 4: Trip Assignment

3.4 Post Development Conditions

The 2022 post development volumes were determined by adding the development generated trips to the existing volumes. The resulting post development volumes (shown



in **Figure 5)** were analyzed in Synchro to determine the post development conditions. The analysis results are summarized in **Table 3**.

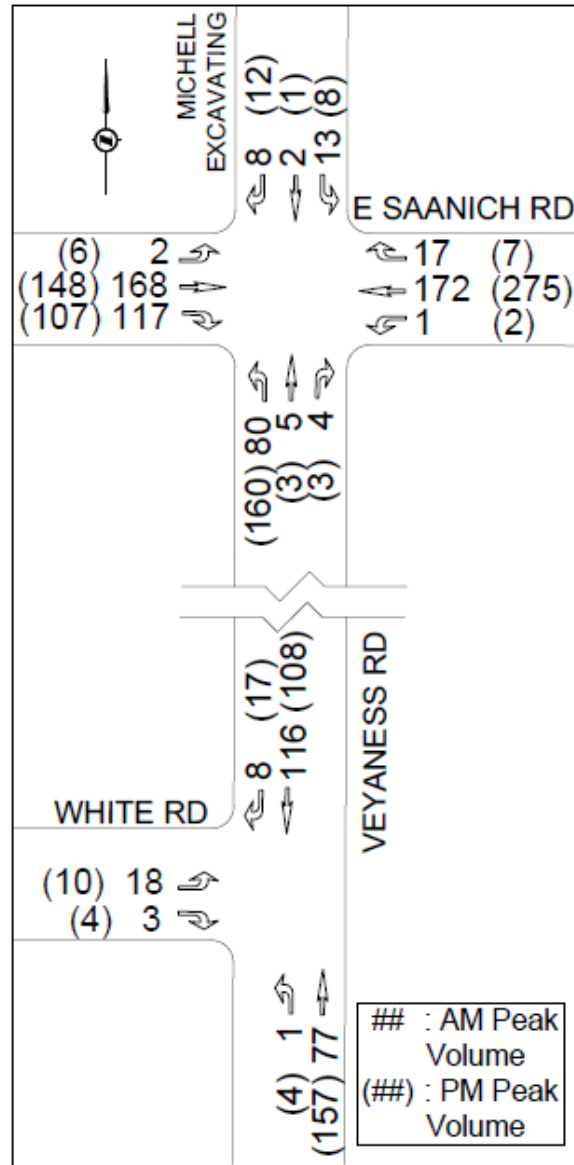


Figure 5: 2022 Post Development Volumes



Table 3: 2022 Post Development Conditions

Intersection (EW / NS)	Movement	AM Peak			PM Peak		
		LOS	Delay (s)	95 th % Queue (m)	LOS	Delay (s)	95 th % Queue (m)
East Saanich Rd / Veyaness Rd	EB L/T	A	7.7	0.0	A	8.0	0.7
	EBR	A	0.0	0.0	A	0.0	0.0
	WB L/T/R	A	0.1	0.0	A	0.1	0.0
	NB L/T/R	B	14.3	7.0	C	22.6	21.0
	SB L/T/R	B	11.8	1.4	B	12.6	2.1
Veyaness Rd / White Rd	EBL	B	10.0	0.1	B	10.9	0.7
	EBR	A	0.1	0.0	A	9.0	0.0
	NB L/T	A	0.1	0.0	A	0.3	0.0
	SB R/T	A	0.0	0.0	A	0.0	0.0

Both study intersections continue to operate acceptably under 2022 post development conditions, with all movements at LOS A/B in the AM peak hour and LOS C or better in the PM peak hour. The addition of site traffic does not have impact the intersection operations, and all levels of service remain unchanged from existing (with the exception of the Veyaness Road / White Road eastbound left turn movement, which crosses the threshold from LOS A to B in the AM due to a 0.3 second delay increase). No queueing issues were observed.



4.0 LONG-TERM CONDITIONS (2032)

In order to determine the long-term impact of the proposed development, the background and post development conditions were examined for the 10-year post development horizon (2032).

4.1 2032 Background Conditions

The 2032 background volumes were determined by applying an annual growth rate to the existing 2022 volumes. Based on historical volumes obtained from the CRD's traffic data website, between 2008 and 2018 the volumes on East Saanich Road grew by less than 1% annually (2020 volumes were excluded due to the impact of Covid). To be conservative, an annual growth rate of 1.5% was used to determine long-term volumes. The resulting 2032 background volumes are shown in **Figure 6**. The 2032 background volumes were then analyzed in Synchro software to determine the long-term conditions. The analysis results are summarized in **Table 4**.

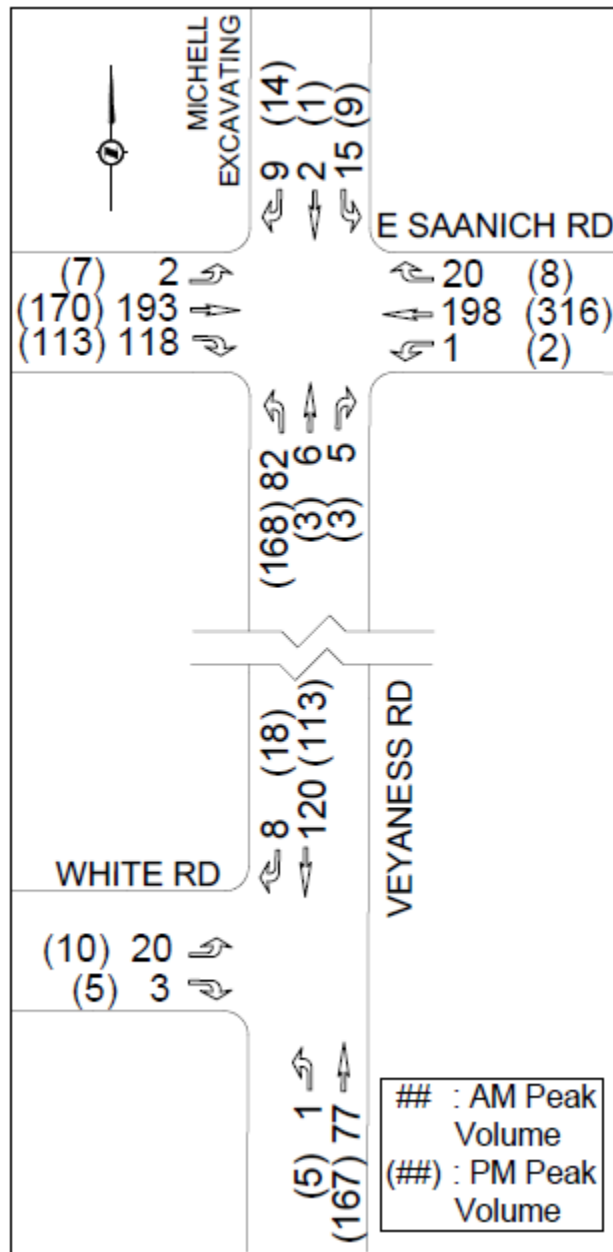


Figure 6: 2032 Background Volumes



Table 4: 2032 Background Conditions

Intersection (EW / NS)	Movement	AM Peak			PM Peak		
		LOS	Delay (s)	95 th % Queue (m)	LOS	Delay (s)	95 th % Queue (m)
East Saanich Rd / Veyaness Rd	EB L/T	A	7.8	0.0	A	8.1	0.7
	EBR	A	0.0	0.0	A	0.0	0.0
	WB L/T/R	A	0.1	0.0	A	0.1	0.0
	NB L/T/R	C	15.4	7.7	D	29.8	29.4
	SB L/T/R	B	12.5	1.4	B	13.5	2.1
Veyaness Rd / White Rd	EBL	B	10.0	0.7	B	11.1	0.7
	EBR	A	9.0	0.0	A	9.0	0.0
	NB L/T	A	0.1	0.0	A	0.3	0.0
	SB R/T	A	0.0	0.0	A	0.0	0.0

Under 2032 background conditions, the northbound movement at the East Saanich Road / Veyaness Road intersection drops from LOS C to LOS D in the PM peak. The remaining movements are at LOS C or better during both peak hours. The vast majority of northbound traffic (96%) is turning left during the PM peak hour; providing a separate left turn lane to allow through / right-turning traffic to bypass the queue is not warranted.

The Veyaness Road / White Road operates acceptably in 2032, with all movements at LOS A/B during both peak hours under background conditions. No significant queueing issues were observed.



4.2 2032 Post Development Conditions

The 2032 post development volumes were obtained by adding the trips generated by the site to the 2032 background volumes. The resulting 2032 post development volumes are shown in **Figure 7**.

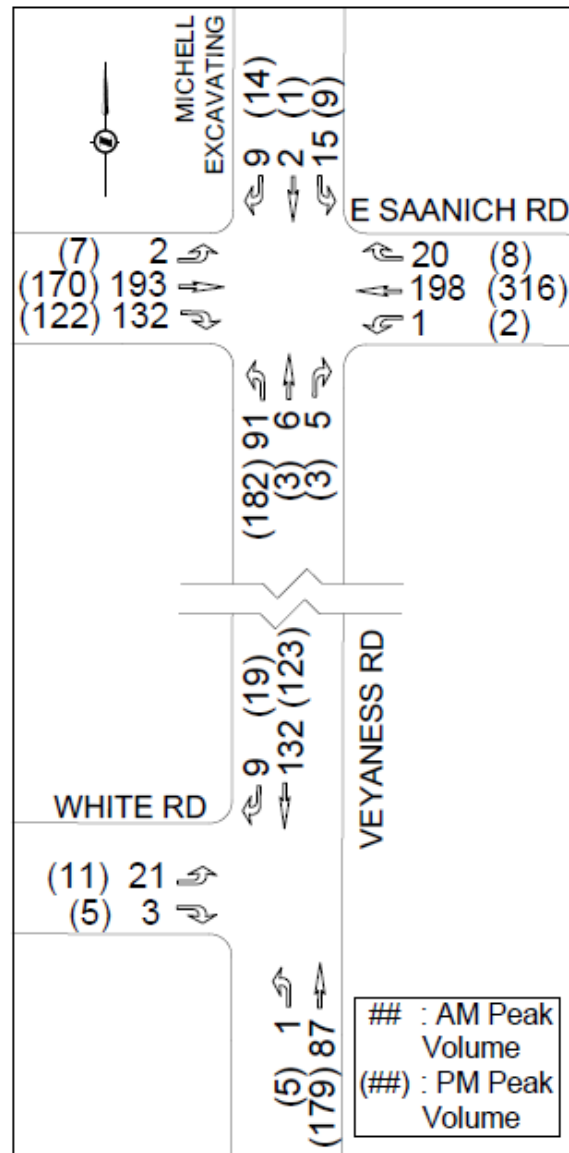


Figure 7: 2032 Post Development Volumes



Table 5: 2032 Post Development Conditions

Intersection (EW / NS)	Movement	AM Peak			PM Peak		
		LOS	Delay (s)	95 th % Queue (m)	LOS	Delay (s)	95 th % Queue (m)
East Saanich Rd / Veyaness Rd	EB L/T	A	7.8	0.0	A	8.1	0.7
	EBR	A	0.0	0.0	A	0.0	0.0
	WB L/T/R	A	0.1	0.0	A	0.1	0.0
	NB L/T/R	C	15.9	8.4	D	33.2	34.3
	SB L/T/R	B	12.5	1.4	B	13.5	2.1
Veyaness Rd / White Rd	EBL	B	10.2	0.7	B	11.3	0.7
	EBR	A	9.1	0.0	A	9.1	0.0
	NB L/T	A	0.1	0.0	A	0.3	0.0
	SB R/T	A	0.0	0.0	A	0.0	0.0

Under 2032 post development conditions, the intersections are not impacted by the addition of site traffic. The levels of service of all intersection movements are unchanged from 2032 background conditions. No significant queueing issues were observed.

5.0 ACCESS REVIEW

5.1 Spacing

The proposed site access is located on Veyaness Road 85m north of White Road, which exceeds the TAC recommended minimum corner clearance of 15m for local roads from a stop-controlled major intersection. The spacing between the access and the driveway for



the adjacent property is 10m, which exceeds the 5m spacing recommended by TAC. Based on the above, the access spacing for the proposed development is appropriate.

5.2 Sightlines

The TAC *Geometric Design Guide for Canadian Roads* (2017) provides recommended minimum intersection sight distances for drivers turning out onto a road from a stop-controlled intersection. For turning onto a road with a speed limit of 40km/h, TAC recommends a sight distance of 85m looking to the right and 75m looking to the left (Tables 9.9.4 / 9.9.6). At the proposed access, the sight distances to the left (north) and right (south) are both 110m in length, exceeding the TAC recommendations.

6.0 WHITE ROAD INTERSECTION AT VEYANESS ROAD

The intersection of White Road at Veyaness Road has a non-standard “Y” configuration. This allows for unexpected vehicle maneuvers, left and right turns from two closely spaced locations, an overly steep look-back angle for the southern leg looking left, and in general should be examined for changes.

The traffic analysis in this report demonstrates that the proposed development does not alter traffic along White Road such that it would be responsible for any roadworks associated with changes at this intersection.

7.0 ACTIVE TRANSPORTATION

7.1 Pedestrians

There are sidewalks on both sides of East Saanich Road north of Veyaness Road. South of Veyaness Road, there is a sidewalk on the west side of East Saanich Road only. There are crosswalks across the east and south leg of the East Saanich Road / Veyaness Road intersection. Veyaness Road has a gravel pathway on the west side that runs from East



Saanich Road to the north boundary of the development site. There are no pedestrian facilities on Veyaness Road south of the site. White Road has no pedestrian facilities; due to the low traffic volumes, pedestrians should be able to share the travel lane.

There is a network of informal walking trails through the development site. These trails connect to the gravel path on Veyaness Road and provide a connection through the site between White Road and Seabrook Road. The developer is proposing to build a formal trail on the west edge of the property to maintain the pedestrian connection from Seabrook Road to White Road. A 1.8m gravel path is also proposed along White Road which will link the Seabrooke Road/White Road path to the proposed sidewalk along the eastern frontage on Veyaness Road. This sidewalk will connect to the existing gravel path north of the site thus creating pedestrian facilities on three sides of the centre.

There are no pedestrian facilities on the east side of Veyaness Road, and no pedestrian facilities south of the development site. As such no crosswalks are warranted across Veyaness Road or White Road at this time.

7.2 Cyclists

There are painted bike lanes on both sides of East Saanich Road. There are no dedicated bicycle facilities on Veyaness Road or on White Road. In the District of Central Saanich's *Active Transportation Plan* (2021), Seabrook Road is designated as a future connector route that will connect to future facilities on Stellys Cross Road and Keating Cross Road. Most of this route will be a shared road, as Seabrook Road has low vehicle volumes and should be comfortable for most cyclists to use; however, Seabrook Road is discontinuous and divided into two sections by the development site. The proposed 1.8m gravel pathway through the west portion of the development site will provide a connection between the north and south sections of Seabrook Road. The developer should discuss with the District regarding the pathway width requirements for use as cyclist connector.



7.3 Transit

The nearest transit stops are located 260m north of the site on East Saanich Road at the Veyaness Road intersection. The stops are serviced by BC Transit Route #72 (Swartz Bay / Downtown). Route #72 provides frequent service (every 30-45 minutes) between downtown Victoria and the Swartz Bay ferry terminal and provides connection to Saanich and Sidney as well as Uptown mall and the Royal Oak, Saanichton, and McTavish exchanges.

8.0 CONCLUSIONS

The East Saanich Road / Veyaness Road and Veyaness Road / White Road intersections operate well under existing conditions, with all movements at LOS A/B in the AM peak hour and LOS C or better in the PM peak hour.

The proposed Veyaness Child Care Centre development will generate 47 trips during each of the AM and PM peak hours. Under post development conditions, the study intersections continue to operate acceptably; no changes to the levels of service occur due to the addition of site traffic except for the Veyaness Road / White Road eastbound left turn movement, which crosses the threshold from LOS A to B in the AM due to a 0.3 second delay increase.

In the long-term 10-year post-development horizon (2032), under background conditions, the northbound movement of East Saanich Road / Veyaness Road drops to LOS D in the PM peak. The remaining movements at both study intersections operate at LOS C or better during both peak hours. Under 2032 post development conditions, the intersection operations are not impacted by the addition of site traffic; no changes to the levels of service occur (compared to 2032 background conditions).



Traffic analysis results demonstrate that no roadway changes are needed and that the existing network has capacity to spare. This includes changes to the intersection of White Road and Veyaness Road.

The proposed site access location is spaced appropriately from both the nearest driveway and nearest intersection and has adequate sightlines to allow drivers to easily exit the site.

The proposed pedestrian improvements (pathways and sidewalk) will allow for greater pedestrian access of the area. No crosswalks are warranted across Veyaness Road or White Road at this time.

As Seabrook Road is intended as a future cycling connector route, the developer should discuss with the district on the required width of the pathway through the site to ensure the pathway will accommodate the connector route. Transit stops are located 260m north of the site; no upgrades to transit infrastructure are recommended.

8.1 Recommendations

The following recommendations are made for the proposed Veyaness Child Care Centre development:

- Regarding the pathway through the west portion of the site connecting Seabrook Road and White Road, the developer should discuss with the District regarding the pathway width requirements needed to function as a future cyclist connector route.

The following recommendations are made for the District:

- The District should examine changes to the intersection of White Road and Veyaness Road, and seek to remove one of the “Y” legs in the future.



APPENDIX A: SYNCHRO BACKGROUND



SYNCHRO MODELLING SOFTWARE DESCRIPTION

The traffic analysis was completed using Synchro (Signal and stop-controlled intersections), SimTraffic traffic modeling software and SIDRA (for roundabout intersections). Results were measured in delay, level of service (LOS) and 95th percentile queue length. Synchro is based on the Highway Capacity Manual (HCM 2010) methodology. SimTraffic integrates established driver behaviours and characteristics to simulate actual conditions by randomly “seeding” or positioning vehicles travelling throughout the network. The simulation is run five times (five different random seedings of vehicle types, behaviours and arrivals) to obtain statistical significance of the results. SIDRA provides results using HCM 2010 methodology as well. SIDRA and Synchro uses measures of effectiveness to return the results of the analysis.

Levels of Service

Traffic operations are typically described in terms of levels of service, which rates the amount of delay per vehicle for each movement and the entire intersection. Levels of service range from LOS A (representing best operations) to LOS E/F (LOS E being poor operations and LOS F being unpredictable/disruptive operations). LOS E/F are generally unacceptable levels of service under normal everyday conditions.

The hierarchy of criteria for grading an intersection or movement not only includes delay times, but also takes into account traffic control type (stop signs or traffic signal). For example, if a vehicle is delayed for 19 seconds at an unsignalized intersection, it is considered to have an average operation, and would therefore be graded as an LOS C. However, at a signalized intersection, a 19 second delay would be considered a good operation and therefore it would be given an LOS B. The table below indicates the range of delay for LOS for signalized and unsignalized intersections.



Table A1: LOS Criteria, by Intersection Traffic Control

Level of Service	Unsignalized Intersection Average Vehicle Delay (sec/veh)	Signalized Intersection Average Vehicle Delay (sec/veh)
A	Less than 10	Less than 10
B	10 to 15	11 to 20
C	15 to 25	20 to 35
D	25 to 35	35 to 55
E	35 to 50	55 to 80
F	More than 50	More than 80