CTQ Consultants Ltd

Project No.: 16028
File No.: 5-L-007

September 28, 2016

COST

TIME

QUALITY

Lark Group
Suite 1500, 13737 96 Avenue
Surrey, BC V3V 0C6
Attention: **Mr. Malek Tawashy**

Dear Sir:

Re: Okanagan Vistas Independent & Assisted Living, Summerland BC
Traffic Review

We are pleased to provide the following review of the anticipated traffic generated by the proposed 346 unit mixed use, market Housing and Seniors Residential Development with access off of Banks Crescent. The site location is shown on the **Figure 1** air photo below.

Figure 1 - Site Location

Reference: **Okanagan Vistas Independent & Assisted Living, Summerland BC**
Traffic Review

The development is planned to have:

- 211 units of 1 and 2 bedroom Condominium Units (Market Housing);
- 99 Independent Living Rental Units for Seniors (with independent kitchens); and
- 36 Assisted Living and Memory Care Units for Seniors (with shared kitchen facilities).

In support of the anticipated traffic generation from the project, we have reviewed the existing traffic on Latimer Avenue and Solly Road. Latimer Avenue connects with Solly Road to the north, and via Gillespie Road, back to Solly Road to the east. Solly Road intersects with Highway 97 to the west and Lakeshore Drive S to the east. We completed a physical one day traffic count on July 11, 2016 at the intersection of Solly Road and Latimer Avenue. The observed traffic volumes of 1,500 vehicles per day on Solly Road (to the west of Larimer Avenue) are currently well below the collector road threshold of 8,000 trips per day.

A) TRIP GENERATION AND DISTRIBUTION

Reviews of similar types of independent and assisted living developments indicate that the major traffic generation is from the arrival and departure of the kitchen and support staff. The staff tends to arrive prior to the AM peak hour and depart after the PM peak hour, and thus have a minimal impact on the local road network. The number of visitors is minimal, with the largest numbers of visits occurring during the weekend.

We anticipate the development will generate traffic of a similar proportion and distribution to the *Institute of Transportation Engineers Trip Generation 9th Edition Manual* for the following, and as presented in **Table 1** on the following page:

- Residential Condo / Townhouse (Land Use Code 230);
- Senior Adult Housing – attached (Land Use Code 254); and
- Assisted living (Land Use Code 230).

Reference: **Okanagan Vistas Independent & Assisted Living, Summerland BC**
Traffic Review

ITE Trip Generation Rates - 9th Edition

Description /ITE Code	Units	ITE Vehicle Trip Generation Rates							Expected Units	Total Generated			Total Distribution of Generated			
		Weekday	AM	PM	AM In	AM Out	PM In	PM Out		Daily	AM Hour	PM Hour	AM In	AM Out	PM In	PM Out
Senior Adult Housing-Attached 252	DU	3.44	0.20	0.25	34%	66%	54%	46%	99	341	20	25	7	13	13	11
Assisted Living 254	Beds	2.66	0.14	0.22	65%	35%	44%	56%	36	96	5	8	3	2	3	4
Resd. Condo /Townhouse 230	DU	5.81	0.44	0.52	17%	83%	67%	33%	211	1,226	93	110	16	77	74	36
										1,662	118	142	26	92	90	52

Table 1 – ITE Trip Generation Rates

The ITE Trip Generation rates from **Table 1** produce the following average weekday traffic volumes:

- AM Peak Hour - 92 out bound trips, 26 inbound trips;
- PM Peak Hour - 52 outbound trips, 90 inbound trips.

The *Institute of Transportation Engineers Trip Generation 9th Edition Manual* is used as an industry standard to provide estimates of vehicle trips for specific developments. The rates are based on information collated from actual traffic studies, and presented for the average weekday Peak Hour volumes the specific land use will generate, during normal operations.

Based on a review of the background traffic volumes and the anticipated areas of employment, and commercial activity for the development residents, we anticipate the following traffic distribution to and from the site:

- 50% of the traffic will to and from the central core of Summerland via Prairie Valley Road on to Solly Road;
- 25% of the traffic will be to and from the north via Highway 97 onto Solly Road; and
- 25% of the traffic will be to and from the south, with an even split between Highway 97 (onto Solly Road), and Lakeshore Drive S (onto Gillespie Road).

The site generated traffic distribution for the PM Peak Hour is presented on **Figure 2** on the following page.

Reference: **Okanagan Vistas Independent & Assisted Living, Summerland BC**
Traffic Review

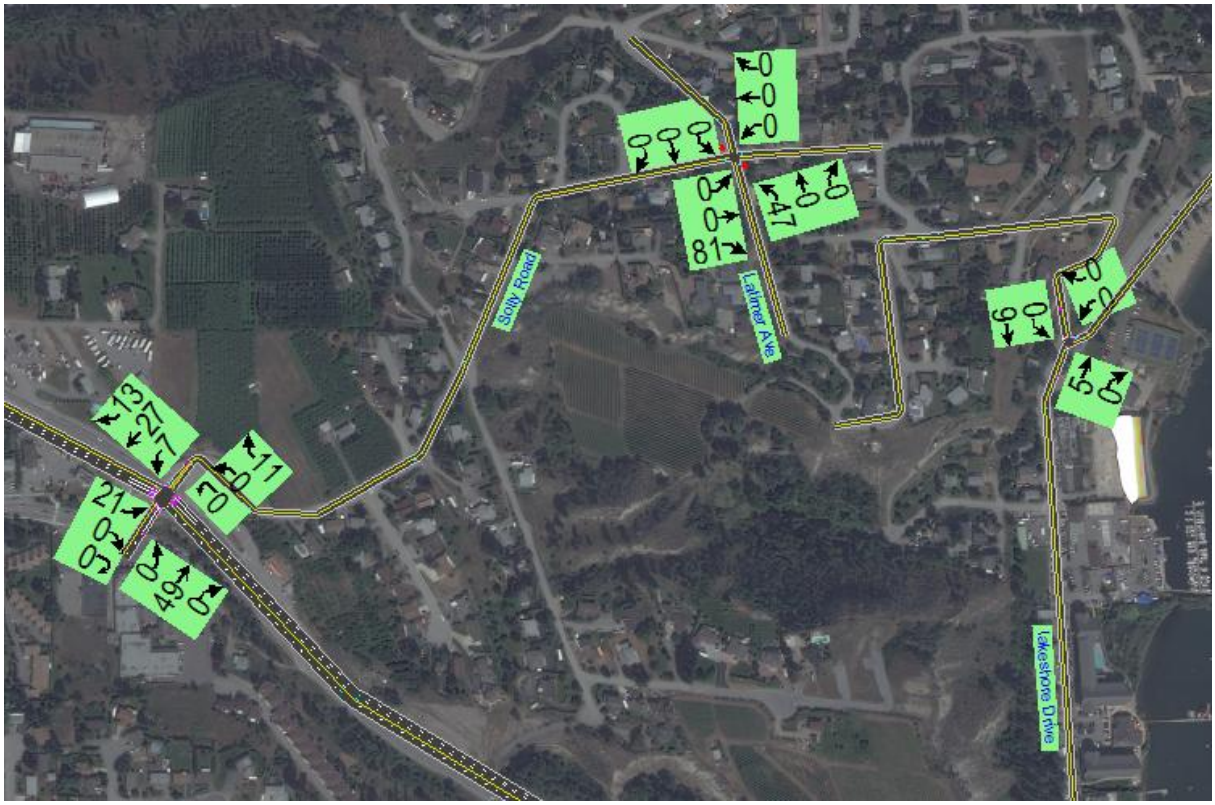

Figure 2 - Site Traffic Distribution

B) BACKGROUND TRAFFIC

We completed a physical one day traffic count on July 11, 2016 at the intersection of Solly Road and Latimer Avenue. The recorded PM Peak Hour traffic volumes are presented in **Figure 3** below.

Figure 3 – 2016 Background PM Peak Hour Traffic

Reference: **Okanagan Vistas Independent & Assisted Living, Summerland BC**
Traffic Review

C) TRAFFIC ANALYSIS

The operation of the Solly Road and Latimer Avenue intersection has been analyzed utilizing Highway Capacity Manual Synchro 9 software for unsignalized intersections. An operational level of service is determined for each movement based upon the calculated delay.

The Levels of Service for unsignalized intersections are as follows:

- Level of Service (LoS) A represents less than 10 seconds of average delay and is considered a good operating condition.
- Level of Service (LoS) B represents greater than 10 seconds and less than 15 seconds of average delay and is considered a good operating condition.
- Level of Service C represents greater than 15 seconds and less than 25 seconds of average delay and is considered a fair operating condition.
- Level of Service D represents greater than 25 seconds and less than 35 seconds of average delay and is considered a fair operating condition.
- Level of Service E represents greater than 35 seconds and less than 50 seconds of average delay and is considered a poor operating condition.
- Level of Service F represents more than 50 seconds of average delay and is considered a failed operating condition.

Generally, and in accordance with the *Ministry of Transportation Site Impact Analysis Requirements Manual*, in urban areas, improvements are considered when the overall intersection performance nears Level of Service E. For arterial streets, trough traffic improvements are to be considered when the performance nears Level of Service D.

The Background traffic was analyzed for the Weekday PM Peak Hour traffic for the 2026 year. The 2016 background traffic was increased by an annual growth of 2% per year to establish the 2016 background traffic volumes. The Synchro 9 analysis results are provided in **Figure 4** on the following page**.**

Reference: **Okanagan Vistas Independent & Assisted Living, Summerland BC**
Traffic Review

HCM 2000 SIGNING SETTINGS	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lanes and Sharing (#RL)												
Traffic Volume (vph)	13	78	5	4	38	1	1	2	2	4	0	17
Future Volume (vph)	13	78	5	4	38	1	1	2	2	4	0	17
Sign Control	—	Free	—	—	Free	—	—	Stop	—	—	Stop	—
Median Width (m)	—	0.0	—	—	0.0	—	—	0.0	—	—	0.0	—
TWLTL Median	—	☐	—	—	☐	—	—	☐	—	—	☐	—
Right Turn Channelized	—	—	None	—	—	None	—	—	None	—	—	None
Critical Gap, tC (s)	4.1	—	—	4.1	—	—	7.1	6.5	6.2	7.1	—	6.2
Follow Up Time, tF (s)	2.2	—	—	2.2	—	—	3.5	4.0	3.3	3.5	—	3.3
Volume to Capacity Ratio	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.02	—	0.02
Control Delay (s)	0.1	1.0	1.0	0.0	0.7	0.7	9.5	9.5	9.5	8.9	—	8.9
Level of Service	A	A	A	A	A	A	A	A	A	A	—	A
Queue Length 95th (m)	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.5	—	0.5
Approach Delay (s)	—	1.0	—	—	0.7	—	—	9.5	—	—	8.9	—

Figure 4 – 2026 Background PM Peak Hour Traffic Analysis

The intersection operation for the 2026 background traffic had the following results:

- Level of Service ‘A’;
- Maximum volume to capacity ratio of 0.02;
- Intersection delay of 2.2 seconds.

The Background plus full build out of the development traffic was analyzed for the Weekday PM Peak Hour traffic for the 2026 year. The Synchro 9 analysis results are provided in **Figure 5** below**.**

HCM 2000 SIGNING SETTINGS	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lanes and Sharing (#RL)												
Traffic Volume (vph)	13	78	85	4	38	1	48	2	2	4	0	17
Future Volume (vph)	13	78	85	4	38	1	48	2	2	4	0	17
Sign Control	—	Free	—	—	Free	—	—	Stop	—	—	Stop	—
Median Width (m)	—	0.0	—	—	0.0	—	—	0.0	—	—	0.0	—
TWLTL Median	—	☐	—	—	☐	—	—	☐	—	—	☐	—
Right Turn Channelized	—	—	None	—	—	None	—	—	None	—	—	None
Critical Gap, tC (s)	4.1	—	—	4.1	—	—	7.1	6.5	6.2	7.1	—	6.2
Follow Up Time, tF (s)	2.2	—	—	2.2	—	—	3.5	4.0	3.3	3.5	—	3.3
Volume to Capacity Ratio	0.01	0.01	0.01	0.00	0.00	0.00	0.08	0.08	0.08	0.02	—	0.02
Control Delay (s)	0.1	0.6	0.6	0.0	0.7	0.7	10.7	10.7	10.7	8.9	—	8.9
Level of Service	A	A	A	A	A	A	B	B	B	A	—	A
Queue Length 95th (m)	0.2	0.2	0.2	0.1	0.1	0.1	2.0	2.0	2.0	0.5	—	0.5
Approach Delay (s)	—	0.6	—	—	0.7	—	—	10.7	—	—	8.9	—

Figure 5 – 2026 Background plus Development PM Peak Hour Traffic Analysis

Reference: **Okanagan Vistas Independent & Assisted Living, Summerland BC**
Traffic Review

The intersection operation for the 2026 background plus development traffic had the following results:

- Level of Service 'A';
- Maximum volume to capacity ratio of 0.08;
- Intersection delay of 3 seconds; and
- The north bound traffic had a queue of 2 vehicles.

The combination of the forecast 2026 traffic combined with the development traffic did not result in any system or capacity issues, and there are no infrastructure improvements required to accommodate the additional development traffic.

D) TRUCK ROUUTES

Truck access to the site is recommended via Highway 97 to Solly Road, and then on to Latimer Avenue. Gillespie Road to Lakeshore Drive is not recommended due to the steep, narrow and tight curves along the route.

E) PEDESTRIAN CONECTIVITY

The residential area adjacent to the site is made up of rural open shoulder local roadways, and do not include sidewalks or bike lanes. The only sidewalk in the area adjacent to the site is located on the east side of Solly Road for a length of 80m just to the south of the Bristow Road intersection.

Vehicle activity on the adjacent local roadways is light and the development of sidewalks would be problematic given the topography of the area. The limited cross section width available for the roadways, means that without retaining the adjacent embankments there is minimal room available for the addition of sidewalks.

The main desire line for pedestrian access to the site will be from the south west via Solly Road. Given the site is located in a natural depression on average 36m below the level of Solly Road to the west, we recommend the potential for a stairway from the site to Solly Road be investigated. The embankment material is not ideal and a geotechnical review would need to be conducted to determine the suitability of the soils and the constructability of a stairway.

Reference: **Okanagan Vistas Independent & Assisted Living, Summerland BC**
Traffic Review

F) RECOMENDATIONS

The District of Summerland Rezoning requirements call for the development of the road rights of way abutting the site be brought up to current District urban roadway standards from the property line to the center of the roadway.

Due to the size and nature of the site, there is property frontage on the following roadways:

- Bristow Road - approx 220m of frontage, without curb and gutter or sidewalk;
- Solly Road - approx 100m of frontage, without curb and gutter or sidewalk; and
- Banks Cr. - approx 170m of frontage, without curb and gutter or sidewalk.

Bristow Road, MacDonald Pl., and Banks Cr. Have minimal pedestrian activity and off site works would be better suited to the development of pedestrian links to other areas adjacent to the development. Upon discussion with the District of Summerland, it is recommended that a portion of the adjacent offsite frontage improvement works be replaced with the development of sidewalks in the following locations:

- from the site to the west on Solly Road, tying into the existing sidewalk, approximate length of 230m;
- from Latimer Avenue to the west at MacDonald Place, approximate length of 270m; and
- From Latimer Avenue to the east at MacDonald Street, approximate length of 230m.

Improvements to the Latimer Avenue and Solly Road intersection could also be completed in replacement to adjacent offsite frontage improvements.

We trust the above meets your requirements. Please contact the undersigned if you have any questions on the above or require further information.

Yours very truly,
CTQ CONSULTANTS LTD.
Per:

Mr. David D. Cullen, P.Eng.
Transportation Engineer

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