Attachment 6 - Traffic Brief (prepared by Asurza Engineers

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May 3, 2021

Mr. Bob Clark
Clark Consulting Services
52 John St.
Port Hope, ON
L1A 2Z2

Reference: Proposed Demonstration Farm
Hope Towns Farm Hub
5373 Lakeshore Rd., Port Hope
Traffic Brief
Project N° 2179-21

Dear Mr. Clark,

Asurza Engineers Ltd. was retained by the proponent to undertake a traffic impact review for the proposed demonstration farm development to be located outside of the Port Hope urban area at the south side of the Lakeshore Rd. This analysis is required to meet the Municipality's requirement for a review of traffic implications of the proposed additional uses.

1. The proposed Development

The site is currently an open land with an agricultural area not currently active at this time. The site also contains three (3) small cottages/cabins (each with separate ownership) on the Ontario Lake shoreline; access to the land and cottages is via an existing narrow vehicular path which shows significantly deterioration due to lowlands and wetlands in the area.

The subject site is planned to reactivate the agricultural area of the land, build an additional ten (10) small self-sufficient cabins and an additional dwelling unit on the lake shoreline. Due to the deterioration of the current vehicular path,

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a new access that will serve the existing cottages and that will improve the efficiency of the farm operations is proposed.

At the peak season of the farming (Spring & Summer), it is expected the farm to have approximately 20 employees; it is thought that approximately 10 of them will be living on the farm, 5 employees will be driving, and other 5 employees will be using a shuttle bus service that will be provided as part of the farm operations.

Exhibit 1: *Site Location.*

The land will be able to receive visitors from the public to learn about the farming activities; a shuttle bus service will be provided for all of those desiring to visit the farm; it is expected that during the high season the shuttle bus to run

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at maximum of 6 to 8 times a day from Port Hope downtown to the farm and vice versa. Direct public access to the farm by private vehicles will be restricted.

Within the next five years, it is expected to prepare a trail for pedestrians and cyclists (active transportation) as another mean to access/visit the site. Wherever possible, the noted trail will make use of the abandoned rail corridor which crosses the subject land.

2. Existing Traffic Conditions

Lakeshore Road within the study area is an east-west, two-lane (one lane per direction) undivided roadway; the road is under the jurisdiction of the Municipality of Port Hope. Lakeshore Road within the area shows a rural cross-section with narrow shoulders, ditches and culverts for surface drainage. The posted speed within the area is 60 km/h.

For purposes of this analysis, traffic counts for Lakeshore Rd were obtained from counts performed by Tranplan Associates which is included in the Transportation Impact Study Report for the Port Hope Residential Subdivision (July 2017) prepared by Paradigm.

The registered traffic data was projected using the 2.0% growth rate, annually compounded. The projection assumes no disturbance on the regular traffic due to restriction of the province to control COVID-19; therefore, a permanent grow is assumed for this study. Based on this premises, the existing traffic volumes on Lakeshore Road is shown in ***Exhibit 2*** below.

			Traffic Volumes	
			2016	2021
			Registered	Projected
Lakeshore Rd	AM	EB	33	36
		WB	14	15
	PM	EB	46	51
		WB	41	45

Table 1: *Lakeshore Rd. Projected Traffic Volumes 2021.*

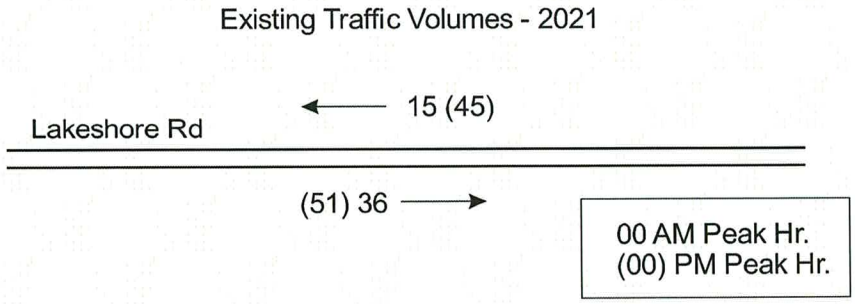

Exhibit 2: *Existing Traffic Volumes - 2021.*

According to the Transportation Impact Study Report for the Port Hope Residential Subdivision (July 2017) prepared by Paradigm, a proposed residential development located at the south of Lakeshore Road and west of Victoria St. South, will generate additional trips on the road network including additional trips on Lakeshore Rd; therefore, the total traffic volumes including those generated by the proposed residential development for the year 2022 is included as part of this traffic assessment.

The background volumes for Lakeshore Rd. are shown in the following table and exhibit:

			Traffic Volumes	
			2022	2027
			Projected	Projected
Lakeshore Rd	AM	EB	41	45
		WB	24	26
	PM	EB	62	68
		WB	53	59

Table 2: *Lakeshore Rd. Background Traffic Volumes for 2022 & 2027.*

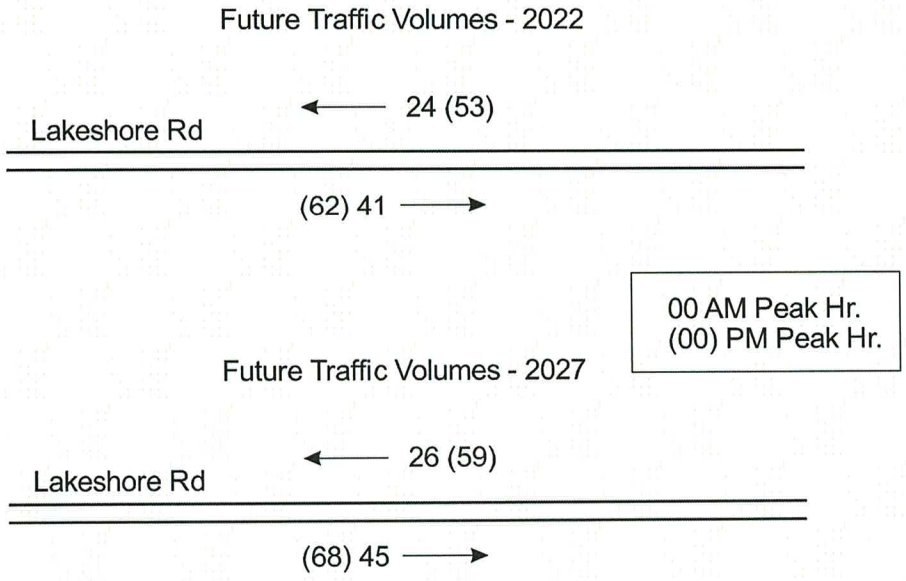

Exhibit 3: *Background Traffic Volumes 2022 and 2027.*

3. Traffic Generation

Due to the singular intended use and adjacent uses (cottages/cabins), trip rates as published in the Trips Generation Manual (ITE Publication) are not directly

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applicable; therefore, the first principle methodology for estimation of anticipated trips is included.

At the busiest season, it is expected 20 employees for the farm operation; although there are plans to have some employee living at the farm, and some others taking the offered shuttle bus, we make this more conservative by assuming that 50% of them are driving to the farm in the morning and leaving the farm in the afternoon.

Additionally, it is assumed that the three (3) existing cottages plus the new dwelling unit on the shoreline make a total of 4 trips leaving the site in the morning peak hour and all together return to the site in the afternoon peak hour.

Furthermore, it is assumed that 50% of all the shuttle bus trips to take visitor to the farm happen in a single hour, morning and afternoon peak hour.

As noted above, it is unlikely this scenario happens but makes this very conservative to see traffic operation results based on the worst-case scenario; a summary of the trips is shown below:

- 20 Total Employees (50% driving to the farm) – 10 trips
- 4 Total Cottages (100% leaving the site) – 4 trips
- 8 Total Shuttle bus Service (50% driving to the farm) – 4 trips

Based on the above number of trips, the estimated number of trips into the farm is 14 trips, and the total number of trips out of the farm is 4 trips for the morning peak hour. For the afternoon peak hour, it is expected a reverse outcome, 4 trips IN and 14 trips OUT. The distribution of these trips are based on the currente traffic patterns; therefore, the number of new trips added to the network are shown in the following figure:

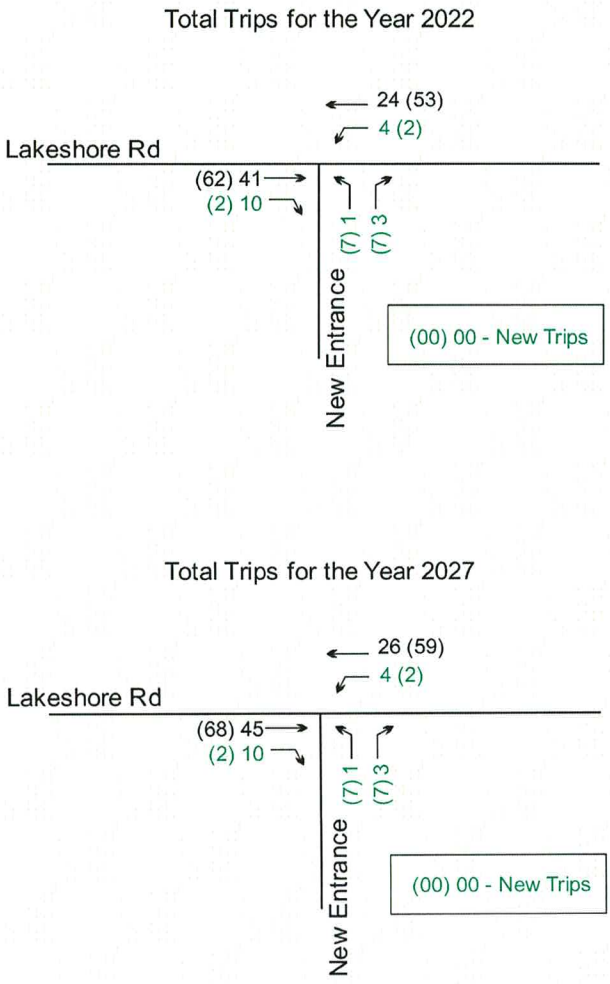

Exhibit 4: *Total Trips for the Year 2022 and 2027.*

4. Future Traffic Operations

As noted, the trips generated by the proposed site were distributed according the current traffic patterns; summary of traffic operations on Lakeshore Rd. at the new entrance is shown in the following table:

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		Volume Capacity Analysis - Total Trips Year 2022							
		AM Peak Hour				PM Peak Hour			
		V/C	Delay (s)	Q_{95} (m)	LOS	V/C	Delay (s)	Q_{95} (m)	LOS
Lakeshore at New Entrance	EB-TR	0.03	0.0	0.0	A	0.04	0.0	0.0	A
	WB-TL	0.00	1.1	0.1	A	0.00	0.3	0.0	A
	NB-RL	0.00	8.7	0.1	A	0.02	9.0	0.4	A

		Volume Capacity Analysis - Total Horizon Year 2027							
		AM Peak Hour				PM Peak Hour			
		V/C	Delay (s)	Q_{95} (m)	LOS	V/C	Delay (s)	Q_{95} (m)	LOS
Lakeshore at New Entrance	EB-TR	0.04	0.0	0.0	A	0.04	0.0	0.0	A
	WB-TL	0.00	1.0	0.1	A	0.00	0.3	0.0	A
	NB-RL	0.00	8.7	0.1	A	0.02	9.0	0.4	A

Table 3: *Total Volumes Traffic Operations Results for 2022 & 2027.*

As shown in the results, the number of trips to be generated by the proposed development will not affect the traffic operations on Lakeshore Rd. All movements at the new entrance location show an excellent level of service "A" for the year 2022; no changes are expected and the same level of service is maintained over time.

5. Sight Lines at New Entrance

In general, driveways or accesses provide physical transition between the site and the abutting roadway. They should be located and designed to minimize impacts on traffic while providing a safe entry and exit from the served development. In order to provide a safe entry and exit, adequate sight distance is to be provided. Sight distance is the distance needed by a driver on a roadway, or a driver exiting an access or street, to verify that the road is clear and avoid conflicts with other vehicles. Sight lines must

be kept free of object which might interfere with the ability of the driver to see incoming vehicles.

Sight distance was reviewed based on the design speed of the roadway. When the road vertical or horizontal curve do not severely constrain the design speed, as general practice has been used the following design speed:

- For low posted speeds of 60 km/h or less, increase by 10 km/h.
- For high posted speeds of 70 km/h or greater, increase by 20 km/h.

As indicated earlier in this report, the posted speed of Lakeshore St. within the study area is 60 km/h; therefore, the design speed of 70 km/h is adopted for this analysis. The minimum sight lines for a design speed of 70 km/h is 150 m.

Based on the height of a driver eye at 1.1 m and the top of the approaching vehicle at 1.3 m above the pavement, sight lines to east and west of the road from the proposed new entrance was measured in the field. It was found that sight lines exceed substantially the 150 m; therefore, no issues related to sight lines were found.

6. Conclusions

Due to the very limited scale of the proposed development, the additional trips will impose virtually no impact on the adjacent road; any minor traffic increase as a result of the new trips will be negligible to the current traffic operations.

Should you require any further information in consideration of the above, please contact the undersigned.

Respectfully submitted;

Martin Asurza, M.Eng, P.Eng.
Senior Transportation Engineer

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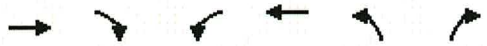
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	36	10	4	15	1	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	11	4	16	1	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			50		70	45
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			50		70	45
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1557		932	1025

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	50	21	4
Volume Left	0	4	1
Volume Right	11	0	3
cSH	1700	1557	1000
Volume to Capacity	0.03	0.00	0.00
Queue Length 95th (m)	0.0	0.1	0.1
Control Delay (s)	0.0	1.6	8.6
Lane LOS		A	A
Approach Delay (s)	0.0	1.6	8.6
Approach LOS			A

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	14.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	51	2	2	45	7	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	55	2	2	49	8	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			58		110	57
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			58		110	57
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1547		886	1010

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	58	51	15
Volume Left	0	2	8
Volume Right	2	0	8
cSH	1700	1547	944
Volume to Capacity	0.03	0.00	0.02
Queue Length 95th (m)	0.0	0.0	0.4
Control Delay (s)	0.0	0.3	8.9
Lane LOS		A	A
Approach Delay (s)	0.0	0.3	8.9
Approach LOS			A

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	14.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	41	10	4	24	1	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	45	11	4	26	1	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			55		85	50
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			55		85	50
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1549		914	1018

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	55	30	4
Volume Left	0	4	1
Volume Right	11	0	3
cSH	1700	1549	990
Volume to Capacity	0.03	0.00	0.00
Queue Length 95th (m)	0.0	0.1	0.1
Control Delay (s)	0.0	1.1	8.7
Lane LOS		A	A
Approach Delay (s)	0.0	1.1	8.7
Approach LOS			A

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	14.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	62	2	2	53	7	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	67	2	2	58	8	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			70		130	68
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			70		130	68
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1531		862	995

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	70	60	15
Volume Left	0	2	8
Volume Right	2	0	8
cSH	1700	1531	924
Volume to Capacity	0.04	0.00	0.02
Queue Length 95th (m)	0.0	0.0	0.4
Control Delay (s)	0.0	0.3	9.0
Lane LOS		A	A
Approach Delay (s)	0.0	0.3	9.0
Approach LOS			A

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	14.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	45	10	4	26	1	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	49	11	4	28	1	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			60		91	54
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			60		91	54
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1544		906	1013

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	60	33	4
Volume Left	0	4	1
Volume Right	11	0	3
cSH	1700	1544	984
Volume to Capacity	0.04	0.00	0.00
Queue Length 95th (m)	0.0	0.1	0.1
Control Delay (s)	0.0	1.0	8.7
Lane LOS		A	A
Approach Delay (s)	0.0	1.0	8.7
Approach LOS			A

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	14.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	68	2	2	59	7	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	74	2	2	64	8	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			76		143	75
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			76		143	75
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1523		848	986

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	76	66	15
Volume Left	0	2	8
Volume Right	2	0	8
cSH	1700	1523	912
Volume to Capacity	0.04	0.00	0.02
Queue Length 95th (m)	0.0	0.0	0.4
Control Delay (s)	0.0	0.3	9.0
Lane LOS		A	A
Approach Delay (s)	0.0	0.3	9.0
Approach LOS			A

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	14.7%	ICU Level of Service	A
Analysis Period (min)	15		