

YORK ENVIRONMENTAL SOLUTIONS LTD.

45 & 47 ANDERSON BOULEVARD DEVELOPMENT

TRANSPORTATION IMPACT STUDY

March 22, 2021





45 & 47 ANDERSON
BOULEVARD
DEVELOPMENT
TRANSPORTATION IMPACT
STUDY

YORK ENVIRONMENTAL SOLUTIONS LTD.

PROJECT NO.: 20M-00392-00 T01

DATE: FEBRUARY 26, 2021

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March 22, 2021

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Subject: Transportation Impact Study – 45 & 47 Anderson Boulevard, Township of Uxbridge Development

WSP Canada Group Limited (WSP) is pleased to present the findings of our Transportation Impact Study (TIS) for the proposed development located at 45 & 47 Anderson Boulevard in the Township of Uxbridge in the Region of Durham, Ontario.

Based on the enclosed study findings, it is expected that the proposed development can be readily accommodated by the study area transportation network during the opening year, and five years after.

We thank you for the opportunity to undertake this study. Please do not hesitate to contact us if you have any questions or comments.

Sincerely,

WSP Canada Group Limited

Ismet Medic
Senior Project Manager

Alaric Man
Transportation Planner
Transportation Planning

WSP ref.: 20M-00392-00 T01



TABLE OF CONTENTS

1	INTRODUCTION.....	1
2	EXISTING CONDITIONS	4
2.1	Boundary Roadways	4
2.2	Existing Transit Services.....	6
2.3	Existing Active Transportation Network.....	8
2.4	Traffic Data.....	8
2.5	Model Assumptions	8
2.6	Existing Transportation Conditions	10
2.6.1	Methodology	10
2.6.2	Existing Traffic Conditions	10
3	FUTURE BACKGROUND CONDITIONS.....	12
3.1	Horizon Year	12
3.2	Background General Traffic volumes	12
3.3	Background Developments.....	12
3.4	Background Road Network	12
3.5	Future Active Transportation Facilities	12
3.6	Future Background Traffic Conditions	12
4	SITE-GENERATED VOLUMES	17
4.1	Trip Generation.....	17
4.2	Trip Distribution and Assignment	17
5	FUTURE TOTAL CONDITIONS.....	21
6	PARKING REVIEW	25
6.1	Review of Site Parking Supply.....	25
7	SITE PLAN REVIEW	26
7.1		26



8	TRANSPORTATION DEMAND MANAGEMENT (TDM) MEASURES	27
9	CONCLUSIONS	28

APPENDICES

A	TERMS OF REFERENCE	
B	TRAFFIC DATA	
C	LOS DEFINITIONS	
D	EXISTING TRAFFIC CONDITIONS	
E	FUTURE BACKGROUND TRAFFIC CONDITIONS	
F	FUTURE TOTAL TRAFFIC CONDITIONS	

1 INTRODUCTION

WSP was retained by York Environmental Solutions Ltd. to prepare a Transportation Impact Study (TIS) for the 45 & 47 Anderson Boulevard development in the Township of Uxbridge, Ontario. The site location and study area are shown in **Figure 1-1**.

The proposed development features a Soil Processing Facility and the site plan is shown in **Figure 1-2**.

The site's operation hours will be from 7am to 6pm. It is expected that a maximum number of daily truck trips will be 100 (100 inbound and 100 outbound trips). The absolute maximum number of trucks arriving within a single hour is estimated at 20 trucks. The truck arrival is expected to be evenly distributed throughout the day, and the peak arrival will probably occur outside of the peak traffic conditions on adjacent streets. Non-truck traffic is estimated at 20 vehicles per day. Due to the working hours and shift work, most of employees will arrive to and leave the site outside of the peak traffic hours. As a conservative assumption, it was assumed that the site will generate 10 two-way non-truck trips during the peak hours.

The main objective of this study is to evaluate the traffic impacts of the development on the study area transportation network, and identify any issues or mitigation measures.

A Terms of Reference (TOR), agreed upon with the Region of Durham transportation staff prior to commencing the TIS, is provided in **Appendix A**. Our study approach and findings are documented herein.

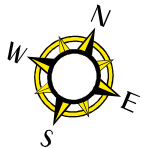
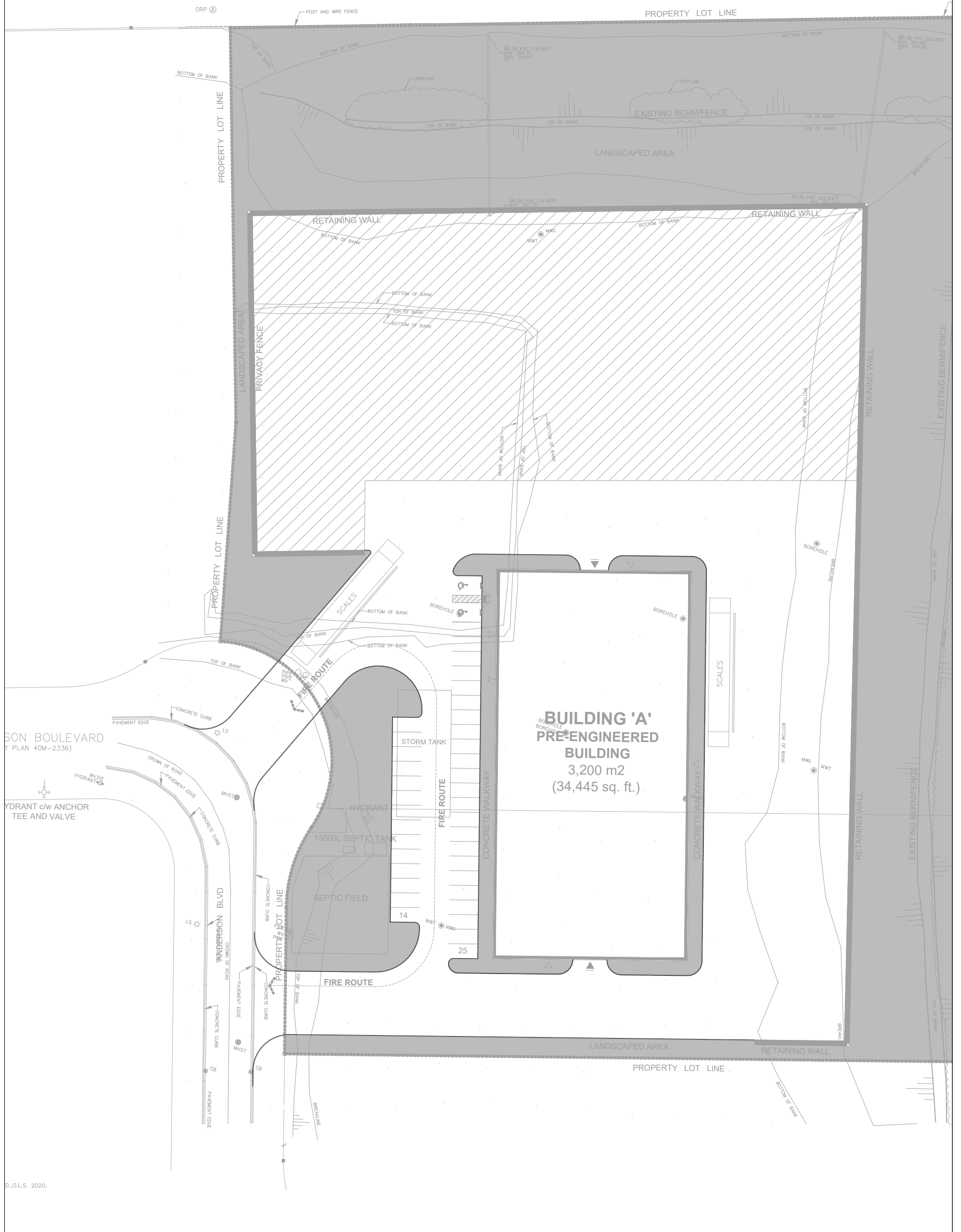


Figure 1-1

Site Location

ROAD ALLOWANCE BETWEEN LOTS 15 AND 16, CONCESSION (NOT PAVED)



C:\Users\nima.faridi\Desktop\Projects\20M-00392-00 Anderson Uxbridge\2021.03.17\CAD

Scale: 1:750



Figure 1-2
Site Plan Review
45-47 Anderson Boulevard Development TIS - Uxbridge

2 EXISTING CONDITIONS

This section of our assessment describes the existing road network and traffic conditions within the study area.

2.1 BOUNDARY ROADWAYS

The following roadways make up the boundary road network that surrounds the subject site:

Highway 47, which is located south of the site, is an east-west arterial road with a posted speed limit of 80 km/h. Highway 47 has a two-lane cross-section, with one lane in each direction. There is an eastbound left turn and westbound right turn at the intersection of Highway 47 and Paisley Lane. Highway 47 is under the jurisdiction of the Durham Region.

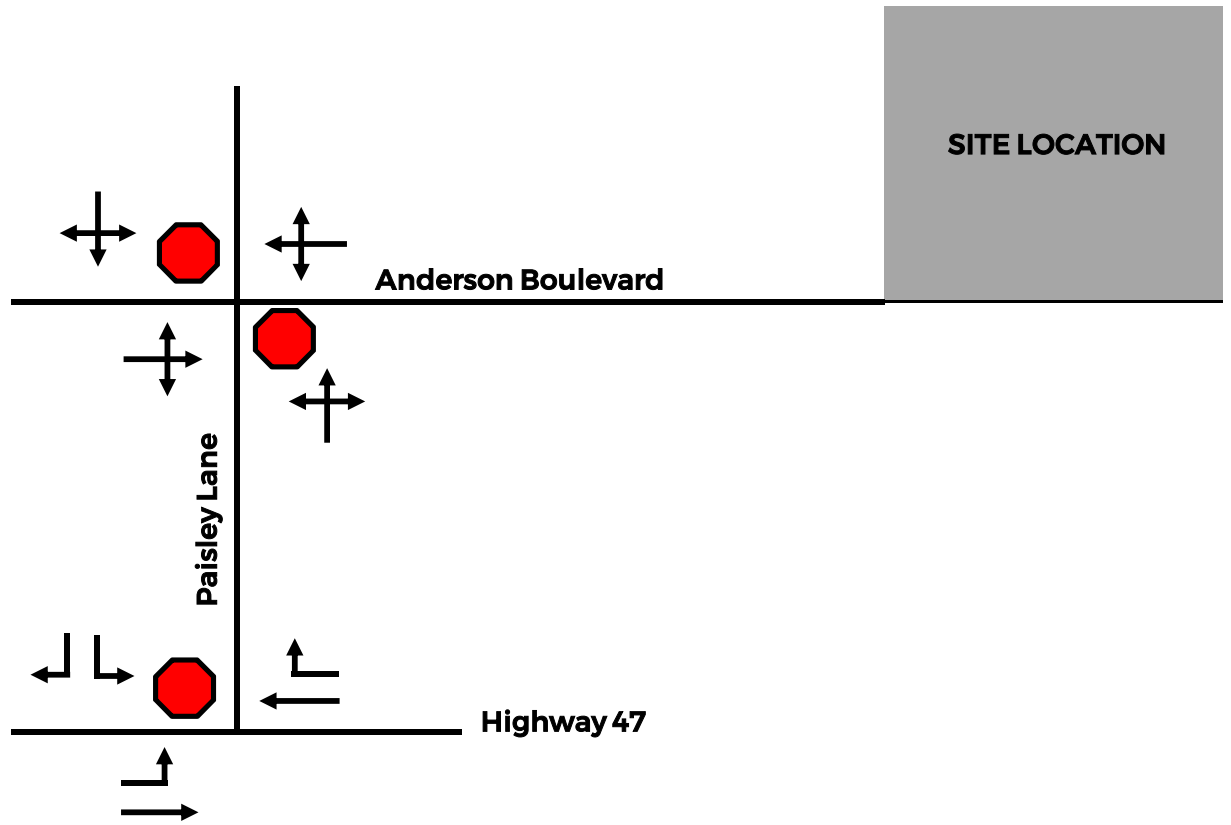
Paisley Lane, which is located west of the site, is a north-south local roadway under the jurisdiction of the Township of Uxbridge, with an assumed speed limit of 50 km/h. Paisley Lane has a two-lane cross-section, with one lane in each direction. However, at the intersection of Highway 47 and Paisley Lane, it is assumed that there are two lanes available for the southbound direction given the width of the roadway. For this assessment it is assumed that one lane is dedicated for southbound left turns, and another lane is for southbound right turns.

Anderson Boulevard, which directly borders the site to the south, is an east-west roadway under the jurisdiction of the Township of Uxbridge, with a two-lane cross-section and a posted speed limit of 50 km/h.

Based on the terms of reference, the following study intersections have been evaluated in this TIS:

- Highway 47 at Paisley Boulevard (unsignalized);
- Anderson Boulevard at Paisley Boulevard (unsignalized)

The existing lane configurations at the study intersections are illustrated in **Figure 2-1**.



Legend
 Stop Control

Figure 2-1
Existing Lane Configurations

2.2 EXISTING TRANSIT SERVICES

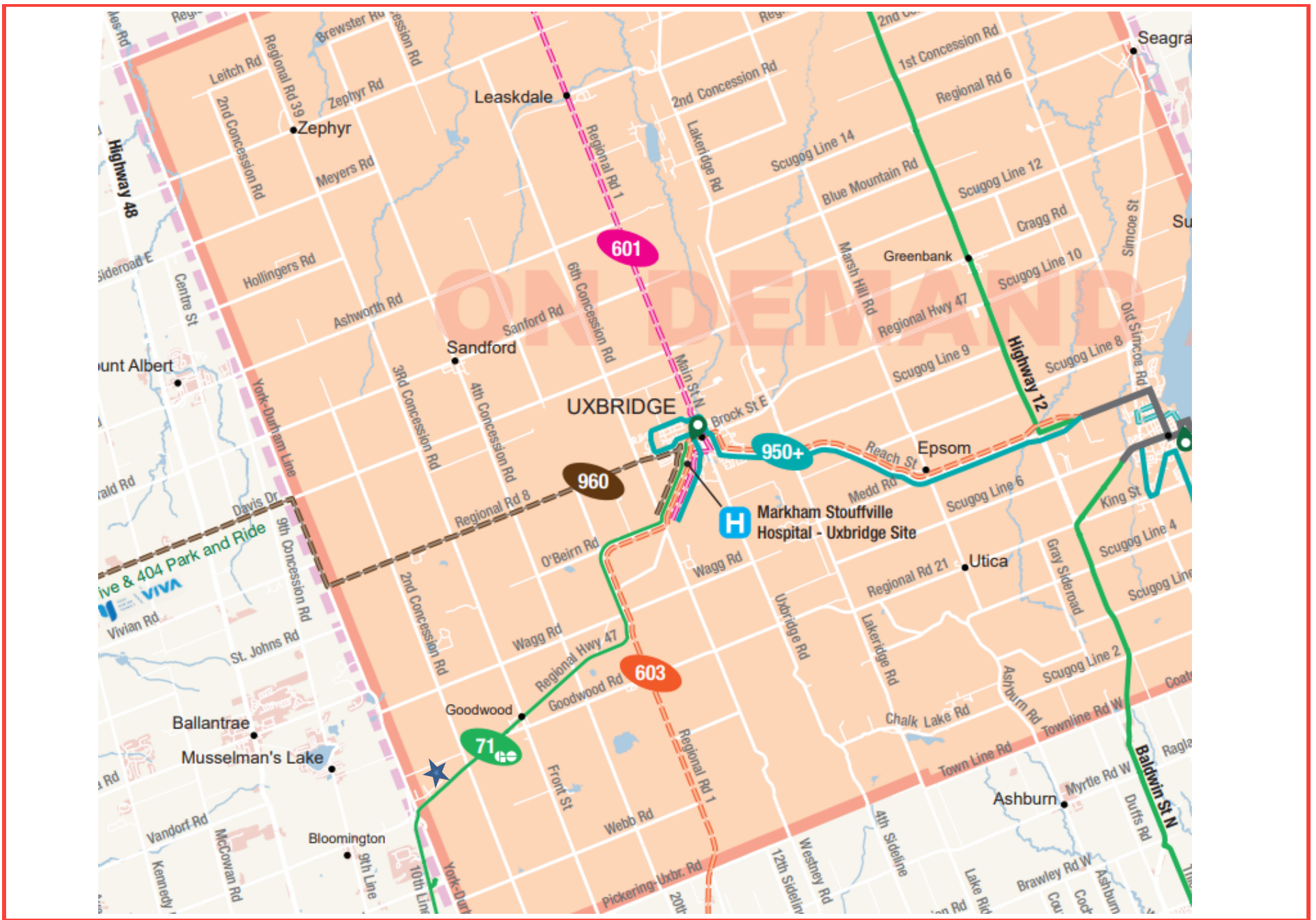
The site is situated in an area that is served by the following GO Transit surface transit routes:

- The **Route 70/71** bus route operates in a north-south direction between Railway Station at Albert Street in Uxbridge and Union Station in Downtown Toronto. The nearest bus stop along this route to the site location is located at Highway 47 at Goodwood Road, which is approximately 2 km in distance. This route is operation during all seven days of the week.

Table 2-1 summarizes the above-noted transit service, along with their posted headways throughout the service period. It should be noted that the headways shown are for each direction of travel. A map of the above transit routes is shown in **Figure 2-2**.

Table 2-1: Existing Transit Services

Route	Transit Service Operating Headways			
	A.M. Peak	Weekday Midday	P.M. Peak	Weekday Night
Route 70/71	60 minutes	60 minutes	60 minutes	60 minutes



Legend

Site Location

Figure 2-2

Existing Transit Services

2.3 EXISTING ACTIVE TRANSPORTATION NETWORK

With respect to the active transportation network in the area, there are limited facilities to service both cyclist and pedestrians in the study area. Along Paisley Lane, Anderson Boulevard, and Highway 47, there are no bicycle lanes or pathways according to the Durham Region Transportation Master Plan 2017. Also, there are currently no sidewalks provided along the three aforementioned roadways within the study area. This indicates that the area does not accommodate pedestrian traffic adequately. However, it is anticipated given the context of the industrial area in which the proposed development is located, that minimal pedestrian traffic will be generated as a result of the current land uses.

2.4 TRAFFIC DATA

Table 2-2 summarizes the turning movement counts (TMC) collected for this study, as well as the source and date of the counts. Traffic data was collected during the weekday a.m. (7:00 a.m. to 9:00 a.m.) and p.m. (4:00 p.m. and 6:00 p.m.) peak periods. Details of the turning movement counts are included in **Appendix B**.

Table 2-2: Traffic Data Information

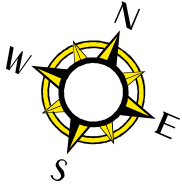
Intersections	Date of the count	Source
Highway 47 at Paisley Lane	July 7, 2020	Ontario Traffic Inc.
Anderson Boulevard at Paisley Lane	July 7, 2020	Ontario Traffic Inc.

It was confirmed that almost all of the land uses and stores within the study area were open at the time when the traffic counts were conducted, albeit operating under the COVID-19 circumstances. Hence, it can be concluded that the observed traffic volumes reflect the typical conditions.

The resulting 2020 a.m. and p.m. peak hour volumes at the study intersections are illustrated in **Figure 2-3**.

2.5 MODEL ASSUMPTIONS

Synchro 10.0 is the software used for the traffic analysis of this study. The peak hour factors (PHF) are based on the Region's guideline of 0.92 for both peak hours. The heavy vehicle percentages based on the TMCs have also been inputted to the Synchro model. For the purposes of this analysis, it is assumed that there are two approaching lanes for the southbound leg of the intersection of Highway 47 and Paisley Lane. One lane is for the southbound left turn movements, and another is for the southbound right turn movements.



Legend

xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes

Figure 2-3

Existing Traffic Volumes

2.6 EXISTING TRANSPORTATION CONDITIONS

2.6.1 METHODOLOGY

To analyze existing traffic conditions in the study area, capacity analyses were undertaken using the Synchro 10 traffic analysis software. This software incorporates the methodology outlined in the Highway Capacity Manual (HCM), Transportation Research Board, 2000 and 2010. The Synchro models were updated to reflect the Durham Region guidelines.

An intersection capacity analysis provides an indication of traffic operations based on calculations of volume-to-capacity (v/c) and delays for individual movements at an intersection. Level of Service (LOS) denoted by letters 'A' through 'D', represent satisfactory traffic operations. LOS denoted by the letters 'E' and 'F' represent congested traffic operations. **Appendix C** provides the LOS definitions according to the HCM 2000 methodology.

2.6.2 EXISTING TRAFFIC CONDITIONS

Traffic operations were analyzed at the study intersections to understand the existing LOS during the weekday a.m. and p.m. peak hours. The results of the existing conditions assessment are summarized in **Table 2-3**. Detailed Synchro worksheets are provided in **Appendix D**.

Table 2-3: 2020 Existing Intersection Operations

Intersections	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
	LOS (Delay in Seconds)	Critical Movement (Volume/Capacity Ratio)	LOS (Delay in Seconds)	Critical Movement (Volume/Capacity Ratio)
Highway 47 & Paisley Lane	C (24 sec)	SB-L (0.04)	E (44 sec)	SB-L (0.47)
Highway 47 & Paisley Lane (Calibrated)			E (38 sec)	SB-L (0.42)
Anderson Boulevard & Paisley Lane	B (11 sec)	SB-LTR (0.03)	B (11 sec)	SB-LTR (0.04)

Note: For two-way stop controlled intersections, the LOS is based on the delay associated with the critical movement.

The results presented in **Table 2-3** indicate that the study intersection of Anderson Boulevard and Paisley Lane operates at good LOS 'B' under the existing conditions. However, the critical southbound left turning movement at the intersection of Highway 47 and Paisley Lane operates with LOS 'C' during the a.m. peak hour, and a LOS 'E' with the delay of 44 seconds during the p.m. peak hour. Despite the LOS 'E' experienced during the p.m. peak hour, the delays are not considered very high, and the v/c ratio is 0.47, well below capacity.

We used videos of the turning movement counts at the intersection of Highway 47 and Paisley Lane to measure delays for the southbound turning movements during the p.m. peak period. Average delays were calculated for both southbound left and right movements, and the Synchro models were calibrated accordingly. The average delays experienced by the he southbound left turn and right turn movements are 37 seconds and 13 seconds, respectively. The calculations of these average delays are presented in **Appendix B**.

As all the critical movements at both intersections experience v/c ratios below capacity during both a.m. and p.m. peak hours, this indicates that there is the residual capacity to accommodate the additional traffic demand.

3 FUTURE BACKGROUND CONDITIONS

3.1 HORIZON YEAR

While the proposed development is anticipated to be built in the next 5 years, a horizon year of 2022 has been adopted as the opening year of the development. In addition, Durham Region staff indicated that a 5-year post build-out horizon year was required, therefore a horizon year of 2027 was included in the study.

3.2 BACKGROUND GENERAL TRAFFIC VOLUMES

Based on correspondence with Durham Region staff, an annual general growth factor of 1% was applied for the purposes of this study, for the eastbound and westbound through movements only along Highway 47. No growth rates were applied along the other boundary roadways.

3.3 BACKGROUND DEVELOPMENTS

No background developments were considered as future background traffic for this study. Based on correspondence with Durham Region, no current applications have been discussed or addressed for consideration as background traffic.

3.4 BACKGROUND ROAD NETWORK

There are no planned major roadway changes to the network planned by the 2022 and 2027 horizon year. Therefore, the future background analysis was conducted with the existing road network in place.

3.5 FUTURE ACTIVE TRANSPORTATION FACILITIES

Based on the Durham Region Transportation Master Plan 2017, there are no anticipated active transportation facilities along the study roadways by the 2022 and 2027 horizon years. This includes any cycling lanes or pedestrian trails in the vicinity of the subject site.

3.6 FUTURE BACKGROUND TRAFFIC CONDITIONS

The projected future background traffic volumes were developed by applying the annual 1% growth rates to the existing traffic volumes in **Figure 2-3**. The resulting future background volumes are shown in **Figure 3-1** and **Figure 3-2** for the 2022 and 2027 horizon year scenarios respectively. The resulting intersection operations are outlined in **Table 3-1** and **Table 3-2** and the Synchro worksheets are in **Appendix E**.

Table 3-1: Future Background Intersection Operations – 2022 Full Buildout Year

Intersections	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
	LOS (Delay in Seconds)	Critical Movement (Volume/Capacity Ratio)	LOS (Delay in Seconds)	Critical Movement (Volume/Capacity Ratio)
Highway 47 & Paisley Lane	C (25 sec)	SB-L (0.04)	E (48 sec)	SB-L (0.49)
Highway 47 & Paisley Lane (Calibrated)			E (40 sec)	SB-L (0.44)
Anderson Boulevard & Paisley Lane	B (11 sec)	SB-LTR (0.03)	B (11 sec)	SB-LTR (0.04)

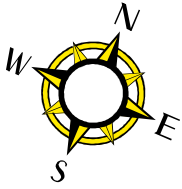
Note: For two-way stop controlled intersections, the LOS is based on the delay associated with the critical movement.

The results in **Table 3-1** indicate that under the 2022 full build-out year future background conditions, the intersection of Anderson Boulevard and Paisley Lane is expected to continue to operate at good Levels of Service ‘B’ for both the a.m. and p.m. peak hours, and the v/c ratios are well below capacity. This indicates that there are residual capacities at this study intersection to accommodate additional traffic volumes.

The intersection of Highway 47 and Paisley Lane is also expected to continue to operate similar to the existing conditions. During the a.m. peak hour, the delay for the southbound left turn movement increased by only 1 second, and the v/c ratio is the same as existing at 0.04, which is well below capacity.

During the p.m. peak hour, the southbound left turn movement is expected to experience the delay of 48 seconds or 4 seconds more compared to the existing conditions.

Furthermore, the calibrated model of the intersection of Highway 47 at Paisley Lane indicates this critical movement would experience a lower delay at 40 seconds, and a lower v/c ratio of 0.44. These results would be more reflective of the actual conditions experienced.



Legend

xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes

Figure 3-1
2022 Future Background Traffic Volumes

Table 3-2: Future Background Intersection Operations – 2027 Horizon Year

Intersections	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
	LOS (Delay in Seconds)	Critical Movement (Volume/Capacity Ratio)	LOS (Delay in Seconds)	Critical Movement (Volume/Capacity Ratio)
Highway 47 & Paisley Lane	D (26 sec)	SB-L (0.04)	F (55 sec)	SB-L (0.54)
Highway 47 & Paisley Lane (Calibrated)			E (45 sec)	SB-L (0.48)
Anderson Boulevard & Paisley Lane	B (11 sec)	SB-LTR (0.03)	B (11 sec)	SB-LTR (0.04)

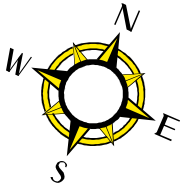
Note: For two-way stop controlled intersections, the LOS is based on the delay associated with the critical movement.

The results in **Table 3-2** indicate that under the 2027 future background conditions, similar to the 2022 future background conditions, the intersection of Anderson Boulevard and Paisley Lane will experience good LOS ‘B’ for the critical southbound left-right movement, with minimal delays and low v/c ratios.

As for the intersection of Highway 47 at Paisley Lane, similar to the 2022 future background conditions, the critical movement of the southbound left movement experiences acceptable LOS ‘D’ during the a.m. and poor LOS ‘F’ during the p.m. peak hour. The increase in traffic due to the applied annual growth rate of 1.0% along Highway 47 further worsens the conditions at this intersection.

During the a.m. peak hour at Highway 47 at Paisley Lane, the v/c ratio for the movement is well below capacity at 0.04 and the delay has increased by only 2 seconds from the existing conditions. During the p.m. peak hour, this movement is expected to experience an increase in delay by 11 seconds to 55 seconds, in comparison to the existing conditions. The v/c ratio has also increased by 0.07. However, although the LOS has worsened to LOS ‘F’ from the existing conditions, it should be noted that the v/c ratio is still below capacity. This indicates that the movement can accommodate for additional site traffic during the 2027 future total conditions.

In comparison, the calibrated model of the Highway 47 at Paisley Lane intersection has its critical southbound left movement experience LOS ‘E’, a lower delay at 45 seconds, and a lower v/c ratio at 0.48. These results are more reflective of the actual conditions would be experienced by the critical movement.



Legend

xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes

Figure 3-2
2027 Future Background Traffic Volumes

4 SITE-GENERATED VOLUMES

4.1 TRIP GENERATION

The trip generation was determined on the basis that a maximum of 100 truck trips entering and exiting the subject site will be generated for the duration of the entire day. For the purposes of assessing conditions under peak traffic conditions, 20 truck trips have been estimated as the maximum number of two-way vehicle trips entering the facility. Therefore, 10 inbound and 10 outbound truck trips are estimated to be generated by the proposed development during both the a.m. and p.m. peak hours. Also, 10 passenger vehicle trips are expected to be generated during the a.m. and p.m. peak hours. The inbound and outbound splits for the passenger vehicles have been determined based on Institute of Transportation Engineers (ITE) 10th Edition rates for Land Use Code 110, General Light Industrial.

Table 4-1: Site-Generated Vehicle Trips

	Trip Generation Rates					
	A.M. Peak Hour			P.M. Peak Hour		
	In	Out	Total	In	Out	Total
Truck Trips	10	10	20	10	10	20
Passenger Vehicle Trips	9	1	10	2	8	10
Total Trips	19	11	30	12	18	30

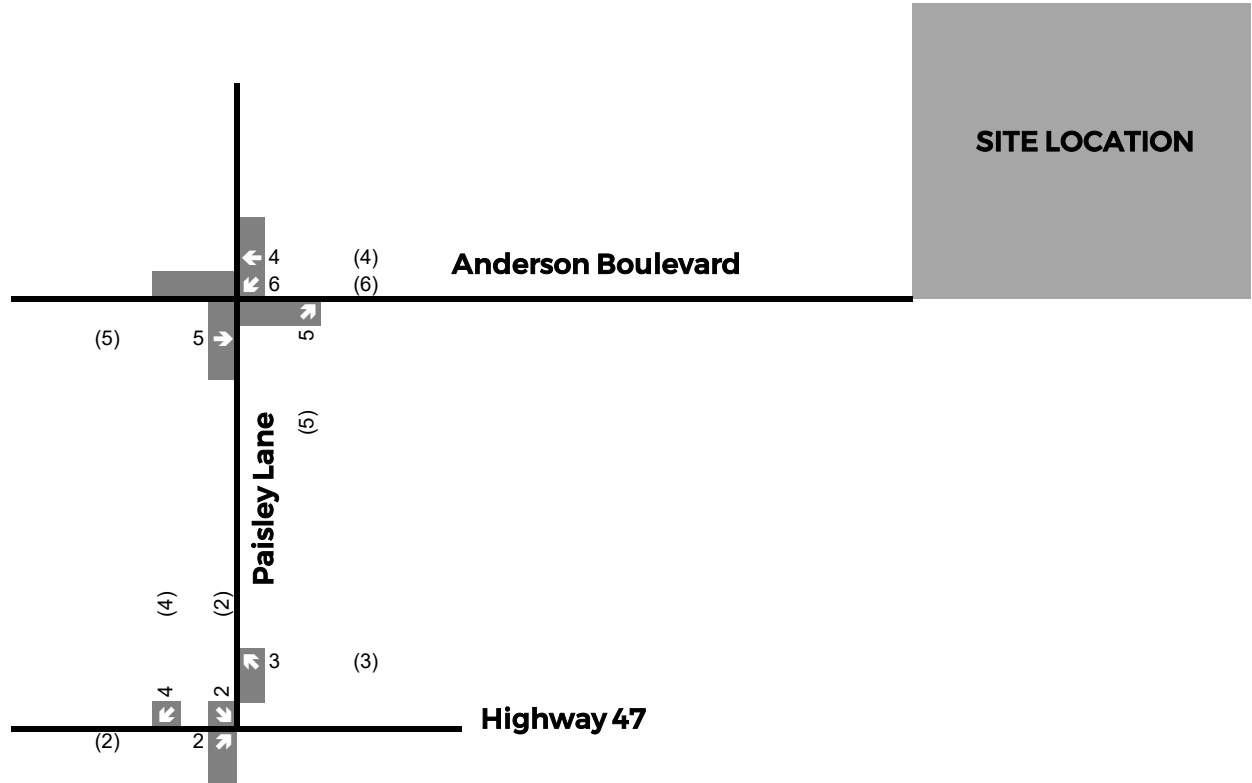
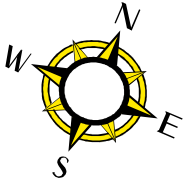
As shown in **Table 4-1**, the development is forecasted to generate a total of 30 vehicle trips during the weekday a.m. and p.m. peak hours, respectively. Also, non-auto reduction to the trips was not applied for the purposes of this analysis. The site generated trips for the trucks and passenger vehicles are presented in **Figure 4-1** and **Figure 4-2** below.

4.2 TRIP DISTRIBUTION AND ASSIGNMENT

With respect to trip distribution and assignment of the trucks entering and exiting the proposed development, it is assumed that the trucks will arrive from random locations. This was based on correspondence with the client, with regards to the origin locations of the trucks.

Therefore, the assignment of the trips across the network was not based on current surveyed data, such as the Transportation Tomorrow Survey (TTS), but was based on the road network relative to the site location. For the passenger vehicles, trip assignment was based on the existing volume splits at the study area intersections, since the trips are nominal.

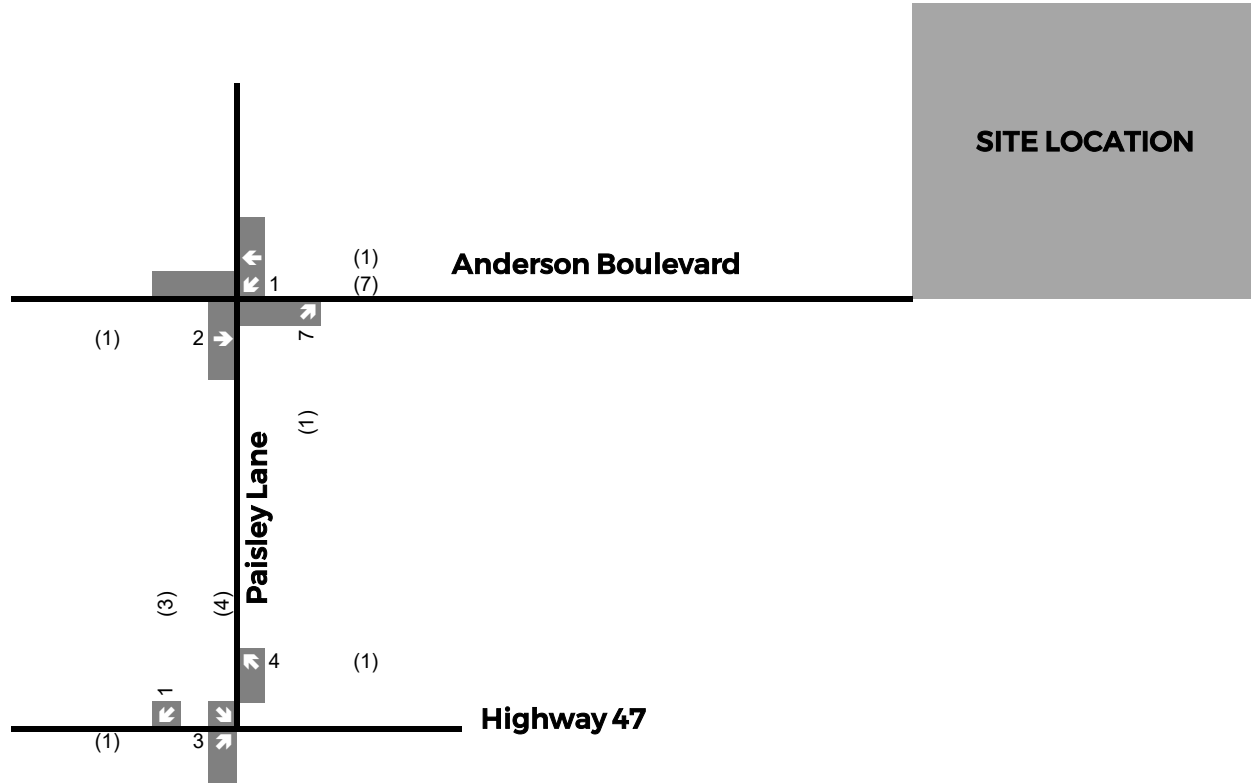
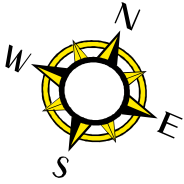
Figure 4-3 illustrates the trip assignment for both the inbound and outbound truck trips during the a.m. and p.m. peak hour.



Legend

- xx A.M. Peak Hour Traffic Volumes
- (xx) P.M. Peak Hour Traffic Volumes

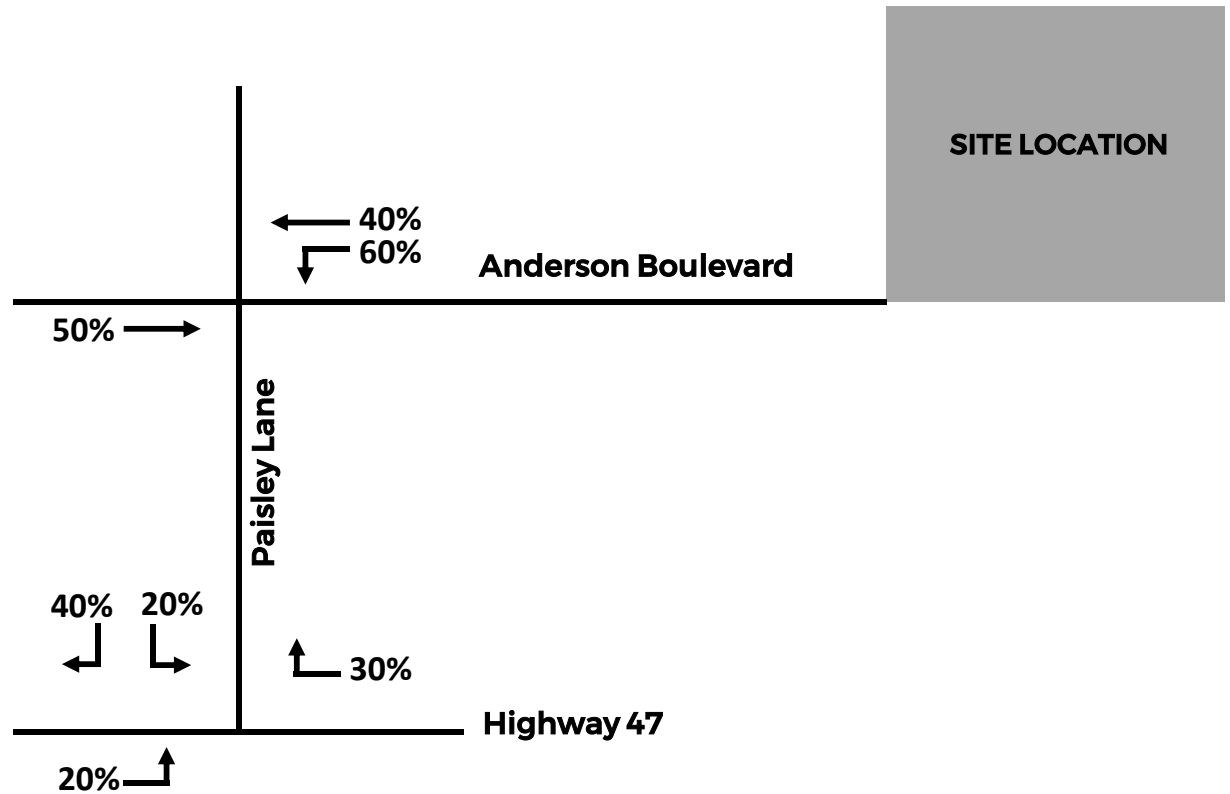
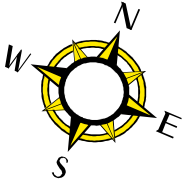
Figure 4-1
Site Generated Traffic Volumes - Trucks



Legend

- xx A.M. Peak Hour Traffic Volumes
- (xx) P.M. Peak Hour Traffic Volumes

Figure 4-2
 Site Generated Traffic Volumes - Passenger Vehicles



Assignment is applicable
for both a.m. and p.m.
peak hours



Figure 4-3

5 FUTURE TOTAL CONDITIONS

The future total traffic volumes were developed by superimposing the following volumes:

- Future background volumes as shown in **Figure 3-1** and **Figure 3-2**; and
- Site-generated traffic volumes as shown in **Figure 4-1** and **Figure 4-2**.

The resulting future total traffic volumes are shown in **Figure 5-1** and **Figure 5-2**. Based on these volumes, the future total intersection operations have been evaluated and documented in **Table 5-1** and **Table 5-2**. Detailed Synchro worksheets are available in **Appendix F**.

Table 5-1: Future Total Intersection Operations – 2022 Full Buildout Year

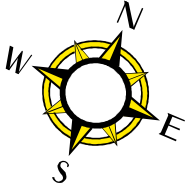
Intersection	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
	LOS (Delay)	Critical Movement (Volume/Capacity Ratio)	LOS (Delay)	Critical Movement (Volume/Capacity Ratio)
Highway 47 & Paisley Lane	D (25 sec)	SB-L (0.05)	F (52 sec)	SB-L (0.54)
Highway 47 & Paisley Lane (Calibrated)	-	-	E (43 sec)	SB-L (0.48)
Anderson Boulevard & Paisley Lane	B (11 sec)	SB-LTR (0.03)	B (11 sec)	SB-LTR (0.05)

Note: For two-way stop controlled intersections, the LOS is based on the delay associated with the critical movement.

The results in **Table 5-1** indicate that traffic operations will experience minimal increase in delays under the future total conditions compared to the future background conditions. As presented under the 2022 future background conditions, the southbound left movement at the Highway 47 and Paisley Lane intersection already experiences LOS ‘C’ and LOS ‘E’ during the a.m. and p.m. peak period respectively. The addition of the site traffic increases the delay and v/c ratio for both peak periods. The most notable increase is during the p.m. peak period, with an increase in 4 seconds of delay, and a v/c ratio increase of 0.05. However, it should be noted that the v/c ratio is still below capacity during both a.m. and p.m. peak periods as well during the 2022 future total conditions.

Moreover, the calibrated model shows that the southbound left turn movement at the Highway 47 and Paisley Lane intersection is expected to operate with LOS ‘E’, and lower delays at 43 seconds and a lower v/c ratio at 0.48. This model more accurately estimates future traffic operations than the uncalibrated model.

It should be noted that both the passenger vehicle trips and truck trips estimated for the purposes of this analysis are estimations of the maximum number of trips in a given peak hour. Realistically, the trips would be dispersed throughout the day, and this volume of site traffic will therefore be lower during a peak hour scenario.



Legend

xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes

Figure 5-1
2022 Future Total Traffic Volumes

Table 5-2: Future Total Intersection Operations -2027 Horizon Year

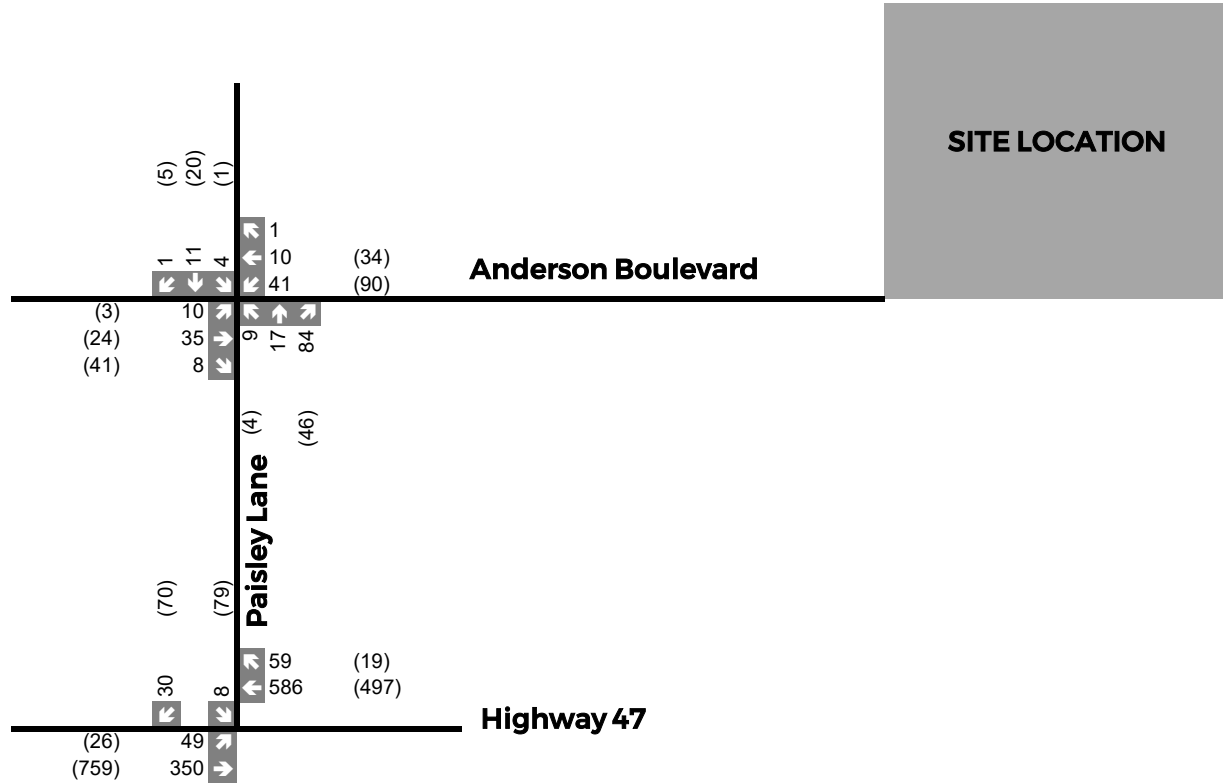
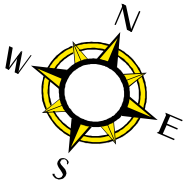
Intersection	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
	LOS (Delay)	Critical Movement (Volume/Capacity Ratio)	LOS (Delay)	Critical Movement (Volume/Capacity Ratio)
Highway 47 & Paisley Lane	D (27 sec)	SB-L (0.05)	F (61 sec)	SB-L (0.59)
Highway 47 & Paisley Lane (Calibrated)	-	-	E (49 sec)	SB-L (0.53)
Anderson Boulevard & Paisley Lane	B (11 sec)	SB-LTR (0.03)	B (11 sec)	SB-LTR (0.05)

Note: For two-way stop controlled intersections, the LOS is based on the delay associated with the critical movement.

The results in **Table 5-2** indicate that the 2027 future total conditions for the intersection of Anderson Boulevard at Paisley Lane are similar to future background conditions, but the conditions at Highway 47 and Paisley Lane slightly worsened in comparison. Anderson Boulevard at Paisley Lane operates without any issues, at LOS ‘B’ and low v/c ratios.

The LOS for Highway 47 at Paisley Lane remains the same as under future background conditions, with a LOS ‘D’ for the a.m. peak period, and a LOS ‘F’ for the p.m. peak period. The delay during the a.m. peak hour has increased by 1 second, whereas the p.m. peak hour delay has increased by 6 seconds. The v/c ratio during the a.m. peak hour has only increased by 0.01 to a ratio of 0.05, which indicates that the movement still operates within capacity.

Furthermore, the calibrated Synchro model, which is considered more accurate, shows that the southbound left turn movement is expected to operate at a better LOS ‘E’ and a lower delay of 49 seconds in comparison to 61 seconds estimated in the uncalibrated model.



Legend

xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes

Figure 5-2
2027 Future Total Traffic Volumes

6 PARKING REVIEW

6.1 REVIEW OF SITE PARKING SUPPLY

Based on the most recent site statistics, the proposed parking supply was compared to the applicable Zoning By-law requirements in order to determine if they are met. The Township of Uxbridge Zoning By-law 81-19 and Zoning By-law 2013-184 were reviewed for the purposes of this assessment. In discussions with municipal staff it was agreed that the “Manufacturing, Processing, Assembling or Fabricating Plant, Wholesale Establishment Warehouse Located on Privately Serviced Lands” rates are applicable for the proposed development.

The parking space requirements and proposed parking supply are summarized in the table below.

Table 6-1: Parking Requirements and Proposed Parking Supply Comparison

Use	GFA/Spaces	Minimum Parking Requirement	Minimum Parking Supply	Proposed Parking Supply
Manufacturing, Processing, Assembling or Fabricating Plant, Wholesale Establishment Warehouse Located on Privately Serviced Lands (By-law 81-19)	3,200 sq.m.	1 parking space per 100 sq.m. or gross floor area or portion thereof	32	39
Accessible Parking Spaces (By-law 2013-184)	39	2 spaces for number of designated parking spaces 1-50 (51-100)	1	2

Based on the table above, a minimum of 32 vehicular parking spaces are required to be provided on the site based on rates for uses located on privately serviced lands.

The anticipated actual peak parking demand for the site was also assessed using the first principles approach based on a number of employees and level of activity on the site. It is planned that the proposed development will provide jobs for no more than 10 employees. Assuming that all of employees drive to work, which represents a conservative assumption, that would result in a need to provide 10 vehicular parking spaces.

Based on the assessment above, it is proposed to provide 39 vehicular parking spaces on the site. The proposed parking supply exceeds the anticipated maximum parking demand by almost four times and results in the parking surplus of 29 parking spaces. Moreover, the proposed parking supply exceeds the By-law 81-19 parking requirements for Manufacturing, Processing, Assembling or Fabricating Plant, Wholesale Establishment Warehouse located on privately serviced Lands by seven parking space. Hence, it is our opinion that the proposed parking supply of 39 spaces is more than adequate to accommodate the parking needs for the proposed development.

Furthermore, 2 designated accessible parking spaces are provided on the current site plan, satisfying the minimum requirements of Zoning By-law 2013-184.

7 SITE CIRCULATION TESTS

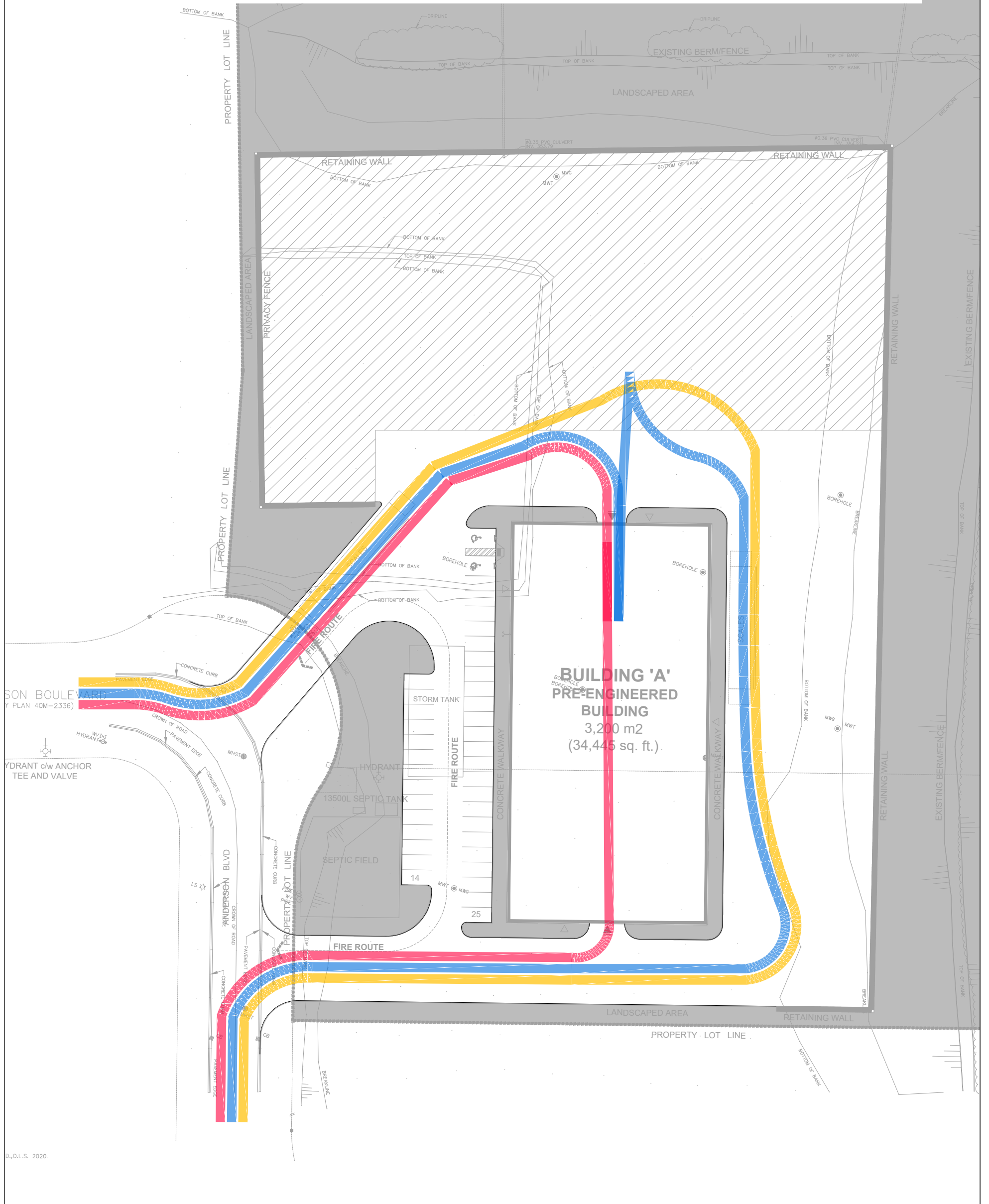
WSP reviewed the proposed redevelopment's on-site circulation using AutoTURN 10.2 vehicle turning template software to determine whether service vehicles can ingress, egress and circulate the site in a safe and efficient manner. In consultation with the client, WSP determined which trucks will be circulating through the site, and where in the site they will drive to and leave from.

There are 3 general truck paths identified on the site. The proposed truck routes, labelled Red, Blue, and Gold, can be seen on **Figure 7-1**.

LEGEND

- RED ROUTE, DRIVING FRONT IN INTO THE BUTLER BUILDING
- BLUE ROUTE, REVERSING INTO THE BUTLER BUILDING
- GOLD ROUTE, SERVING THE SITE AT THE SIDE OF THE BUTLER BUILDING

SSION



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D., O.L.S. 2020.

Scale: 1:750



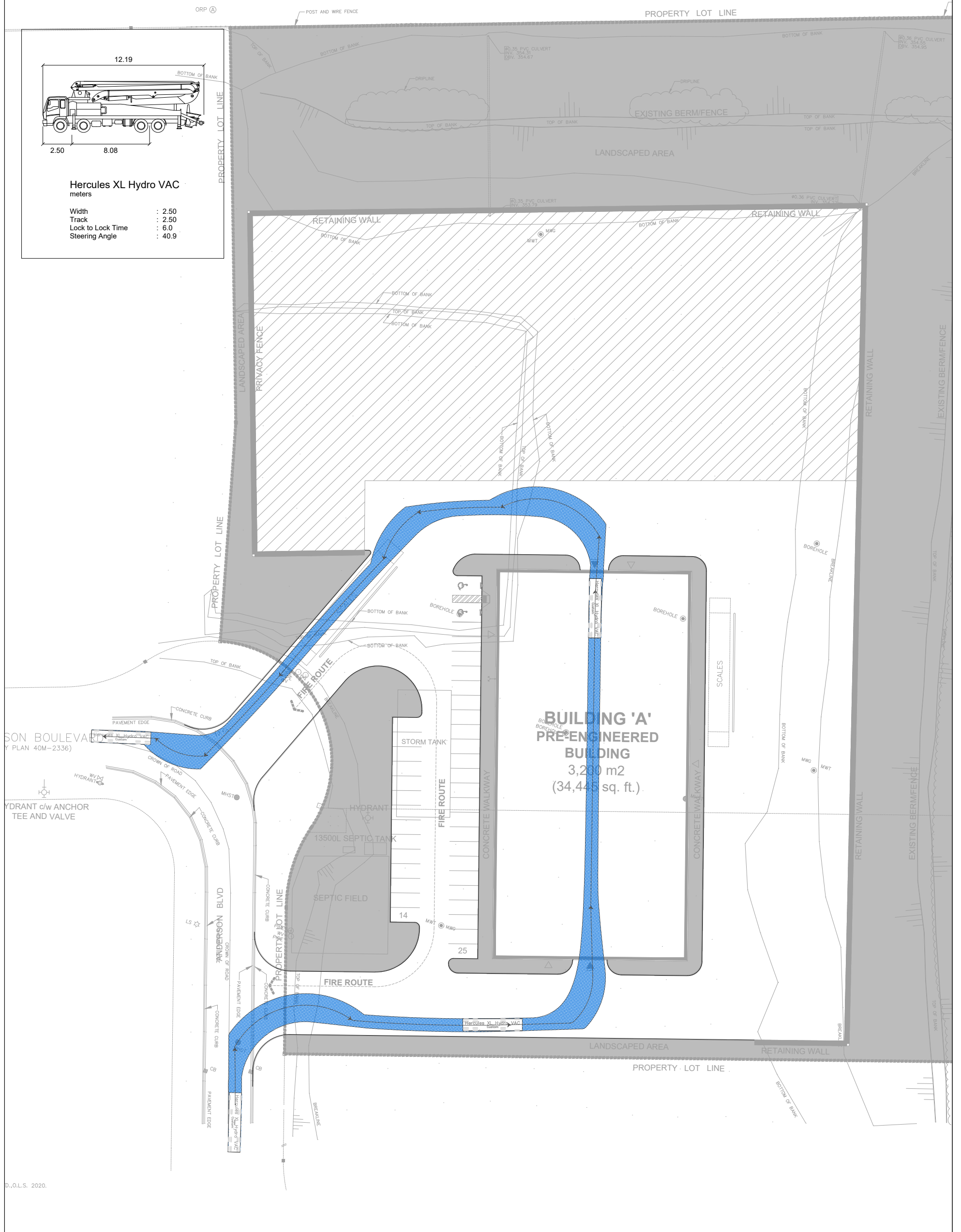
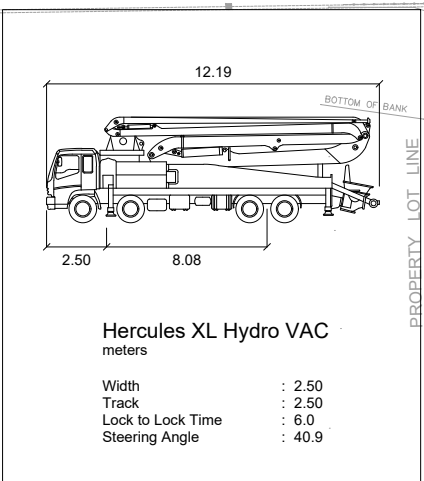
Figure 7-1
Proposed Truck Routes
45-47 Anderson Boulevard Development TIS - Uxbridge

7.1 RED ROUTE

As demonstrated on **Figure 7-1**, there is a designated route, labelled for the sake of this report in the colour red, that depicts the route for a truck to circulate through the site, enter the Butler Building front in, and leave.

A Hydro VAC truck is expected to travel through the Butler Building along this route. The client provided the specifications of a 28 inch long boom Hercule XL Hydro VAC truck. Thus, WSP modeled the vehicle on AutoTurn, and simulated its turning movements. The truck can maneuver through the site with no issue. The turning movements are illustrated on **Figure 7-2**

ROAD ALLOWANCE BETWEEN LOTS 15 AND 16, CONCESSION (NOT PAVED)



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D., O.L.S. 2020.

Scale: 1:750



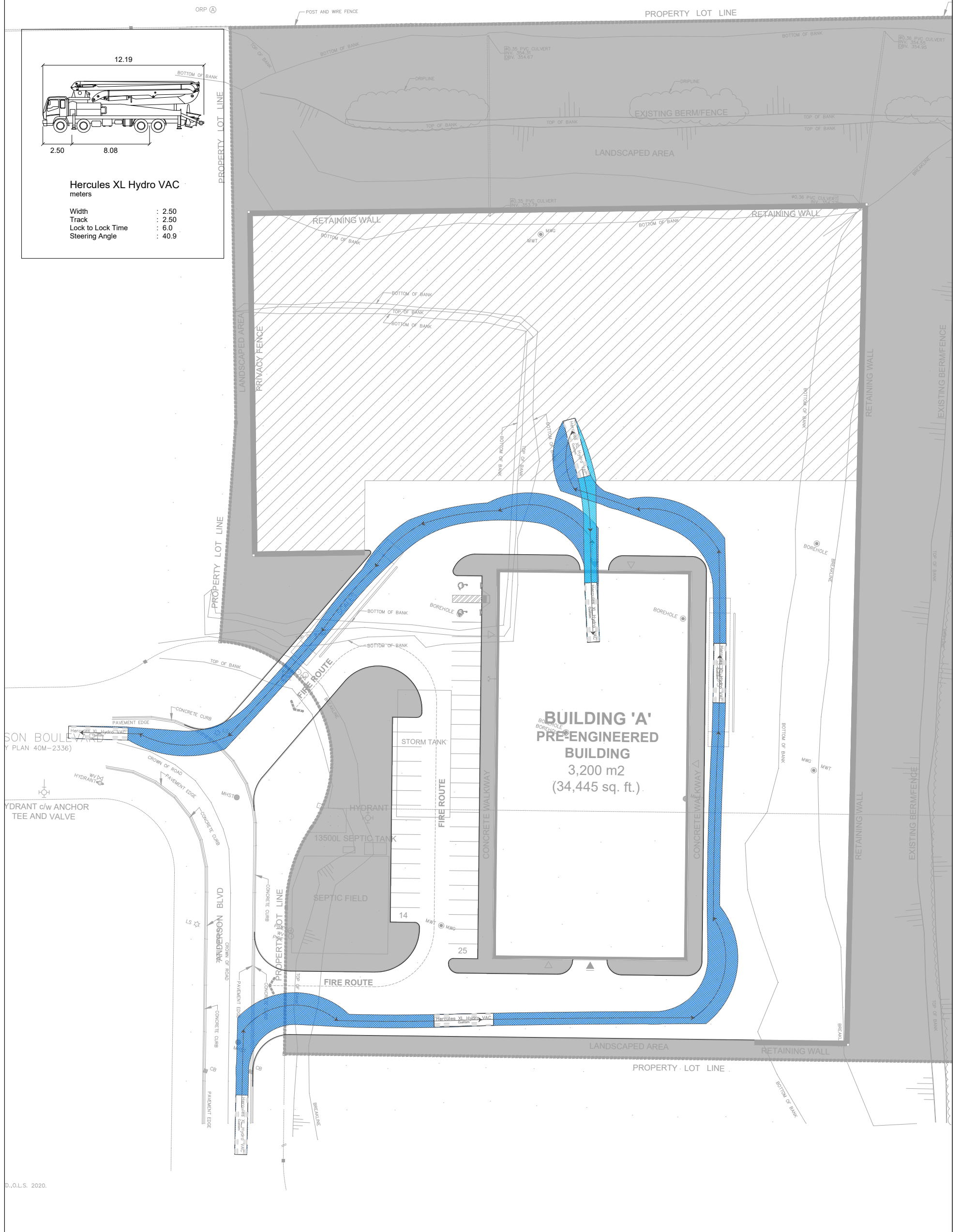
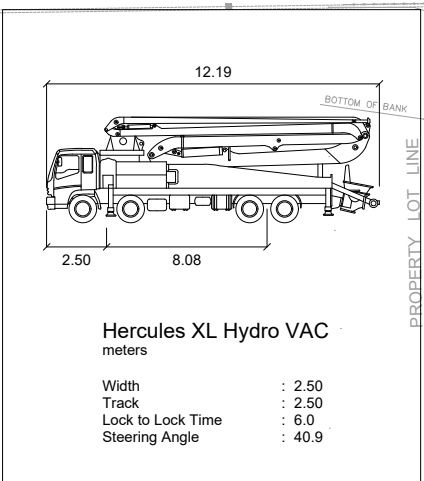
Figure 7-2
Hercules XL Hydro VAC Truck Site Circulation - Red Route
45-47 Anderson Boulevard Development TIS - Uxbridge

7.2 BLUE ROUTE

As demonstrated on **Figure 7-1**, there is a designated route, labelled for the sake of this report in the colour blue, that depicts the route for a truck to circulate through the site, enter the Butler Building reverse in, and leave.

Similar to Red Route, a Hydro VAC truck is expected to travel through the Butler Building along this route. A 28 inch long boom Hercule XL Hydro VAC truck was simulated its turning movements. The truck can maneuver through the site with no issue. The turning movements are illustrated in **Figure 7-3**.

ROAD ALLOWANCE BETWEEN LOTS 15 AND 16, CONCESSION (NOT PAVED)



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Figure 7-3
Hercules XL Hydro VAC Truck Site Circulation - Blue Route
45-47 Anderson Boulevard Development TIS - Uxbridge

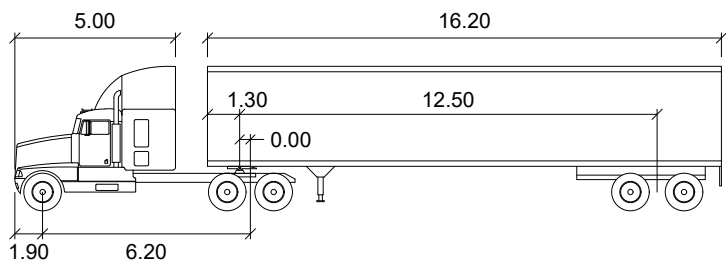
7.3 GOLD ROUTE

As demonstrated on **Figure 7-1**, there is a designated route, labelled for the sake of this report in the colour gold, that depicts the route for a truck to circulate through the site, and serve the site at the edge of the curb the Eastern Side of the buildings.

As per the information provided by the client, the following trucks are to serve the site along this route:

1. 23m Long Tractor Trailer
2. 12m Long Self Steer Triaxle Truck
3. 23m Long Truck-Trailer combination with fixed axle pony
4. Triaxle Dump Truck
5. Triaxle Dump Truck pulling pony-pup Trailer
6. Tractor Pulling 4-axle dump trailer.

WSP modeled the above trucks circulating through the site, pulling close to the curb for the sake of loading/unloading, and leaving the site. All turning movements work with no issue, as illustrated in **Figures Figure 7-4 to Figure 7-9**.

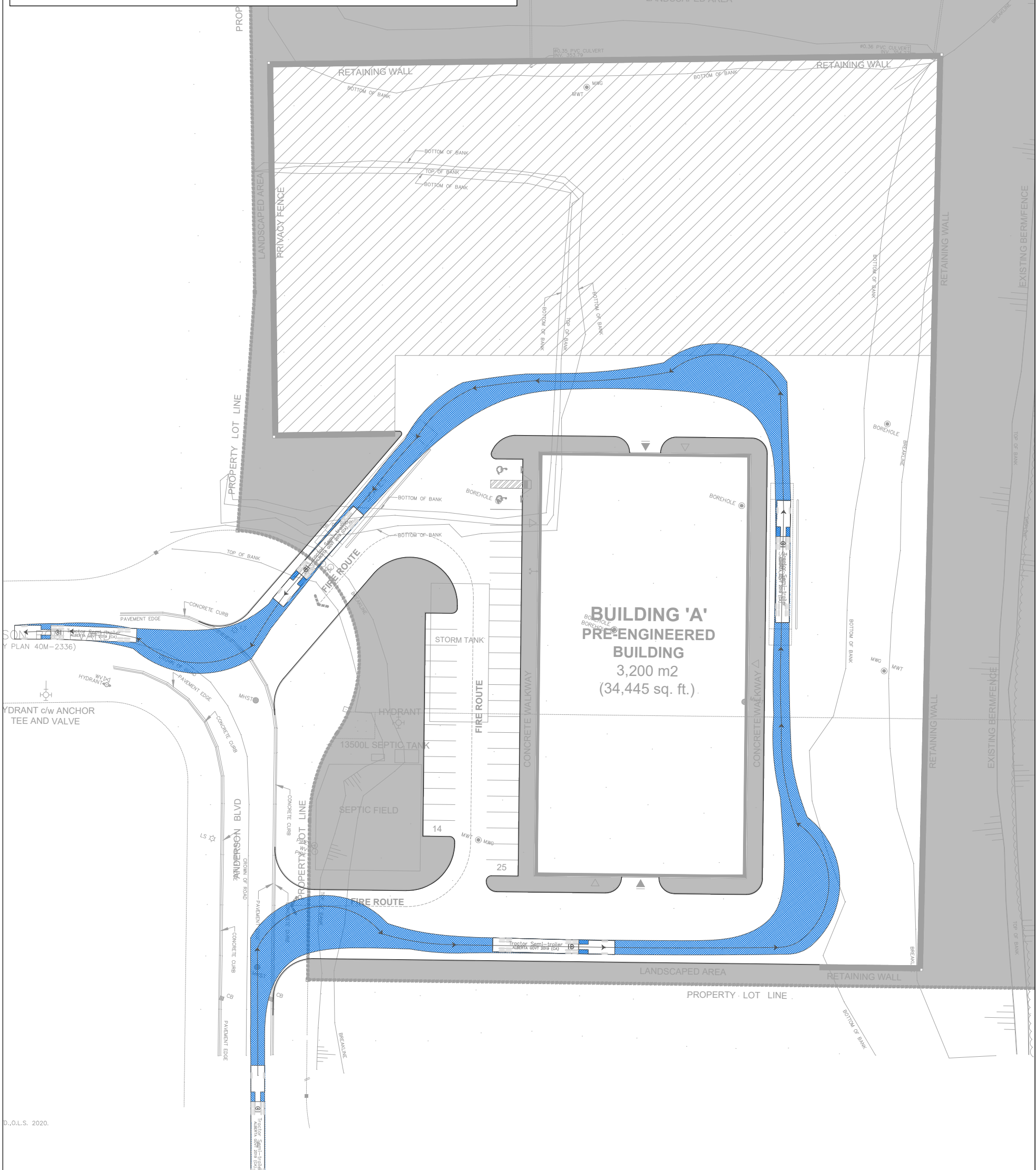


Tractor Semi-trailer

	meters		
Tractor Width	: 2.60	Lock to Lock Time	: 6.0
Trailer Width	: 2.60	Steering Angle	: 28.2
Tractor Track	: 2.60	Articulating Angle	: 70.0
Trailer Track	: 2.60		

LOTS 15 AND 16, CONCESSION (PAVED)

PROPERTY LOT LINE



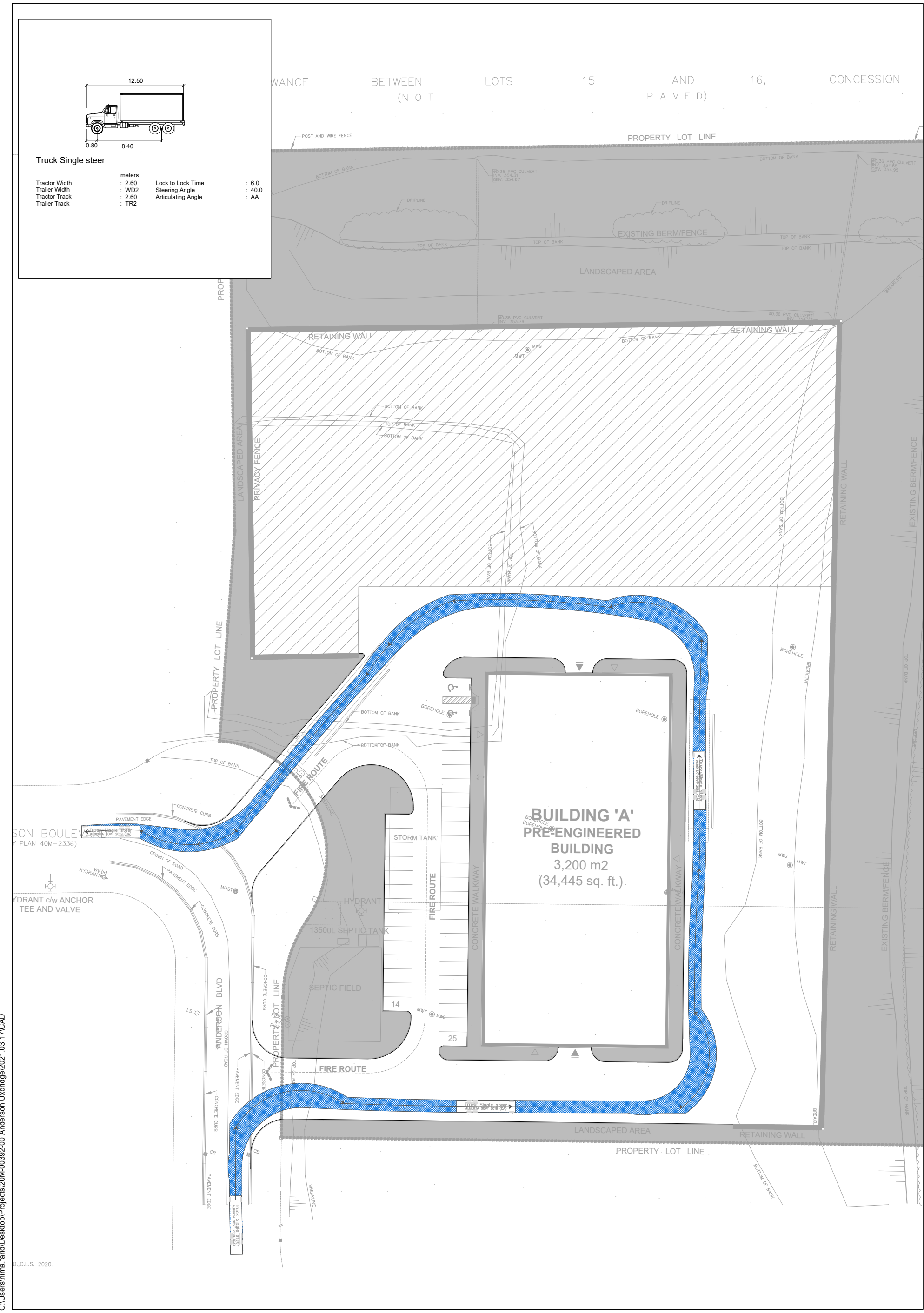
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Scale: 1:750

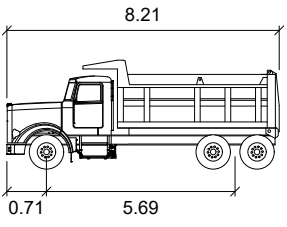


Figure 7-4
Tractor-Trailer Site Circulation
45-47 Anderson Boulevard Development TIS - Uxbridge



Source: Scale: 1:750

Figure 4-5
Self Steer Triaxle Truck Site Circulation
45-47 Anderson Boulevard Development TIS - Uxbridge



International 5500i Dump Truck

	metres
Width	: 2.44
Track	: 2.44
Lock to Lock Time	: 6.0
Steering Angle	: 35.4

ALLOWANCE BETWEEN LOTS 15 AND 16, CONCESSION (NOT PAVED)



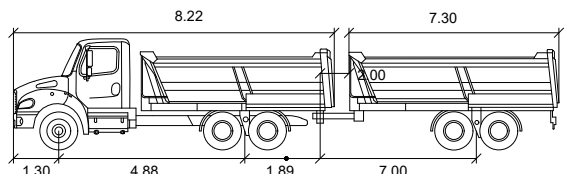
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D., O.L.S. 2020.

Scale: 1:750



Figure 7-7
Triaxle Dump Truck Site Circulation
45-47 Anderson Boulevard Development TIS - Uxbridge



Mack Granite Axle Back 6X4_Config 1

meters			
First Unit Width	: 2.58	Lock to Lock Time	: 6.0
Trailer Width	: 2.58	Steering Angle	: 28.0
First Unit Track	: 2.55	Articulating Angle	: 70.0
Trailer Track	: 2.55		

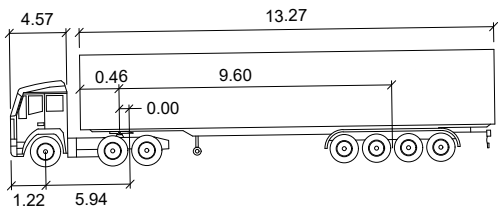
BETWEEN LOTS 15 AND 16, CONCESSION (NOT PAVED)



Scale: 1:750



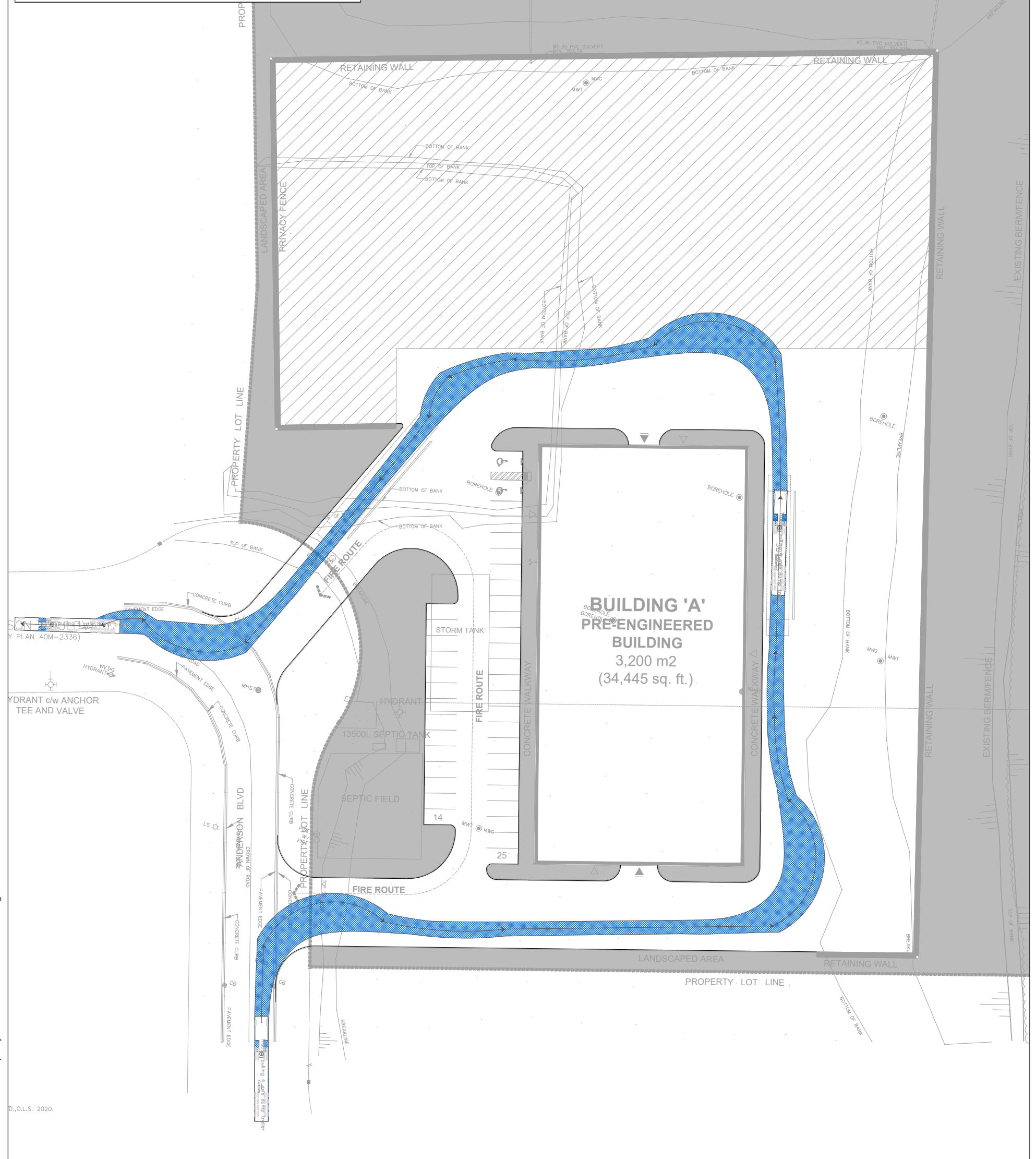
Figure 7-8
Triaxle Dump Truck pulling Pony-Pup Trailer Site Circulation
45-47 Anderson Boulevard Development TIS - Uxbridge



Tractor pulling 4 axle dump trailer

	Tractor	Trailer	Tractor + Trailer
Tractor Width	: 2.44		
Trailer Width		: 2.59	
Tractor Track	: 2.44		
Trailer Track		: 2.59	
Lock to Lock Time			: 6.0
Steering Angle			: 28.4
Articulating Angle			: 75.0

BETWEEN LOTS 15 AND 16, CONCESSION (NOT PAVED)



Scale: 1:750



Figure 7-9
Triaxle Dump Truck pulling Pony-Pup Trailer Site Circulation
45-47 Anderson Boulevard Development TIS - Uxbridge

8 TRANSPORTATION DEMAND MANAGEMENT (TDM) MEASURES

Although the proposed development is located in an area of Uxbridge where transit services and active transportation facilities are limited, there are measures that can encourage staff to use alternative modes of travel. Carpooling opportunities will be promoted as a measure to reduce single occupancy vehicle trips. Although the current Durham Region TMP does not include any planned active transportation infrastructure improvements for the two horizon years along the study roadways, it is recommended that sidewalks be provided along the site location at Anderson Boulevard, in order to promote connectivity to other land uses and bus stop locations.

9 CONCLUSIONS

This TIS has assessed the ability of the road network to accommodate the proposed soil processing facility at 45 & 47 Anderson Boulevard.

The subject development is forecasted to generate a total of 20 truck trips and 10 passenger vehicle trips during the a.m. and p.m. peak hours, respectively. The analysis indicates that the traffic impacts of the development proposal on the boundary road network are minimal, and that the study area intersections would operate at the acceptable levels of service.

There are limited active transportation facilities present within the vicinity of the site, and there are no future infrastructure planned to service pedestrians, cyclists, or transit ridership by the future 2022 and 2027 horizon years.

The proposed parking supply of 39 vehicular spaces satisfies the Zoning By-law minimum requirement of 32 spaces. It is recommended that a minimum of 2 accessible parking spaces be provided in future iterations of the site plan.

APPENDIX

A TERMS OF REFERENCE



Cc: Doug Robertson <Doug.Robertson@Durham.ca>

Subject: RE: 45& 47 Anderson Boulevard, Township of Uxbridge - Traffic Counts during Covid-19

Hi Ismet.

Based on the 100 truck trips per day, we are agreeable to analysis of the Anderson Boulevard and Paisley Line (Unsignalized) and Highway 47 and Paisley Line (Unsignalized) intersections. You should select a reasonable / achievable opening year and 5 year horizon. Based on historic growth in the corridor a 1% annual growth rate should be applied.

The traffic brief should include a comparison of the count data to historical ATR counts on Reg Hwy 47 (from the traffic counts web site [traffic counts map](#).) to confirm that the volumes are relatively "typical". A COVID adjustment factor could be applied if the counts appear to be too low.

As per Regional TIS guidelines, the study should include transit, active transportation and TDM discussions in the TIS, even though we recognize the limited opportunities for the proposed land use.

As noted below, the Township should also confirm the scope of the study.

Regards

Glyn Reedman
Project Coordinator
Transportation Infrastructure
905-668-7711 Ext 3476

From: Medic, Ismet <lsmet.Medic@wsp.com>

Sent: Friday, July 24, 2020 2:45 AM

To: Doug Robertson <Doug.Robertson@Durham.ca>; Glyn Reedman <Glyn.Reedman@Durham.ca>

Subject: RE: 45& 47 Anderson Boulevard, Township of Uxbridge - Traffic Counts during Covid-19

Hi Doug and Glyn,

We finally received the info from our client regarding the site traffic. The site's operation hours will be from 7am to 6pm. It is expected that a maximum number of daily truck trips will be 100 (100 inbound and 100 outbound trips). The absolute maximum number of trucks arriving within a single hour is estimated at 30 trucks; however, this would not be relatively rear. The truck arrival is expected to be evenly distributed throughout the day, and the peak arrival will probably occur outside of the peak traffic conditions on adjacent streets. Non-truck traffic is estimated at 20 vehicles per day.

We were originally planning to analyze traffic conditions at these two intersections adjacent to the site during the typical weekday a.m. (7:00 – 9:00) and p.m. (4:00 – 6:00) periods :

In accordance with the Region's TIS guidelines, we were planning to analyze the opening year and 5-year after horizons. As suggested in your email below, we confirmed that all industrial businesses in the study area are open and we conducted traffic counts at these intersection during the week of July 6. Based on our observations, it seems that the traffic patterns in the area have already normalized, and that the current traffic volumes reflect the 'typical' conditions.

Given a very limited number of hourly site traffic volumes, it seems that a traffic brief, which will include the assessment of traffic conditions at these two intersections, should be adequate. Could you please advise if you agree with the suggested approach and whether it is required to analyze both the opening year and 5-year after conditions?

Regards,

Ismet Medic, B.A.Sc.
Senior Project Manager
Planning & Advisory
Transportation



New – Direct Number: 1 289-982-4745

100 Commerce Valley Drive West
Thornhill, Ontario
L3T 0A1 Canada
wsp.com

From: Doug Robertson <Doug.Robertson@Durham.ca>
Sent: Tuesday, June 23, 2020 5:43 PM
To: Medic, Ismet <Ismet.Medic@wsp.com>
Cc: Glyn Reedman <Glyn.Reedman@Durham.ca>
Subject: RE: 45& 47 Anderson Boulevard, Township of Uxbridge - Traffic Counts during Covid-19

Ismet,

Our Traffic Division is monitoring volume trends, and they have advised against completing any new counts until at least September (assuming schools reopen then), but I assume that your client can't wait that long.

We have a 2018 count at the Reg Hwy 47/Reg Rd 30 intersection that you could use with corridor growth adjustments to get a reasonable estimate of the through traffic on Reg Hwy 47 at Paisley Lane. (The most recent traffic data available from the Region can be downloaded from our web site through the interactive [traffic counts map](#).) We do not have any data or previous studies for Paisley Lane or Anderson Blvd.

You may be able to get reasonably good counts on Anderson Blvd and Paisley Lane if most of the businesses in the industrial subdivision are open. If you can verify that all or most of the businesses are operating (e.g. through on-site observations and checking the businesses' websites, contacting them, etc.), we would accept the counts. To be on the safe side, you should add a reasonable "COVID adjustment factor" to the counts (e.g. 20%) to account for potential pandemic-related business activity reduction.

If you haven't already done so, please submit a proposed study scope of work to Glyn Reedman (copied on this email) for review and approval before proceeding with your study. Please include at least a rough estimate of the site trip generation. Depending on how much traffic you expect the proposed development to generate, we may want the study to also include the Reg Rd 30/Anderson Blvd intersection, or we may be able to accept a reduced scope traffic brief instead of a full study. The Township would also need to review and approve your scope.

Regards,
Doug

Doug Robertson, P.Eng., PTOE

Project Manager - Transportation Infrastructure
Regional Municipality of Durham, Works Department
605 Rossland Road East, Level 5
PO Box 623, Whitby, ON L1N 6A3
Phone: 905-668-4113 or 1-800-372-1102 Ext.3733
durham.ca | #DurhamStrong

From: Medic, Ismet <Ismet.Medic@wsp.com>
Sent: June 19, 2020 10:34 AM
To: Doug Robertson <Doug.Robertson@Durham.ca>
Subject: 45& 47 Anderson Boulevard, Township of Uxbridge - Traffic Counts during Covid-19

Good morning Doug,

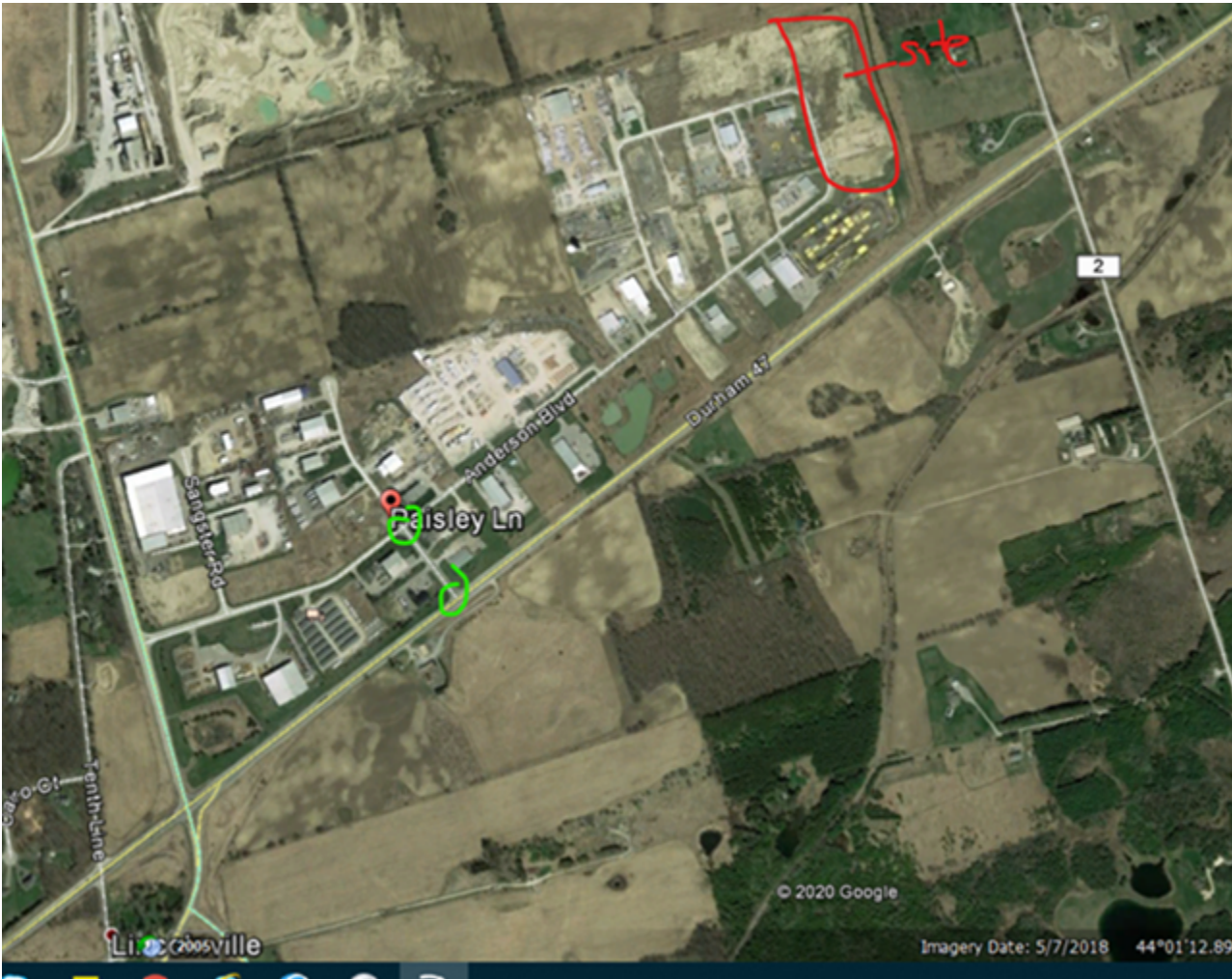
I hope this email finds you well.

WSP is working on a TIS in support of the proposed soil processing facility development at 45 & 47 Anderson Boulevard, in the Township of Uxbridge.

It is anticipated that the development will not generate a significant number of trips. Hence, we were planning to analyze the following intersections:

- Anderson Boulevard and Paisley Line (unsignalized)
- Highway 47 and Paisley Line (unsignalized)

We were planning to conduct traffic counts in April, but were forced to postpone it due to the Covid-19 situation. We already confirmed with Region traffic data staff that traffic counts are not available for these intersection. Our client would like to submit the application soon, so we need to address this traffic data issues. Could you please advise what is Region's policy regarding traffic counts during the current conditions? It seems that the traffic conditions starting to normalize slowly, and that in a few weeks we might get close to 'typical conditions'. If we are to do counts in next few weeks, would the Region consider these counts acceptable if some adjustment factors are applied? I am not sure if the Region already had to deal with the similar issues, but your direction regarding this issue will be appreciated.



Regards,

Ismet Medic, B.A.Sc.
Senior Project Manager
Planning & Advisory
Transportation



New – Direct Number: 1 289-982-4745

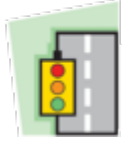
100 Commerce Valley Drive West
Thornhill, Ontario
L3T 0A1 Canada
wsp.com

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APPENDIX

B TRAFFIC DATA





Ontario Traffic Inc.
TRAFFIC MONITORING  SERVICES & PRODUCTS

Project #20-101 - WSP

Intersection Count Report

Intersection:	Anderson Blvd & Paisley Line
Municipality:	Uxbridge
Count Date:	Jul 07, 2020
Site Code:	2010100001
Count Categories:	Cars, Light Trucks, Heavy Trucks, Pedestrians
Count Period:	07:00-09:00, 16:00-18:00
Weather:	Clear



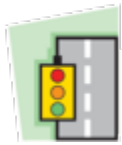
Traffic Count Map

Intersection: Anderson Blvd & Paisley Line

Municipality: Uxbridge

Count Date: Jul 07, 2020





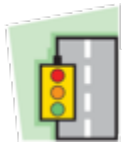
Ontario Traffic Inc.
TRAFFIC MONITORING + SERVICES & PRODUCTS

Traffic Count Summary

Intersection: Anderson Blvd & Paisley Line
Municipality: Uxbridge
Count Date: Jul 07, 2020

Paisley Line - Traffic Summary

Hour	North Approach Totals						South Approach Totals					
	Includes Cars, Light Trucks, Heavy Trucks						Includes Cars, Light Trucks, Heavy Trucks					
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds
07:00 - 08:00	3	7	2	0	12	0	13	19	59	0	91	1
08:00 - 09:00	1	14	1	0	16	0	6	19	54	0	79	0
BREAK												
16:00 - 17:00	0	31	8	0	39	1	8	2	26	0	36	0
17:00 - 18:00	1	19	3	0	23	0	4	1	34	0	39	0
GRAND TOTAL	5	71	14	0	90	1	31	41	173	0	245	1



Ontario Traffic Inc.
TRAFFIC MONITORING + SERVICES & PRODUCTS

Traffic Count Summary

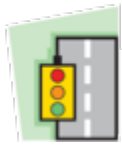
Intersection: Anderson Blvd & Paisley Line
Municipality: Uxbridge
Count Date: Jul 07, 2020

Anderson Blvd - Traffic Summary

East Approach Totals

West Approach Totals

Hour	Includes Cars, Light Trucks, Heavy Trucks						Includes Cars, Light Trucks, Heavy Trucks					
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds
07:00 - 08:00	23	9	1	0	33	0	13	19	5	0	37	0
08:00 - 09:00	38	10	1	0	49	1	4	25	9	0	38	0
BREAK												
16:00 - 17:00	54	24	0	0	78	2	1	17	35	1	54	0
17:00 - 18:00	74	27	0	0	101	0	3	10	20	0	33	0
GRAND TOTAL	189	70	2	0	261	3	21	71	69	1	162	0



Peak Hour Diagram

Specified Period

From: 07:00:00
To: 09:00:00

One Hour Peak

From: 07:30:00
To: 08:30:00

Intersection: Anderson Blvd & Paisley Line
Site ID: 2010100001
Count Date: Jul 07, 2020

Weather conditions:

**** Unsignalized Intersection ****

Major Road: Anderson Blvd runs E/W

North Approach

	Out	In	Total
🚗	5	12	17
LT	5	13	18
HT	6	3	9
Totals	16	28	44

Paisley Line

HT	0	5	1	0
LT	0	4	1	0
🚗	1	2	2	0
Totals	1	11	4	0

← ↓ → ↻

East Approach

	Out	In	Total
🚗	15	69	84
LT	11	29	40
HT	15	6	21
Totals	41	104	145

Anderson Blvd

HT	LT	🚗	Totals	
0	0	0	0	↻
2	4	4	10	↑
3	8	17	28	→
2	2	4	8	↓

Peds: 0

Peds: 0



Peds: 0

Anderson Blvd

Totals	🚗	LT	HT
0	0	0	0
1	0	1	0
6	2	1	3
34	13	9	12

Peds: 0

West Approach

	Out	In	Total
🚗	25	8	33
LT	14	3	17
HT	7	5	12
Totals	46	16	62

Totals	9	17	72	0
🚗	5	8	50	0
LT	2	8	20	0
HT	2	1	2	0

Paisley Line

South Approach

	Out	In	Total
🚗	63	19	82
LT	30	15	45
HT	5	19	24
Totals	98	53	151

🚗 - Cars

LT - Light Trucks

HT - Heavy Trucks

Comments



Ontario Traffic Inc.
TRAFFIC MONITORING SERVICES & PRODUCTS

Peak Hour Summary

Intersection: Anderson Blvd & Paisley Line
Count Date: Jul 07, 2020
Period: 07:00 - 09:00

Peak Hour Data (07:30 - 08:30)

Start Time	North Approach Paisley Line						South Approach Paisley Line						East Approach Anderson Blvd						West Approach Anderson Blvd						Total Vehicles
	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
07:30	1	2	0	0	0	3	2	2	20	0	0	24	5	2	0	0	0	7	7	6	1	0	0	14	48
07:45	2	2	0	0	0	4	2	6	22	0	0	30	11	1	1	0	0	13	1	7	3	0	0	11	58
08:00	0	4	1	0	0	5	3	3	13	0	0	19	7	0	0	0	0	7	1	7	3	0	0	11	42
08:15	1	3	0	0	0	4	2	6	17	0	0	25	11	3	0	0	0	14	1	8	1	0	0	10	53
Grand Total	4	11	1	0	0	16	9	17	72	0	0	98	34	6	1	0	0	41	10	28	8	0	0	46	201
Approach %	25	68.8	6.3	0	-	-	9.2	17.3	73.5	0	-	-	82.9	14.6	2.4	0	-	21.7	60.9	17.4	0	-	-		
Totals %	2	5.5	0.5	0	-	8	4.5	8.5	35.8	0	-	48.8	16.9	3	0.5	0	20.4	5	13.9	4	0	-	22.9		
PHF	0.5	0.69	0.25	0	-	0.8	0.75	0.71	0.82	0	-	0.82	0.77	0.5	0.25	0	0.73	0.36	0.88	0.67	0	-	0.82	0.87	
Cars	2	2	1	0	-	5	5	8	50	0	-	63	13	2	0	0	15	4	17	4	0	-	25	108	
% Cars	50	18.2	100	0	-	31.3	55.6	47.1	69.4	0	-	64.3	38.2	33.3	0	0	36.6	40	60.7	50	0	-	54.3	53.7	
Light Trucks	1	4	0	0	-	5	2	8	20	0	-	30	9	1	1	0	11	4	8	2	0	-	14	60	
% Light Trucks	25	36.4	0	0	-	31.3	22.2	47.1	27.8	0	-	30.6	26.5	16.7	100	0	26.8	40	28.6	25	0	-	30.4	29.9	
Heavy Trucks	1	5	0	0	-	6	2	1	2	0	-	5	12	3	0	0	15	2	3	2	0	-	7	33	
% Heavy Trucks	25	45.5	0	0	-	37.5	22.2	5.9	2.8	0	-	5.1	35.3	50	0	0	36.6	20	10.7	25	0	-	15.2	16.4	
Peds	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	0
% Peds	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	



Peak Hour Diagram

Specified Period

From: 16:00:00
To: 18:00:00

One Hour Peak

From: 16:30:00
To: 17:30:00

Intersection: Anderson Blvd & Paisley Line
Site ID: 2010100001
Count Date: Jul 07, 2020

Weather conditions:

**** Unsignalized Intersection ****

Major Road: Anderson Blvd runs E/W

North Approach

	Out	In	Total
	12	1	13
LT	13	1	14
HT	0	0	0
Totals	25	2	27

Paisley Line

HT	0	0	0	0
LT	2	10	1	0
	3	9	0	0
Totals	5	19	1	0

← ↓ → ↻

East Approach

	Out	In	Total
	83	34	117
LT	19	10	29
HT	4	15	19
Totals	106	59	165

Anderson Blvd

HT	LT		Totals
0	0	1	1
0	1	1	2
7	3	8	18
0	7	34	41

↻ ↑ → ↓

Peds: 0

Peds: 0



Peds: 0

Peds: 0

Anderson Blvd

Totals		LT	HT
0	0	0	0
0	0	0	0
29	26	2	1
77	57	17	3

↻ ↑ ↓

West Approach

	Out	In	Total
	44	32	76
LT	11	5	16
HT	7	2	9
Totals	62	39	101

Totals	4	0	40	0
	2	0	26	0
LT	1	0	6	0
HT	1	0	8	0

← ↑ → ↻

Paisley Line

South Approach

	Out	In	Total
	28	100	128
LT	7	34	41
HT	9	3	12
Totals	44	137	181

- Cars

LT - Light Trucks

HT - Heavy Trucks

Comments



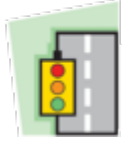
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Peak Hour Summary

Intersection: Anderson Blvd & Paisley Line
 Count Date: Jul 07, 2020
 Period: 16:00 - 18:00

Peak Hour Data (16:30 - 17:30)

Start Time	North Approach Paisley Line						South Approach Paisley Line						East Approach Anderson Blvd						West Approach Anderson Blvd						Total Vehicles
	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
16:30	0	3	0	0	0	3	2	0	5	0	0	7	12	4	0	0	0	16	0	5	22	1	0	28	54
16:45	0	5	3	0	0	8	0	0	11	0	0	11	18	6	0	0	0	24	0	8	6	0	0	14	57
17:00	1	6	2	0	0	9	1	0	10	0	0	11	34	12	0	0	0	46	1	3	9	0	0	13	79
17:15	0	5	0	0	0	5	1	0	14	0	0	15	13	7	0	0	0	20	1	2	4	0	0	7	47
Grand Total	1	19	5	0	0	25	4	0	40	0	0	44	77	29	0	0	0	106	2	18	41	1	0	62	237
Approach %	4	76	20	0	-	-	9.1	0	90.9	0	-	-	72.6	27.4	0	0	-	3.2	29	66.1	1.6	-	-		
Totals %	0.4	8	2.1	0	-	10.5	1.7	0	16.9	0	-	18.6	32.5	12.2	0	0	44.7	0.8	7.6	17.3	0.4	-	26.2		
PHF	0.25	0.79	0.42	0	-	0.69	0.5	0	0.71	0	-	0.73	0.57	0.6	0	0	0.58	0.5	0.56	0.47	0.25	-	0.55	0.75	
Cars	0	9	3	0	-	12	2	0	26	0	-	28	57	26	0	0	83	1	8	34	1	-	44	167	
% Cars	0	47.4	60	0	-	48	50	0	65	0	-	63.6	74	89.7	0	0	78.3	50	44.4	82.9	100	-	71	70.5	
Light Trucks	1	10	2	0	-	13	1	0	6	0	-	7	17	2	0	0	19	1	3	7	0	-	11	50	
% Light Trucks	100	52.6	40	0	-	52	25	0	15	0	-	15.9	22.1	6.9	0	0	17.9	50	16.7	17.1	0	-	17.7	21.1	
Heavy Trucks	0	0	0	0	-	0	1	0	8	0	-	9	3	1	0	0	4	0	7	0	0	-	7	20	
% Heavy Trucks	0	0	0	0	-	0	25	0	20	0	-	20.5	3.9	3.4	0	0	3.8	0	38.9	0	0	-	11.3	8.4	
Peds	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	0
% Peds	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-



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Project #20-101 - WSP

Intersection Count Report

Intersection: Hwy 47 & Paisley Line
Municipality: Uxbridge
Count Date: Jul 07, 2020
Site Code: 2010100002
Count Categories: Cars, Light Trucks, Heavy Trucks, Pedestrians
Count Period: 07:00-09:00, 16:00-18:00
Weather: Clear



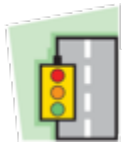
Traffic Count Map

Intersection: Hwy 47 & Paisley Line

Municipality: Uxbridge

Count Date: Jul 07, 2020





Traffic Count Summary

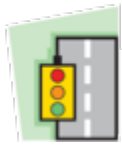
Intersection: Hwy 47 & Paisley Line
Municipality: Uxbridge
Count Date: Jul 07, 2020

Hwy 47 - Traffic Summary

East Approach Totals

West Approach Totals

Hour	Includes Cars, Light Trucks, Heavy Trucks						Includes Cars, Light Trucks, Heavy Trucks					
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds
07:00 - 08:00	0	547	52	0	599	0	44	327	0	0	371	0
08:00 - 09:00	0	438	34	0	472	0	46	334	0	1	381	0
BREAK												
16:00 - 17:00	0	457	12	0	469	0	27	697	0	0	724	0
17:00 - 18:00	0	386	19	0	405	0	20	657	0	0	677	0
GRAND TOTAL	0	1828	117	0	1945	0	137	2015	0	1	2153	0



Peak Hour Diagram

Specified Period

From: 07:00:00
To: 09:00:00

One Hour Peak

From: 07:00:00
To: 08:00:00

Intersection: Hwy 47 & Paisley Line
Site ID: 2010100002
Count Date: Jul 07, 2020

Weather conditions:

**** Unsignalized Intersection ****

Major Road: Hwy 47 runs E/W

North Approach

	Out	In	Total
	9	60	69
LT	8	30	38
HT	14	6	20
Totals	31	96	127

Paisley Line

HT	11	3	0
LT	6	2	0
	8	1	0
Totals	25	6	0

East Approach

	Out	In	Total
	386	207	593
LT	159	65	224
HT	54	61	115
Totals	599	333	932

Hwy 47

HT	LT		Totals
0	0	0	0
2	13	29	44
58	63	206	327

Peds: 0



Peds: 0

Peds: 0

Peds: 0

Hwy 47

Totals		LT	HT
0	0	0	0
52	31	17	4
547	355	142	50

West Approach

	Out	In	Total
	235	363	598
LT	76	148	224
HT	60	61	121
Totals	371	572	943

- Cars

LT - Light Trucks

HT - Heavy Trucks

Comments



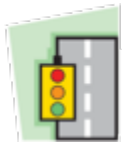
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Peak Hour Summary

Intersection: Hwy 47 & Paisley Line
Count Date: Jul 07, 2020
Period: 07:00 - 09:00

Peak Hour Data (07:00 - 08:00)

Start Time	North Approach Paisley Line						South Approach						East Approach Hwy 47						West Approach Hwy 47						Total Vehicles
	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
07:00	0		3	0	0	3					0			129	14	0	0	143	6	88		0	0	94	240
07:15	2		4	0	0	6					0			141	8	0	0	149	10	68		0	0	78	233
07:30	0		8	0	0	8					0			138	14	0	0	152	12	91		0	0	103	263
07:45	4		10	0	0	14					0			139	16	0	0	155	16	80		0	0	96	265
Grand Total	6		25	0	0	31					0	0		547	52	0	0	599	44	327		0	0	371	1001
Approach %	19.4		80.6	0	-	-					-	-		91.3	8.7	0	-	-	11.9	88.1		0	-	-	-
Totals %	0.6		2.5	0	3.1						0			54.6	5.2	0		59.8	4.4	32.7		0		37.1	
PHF	0.38		0.63	0	0.55						0			0.97	0.81	0		0.97	0.69	0.9		0		0.9	0.94
Cars	1		8	0	9						0			355	31	0		386	29	206		0		235	630
% Cars	16.7		32	0	29						0			64.9	59.6	0		64.4	65.9	63		0		63.3	62.9
Light Trucks	2		6	0	8						0			142	17	0		159	13	63		0		76	243
% Light Trucks	33.3		24	0	25.8						0			26	32.7	0		26.5	29.5	19.3		0		20.5	24.3
Heavy Trucks	3		11	0	14						0			50	4	0		54	2	58		0		60	128
% Heavy Trucks	50		44	0	45.2						0			9.1	7.7	0		9	4.5	17.7		0		16.2	12.8
Peds					0	-					0	-						0				0	-		0
% Peds					0	-					0	-						0				0	-		0



Peak Hour Diagram

Specified Period

From: 16:00:00
To: 18:00:00

One Hour Peak

From: 16:15:00
To: 17:15:00

Intersection: Hwy 47 & Paisley Line
Site ID: 2010100002
Count Date: Jul 07, 2020

Weather conditions:

**** Unsignalized Intersection ****

Major Road: Hwy 47 runs E/W

North Approach

	Out	In	Total
🚗	97	24	121
LT	37	6	43
HT	2	8	10
Totals	136	38	174

Paisley Line

HT	0	2	0
LT	13	24	0
🚗	50	47	0
Totals	63	73	0

East Approach

	Out	In	Total
🚗	336	561	897
LT	91	191	282
HT	52	30	82
Totals	479	782	1261

Hwy 47

HT	LT	🚗	Totals
0	0	0	0
7	5	11	23
28	167	514	709

Peds: 0



Hwy 47

Totals	🚗	LT	HT
0	0	0	0
15	13	1	1
464	323	90	51

Peds: 0

West Approach

	Out	In	Total
🚗	525	373	898
LT	172	103	275
HT	35	51	86
Totals	732	527	1259

🚗 - Cars

LT - Light Trucks

HT - Heavy Trucks

Comments



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Peak Hour Summary

Intersection: Hwy 47 & Paisley Line
Count Date: Jul 07, 2020
Period: 16:00 - 18:00

Peak Hour Data (16:15 - 17:15)

Start Time	North Approach Paisley Line						South Approach						East Approach Hwy 47						West Approach Hwy 47						Total Vehicles
	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
16:15	8		8	0	0	16					0		97	5	0	0	102	1	193			0	0	194	312
16:30	16		22	0	0	38					0		133	2	0	0	135	9	186			0	0	195	368
16:45	19		11	0	0	30					0		110	3	0	0	113	7	142			0	0	149	292
17:00	30		22	0	0	52					0		124	5	0	0	129	6	188			0	0	194	375
Grand Total	73		63	0	0	136					0	0	464	15	0	0	479	23	709			0	0	732	1347
Approach %	53.7		46.3	0		-					-		96.9	3.1	0		-	3.1	96.9			0		-	
Totals %	5.4		4.7	0		10.1					0		34.4	1.1	0		35.6	1.7	52.6			0		54.3	
PHF	0.61		0.72	0		0.65					0		0.87	0.75	0		0.89	0.64	0.92			0		0.94	0.9
Cars	47		50	0		97					0		323	13	0		336	11	514			0		525	958
% Cars	64.4		79.4	0		71.3					0		69.6	86.7	0		70.1	47.8	72.5			0		71.7	71.1
Light Trucks	24		13	0		37					0		90	1	0		91	5	167			0		172	300
% Light Trucks	32.9		20.6	0		27.2					0		19.4	6.7	0		19	21.7	23.6			0		23.5	22.3
Heavy Trucks	2		0	0		2					0		51	1	0		52	7	28			0		35	89
% Heavy Trucks	2.7		0	0		1.5					0		11	6.7	0		10.9	30.4	3.9			0		4.8	6.6
Peds					0	-					0	-					0	-				0	-		0
% Peds					0	-					0	-					0	-				0	-		0

Average Delays based on Video Review			
Hwy 47 and Paisley Lane			
AM Peak Hour		PM Peak Hour	
Delays (seconds)		Delays (seconds)	
SBL	SBR	SBL	SBR
26	5	2	1
27	7	12	3
1	1	47	1
2	0	37	12
15	1	8	14
33	36	2	8
	1	10	1
	1	33	12
	0	7	3
	0	41	3
	0	3	1
	0	45	1
	7	47	1
	1	62	9
	32	67	1
	0	55	2
	3	57	0
	1	4	1
	40	16	1
	30	16	12
	1	40	1
	8	59	2
	9	86	21
	1	79	34
	1	5	22
		25	33
		125	12
		121	2
		118	1
		24	9
		4	0
		1	0
		21	1
		55	28
		52	2
		37	59
		38	1
		39	20
		73	4
		54	6
		5	30
		6	19
		2	22
		16	2
		50	5
		48	2
		52	82
		72	75
		78	62
		79	55
		10	51
		50	1
		27	2
		2	0
		2	2
		29	2
		18	10
		17	8
		2	3
		22	13
		20	2
		17	1
		15	3
		80	
		74	
		71	
		47	
		44	
		10	
		8	
		32	
		29	
		10	
Average	17	7	
			Average 37 13

APPENDIX

C LOS DEFINITIONS

LEVEL OF SERVICE DEFINITIONS AT SIGNALIZED INTERSECTIONS⁽¹⁾

Level of service for signalized intersections is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. Specifically, level-of-service (LOS) criteria are stated in terms of the average control delay per vehicle, typically for a 15-min analysis period. The criteria are given in the table below. Delay may be measured in the field or estimated using software such as Highway Capacity Software. Delay is a complex measure and is dependent upon a number of variables, including quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group in question.

Level of Service	Features	Control Delay per vehicle (sec)
A	LOS A describes operations with very low delay, up to 10 sec per vehicle. This level of service occurs when progression is extremely favourable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	≤ 10
B	LOS B describes operations with delay greater than 10 and up to 20 sec per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.	> 10 and ≤ 20
C	LOS C describes operations with delay greater than 20 and up to 35 sec per vehicle. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.	> 20 and ≤ 35
D	LOS D describes operations with delay greater than 35 and up to 55 sec per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavourable progression, long cycle lengths, of high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	> 35 and ≤ 55
E	LOS E describes operations with delay greater than 55 and up to 80 sec per vehicle. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.	> 55 and ≤ 80
F	LOS F describes operations with delay in excess of 80 sec per vehicle. This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.	> 80

(1) Highway Capacity Manual 2000

LEVEL OF SERVICE DEFINITIONS AT UNSIGNALIZED INTERSECTIONS⁽¹⁾

The level of service criteria for unsignalized intersections are given in the table below. As used here, total delay is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line; this time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position. The average total delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation.

Level of Service	Features	Average Total Delay (sec/veh)
A	Little or no traffic delay occurs. Approaches appear open, turning movements are easily made, and drivers have freedom of operation.	≤ 10
B	Short traffic delays occur. Many drivers begin to feel somewhat restricted in terms of freedom of operation.	> 10 and ≤ 15
C	Average traffic delays occur. Operations are generally stable, but drivers emerging from the minor street may experience difficulty in completing their movement. This may occasionally impact on the stability of flow on the major street.	> 15 and ≤ 25
D	Long traffic delays occur. Motorists emerging from the minor street experience significant restriction and frustration. Drivers on the major street will experience congestion and delay as drivers emerging from the minor street interfere with the major through movements.	> 25 and ≤ 35
E	Very long traffic delays occur. Operations approach the capacity of the intersection.	> 35 and ≤ 50
F	Saturation occurs, with vehicle demand exceeding the available capacity. Very long traffic delays occur.	> 50

(1) Highway Capacity Manual 2000.

















APPENDIX

D EXISTING TRAFFIC CONDITIONS

HCM Unsignalized Intersection Capacity Analysis

1: Paisley Lane & Anderson Boulevard

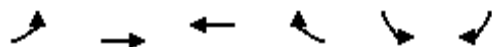
<Existing> AM Peak
10/09/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	28	8	34	6	1	9	17	72	4	11	1
Future Volume (Veh/h)	10	28	8	34	6	1	9	17	72	4	11	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	30	9	37	7	1	10	18	78	4	12	1
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	8			39			145	138	34	225	142	8
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	8			39			145	138	34	225	142	8
tC, single (s)	4.3			4.2			7.3	6.6	6.2	7.3	7.0	6.2
tC, 2 stage (s)												
tF (s)	2.4			2.3			3.7	4.1	3.3	3.7	4.4	3.3
p0 queue free %	99			98			99	98	92	99	98	100
cM capacity (veh/h)	1502			1527			748	722	1036	606	654	1081
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	50	45	106	17								
Volume Left	11	37	10	4								
Volume Right	9	1	78	1								
cSH	1502	1527	933	657								
Volume to Capacity	0.01	0.02	0.11	0.03								
Queue Length 95th (m)	0.2	0.6	2.9	0.6								
Control Delay (s)	1.7	6.1	9.4	10.6								
Lane LOS	A	A	A	B								
Approach Delay (s)	1.7	6.1	9.4	10.6								
Approach LOS			A	B								
Intersection Summary												
Average Delay			7.0									
Intersection Capacity Utilization			19.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

2: Highway 47 & Paisley Lane

















<Existing> AM Peak
10/09/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	44	327	547	52	6	25
Future Volume (Veh/h)	44	327	547	52	6	25
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)	48	355	595	57	7	27
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	652				1046	595
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	652				1046	595
tC, single (s)	4.1				6.9	6.6
tC, 2 stage (s)						
tF (s)	2.2				4.0	3.7
p0 queue free %	95				96	94
cM capacity (veh/h)	920				196	434
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	48	355	595	57	7	27
Volume Left	48	0	0	0	7	0
Volume Right	0	0	0	57	0	27
cSH	920	1700	1700	1700	196	434
Volume to Capacity	0.05	0.21	0.35	0.03	0.04	0.06
Queue Length 95th (m)	1.3	0.0	0.0	0.0	0.8	1.5
Control Delay (s)	9.1	0.0	0.0	0.0	24.1	13.8
Lane LOS	A				C	B
Approach Delay (s)	1.1		0.0		15.9	
Approach LOS					C	
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			45.5%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
1: Paisley Lane & Anderson Boulevard

<Existing> PM Peak
10/09/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	18	41	77	29	0	4	0	40	1	20	5
Future Volume (Veh/h)	3	18	41	77	29	0	4	0	40	1	20	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	20	45	84	32	0	4	0	43	1	22	5
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	32			65			264	248	42	292	271	32
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	32			65			264	248	42	292	271	32
tC, single (s)	4.1			4.1			7.3	6.5	6.4	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.7	4.0	3.5	3.5	4.0	3.3
p0 queue free %	100			94			99	100	96	100	96	100
cM capacity (veh/h)	1593			1524			596	617	979	608	603	1048
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	68	116	47	28								
Volume Left	3	84	4	1								
Volume Right	45	0	43	5								
cSH	1593	1524	928	652								
Volume to Capacity	0.00	0.06	0.05	0.04								
Queue Length 95th (m)	0.0	1.3	1.2	1.0								
Control Delay (s)	0.3	5.5	9.1	10.8								
Lane LOS	A	A	A	B								
Approach Delay (s)	0.3	5.5	9.1	10.8								
Approach LOS			A	B								
Intersection Summary												
Average Delay			5.4									
Intersection Capacity Utilization			23.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
2: Highway 47 & Paisley Lane

<Existing> PM Peak
10/09/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑	↑	↗	↖	↗
Traffic Volume (veh/h)	23	709	464	15	73	63
Future Volume (Veh/h)	23	709	464	15	73	63
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)	25	771	504	16	79	68
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	520				1325	504
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	520				1325	504
tC, single (s)	*4.4				*6.4	*6.2
tC, 2 stage (s)						
tF (s)	*2.5				*3.5	*3.3
p0 queue free %	97				53	88
cM capacity (veh/h)	909				169	572
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	25	771	504	16	79	68
Volume Left	25	0	0	0	79	0
Volume Right	0	0	0	16	0	68
cSH	909	1700	1700	1700	169	572
Volume to Capacity	0.03	0.45	0.30	0.01	0.47	0.12
Queue Length 95th (m)	0.6	0.0	0.0	0.0	16.8	3.1
Control Delay (s)	9.1	0.0	0.0	0.0	43.8	12.1
Lane LOS	A				E	B
Approach Delay (s)	0.3		0.0		29.2	
Approach LOS					D	
Intersection Summary						
Average Delay			3.1			
Intersection Capacity Utilization			48.0%		ICU Level of Service	A
Analysis Period (min)			15			

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
2: Highway 47 & Paisley Lane

<Existing-Calibrated> PM Peak
10/09/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑	↑	↗	↖	↗
Traffic Volume (veh/h)	23	709	464	15	73	63
Future Volume (Veh/h)	23	709	464	15	73	63
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)	25	771	504	16	79	68
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	520				1325	504
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	520				1325	504
tC, single (s)	*4.4				*6.2	*6.2
tC, 2 stage (s)						
tF (s)	*2.5				*3.3	*3.3
p0 queue free %	97				58	88
cM capacity (veh/h)	909				187	572
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	25	771	504	16	79	68
Volume Left	25	0	0	0	79	0
Volume Right	0	0	0	16	0	68
cSH	909	1700	1700	1700	187	572
Volume to Capacity	0.03	0.45	0.30	0.01	0.42	0.12
Queue Length 95th (m)	0.6	0.0	0.0	0.0	14.6	3.1
Control Delay (s)	9.1	0.0	0.0	0.0	37.6	12.1
Lane LOS	A				E	B
Approach Delay (s)	0.3		0.0		25.8	
Approach LOS					D	
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization			48.0%		ICU Level of Service	A
Analysis Period (min)			15			

* User Entered Value

APPENDIX

E

FUTURE

BACKGROUND

TRAFFIC

CONDITIONS

HCM Unsignalized Intersection Capacity Analysis
1: Paisley Lane & Anderson Boulevard

<Future Background 2022> AM Peak
10/09/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	10	28	8	34	6	1	9	17	72	4	11	1
Future Volume (Veh/h)	10	28	8	34	6	1	9	17	72	4	11	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	30	9	37	7	1	10	18	78	4	12	1
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	8			39			145	138	34	225	142	8
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	8			39			145	138	34	225	142	8
tC, single (s)	4.3			4.2			7.3	6.6	6.2	7.3	7.0	6.2
tC, 2 stage (s)												
tF (s)	2.4			2.3			3.7	4.1	3.3	3.7	4.4	3.3
p0 queue free %	99			98			99	98	92	99	98	100
cM capacity (veh/h)	1502			1527			748	722	1036	606	654	1081
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	50	45	106	17								
Volume Left	11	37	10	4								
Volume Right	9	1	78	1								
cSH	1502	1527	933	657								
Volume to Capacity	0.01	0.02	0.11	0.03								
Queue Length 95th (m)	0.2	0.6	2.9	0.6								
Control Delay (s)	1.7	6.1	9.4	10.6								
Lane LOS	A	A	A	B								
Approach Delay (s)	1.7	6.1	9.4	10.6								
Approach LOS			A	B								
Intersection Summary												
Average Delay			7.0									
Intersection Capacity Utilization			19.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 2: Highway 47 & Paisley Lane

<Future Background 2022> AM Peak

















10/09/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	44	334	558	52	6	25
Future Volume (Veh/h)	44	334	558	52	6	25
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)	48	363	607	57	7	27
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	664				1066	607
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	664				1066	607
tC, single (s)	4.1				6.9	6.6
tC, 2 stage (s)						
tF (s)	2.2				4.0	3.7
p0 queue free %	95				96	94
cM capacity (veh/h)	911				190	427
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	48	363	607	57	7	27
Volume Left	48	0	0	0	7	0
Volume Right	0	0	0	57	0	27
cSH	911	1700	1700	1700	190	427
Volume to Capacity	0.05	0.21	0.36	0.03	0.04	0.06
Queue Length 95th (m)	1.3	0.0	0.0	0.0	0.9	1.5
Control Delay (s)	9.2	0.0	0.0	0.0	24.7	14.0
Lane LOS	A				C	B
Approach Delay (s)	1.1		0.0		16.2	
Approach LOS					C	
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			46.0%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
1: Paisley Lane & Anderson Boulevard

<Future Background 2022> PM Peak
10/09/2020

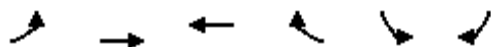
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	18	41	77	29	0	4	0	40	1	20	5
Future Volume (Veh/h)	3	18	41	77	29	0	4	0	40	1	20	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	20	45	84	32	0	4	0	43	1	22	5
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	32			65			264	248	42	292	271	32
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	32			65			264	248	42	292	271	32
tC, single (s)	4.1			4.1			7.3	6.5	6.4	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.7	4.0	3.5	3.5	4.0	3.3
p0 queue free %	100			94			99	100	96	100	96	100
cM capacity (veh/h)	1593			1524			596	617	979	608	603	1048
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	68	116	47	28								
Volume Left	3	84	4	1								
Volume Right	45	0	43	5								
cSH	1593	1524	928	652								
Volume to Capacity	0.00	0.06	0.05	0.04								
Queue Length 95th (m)	0.0	1.3	1.2	1.0								
Control Delay (s)	0.3	5.5	9.1	10.8								
Lane LOS	A	A	A	B								
Approach Delay (s)	0.3	5.5	9.1	10.8								
Approach LOS			A	B								
Intersection Summary												
Average Delay			5.4									
Intersection Capacity Utilization			23.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

2: Highway 47 & Paisley Lane

<Future Background 2022> PM Peak

10/09/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↶	↷	↶	↷	↶	↷
Traffic Volume (veh/h)	23	724	474	15	73	63
Future Volume (Veh/h)	23	724	474	15	73	63
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)	25	787	515	16	79	68
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	531				1352	515
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	531				1352	515
tC, single (s)	4.4				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.5				3.5	3.3
p0 queue free %	97				51	88
cM capacity (veh/h)	905				160	564
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	25	787	515	16	79	68
Volume Left	25	0	0	0	79	0
Volume Right	0	0	0	16	0	68
cSH	905	1700	1700	1700	160	564
Volume to Capacity	0.03	0.46	0.30	0.01	0.49	0.12
Queue Length 95th (m)	0.6	0.0	0.0	0.0	18.0	3.1
Control Delay (s)	9.1	0.0	0.0	0.0	47.6	12.3
Lane LOS	A				E	B
Approach Delay (s)	0.3		0.0		31.3	
Approach LOS					D	
Intersection Summary						
Average Delay			3.2			
Intersection Capacity Utilization			48.8%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
2: Highway 47 & Paisley Lane

<FB 2022-Calibrated> PM Peak
10/09/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↖	↘	↖
Traffic Volume (veh/h)	23	724	474	15	73	63
Future Volume (Veh/h)	23	724	474	15	73	63
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)	25	787	515	16	79	68
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	531				1352	515
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	531				1352	515
tC, single (s)	4.4				*6.2	6.2
tC, 2 stage (s)						
tF (s)	2.5				*3.3	3.3
p0 queue free %	97				56	88
cM capacity (veh/h)	905				180	564
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	25	787	515	16	79	68
Volume Left	25	0	0	0	79	0
Volume Right	0	0	0	16	0	68
cSH	905	1700	1700	1700	180	564
Volume to Capacity	0.03	0.46	0.30	0.01	0.44	0.12
Queue Length 95th (m)	0.6	0.0	0.0	0.0	15.3	3.1
Control Delay (s)	9.1	0.0	0.0	0.0	39.7	12.3
Lane LOS	A				E	B
Approach Delay (s)	0.3		0.0		27.0	
Approach LOS					D	
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization			48.8%		ICU Level of Service	A
Analysis Period (min)			15			

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
1: Paisley Lane & Anderson Boulevard

<Future Background 2027> AM Peak
10/09/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	10	28	8	34	6	1	9	17	72	4	11	1
Future Volume (Veh/h)	10	28	8	34	6	1	9	17	72	4	11	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	30	9	37	7	1	10	18	78	4	12	1
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	8			39			145	138	34	225	142	8
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	8			39			145	138	34	225	142	8
tC, single (s)	4.3			4.2			7.3	6.6	6.2	7.3	7.0	6.2
tC, 2 stage (s)												
tF (s)	2.4			2.3			3.7	4.1	3.3	3.7	4.4	3.3
p0 queue free %	99			98			99	98	92	99	98	100
cM capacity (veh/h)	1502			1527			748	722	1036	606	654	1081
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	50	45	106	17								
Volume Left	11	37	10	4								
Volume Right	9	1	78	1								
cSH	1502	1527	933	657								
Volume to Capacity	0.01	0.02	0.11	0.03								
Queue Length 95th (m)	0.2	0.6	2.9	0.6								
Control Delay (s)	1.7	6.1	9.4	10.6								
Lane LOS	A	A	A	B								
Approach Delay (s)	1.7	6.1	9.4	10.6								
Approach LOS			A	B								
Intersection Summary												
Average Delay			7.0									
Intersection Capacity Utilization			19.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
2: Highway 47 & Paisley Lane

<Future Background 2027> AM Peak

















10/09/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	44	350	586	52	6	25
Future Volume (Veh/h)	44	350	586	52	6	25
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)	48	380	637	57	7	27
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	694				1113	637
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	694				1113	637
tC, single (s)	4.1				6.9	6.6
tC, 2 stage (s)						
tF (s)	2.2				4.0	3.7
p0 queue free %	95				96	93
cM capacity (veh/h)	888				177	410
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	48	380	637	57	7	27
Volume Left	48	0	0	0	7	0
Volume Right	0	0	0	57	0	27
cSH	888	1700	1700	1700	177	410
Volume to Capacity	0.05	0.22	0.37	0.03	0.04	0.07
Queue Length 95th (m)	1.3	0.0	0.0	0.0	0.9	1.6
Control Delay (s)	9.3	0.0	0.0	0.0	26.2	14.4
Lane LOS	A				D	B
Approach Delay (s)	1.0		0.0		16.8	
Approach LOS					C	
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			46.6%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
1: Paisley Lane & Anderson Boulevard

<Future Background 2027> PM Peak
10/09/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	18	41	77	29	0	4	0	40	1	20	5
Future Volume (Veh/h)	3	18	41	77	29	0	4	0	40	1	20	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	20	45	84	32	0	4	0	43	1	22	5
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	32			65			264	248	42	292	271	32
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	32			65			264	248	42	292	271	32
tC, single (s)	4.1			4.1			7.3	6.5	6.4	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.7	4.0	3.5	3.5	4.0	3.3
p0 queue free %	100			94			99	100	96	100	96	100
cM capacity (veh/h)	1593			1524			596	617	979	608	603	1048
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	68	116	47	28								
Volume Left	3	84	4	1								
Volume Right	45	0	43	5								
cSH	1593	1524	928	652								
Volume to Capacity	0.00	0.06	0.05	0.04								
Queue Length 95th (m)	0.0	1.3	1.2	1.0								
Control Delay (s)	0.3	5.5	9.1	10.8								
Lane LOS	A	A	A	B								
Approach Delay (s)	0.3	5.5	9.1	10.8								
Approach LOS			A	B								
Intersection Summary												
Average Delay			5.4									
Intersection Capacity Utilization			23.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
2: Highway 47 & Paisley Lane

<Future Background 2027> PM Peak

10/09/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	23	759	497	15	73	63
Future Volume (Veh/h)	23	759	497	15	73	63
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)	25	825	540	16	79	68
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	556				1415	540
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	556				1415	540
tC, single (s)	4.4				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.5				3.5	3.3
p0 queue free %	97				46	88
cM capacity (veh/h)	885				146	546
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	25	825	540	16	79	68
Volume Left	25	0	0	0	79	0
Volume Right	0	0	0	16	0	68
cSH	885	1700	1700	1700	146	546
Volume to Capacity	0.03	0.49	0.32	0.01	0.54	0.12
Queue Length 95th (m)	0.7	0.0	0.0	0.0	20.3	3.2
Control Delay (s)	9.2	0.0	0.0	0.0	55.2	12.5
Lane LOS	A				F	B
Approach Delay (s)	0.3		0.0		35.5	
Approach LOS					E	
Intersection Summary						
Average Delay			3.5			
Intersection Capacity Utilization			50.7%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
2: Highway 47 & Paisley Lane

<FB 2027 - Calibrated> PM Peak
10/09/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑	↑	↗	↖	↗
Traffic Volume (veh/h)	23	759	497	15	73	63
Future Volume (Veh/h)	23	759	497	15	73	63
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)	25	825	540	16	79	68
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	556				1415	540
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	556				1415	540
tC, single (s)	4.4				*6.2	6.2
tC, 2 stage (s)						
tF (s)	2.5				*3.3	3.3
p0 queue free %	97				52	88
cM capacity (veh/h)	885				165	546
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	25	825	540	16	79	68
Volume Left	25	0	0	0	79	0
Volume Right	0	0	0	16	0	68
cSH	885	1700	1700	1700	165	546
Volume to Capacity	0.03	0.49	0.32	0.01	0.48	0.12
Queue Length 95th (m)	0.7	0.0	0.0	0.0	17.2	3.2
Control Delay (s)	9.2	0.0	0.0	0.0	45.2	12.5
Lane LOS	A				E	B
Approach Delay (s)	0.3		0.0		30.1	
Approach LOS					D	
Intersection Summary						
Average Delay			3.0			
Intersection Capacity Utilization			50.7%		ICU Level of Service	A
Analysis Period (min)			15			

* User Entered Value

APPENDIX

F

FUTURE TOTAL
TRAFFIC
CONDITIONS

HCM Unsignalized Intersection Capacity Analysis

1: Paisley Lane & Anderson Boulevard

<Future Total 2022> AM Peak
10/09/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	10	35	8	41	10	1	9	17	85	4	11	1
Future Volume (Veh/h)	10	35	8	41	10	1	9	17	85	4	11	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	38	9	45	11	1	10	18	92	4	12	1
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	12			47			173	166	42	267	170	12
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	12			47			173	166	42	267	170	12
tC, single (s)	4.3			4.2			7.3	6.6	6.2	7.3	7.0	6.2
tC, 2 stage (s)												
tF (s)	2.4			2.3			3.7	4.1	3.3	3.7	4.4	3.3
p0 queue free %	99			97			99	97	91	99	98	100
cM capacity (veh/h)	1497			1517			713	693	1025	556	626	1075
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	58	57	120	17								
Volume Left	11	45	10	4								
Volume Right	9	1	92	1								
cSH	1497	1517	925	623								
Volume to Capacity	0.01	0.03	0.13	0.03								
Queue Length 95th (m)	0.2	0.7	3.4	0.6								
Control Delay (s)	1.5	5.9	9.5	10.9								
Lane LOS	A	A	A	B								
Approach Delay (s)	1.5	5.9	9.5	10.9								
Approach LOS			A	B								
Intersection Summary												
Average Delay			6.9									
Intersection Capacity Utilization			23.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 2: Highway 47 & Paisley Lane

<Future Total 2022> AM Peak
 10/09/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↶	↷	↶	↷	↶	↷
Traffic Volume (veh/h)	49	334	558	59	8	30
Future Volume (Veh/h)	49	334	558	59	8	30
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)	53	363	607	64	9	33
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	671				1076	607
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	671				1076	607
tC, single (s)	4.1				6.9	6.6
tC, 2 stage (s)						
tF (s)	2.2				4.0	3.7
p0 queue free %	94				95	92
cM capacity (veh/h)	905				186	427
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	53	363	607	64	9	33
Volume Left	53	0	0	0	9	0
Volume Right	0	0	0	64	0	33
cSH	905	1700	1700	1700	186	427
Volume to Capacity	0.06	0.21	0.36	0.04	0.05	0.08
Queue Length 95th (m)	1.4	0.0	0.0	0.0	1.2	1.9
Control Delay (s)	9.2	0.0	0.0	0.0	25.3	14.1
Lane LOS	A				D	B
Approach Delay (s)	1.2		0.0		16.5	
Approach LOS					C	
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			46.0%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
1: Paisley Lane & Anderson Boulevard

<Future Total 2022> PM Peak
10/09/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	3	24	41	90	34	0	4	0	46	1	20	5
Future Volume (Veh/h)	3	24	41	90	34	0	4	0	46	1	20	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	26	45	98	37	0	4	0	50	1	22	5
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	37			71			304	288	48	338	310	37
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	37			71			304	288	48	338	310	37
tC, single (s)	4.1			4.1			7.3	6.5	6.4	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.7	4.0	3.5	3.5	4.0	3.3
p0 queue free %	100			94			99	100	95	100	96	100
cM capacity (veh/h)	1587			1517			556	581	971	558	568	1041
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	74	135	54	28								
Volume Left	3	98	4	1								
Volume Right	45	0	50	5								
cSH	1587	1517	920	617								
Volume to Capacity	0.00	0.06	0.06	0.05								
Queue Length 95th (m)	0.0	1.6	1.4	1.1								
Control Delay (s)	0.3	5.6	9.2	11.1								
Lane LOS	A	A	A	B								
Approach Delay (s)	0.3	5.6	9.2	11.1								
Approach LOS			A	B								
Intersection Summary												
Average Delay			5.4									
Intersection Capacity Utilization			24.8%		ICU Level of Service				A			
Analysis Period (min)			15									

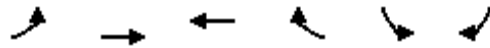
HCM Unsignalized Intersection Capacity Analysis
 2: Highway 47 & Paisley Lane

<Future Total 2022> PM Peak
 10/09/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↶	↷	↶	↷	↶	↷
Traffic Volume (veh/h)	26	724	474	19	79	70
Future Volume (Veh/h)	26	724	474	19	79	70
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)	28	787	515	21	86	76
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	536				1358	515
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	536				1358	515
tC, single (s)	4.4				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.5				3.5	3.3
p0 queue free %	97				46	87
cM capacity (veh/h)	901				158	564
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	28	787	515	21	86	76
Volume Left	28	0	0	0	86	0
Volume Right	0	0	0	21	0	76
cSH	901	1700	1700	1700	158	564
Volume to Capacity	0.03	0.46	0.30	0.01	0.54	0.13
Queue Length 95th (m)	0.7	0.0	0.0	0.0	20.8	3.5
Control Delay (s)	9.1	0.0	0.0	0.0	52.0	12.4
Lane LOS	A				F	B
Approach Delay (s)	0.3		0.0		33.4	
Approach LOS					D	
Intersection Summary						
Average Delay			3.7			
Intersection Capacity Utilization			49.1%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis <Future Total 2022 - Calibrated> PM Peak
 2: Highway 47 & Paisley Lane 10/09/2020



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↗	↑	↑	↗	↘	↗
Traffic Volume (veh/h)	26	724	474	19	79	70
Future Volume (Veh/h)	26	724	474	19	79	70
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)	28	787	515	21	86	76
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	536				1358	515
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	536				1358	515
tC, single (s)	4.4				*6.2	6.2
tC, 2 stage (s)						
tF (s)	2.5				*3.3	3.3
p0 queue free %	97				52	87
cM capacity (veh/h)	901				178	564
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	28	787	515	21	86	76
Volume Left	28	0	0	0	86	0
Volume Right	0	0	0	21	0	76
cSH	901	1700	1700	1700	178	564
Volume to Capacity	0.03	0.46	0.30	0.01	0.48	0.13
Queue Length 95th (m)	0.7	0.0	0.0	0.0	17.7	3.5
Control Delay (s)	9.1	0.0	0.0	0.0	42.7	12.4
Lane LOS	A				E	B
Approach Delay (s)	0.3		0.0		28.5	
Approach LOS					D	
Intersection Summary						
Average Delay			3.2			
Intersection Capacity Utilization			49.1%		ICU Level of Service	A
Analysis Period (min)			15			

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis

1: Paisley Lane & Anderson Boulevard

<Future Total 2027> AM Peak
10/09/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	35	8	41	10	1	9	17	85	4	11	1
Future Volume (Veh/h)	10	35	8	41	10	1	9	17	85	4	11	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	38	9	45	11	1	10	18	92	4	12	1
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	12			47			173	166	42	267	170	12
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	12			47			173	166	42	267	170	12
tC, single (s)	4.3			4.2			7.3	6.6	6.2	7.3	7.0	6.2
tC, 2 stage (s)												
tF (s)	2.4			2.3			3.7	4.1	3.3	3.7	4.4	3.3
p0 queue free %	99			97			99	97	91	99	98	100
cM capacity (veh/h)	1497			1517			713	693	1025	556	626	1075
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	58	57	120	17								
Volume Left	11	45	10	4								
Volume Right	9	1	92	1								
cSH	1497	1517	925	623								
Volume to Capacity	0.01	0.03	0.13	0.03								
Queue Length 95th (m)	0.2	0.7	3.4	0.6								
Control Delay (s)	1.5	5.9	9.5	10.9								
Lane LOS	A	A	A	B								
Approach Delay (s)	1.5	5.9	9.5	10.9								
Approach LOS			A	B								
Intersection Summary												
Average Delay			6.9									
Intersection Capacity Utilization			23.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 2: Highway 47 & Paisley Lane

<Future Total 2027> AM Peak
 10/09/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	49	350	586	59	8	30
Future Volume (Veh/h)	49	350	586	59	8	30
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)	53	380	637	64	9	33
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	701				1123	637
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	701				1123	637
tC, single (s)	4.1				6.9	6.6
tC, 2 stage (s)						
tF (s)	2.2				4.0	3.7
p0 queue free %	94				95	92
cM capacity (veh/h)	882				173	410
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	53	380	637	64	9	33
Volume Left	53	0	0	0	9	0
Volume Right	0	0	0	64	0	33
cSH	882	1700	1700	1700	173	410
Volume to Capacity	0.06	0.22	0.37	0.04	0.05	0.08
Queue Length 95th (m)	1.5	0.0	0.0	0.0	1.2	2.0
Control Delay (s)	9.3	0.0	0.0	0.0	26.9	14.6
Lane LOS	A				D	B
Approach Delay (s)	1.1		0.0		17.2	
Approach LOS					C	
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			47.5%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
1: Paisley Lane & Anderson Boulevard

<Future Total 2027> PM Peak
10/09/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	3	24	41	90	34	0	4	0	46	1	20	5
Future Volume (Veh/h)	3	24	41	90	34	0	4	0	46	1	20	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	26	45	98	37	0	4	0	50	1	22	5
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	37			71			304	288	48	338	310	37
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	37			71			304	288	48	338	310	37
tC, single (s)	4.1			4.1			7.3	6.5	6.4	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.7	4.0	3.5	3.5	4.0	3.3
p0 queue free %	100			94			99	100	95	100	96	100
cM capacity (veh/h)	1587			1517			556	581	971	558	568	1041
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	74	135	54	28								
Volume Left	3	98	4	1								
Volume Right	45	0	50	5								
cSH	1587	1517	920	617								
Volume to Capacity	0.00	0.06	0.06	0.05								
Queue Length 95th (m)	0.0	1.6	1.4	1.1								
Control Delay (s)	0.3	5.6	9.2	11.1								
Lane LOS	A	A	A	B								
Approach Delay (s)	0.3	5.6	9.2	11.1								
Approach LOS			A	B								
Intersection Summary												
Average Delay			5.4									
Intersection Capacity Utilization			24.8%	ICU Level of Service		A						
Analysis Period (min)			15									

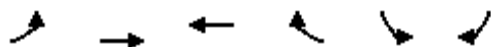
HCM Unsignalized Intersection Capacity Analysis
2: Highway 47 & Paisley Lane

<Future Total 2027> PM Peak
10/09/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	26	759	497	19	79	70
Future Volume (Veh/h)	26	759	497	19	79	70
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)	28	825	540	21	86	76
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	561				1421	540
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	561				1421	540
tC, single (s)	4.4				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.5				3.5	3.3
p0 queue free %	97				41	86
cM capacity (veh/h)	881				145	546
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	28	825	540	21	86	76
Volume Left	28	0	0	0	86	0
Volume Right	0	0	0	21	0	76
cSH	881	1700	1700	1700	145	546
Volume to Capacity	0.03	0.49	0.32	0.01	0.59	0.14
Queue Length 95th (m)	0.7	0.0	0.0	0.0	23.5	3.7
Control Delay (s)	9.2	0.0	0.0	0.0	61.0	12.7
Lane LOS	A				F	B
Approach Delay (s)	0.3		0.0		38.3	
Approach LOS					E	
Intersection Summary						
Average Delay			4.1			
Intersection Capacity Utilization			51.0%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis <Future Total 2027 - Calibrated> PM Peak
 2: Highway 47 & Paisley Lane 10/09/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	26	759	497	19	79	70
Future Volume (Veh/h)	26	759	497	19	79	70
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)	28	825	540	21	86	76
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	561				1421	540
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	561				1421	540
tC, single (s)	4.4				*6.2	6.2
tC, 2 stage (s)						
tF (s)	2.5				*3.3	3.3
p0 queue free %	97				47	86
cM capacity (veh/h)	881				163	546
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	28	825	540	21	86	76
Volume Left	28	0	0	0	86	0
Volume Right	0	0	0	21	0	76
cSH	881	1700	1700	1700	163	546
Volume to Capacity	0.03	0.49	0.32	0.01	0.53	0.14
Queue Length 95th (m)	0.7	0.0	0.0	0.0	19.9	3.7
Control Delay (s)	9.2	0.0	0.0	0.0	49.2	12.7
Lane LOS	A				E	B
Approach Delay (s)	0.3		0.0		32.0	
Approach LOS					D	
Intersection Summary						
Average Delay			3.5			
Intersection Capacity Utilization			51.0%		ICU Level of Service	A
Analysis Period (min)			15			

* User Entered Value