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PLANNING • CIVIL • STRUCTURAL • MECHANICAL • ELECTRICAL

TRANSPORTATION IMPACT ASSESSMENT

119 & 127 CENTRE STREET

LONDON, ONTARIO

PROPOSED APARTMENT BUILDING

KINGSDALE DEVELOPMENT INC.

FEBRUARY 2026

S252168

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City of London
Transportation Impact Assessment

CERTIFICATE OF OWNERSHIP

Development Name/Reference: **119 & 127 Centre Street**

Company or Firm: **Strik, Baldinelli, Moniz Ltd.**

Original Submission or Addendum: **Original**

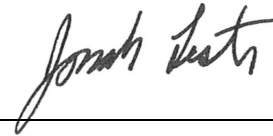
Original Report Name: **Transportation Impact Assessment - 119 & 127 Centre Street**

I hereby certify that the attached document has been prepared accurately and to the best of my knowledge. The assumptions and analysis contained herein have been formulated using sound transportation planning and traffic operations methodologies.

Individual accepting corporate responsibility:

Name: **Jonah Lester, P.Eng.**

Signature:



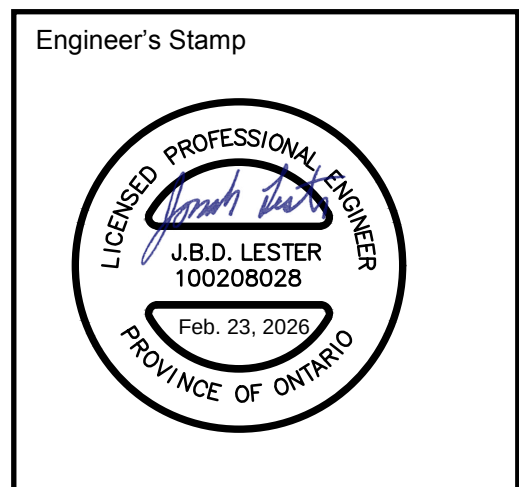
Project Manager (if different than above):

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Other Individuals involved in the preparation of the assessment and can be contact regarding study content:

Name:

Name:





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February 23, 2026
S252168

Attn: Rex Cheng

**Re: Transportation Impact Assessment
119 & 127 Centre Street – Proposed Apartment Building
London, Ontario**

Strik, Baldinelli, Moniz Ltd. is pleased to provide you with the enclosed Transportation Impact Assessment report for the proposed apartment building at 119 & 127 Centre Street in London, Ontario. The report concludes that the development proposal can generally be accommodated by the existing transportation network with no significant impact to traffic operations.

We trust this submission meets your satisfaction and will assist with the approval of the development. Should you have any questions or require additional information, please do not hesitate to contact the undersigned.

Respectfully submitted,

Strik, Baldinelli, Moniz Ltd.

Planning • Civil • Structural • Mechanical • Electrical

Jonah Lester, P.Eng.
Transportation Engineer

EXECUTIVE SUMMARY

This Transportation Impact Assessment (TIA) has been prepared by Strik, Baldinelli, Moniz Ltd. (SBM) for Kingsdale Development Inc. to identify transportation impacts, or a lack thereof, associated with the proposed residential development located at 119 & 127 Centre Street in London, Ontario. The development is proposed to include a 10-storey apartment building with 156 dwelling units. Vehicular access is proposed from a new driveway along Centre Street.

This study has forecasted traffic volumes for a 2033 horizon year and assessed traffic operations within the vicinity of the subject site for existing, future background and future total traffic conditions. Site access and active transportation considerations have also been assessed. Based on the analysis completed, the following key conclusions and recommendations are made in this TIA:

- It is forecast that the proposed development will generate 59 new trips in the AM peak hour (14 in and 45 out) and 59 trips during the PM peak hour (38 in and 21 out).
- Under existing conditions, the Wharncliffe Road South and Centre Street intersection operates acceptably, however, the eastbound and westbound movements from Centre Street and the opposite driveway experience LOS E during the PM peak hour. This is not uncommon for a stop-controlled access on a busy arterial road, and since the v/c ratios for these movements are low, they are functional and considered acceptable.

The Base Line Road West and Cotswold Gate intersection currently operates well, with all movements at LOS B or better.

- Under 2033 background and total traffic conditions, the Wharncliffe Road South and Centre Street intersection will continue to function acceptably. The eastbound and westbound movements will experience some increased delay (LOS F in peak hours), but the v/c ratios will remain low enough that the condition is tolerable.

The Base Line Road West and Cotswold Gate intersection will continue to operate well under 2033 background and total traffic conditions, with all movements at LOS C or better and low v/c ratios.

The proposed site access will operate well beyond the horizon period, with movements at LOS A.

- The proposed site plan provides good internal and external pedestrian connections allowing access to local amenities and nearby transit stops on Base Line Road West and Wharncliffe Road South.
- MTO left turn lane warrants were reviewed for the existing study area intersections. On Base Line Road West at Cotswold Gate, a left turn lane is not warranted under existing or future traffic conditions. On Wharncliffe Road South at Centre Street, a left turn lane is warranted under existing conditions with 15 m of storage, and the warranted storage length increases to 25 m under future background and total traffic conditions. However, implementation of a left turn lane on Wharncliffe Road South is not practical due to right-of-way constraints (as is the case for most minor intersections along Wharncliffe Road South in this area) and therefore is not recommended.
- Traffic signal warrant analysis was performed for the Base Line Road West and Cotswold Gate intersection under both 2033 background and total traffic conditions, and it was concluded that traffic signals will not be warranted.

- Overall, the forecasted site traffic does not introduce any significant operational problems on the surrounding road network, and no road improvements are required to accommodate the proposed development.

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1 INTRODUCTION

This Transportation Impact Assessment (TIA) has been prepared by Strik, Baldinelli, Moniz Ltd. (SBM) for Kingsdale Development Inc. to identify transportation impacts, or a lack thereof, associated with the proposed residential development located at 119 & 127 Centre Street in London, Ontario. The development is proposed to include a 10-storey apartment building with 156 dwelling units. Vehicular access is proposed from a new driveway along Centre Street. The location of the proposed development is illustrated in Figure 1.

Figure 1: Site Location



Aerial Image Source: Google Earth (Imagery date: August 2023)

1.1 SCOPE AND METHODOLOGY

The general scope of the analysis in this study is summarized in Table 1. In accordance with the City of London Transportation Impact Assessment Guidelines (2013), the TIA scope was confirmed with City staff prior to commencing the assessment.

Table 1: Study Scope and Parameters

Study Scope and Parameters	
Analysis Intersections (Study Area)	- Wharncliffe Road South/ Centre Street - Base Line Road West / Cotswold Gate - Centre Street / Proposed Site Access
Analysis Time Periods	- Weekday AM peak hour - Weekday PM peak hour
Analysis Scenarios (Years)	- Existing Traffic 2033 Background Traffic 2033 Total Traffic

The intersection operational analysis has been performed using Synchro 11 software based on the Highway Capacity Manual 2000 (HCM 2000) methodology published by the Transportation Research Board National Research Council.

As per the City's TIA Guidelines, the operational analysis has identified all intersections where:

- the volume to capacity ratio (v/c ratio) for overall operations, through movements, shared through/turning movements increased to 0.9 or above and Level of Service (LOS) E or worse.
- v/c ratios for dedicated turning movements increased to 0.9 or above and LOS E or worse.
- Queues for an individual movement and turning movement projected to exceed available lane storage (95th percentile queue).

Level of Service (LOS) is a function of the average control delay for an entire intersection or an individual movement. The relationships between the LOS letters and average delay ranges are defined in Table 2 for signalized and unsignalized intersections.

Table 2: Vehicular Level of Service Designations

LEVEL OF SERVICE (LOS)	CONTROL DELAY PER VEHICLE (s)	
	SIGNALIZED INTERSECTION	UNSIGNALIZED INTERSECTION
A	≤ 10	≤ 10
B	10 to 20	10 to 15
C	20 to 35	15 to 25
D	35 to 55	25 to 35
E	55 to 80	35 to 50
F	> 80	> 50

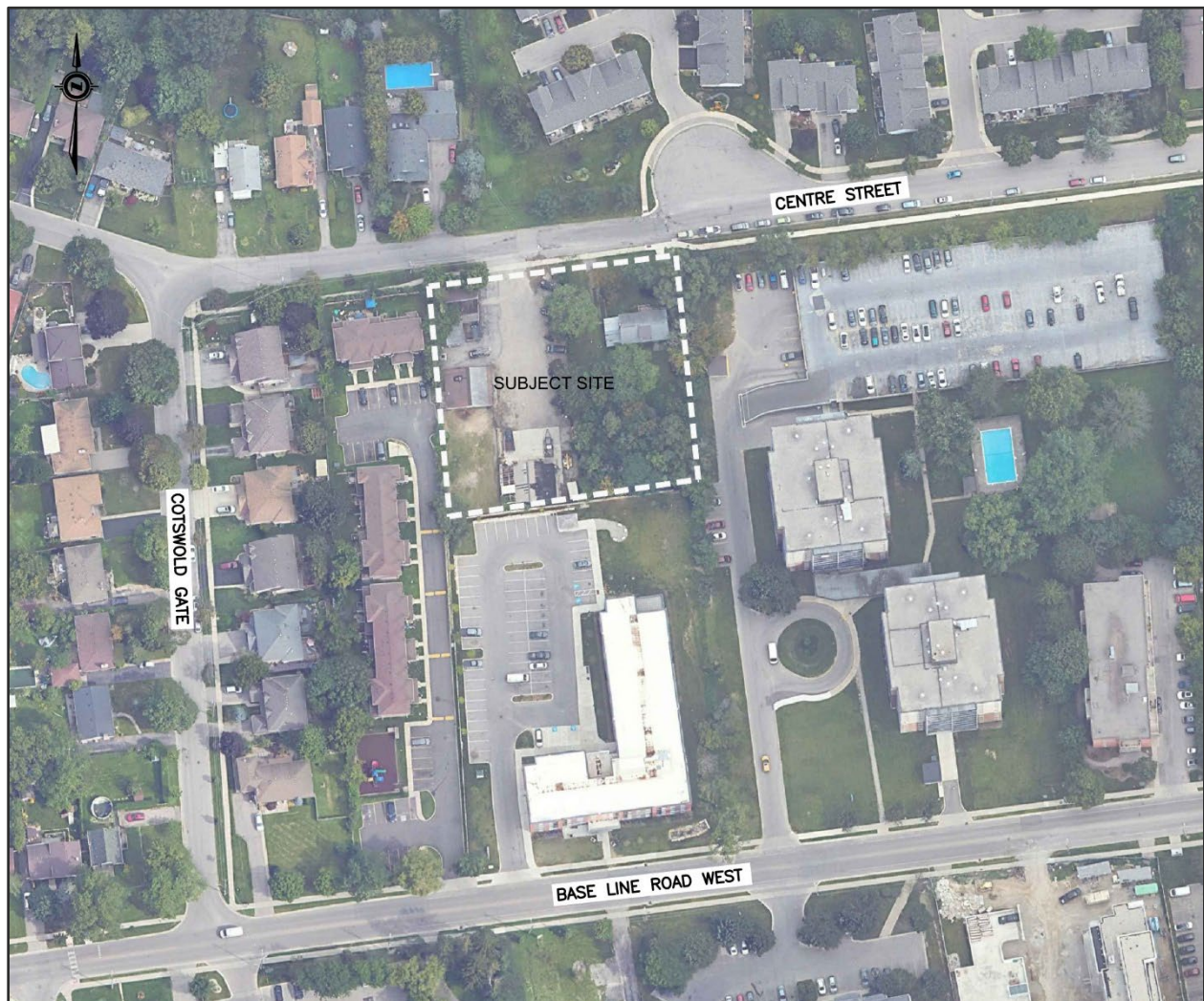
2 EXISTING CONDITIONS

2.1 SITE CONTEXT

The subject land is located on the south side of Centre Street, approximately 75 m east of Cotswold Gate, and includes two properties with a combined area of approximately 0.42 hectares. The site currently contains two single family homes, a garage, accessory structures and driveways, as shown in Figure 2.

The subject property is bounded by the Centre Street right-of-way (ROW) to the north, and residential uses the west, south and east (townhomes to the west and apartment buildings to the south and west).

Figure 2: Site Area



Aerial Image Source: Google Earth (Imagery date: August 2023)

2.2 EXISTING ROAD NETWORK

A site visit was conducted on January 13th, 2026, to confirm the existing study area conditions. The existing road network is described below, and the existing lane configurations and traffic controls are illustrated in Figure 3.

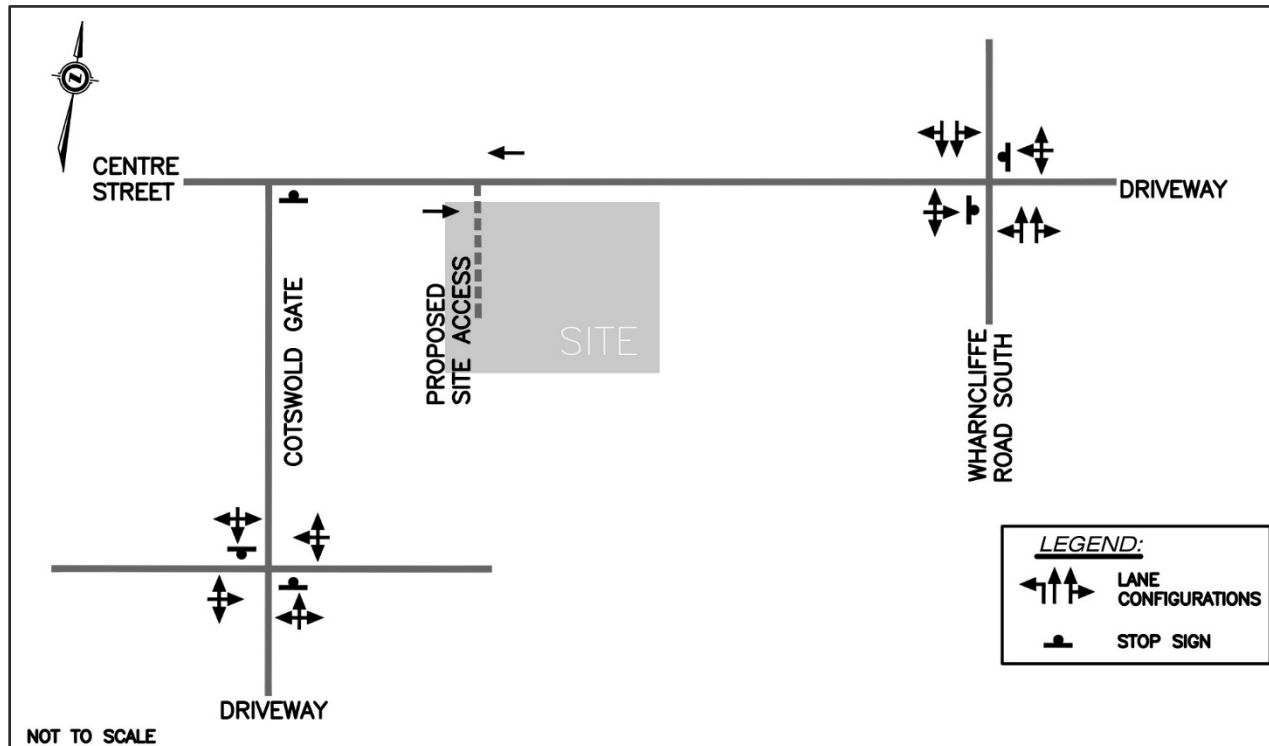
Wharncliffe Road South is a four-lane arterial road (Civic Boulevard) running north-south. It has an urban cross-section (curb & gutter) and sidewalks on both sides of the road. The posted speed limit is 50 km/h in the study area. On-street parking is prohibited on Wharncliffe Road South.

Base Line Road West is a two-lane collector road (Neighbourhood Connector) running east-west with a posted speed limit of 40 km/h. It has an urban cross-section (curb & gutter) and sidewalks on both sides of the road. There are on-street bike lanes on both sides of Base Line Road West from Wharncliffe Road South to approximately 50 m east of Cotswold Gate. On-street parking is not permitted on Base Line Road West in the study area.

Centre Street is a two-lane local road (Neighbourhood Street) running west of Wharncliffe Road South with a posted speed limit of 40 km/h. Centre Street mostly has an urban cross-section (curb & gutter) between Wharncliffe Road South and a point 650 m to the west where there is an “offset cul-de-sac”, although Centre Street continues through it to the west. Between this “offset cul-de-sac” area and Cotswold Gate (i.e. along the frontage of the subject site), Centre Street has a semi-rural cross-section (no curb or gutter). Sidewalk exists on the south side of Centre Street between Cotswold Gate and Wharncliffe Road South, and along the north side through the frontage of the 80 and 120 Centre Street properties (townhouse sites). On-street parking is generally permitted on the south side of Centre Street, except within 160 m of Wharncliffe Road South. Parking is prohibited on the north side of Centre Street.

Cotswold Gate is a two-lane local road (Neighbourhood Street) running north-south between Centre Street and Base Line Road West with an unposted area speed limit of 40 km/h. Cotswold Gate has an urban cross-section with a sidewalk on the east side of the road. On-street parking is permitted only on the east side of the Cotswold Gate.

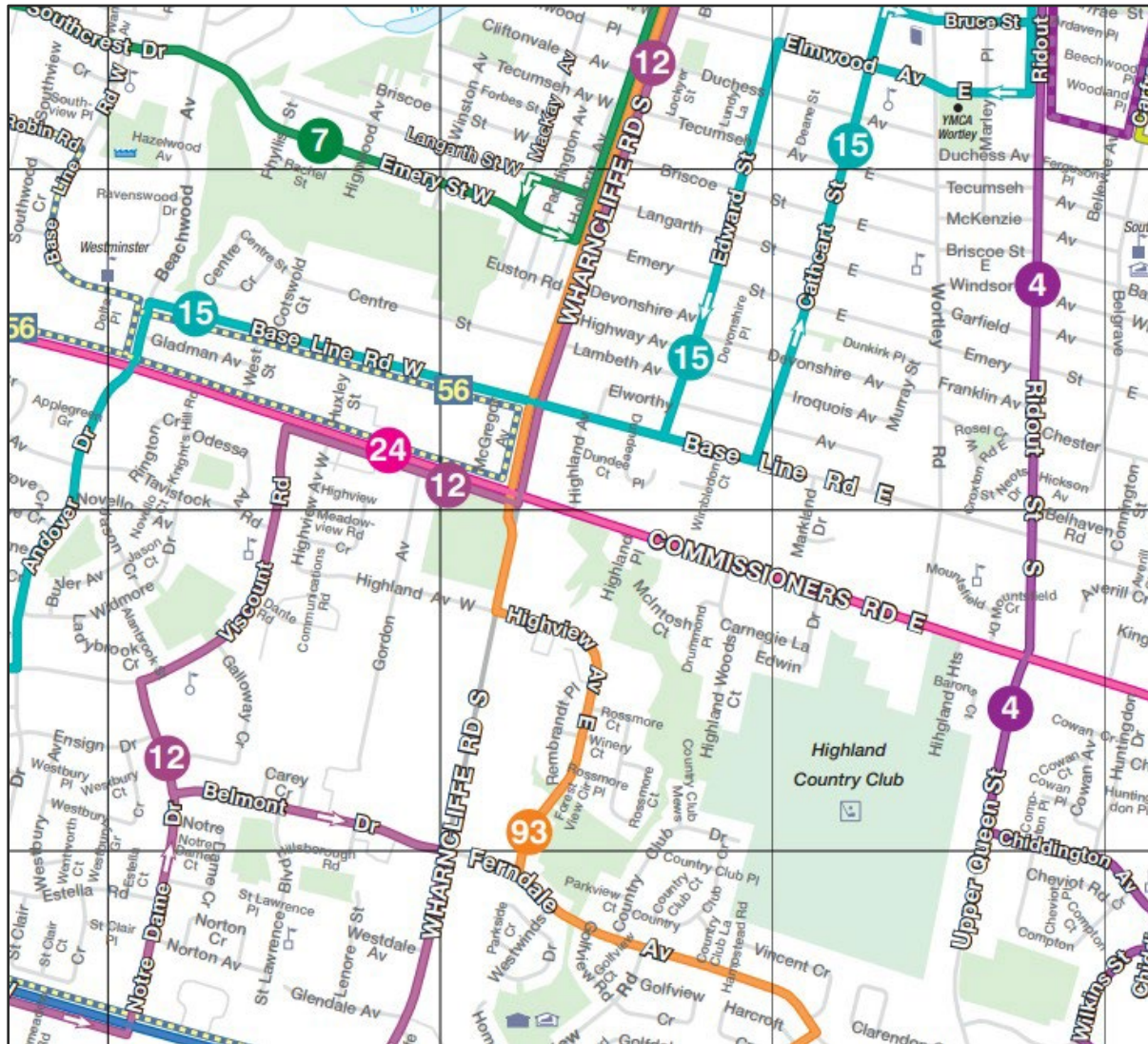
Figure 3: Existing Study Area Traffic Control and Lane Configuration



2.3 EXISTING TRANSIT SERVICES

The subject site is not located directly along a transit route, however, it is located within walking distance of bus routes on Base Line Road West and Wharncliffe Road South, such as routes 12, 15 and 93 as shown in the excerpt from the London Transit Commission (LTC) Ride Guide (service map) in Figure 4.

Figure 4: Transit Service Map



Source: London Transit Commission Ride Guide (June 2025)

The general routes, operating times and headways are summarized as follows:

- **Route 12 Downtown – Wharncliffe Road at Wonderland** runs north-south between Downtown on Wharncliffe Road and loops around the south ends of the city via Wonderland Road. Service runs Monday to Friday approximately 6:00 AM to 12:15 AM with 5-10 minute headways, Saturdays 6:00 AM to 12:15 AM with 5-10 minute headways, and Sundays 8:00 AM to 10:00 PM with approximately 5-10 minute headways.
- **Route 15 - Huron Heights – Westmount Mall** runs between north and south London. Service runs Monday to Friday approximately 6:00 AM to 1:30 AM with 5-10 minute headways, Saturdays 6:00

AM to 1:30 AM with 10 minute headways, and Sundays 6:00 AM to 11:30 PM with approximately 10 minute headways.

- **Route 93 – Express White Oaks Mall – Masonville** runs north-south between White Oaks Mall and Masonville Mall. Service runs Monday to Friday approximately 6:00 AM to 12:30 AM with 5-10 minute headways, Saturdays 8:00 AM to 12:30 AM with 10-15minute headways, and Sundays 8:00 AM to 10:45 PM with approximately 5-10 minute headways.

The nearest bus stop to the site is for route 15, located at the Baseline Road West and Cotswold Gate intersection, which is approximately 240 m from the site and should provide good transit access for the development with regular service to local amenities, key destinations, and connections to other bus routes. The nearest bus stops for routes 12 and 93 along Wharnccliffe Road South are located near the Wharnccliffe Road South and Base Line Road West intersection, which is approximately an 850 m walk from the site, or can be transferred to from route 15 on Base Line Road West.

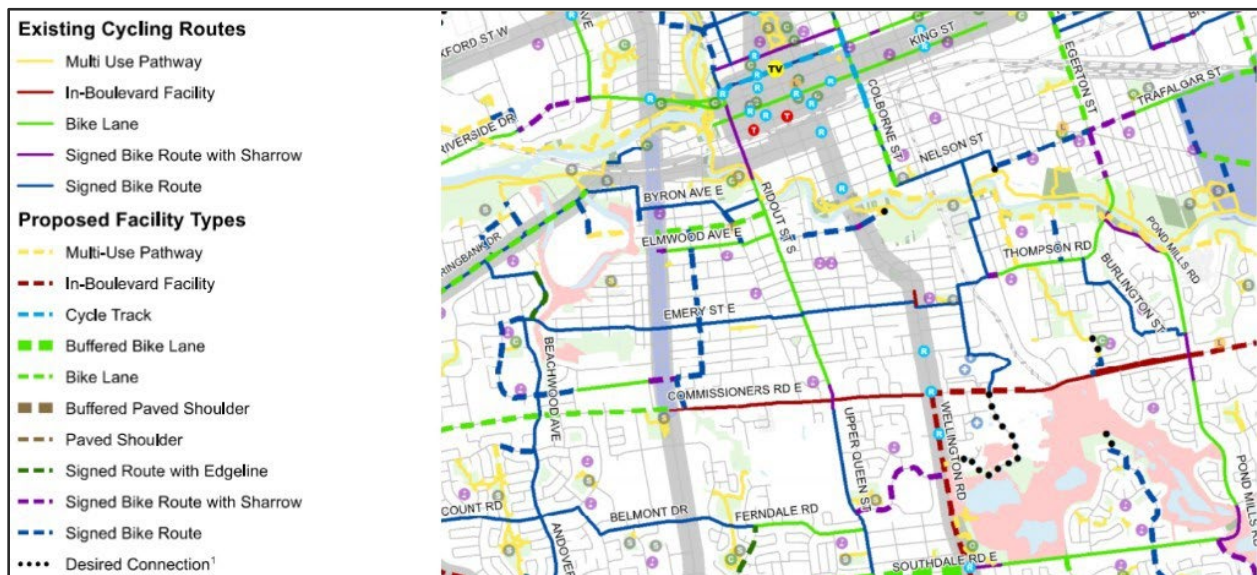
2.4 ACTIVE TRANSPORTATION FACILITIES

As previously noted, there are existing sidewalks on Wharnccliffe Road South, Centre Street, Base Line Road West, and Cotswold Gate, providing good pedestrian access through the area. On Base Line Road West, there is a pedestrian crossover (Level 2, Type C) approximately 25 m west of Cotswold Gate.

The only dedicated cycling facilities within or near the study area are on Base Line Road West, which includes on-street bike lanes from Wharnccliffe Road South to approximately 50 m east of Cotswold Gate.

The City of London Cycling Master Plan (MMM Group, September 2016) proposed to provide a signed bike route on Base Line Road West to the west of Cotswold Gae within a 15-year timeframe, as shown in Figure 5.

Figure 5: Existing and Proposed Cycling Facilities from City of London Cycling Master Plan (2016)



Source: City of London Cycling Master Plan (MMM Group, September 2016)

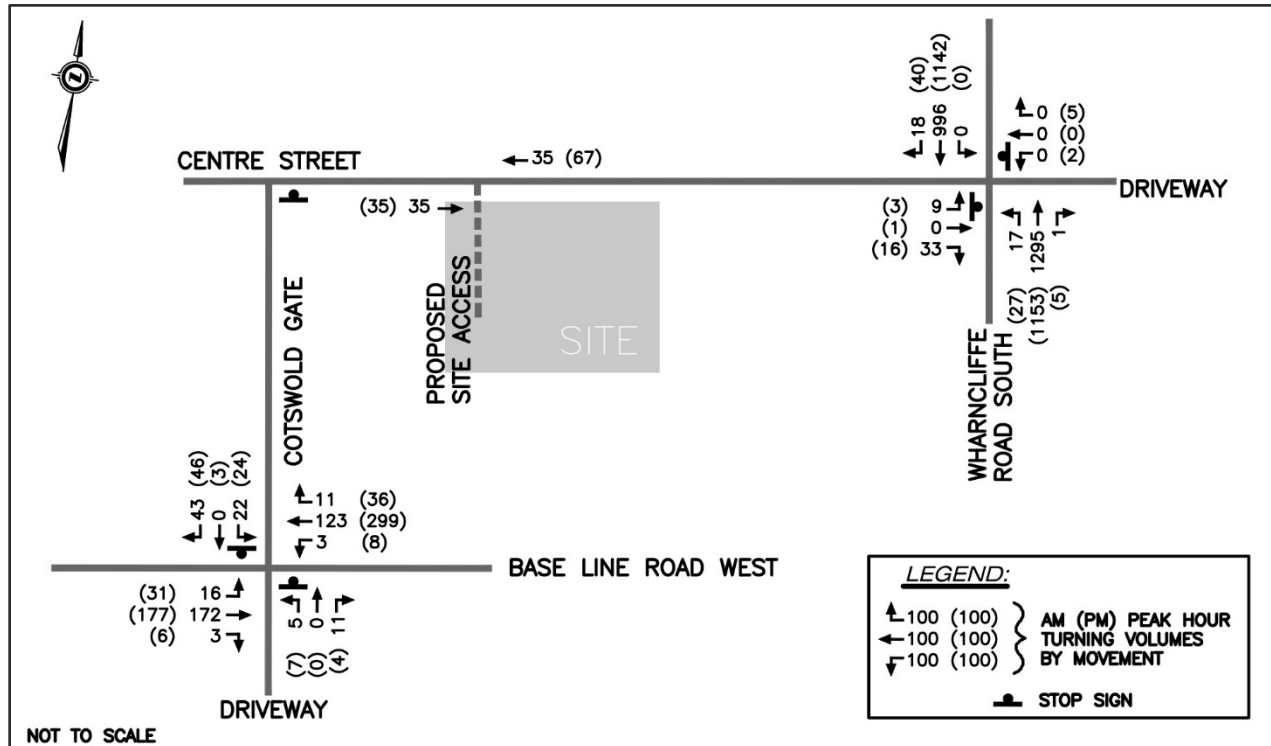
2.5 EXISTING TRAFFIC VOLUMES

Turning movement counts at the study area intersections were completed on Tuesday January 20th, 2026, by Accu-Traffic Inc during the AM and PM peak periods. The traffic count data is provided in Appendix A.

The existing traffic passing the proposed site access location on Centre Street has been conservatively estimated based on the volumes entering/exiting the study area on Centre Street and Cotswold Gate and the primary origins/destinations along those roads.

The existing peak hour traffic volumes for the study area intersections are illustrated in Figure 6.

Figure 6: Existing Peak Hour Traffic Volumes



One observation during the PM peak hour was that the southbound queue at the Wharncliffe Road South and Base Line Road West intersection regularly extends beyond (north of) Centre Street. Queued motorists typically let left turn movements to/from Centre Street through the queue, but this appears to reduce left turn demand (i.e. percentage of left turns) during the PM peak hour at this location.

2.6 EXISTING TRAFFIC OPERATIONS AND QUEUING

Existing traffic operations were assessed at the study area intersections based on the existing lane configuration and traffic volumes presented in Sections 2.2 and 2.5.

The peak hour factors (PHFs) for each peak hour were calculated from the turning movement count data for each intersection and were applied in the analysis.

Table 3 provides a summary of the existing intersection operations and complete Synchro output reports are provided in Appendix B.

Table 3: Existing Intersection Operations Summary

INTERSECTIONS / MOVEMENTS		EXISTING TRAFFIC			
		AM PEAK HOUR		PM PEAK HOUR	
		V/C	LOS	V/C	LOS
Wharncliffe Road South and Centre Street / Driveway	EB LTR	0.25	D	0.14	E
	WB LTR	0.00	A	0.06	E
	NB LT	0.39	A	0.35	A
	NB TR	0.39	A	0.35	A
	SB LT	0.31	A	0.37	A
	SB TR	0.31	A	0.37	A
Base Line Road West and Cotswold Gate / Driveway	EB LTR	0.01	A	0.03	A
	WB LTR	0.00	A	0.01	A
	NB LTR	0.03	B	0.02	B
	SB LTR	0.10	B	0.14	B
Notes: V/C - Volume to Capacity Ratio, LOS – Level of Service, Delay = Average Delay in Seconds EB – Eastbound, WB – Westbound, NB – Northbound, SB - Southbound L – Left, T – Through, R – Right					

The results show that the Wharncliffe Road South and Centre Street intersection is operating acceptably, however, the eastbound and westbound movements do experience longer delays (LOS E) in the PM peak hour. It is noted that the Synchro results are representative of free-flowing traffic on Wharncliffe Road South (i.e. times when queuing from Base Line Road West does not extend past Centre Street). Our field observations during times of extended queuing on Wharncliffe Road South were that the delay to turning movements from Centre Street was actually much lower than the LOS E range when they were allowed to enter/cross the queue. Regardless, longer delay (often LOS F) is not uncommon for a stop-controlled intersection on a busy arterial road and since the volume to capacity (v/c) ratios for these movements are quite low (under 0.15), they are functional and considered acceptable.

The Base Line Road West and Cotswold Gate intersection operates well during the peak hours, with all movements at LOS B or better and v/c ratios below 0.15.

Queuing results were also reviewed to confirm there are no existing queuing concerns. The 95th percentile queue lengths from the Synchro analysis for the stop-controlled movements are summarized in Table 4.

Table 4: Existing Intersection Queuing

INTERSECTIONS / MOVEMENTS		AVAILABLE STORAGE (m)	95 th PERCENTILE QUEUE (m)	
			EXISTING TRAFFIC	
			AM	PM
Wharncliffe Road South and Centre Street / Driveway	EB LTR	-	7	5
	WB LTR	-	5	5
Base Line Road West and Cotswold Gate / Driveway	NB LTR	-	5	5
	SB LTR	-	5	5
Notes: EB – Eastbound, WB – Westbound, NB – Northbound, SB - Southbound L – Left, T – Through, R – Right Queue lengths that were less than 5 m have been rounded up to 5 m to represent a minimum of one car length.				

As shown in Table 4, there are no queuing concerns at either of the existing study area intersections.

3 FUTURE BACKGROUND TRAFFIC

Future background traffic includes existing traffic with a general growth rate applied, plus traffic anticipated to be generated from other developments within or surrounding the study area. For the purposes of this assessment, it is assumed that the proposed development will be constructed by 2028, therefore a 2033 horizon year was selected for future traffic projections and analysis.

3.1 BACKGROUND GROWTH RATE

A background growth rate of 1.5% per annum has been used, as requested by the City. The background growth rate was applied to all traffic movements in the study area.

3.2 BACKGROUND DEVELOPMENT TRAFFIC

The City identified one approved development to be taken into consideration in the future background traffic forecasts, which is located at 129-131 Base Line Road West. The 129-131 Base Line Road West development will include a 14-storey residential building with a total of 176 dwelling units. The planned site access will be on Base Line Road West, approximately 80 meters east of the Cotswold Gate.

The location of 129-131 Base Line Road West (the background development) is shown in Figure 7.

Figure 7: Background Development Location

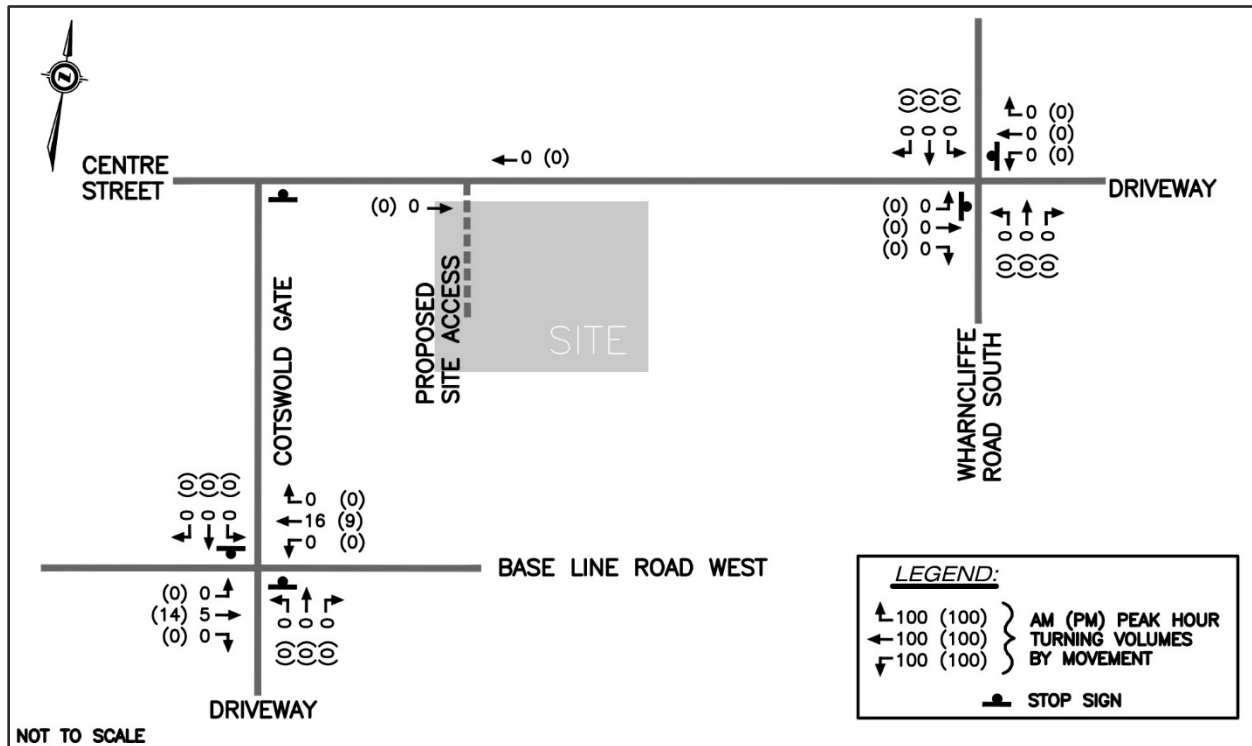


Aerial Image Source: City of London Map

Site-generated traffic volumes for the background development were provided by the City from the 129-131 Base Line Road West, London - Traffic Impact Assessment by F.R. Berry & Associates, dated October 19, 2022.

The resulting peak hour background development traffic volumes through the study area are shown in Figure 8.

Figure 8: Background Development Traffic



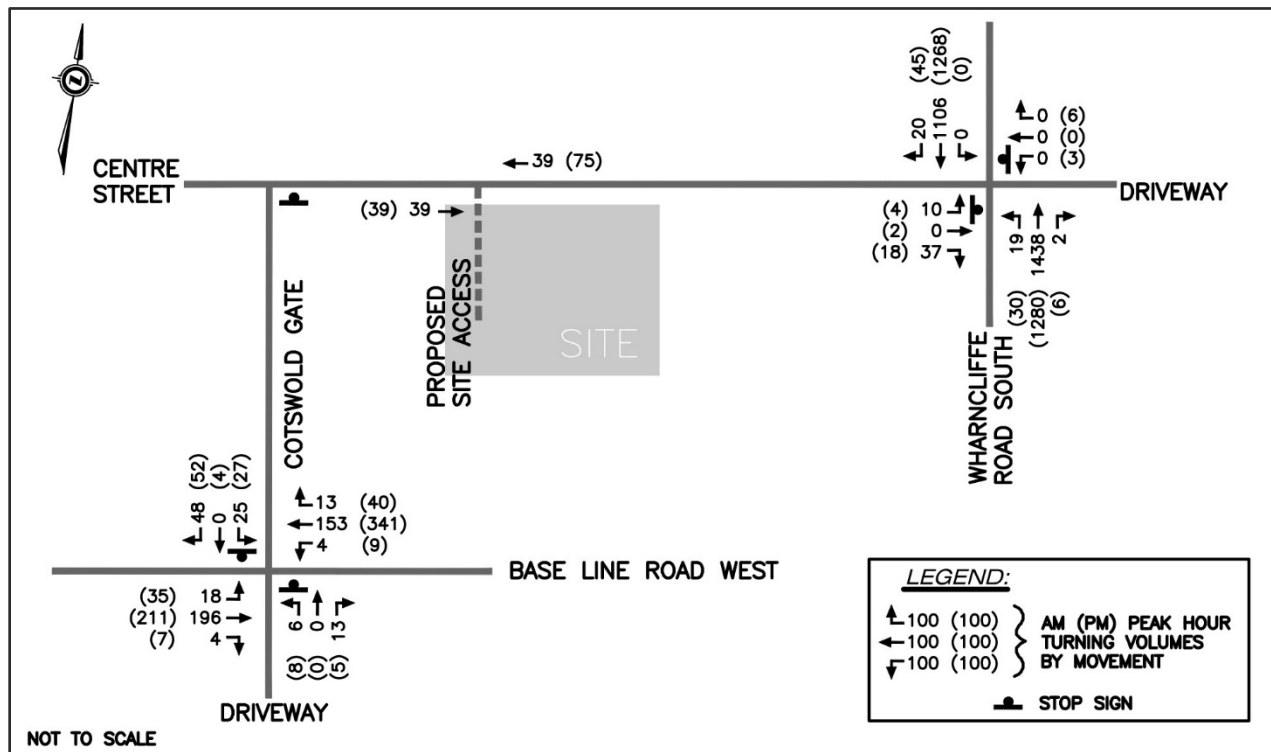
3.3 FUTURE ROAD NETWORK

No future road work is planned within the study area that would alter the lane configuration, therefore the existing lane configuration and intersection control has been used for analysis of future conditions.

3.4 2033 BACKGROUND TRAFFIC VOLUMES

Combining the background growth rate applied to the existing traffic and the traffic from the background development discussed in 3.2, the resulting 2033 background traffic volumes for the AM and PM peak hours are presented in Figure 9.

Figure 9: 2033 Background Traffic Volumes



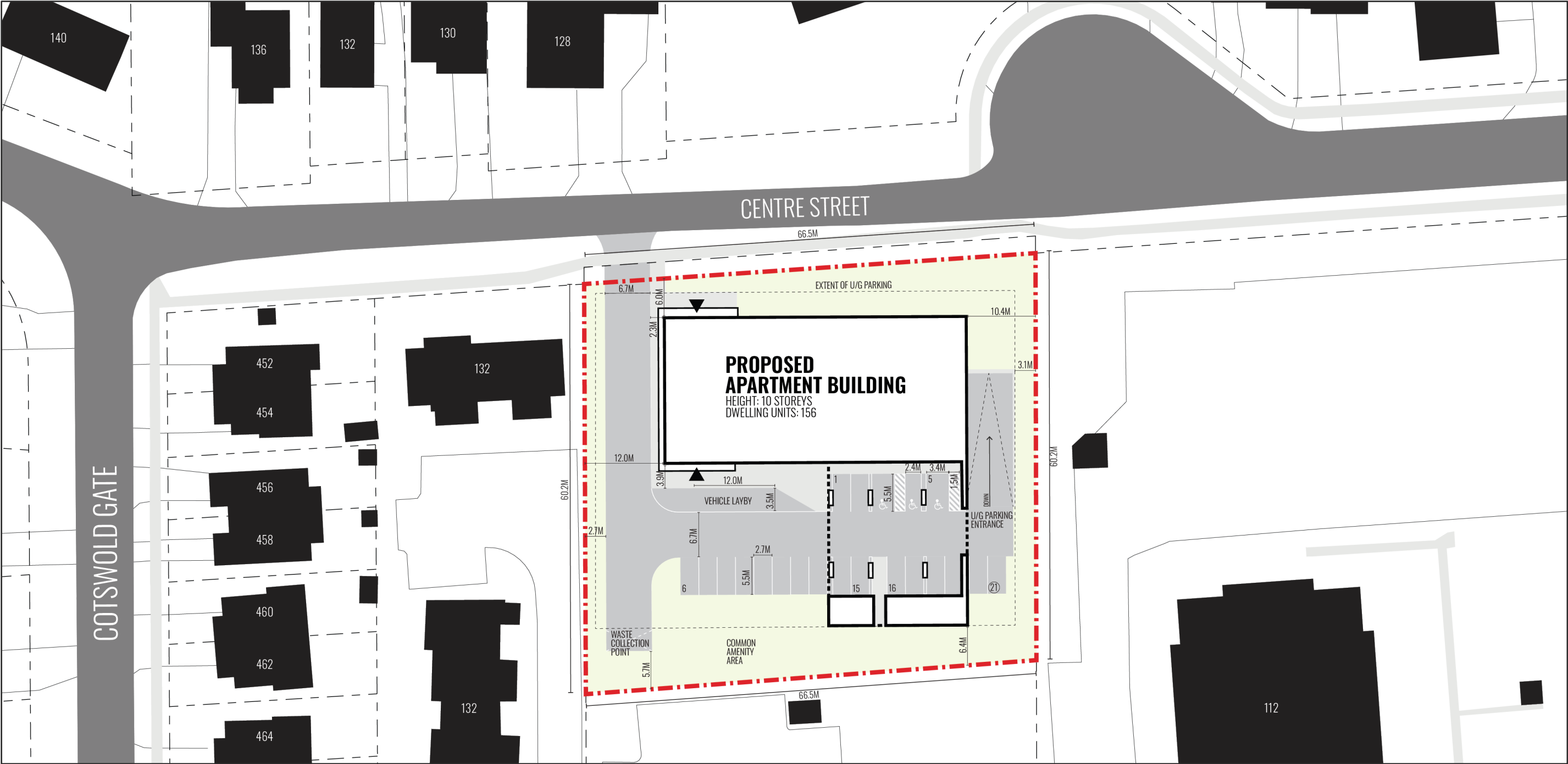
4 PROPOSED DEVELOPMENT

4.1 DEVELOPMENT PLAN

The development is proposed to include a 10-storey apartment building with 156 dwelling units and surface and underground parking. The conceptual Site Plan by Siv-ik Planning and Design Inc. is provided in Figure 10.

As shown, vehicular access to the development will be provided by a single driveway on Centre Street at the west limit of the property.

Figure 10: Conceptual Site Plan



4.2 SITE TRAFFIC GENERATION AND DISTRIBUTION

Site generated traffic volumes from the proposed development have been estimated based on trip rate information contained in the ITE *Trip Generation Manual, 12th Edition*. The “Multifamily Housing (Mid-Rise)” land use (Land Use Code 221) was used for the trip generation estimates. The resulting trip generation estimates for the development are summarized in Table 5.

Table 5: Trip Generation Summary

ITE LAND USE DESCRIPTION	Units	AM PEAK HOUR TRIPS			PM PEAK HOUR TRIPS		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Multifamily Housing (Mid-Rise) (Land Use Code 221)	156	14	45	59	38	21	59

As shown in Table 5, the new trip generation (two-way) for the proposed development is forecast to be 59 trips during both the AM and PM peak hours.

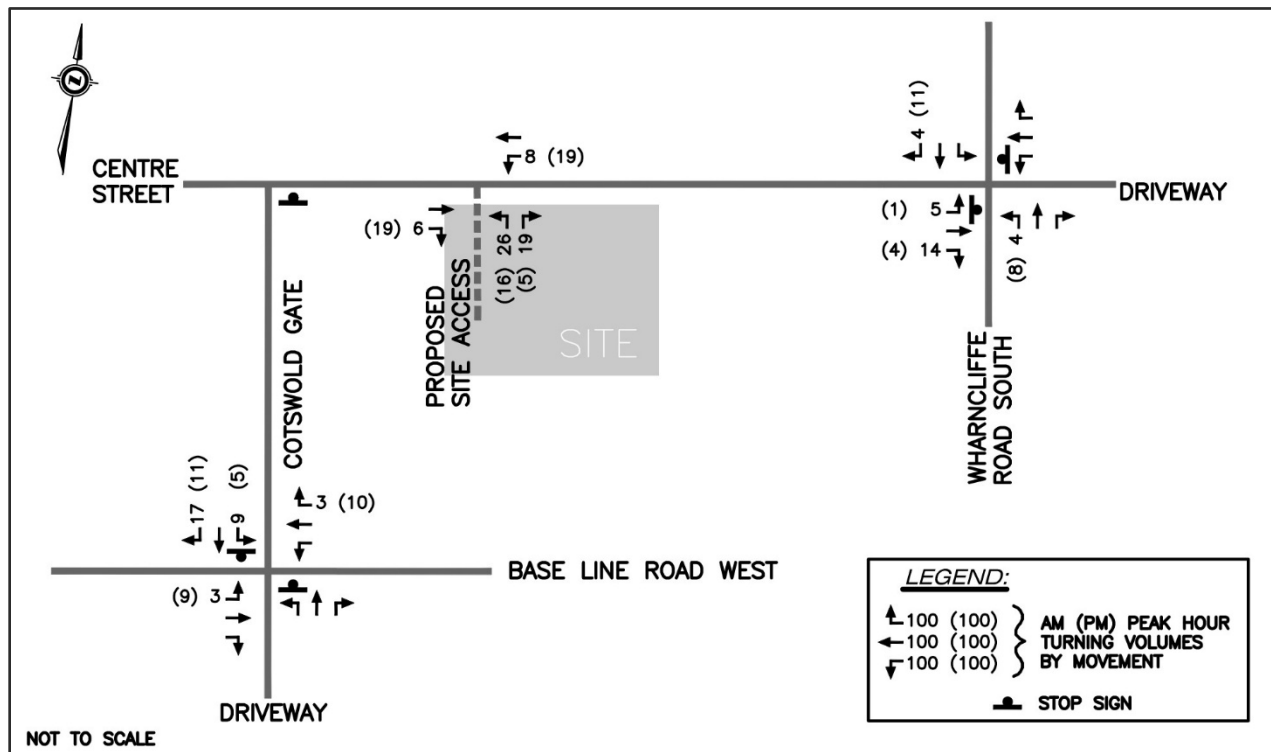
The assumed distribution of site traffic has been determined based on the distribution of existing traffic using Centre Street and Cotswold Gate to enter/exit the study area. Table 6 summarizes the trip distribution applied to the site traffic.

Table 6: Trip Distribution Summary

DIRECTION TO / FROM	VIA	AM		PM	
		IN	OUT	IN	OUT
North	Wharnccliffe Road South	30%	10%	30%	5%
South	Wharnccliffe Road South	25%	30%	20%	20%
East	Base Line Road West	25%	40%	25%	50%
West	Base Line Road West	20%	20%	25%	25%
Total		100%	100%	100%	100%

Applying the above distribution, the resulting site traffic within the study area from the proposed development is illustrated in Figure 11.

Figure 11: Site Traffic



4.3 SITE PLAN REVIEW AND ACCESS CONSIDERATIONS

4.3.1 PROPOSED SITE ACCESS

The proposed Site Access is located on Centre Street, approximately 85 m east of Cotswold Gate (measured centerline to centerline). The site access is proposed as a full-movement driveway with one inbound lane and one outbound lane.

There are no adjacent driveways on the south side of Centre Street in the vicinity of the proposed site access location, so there are no conflicts or spacing concerns.

Sightlines along Centre Street at the site access location were reviewed with respect to Transportation Association of Canada (TAC) guidelines for intersection sight distances. The available sight distance to the east is limited to approximately 160 m due to the vertical alignment of the road, but this is more than sufficient to satisfy the TAC intersection sight distance requirement of 105 m for turning movements from a minor road (or access) at a design speed of 50 km/h.

To the west of the proposed site access, sight distance of up to 110 m is available, limited by the horizontal curvature of Centre Street at the Cotswold Gate intersection. This meets the TAC intersection sight distance requirement, however, several small trees and landscape plantings located within the south boulevard west of the access are expected to obstruct sightlines in closer proximity to the driveway when foliage is present. These plantings, which do not appear to be City-installed and are not identified in the City's tree inventory, will need to be removed or maintained (trimmed to keep foliage only below 0.6 m or above 1.8 m) within 35 m of the access to ensure that adequate sightlines are provided.

Traffic volumes on Centre Street are quite low and will not warrant a left or right turn lane at the proposed site access.

4.3.2 PEDESTRIAN, CYCLING AND TRANSIT ACCESS

The proposed development ties in directly to the municipal sidewalk on Centre Street, which connects to both Wharncliffe Road South for access to daily amenities, and Cotswold Gate for closer access to transit on Base Line Road West.

Additionally, with existing pedestrian facilities in place, the addition of the minor site traffic to the local road network is not expected to have any negative impact on the walkability of the area.

4.3.3 PARKING

The development is proposed to include a total of 119 on-site parking spaces, which is a parking rate of 0.76 spaces per unit and meets the minimum Zoning By-law requirement of 0.5 spaces per unit. 21 spaces will be provided at ground level and 98 spaces will be underground. While not specified on the conceptual site plan, it is assumed that the required visitor parking spaces (minimum of 12 to meet the City's 1 space per 10 units requirement) will be located in the surface lot.

The proposed parking supply strikes an appropriate balance between encouraging active transportation and transit use while still accommodating current market demand and tenant expectations. Provided that parking demand is managed through clearly defined lease terms, the supply is anticipated to be sufficient, with no resulting spillover parking on adjacent streets.

4.4 TRANSPORTATION DEMAND MANAGEMENT (TDM)

Transportation Demand Management (TDM) refers to strategies for increasing the efficiency of the transportation network, most often by reducing the number of single-occupancy vehicle trips. The primary objectives are usually to encourage people to change modes of transportation (e.g. walking, cycling, or transit), travel less (e.g. work from home, combine trips when possible, etc.) or change trip times (i.e. avoid peak hours).

The proposed development supports TDM strategies in the following ways:

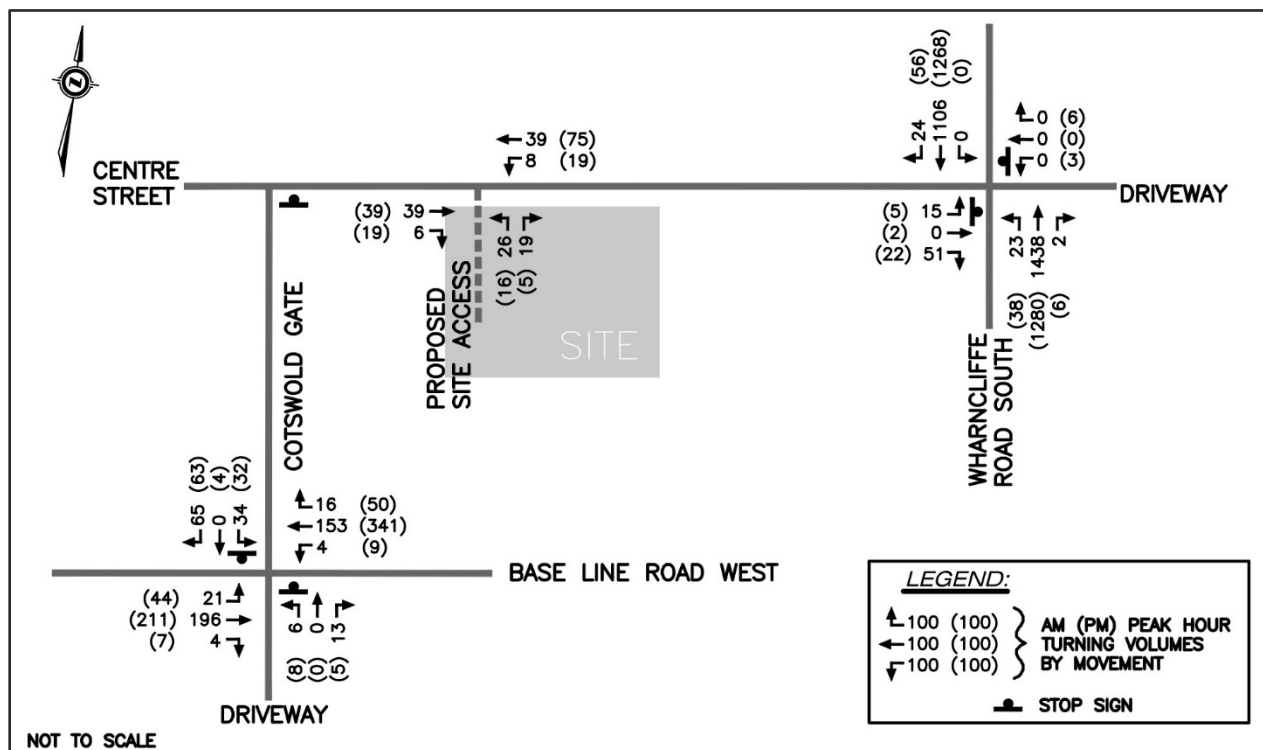
- Below-average parking provisions (i.e. not over-supplied) for the proposed use will promote the use of alternative modes.
- Connections to the public sidewalk network encouraging active transportation and nearby transit access.

In addition, consideration should be given to unbundling parking (i.e., selling or renting parking spaces separately from apartment units) to further encourage residents to adopt alternative travel modes and reduce automobile dependency.

5 FUTURE TOTAL TRAFFIC

The future total traffic is determined by combining the development traffic (site traffic) from Section 4.2 with the future background traffic from Section 3.4. The resulting 2033 total traffic volumes for the weekday AM and PM peak hours are shown in Figure 12.

Figure 12: 2033 Total Traffic Volumes



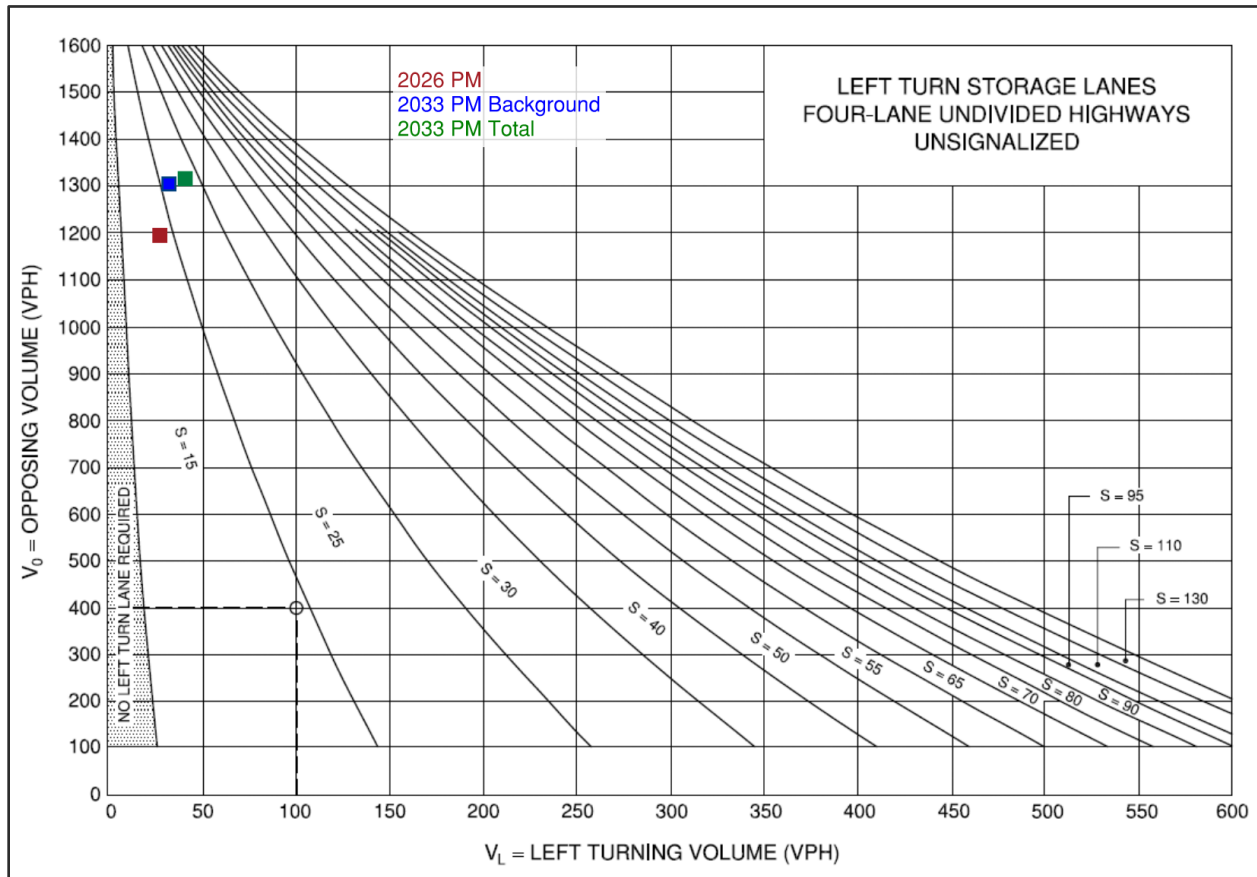
5.1 LEFT TURN LANE WARRANT ANALYSIS

Left turn lane warrants were reviewed for the study area intersections based on the left turn lane warrant graphs from the 2023 *Ministry of Transportation Design Supplement for the TAC Geometric Design Guide for Canadian Roads 2017* (MTO Design Supplement).

The PM peak hour was considered in all cases because the PM volumes are higher than the AM peak hour.

For the Wharnccliffe Road South and Centre Street intersection, the four-lane undivided road warrant graph was used, which is based on the hourly left turn volume and the volume of opposing traffic. The warrant graph is shown in Figure 13, which considers the northbound left turn movement under existing, 2033 background, and 2033 total traffic conditions.

Figure 13: Left Turn Lane Warrant Graph for Wharnccliffe Road South and Centre Street



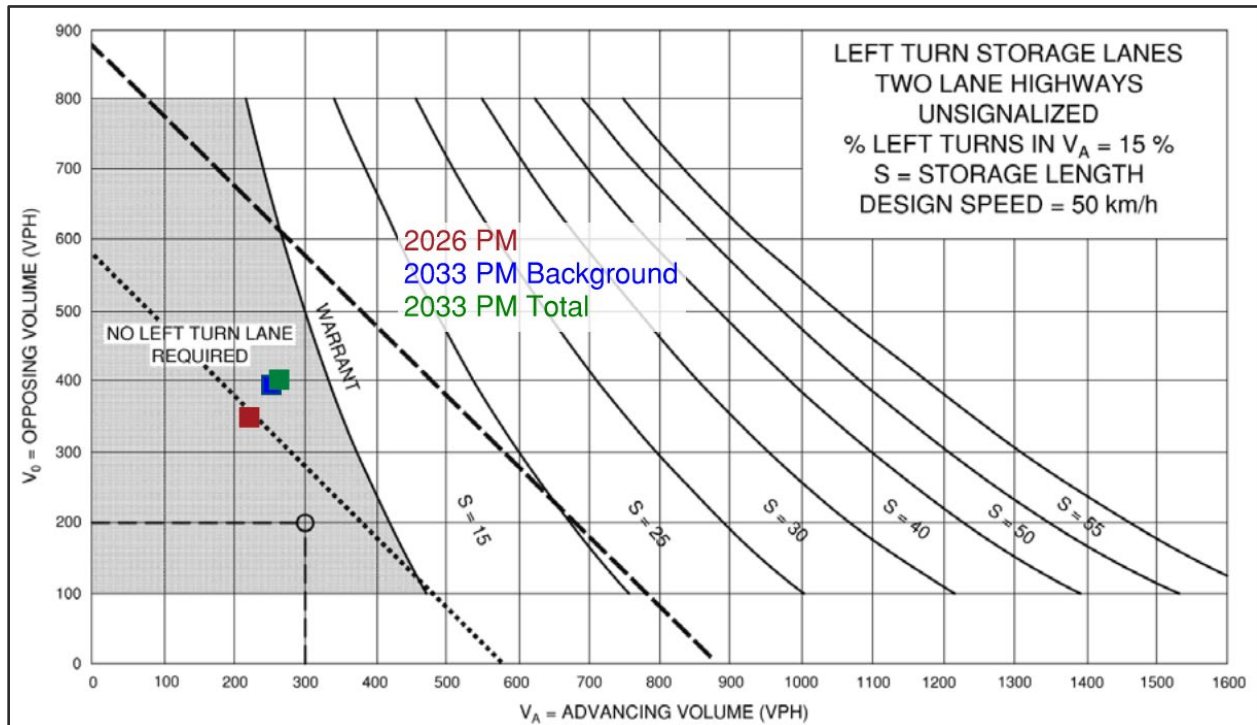
Source: MTO Design Supplement

The warrant graph in Figure 13 indicates that a northbound left turn lane on Wharnccliffe Road South with 15 m of storage is warranted for existing conditions, and the storage need will increase up to 25 m under 2033 background or total traffic conditions.

Despite the left turn lane warrant being met for the Wharnccliffe Road South and Centre Street intersection, there is limited space available within the Wharnccliffe Road South right-of-way (generally 20 m ROW through this section of Wharnccliffe Road South), so implementation of a left turn lane would not be practical due to significant property impacts, as is the case for most sidestreets along Wharnccliffe Road South in this area.

For the Base Line Road West and Cotswold Gate intersection, left turn lane warrant graphs for a two-lane road from the MTO Design Supplement were reviewed, which are based on the design speed, hourly percentage of left turning vehicles, the advancing traffic volume and the volume of opposing traffic. The applied warrant graph, considering the need for an eastbound left turn lane on Base Line Road West, is shown in Figure 14.

Figure 14: Left Turn Lane Warrant Graph for Base Line Road West and Cotswold Gate



Source: MTO Design Supplement

Based on the warrant graph, a left turn lane is not warranted on Base Line Road West at Cotswold Gate under existing or future traffic conditions.

5.2 FUTURE TRAFFIC SIGNAL WARRANT ANALYSIS

Traffic signal warrant analysis was undertaken for the Base Line Road West and Cotswold Gate intersection to determine if traffic signals may be warranted under future traffic conditions. The analysis was based on the *Ontario Traffic Manual Book 12* Justification 7 for Projected Volumes. Justification 7 uses the peak hour traffic volumes, and in the case of forecast volumes at an existing intersection, it requires that 120% of the warrant threshold be met to satisfy the warrant. It was concluded that traffic signals are not anticipated to be warranted under the 2033 background or total traffic conditions (highest warrant value reached is only 37% fulfilled). The signal warrant analysis sheets are contained in Appendix C.

6 FUTURE TRAFFIC OPERATIONAL ANALYSIS

Intersection operations were re-assessed for future background and total traffic conditions. The results of the future conditions analysis are summarized in Table 7. Detailed Synchro reports for the future background traffic and future total traffic are available in Appendix D and Appendix E, respectively.

Table 7: 2033 Intersection Operations Summary

INTERSECTIONS / MOVEMENTS		2033 BACKGROUND				2033 TOTAL			
		AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR	
		V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
Wharncliffe Road South and Centre Street / Driveway	EB LTR	0.37	E	0.30	F (65)	0.55	F (65)	0.36	F (70)
	WB LTR	0.00	A	0.13	F (65)	0.00	A	0.14	F (70)
	NB LT	0.43	A	0.39	A	0.43	A	0.39	A
	NB TR	0.43	A	0.39	A	0.43	A	0.39	A
	SB LT	0.34	A	0.41	A	0.35	A	0.42	A
	SB TR	0.34	A	0.41	A	0.35	A	0.42	A
Base Line Road West and Cotswold Gate / Driveway	EB LTR	0.01	A	0.03	A	0.02	A	0.04	A
	WB LTR	0.00	A	0.01	A	0.00	A	0.01	A
	NB LTR	0.03	B	0.03	B	0.03	B	0.04	C
	SB LTR	0.12	B	0.18	B	0.16	B	0.21	B
Centre Street and Proposed South Access	EB TR	N/A		N/A		0.03	A	0.04	A
	WB LT					0.01	A	0.01	A
	NB LR					0.05	A	0.03	A
Notes: V/C - Volume to Capacity Ratio, LOS – Level of Service EB – Eastbound, WB – Westbound, NB – Northbound, SB - Southbound L – Left, T – Through, R – Right (#) = Average Delay in Seconds for LOS F Movements									

As shown in the results above, the Wharncliffe Road South and Centre Street intersection will continue to function acceptably under future background and total traffic conditions, although the eastbound and westbound movements will experience some increase in delay, reaching LOS F during peak hours. However, since the v/c ratios remain relatively low (maximum of 0.55), the operations are considered acceptable for a stop-controlled intersection on a busy arterial road.

The Base Line Road West and Cotswold Gate intersection will continue to operate well under 2033 background and total traffic conditions, with all movements at LOS C or better and low v/c ratios.

The proposed site access will operate very well, with all movements at LOS A and v/c ratios under 0.05.

Queuing results for the 2033 background and total traffic conditions were also reviewed from the Synchro analysis and the results are presented in Table 8.

Table 8: 2033 Intersection Queuing Summary

INTERSECTIONS / MOVEMENTS		AVAILABLE STORAGE (m)	95 th PERCENTILE QUEUE (m)			
			2033 BACKGROUND		2033 TOTAL	
			AM	PM	AM	PM
Wharncliffe Road South and Centre Street / Driveway	EB LTR	-	12	8	20	11
	WB LTR	-	0	5	0	5
Base Line Road West and Cotswold Gate / Driveway	NB LTR	-	5	5	5	5
	SB LTR	-	5	5	5	6
Centre Street and Proposed Site Access	NB LR	-			5	5
Notes: EB – Eastbound, WB – Westbound, NB – Northbound, SB - Southbound L – Left, T – Through, R – Right Queue lengths that were less than 5 m have been rounded up to 5 m to represent a minimum of one car length.						

From the results in Table 8, there are no future queuing concerns at the study area intersections.

7 CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis completed, the following key conclusions and recommendations are made in this TIA:

- It is forecast that the proposed development will generate 59 new trips in the AM peak hour (14 in and 45 out) and 59 trips during the PM peak hour (38 in and 21 out).
- Under existing conditions, the Wharncliffe Road South and Centre Street intersection operates acceptably, however, the eastbound and westbound movements from Centre Street and the opposite driveway experience LOS E during the PM peak hour. This is not uncommon for a stop-controlled access on a busy arterial road, and since the v/c ratios for these movements are low, they are functional and considered acceptable.

The Base Line Road West and Cotswold Gate intersection currently operates well, with all movements at LOS B or better.

- Under 2033 background and total traffic conditions, the Wharncliffe Road South and Centre Street intersection will continue to function acceptably. The eastbound and westbound movements will experience some increased delay (LOS F in peak hours), but the v/c ratios will remain low enough that the condition is tolerable.

The Base Line Road West and Cotswold Gate intersection will continue to operate well under 2033 background and total traffic conditions, with all movements at LOS C or better and low v/c ratios.

The proposed site access will operate well beyond the horizon period, with movements at LOS A.

- The proposed site plan provides good internal and external pedestrian connections allowing access to local amenities and nearby transit stops on Base Line Road West and Wharncliffe Road South.
- MTO left turn lane warrants were reviewed for the existing study area intersections. On Base Line Road West at Cotswold Gate, a left turn lane is not warranted under existing or future traffic conditions. On Wharncliffe Road South at Centre Street, a left turn lane is warranted under

existing conditions with 15 m of storage, and the warranted storage length increases to 25 m under future background and total traffic conditions. However, implementation of a left turn lane on Wharncliffe Road South is not practical due to right-of-way constraints (as is the case for most minor intersections along Wharncliffe Road South in this area) and therefore is not recommended.

- Traffic signal warrant analysis was performed for the Base Line Road West and Cotswold Gate intersection under both 2033 background and total traffic conditions, and it was concluded that traffic signals will not be warranted.
- Overall, the forecasted site traffic does not introduce any significant operational problems on the surrounding road network, and no road improvements are required to accommodate the proposed development.

8 LIMITATIONS

This Report was prepared by Strik, Baldinelli, Moniz Ltd. (the Consultant) for Kingsdale Development Inc. and the City of London. Use of this Report by any third party, or any reliance upon its findings, is solely the responsibility of that party. Strik, Baldinelli, Moniz Ltd. accepts no responsibility for damages, if any, suffered by a third party as a result of decisions made or actions undertaken as a result of this Report. Third party use of this Report, without the express written consent of the Consultant, denies any claims, whether in contract, tort, and/or any other cause of action in law, against the Consultant.

All findings and conclusions presented in this Report are based on information as it appeared during the period of the investigation. This Report is not intended to be exhaustive in scope, or to imply a risk-free development. It should be recognized that the passage of time may alter the opinions, conclusions, and/or recommendations provided herein.

The analysis was limited to the documents referenced herein. Strik, Baldinelli, Moniz Ltd. accepts no responsibility for the accuracy of the information provided by others. All opinions, conclusions, and/or recommendations presented in this Report are based on the information available at the time of the review.

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Appendix A – Traffic Data

Accu-Traffic Inc.

Morning Peak Diagram	Specified Period From: 7:00:00 To: 9:00:00	One Hour Peak From: 8:00:00 To: 9:00:00
Municipality: London Site #: 2601200004 Intersection: Wharncliffe Rd S & Centre St TFR File #: 1 Count date: 20-Jan-26	Weather conditions: Person counted: Person prepared: Person checked:	
** Non-Signalized Intersection **	Major Road: Wharncliffe Rd S runs N/S	

North Leg Total: 2342 North Entering: 1014 North Peds: 0 Peds Cross:	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Heavys</td><td>5</td><td>26</td><td>0</td><td>31</td></tr> <tr><td>Trucks</td><td>0</td><td>9</td><td>0</td><td>9</td></tr> <tr><td>Cars</td><td>13</td><td>961</td><td>0</td><td>974</td></tr> <tr><td>Totals</td><td>18</td><td>996</td><td>0</td><td></td></tr> </table>	Heavys	5	26	0	31	Trucks	0	9	0	9	Cars	13	961	0	974	Totals	18	996	0		<table style="width: 100%; border-collapse: collapse;"> <tr><td>Heavys</td><td>20</td></tr> <tr><td>Trucks</td><td>5</td></tr> <tr><td>Cars</td><td>1303</td></tr> <tr><td>Totals</td><td>1328</td></tr> </table>	Heavys	20	Trucks	5	Cars	1303	Totals	1328	East Leg Total: 1 East Entering: 0 East Peds: 7 Peds Cross:
Heavys	5	26	0	31																											
Trucks	0	9	0	9																											
Cars	13	961	0	974																											
Totals	18	996	0																												
Heavys	20																														
Trucks	5																														
Cars	1303																														
Totals	1328																														

Heavys	Trucks	Cars	Totals
5	0	30	35

Wharncliffe Rd S

Cars	Trucks	Heavys	Totals
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

Heavys	Trucks	Cars	Totals
1	0	8	9
0	0	0	0
1	0	32	33
2	0	40	

Centre St

Cars	Trucks	Heavys	Totals
1	0	0	1

Peds Cross:	
West Peds:	9
West Entering:	42
West Leg Total:	77

Wharncliffe Rd S

Cars	993
Trucks	9
Heavys	27
Totals	1029

Cars	17	1295	1	1313
Trucks	0	5	0	5
Heavys	0	19	0	19
Totals	17	1319	1	

driveway

Cars	1	0	0	1
------	---	---	---	---

Peds Cross:	
South Peds:	0
South Entering:	1337
South Leg Total:	2366

Wharncliffe Rd S

Cars	17	1295	1	1313
Trucks	0	5	0	5
Heavys	0	19	0	19
Totals	17	1319	1	

Comments

Accu-Traffic Inc.

Afternoon Peak Diagram	Specified Period From: 16:00:00 To: 18:00:00	One Hour Peak From: 16:45:00 To: 17:45:00
Municipality: London Site #: 2601200004 Intersection: Wharncliffe Rd S & Centre St TFR File #: 1 Count date: 20-Jan-26	Weather conditions: Person counted: Person prepared: Person checked:	
** Non-Signalized Intersection **	Major Road: Wharncliffe Rd S runs N/S	

North Leg Total: 2343 North Entering: 1182 North Peds: 0 Peds Cross:	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 2px;">Heavys</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">9</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">9</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Trucks</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">8</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">8</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Cars</td> <td style="padding: 2px;">40</td> <td style="padding: 2px;">1125</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">1165</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Totals</td> <td style="padding: 2px;">40</td> <td style="padding: 2px;">1142</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;"></td> </tr> </table>	Heavys	0	9	0	9	Trucks	0	8	0	8	Cars	40	1125	0	1165	Totals	40	1142	0		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 2px;">Heavys</td> <td style="padding: 2px;">8</td> <td style="padding: 2px;">5</td> <td style="padding: 2px;">1148</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Trucks</td> <td style="padding: 2px;">5</td> <td style="padding: 2px;">1161</td> <td style="padding: 2px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Cars</td> <td style="padding: 2px;">1148</td> <td style="padding: 2px;">1161</td> <td style="padding: 2px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Totals</td> <td style="padding: 2px;">1161</td> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> </table>	Heavys	8	5	1148	Trucks	5	1161		Cars	1148	1161		Totals	1161			East Leg Total: 13 East Entering: 7 East Peds: 16 Peds Cross:
Heavys	0	9	0	9																																			
Trucks	0	8	0	8																																			
Cars	40	1125	0	1165																																			
Totals	40	1142	0																																				
Heavys	8	5	1148																																				
Trucks	5	1161																																					
Cars	1148	1161																																					
Totals	1161																																						

Heavys	Trucks	Cars	Totals
0	0	67	67

Centre St

Wharncliffe Rd S

Cars	Trucks	Heavys	Totals
5	0	0	5
0	0	0	0
2	0	0	2
7	0	0	

driveway

Heavys	Trucks	Cars	Totals
0	0	3	3
0	1	0	1
0	0	16	16
0	1	19	

Wharncliffe Rd S

Cars	Trucks	Heavys	Totals
5	1	0	6

Peds Cross: West Peds: 14 West Entering: 20 West Leg Total: 87	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 2px;">Cars</td> <td style="padding: 2px;">1143</td> <td style="padding: 2px;">27</td> <td style="padding: 2px;">1140</td> <td style="padding: 2px;">5</td> <td style="padding: 2px;">1172</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Trucks</td> <td style="padding: 2px;">8</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">5</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">5</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Heavys</td> <td style="padding: 2px;">9</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">8</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">8</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Totals</td> <td style="padding: 2px;">1160</td> <td style="padding: 2px;">27</td> <td style="padding: 2px;">1153</td> <td style="padding: 2px;">5</td> <td style="padding: 2px;"></td> </tr> </table>	Cars	1143	27	1140	5	1172	Trucks	8	0	5	0	5	Heavys	9	0	8	0	8	Totals	1160	27	1153	5		Peds Cross: South Peds: 0 South Entering: 1185 South Leg Total: 2345
Cars	1143	27	1140	5	1172																					
Trucks	8	0	5	0	5																					
Heavys	9	0	8	0	8																					
Totals	1160	27	1153	5																						

Comments

Accu-Traffic Inc.

Total Count Diagram

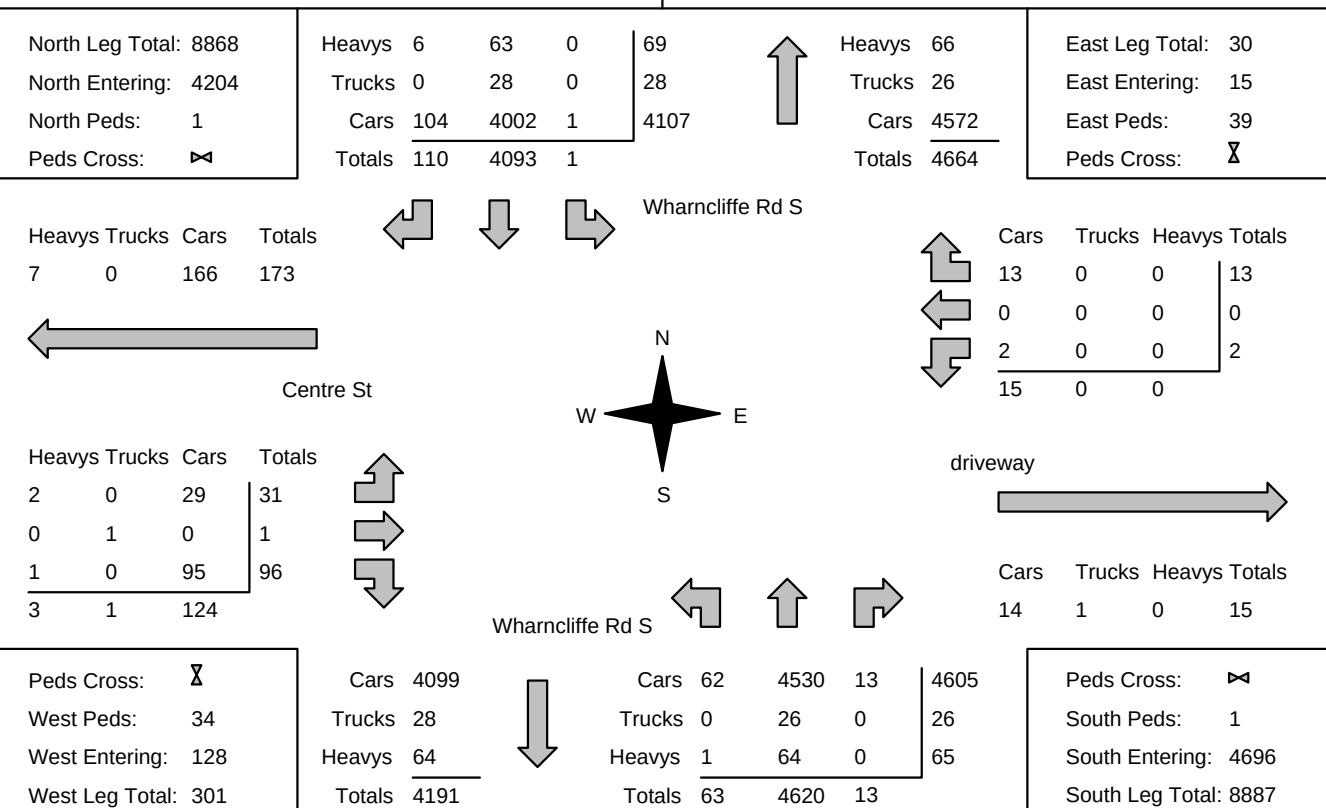
Municipality: London
Site #: 2601200004
Intersection: Wharncliffe Rd S & Centre St
TFR File #: 1
Count date: 20-Jan-26

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Wharncliffe Rd S runs N/S



Comments

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Wharncliffe Rd S & Centre St					Count Date: 20-Jan-26		Municipality: London					
North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	0	855	9	864	1	1936	8:00:00	8	1064	0	1072	1
9:00:00	0	996	18	1014	0	2351	9:00:00	17	1319	1	1337	0
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	1	1129	44	1174	0	2310	17:00:00	12	1117	7	1136	0
18:00:00	0	1113	39	1152	0	2303	18:00:00	26	1120	5	1151	0

[illegible]

[illegible]

[illegible]

[illegible]

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period

From: 7:00:00

To: 9:00:00

One Hour Peak

From: 8:00:00

To: 9:00:00

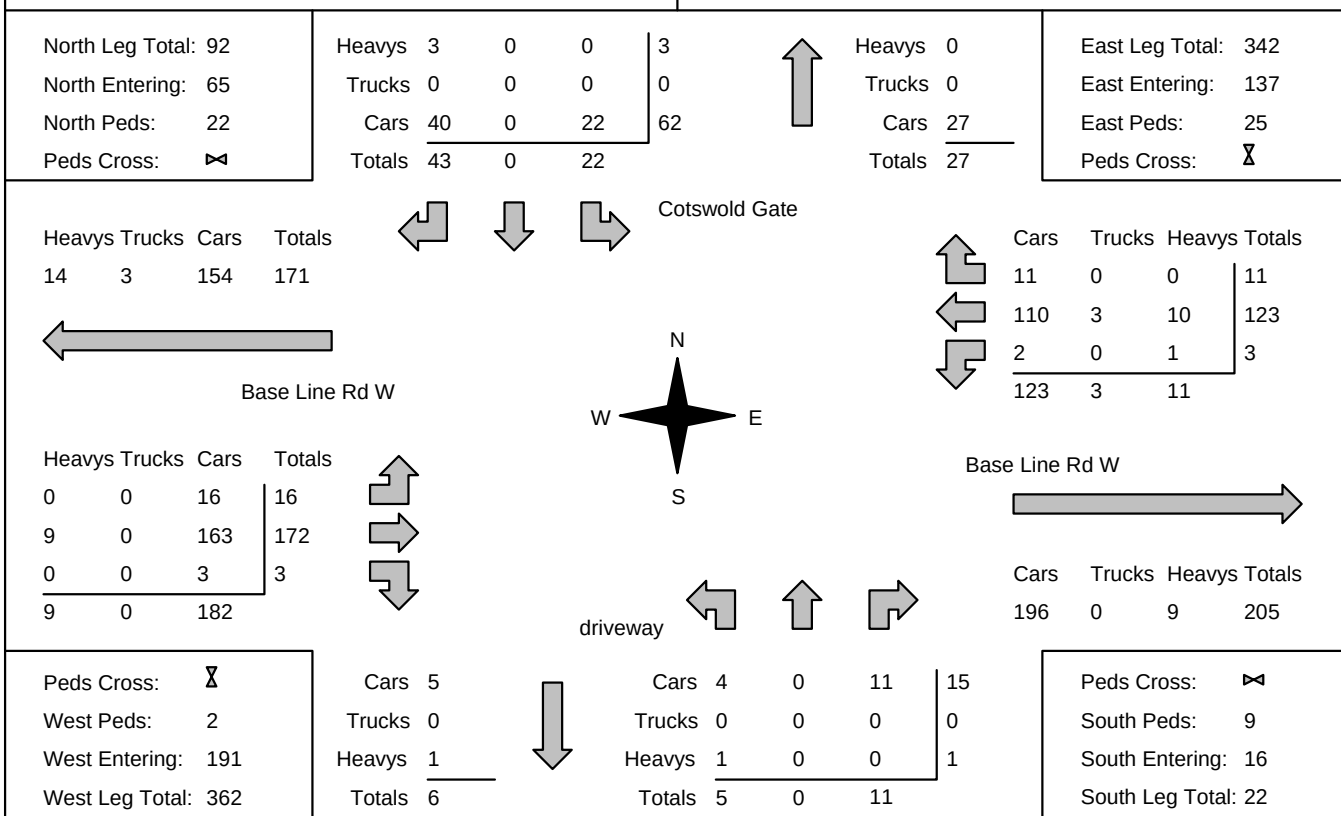
Municipality: London
Site #: 2601200005
Intersection: Base Line Rd W & Cotswold Gate
TFR File #: 1
Count date: 20-Jan-26

Weather conditions:

Person counted:
Person prepared:
Person checked:

** Non-Signalized Intersection **

Major Road: Base Line Rd W runs W/E



Comments

Accu-Traffic Inc.

Afternoon Peak Diagram	Specified Period From: 16:00:00 To: 18:00:00	One Hour Peak From: 16:15:00 To: 17:15:00
Municipality: London Site #: 2601200005 Intersection: Base Line Rd W & Cotswold Gate TFR File #: 1 Count date: 20-Jan-26	Weather conditions: Person counted: Person prepared: Person checked:	
** Non-Signalized Intersection **	Major Road: Base Line Rd W runs W/E	

North Leg Total: 140 North Entering: 73 North Peds: 13 Peds Cross:	<table style="margin: auto;"> <tr><td>Heavys</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Trucks</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Cars</td><td>46</td><td>3</td><td>24</td><td>73</td></tr> <tr><td>Totals</td><td>46</td><td>3</td><td>24</td><td></td></tr> </table>	Heavys	0	0	0	0	Trucks	0	0	0	0	Cars	46	3	24	73	Totals	46	3	24		<table style="margin: auto;"> <tr><td>Heavys</td><td>0</td></tr> <tr><td>Trucks</td><td>0</td></tr> <tr><td>Cars</td><td>67</td></tr> <tr><td>Totals</td><td>67</td></tr> </table>	Heavys	0	Trucks	0	Cars	67	Totals	67	East Leg Total: 548 East Entering: 343 East Peds: 2 Peds Cross:
Heavys	0	0	0	0																											
Trucks	0	0	0	0																											
Cars	46	3	24	73																											
Totals	46	3	24																												
Heavys	0																														
Trucks	0																														
Cars	67																														
Totals	67																														

Heavys	Trucks	Cars	Totals
8	2	342	352

Base Line Rd W

Cotswold Gate

Cars	Trucks	Heavys	Totals
36	0	0	36
289	2	8	299
8	0	0	8
333	2	8	

Base Line Rd W

N
S
E
W

Heavys	Trucks	Cars	Totals
0	0	31	31
6	4	167	177
0	0	6	6
6	4	204	

driveway

Cars	Trucks	Heavys	Totals
195	4	6	205

Peds Cross: West Peds: 0 West Entering: 214 West Leg Total: 566	<table style="margin: auto;"> <tr><td>Cars</td><td>17</td></tr> <tr><td>Trucks</td><td>0</td></tr> <tr><td>Heavys</td><td>0</td></tr> <tr><td>Totals</td><td>17</td></tr> </table>	Cars	17	Trucks	0	Heavys	0	Totals	17	<table style="margin: auto;"> <tr><td>Cars</td><td>7</td><td>0</td><td>4</td><td>11</td></tr> <tr><td>Trucks</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Heavys</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Totals</td><td>7</td><td>0</td><td>4</td><td></td></tr> </table>	Cars	7	0	4	11	Trucks	0	0	0	0	Heavys	0	0	0	0	Totals	7	0	4		Peds Cross: South Peds: 4 South Entering: 11 South Leg Total: 28
Cars	17																														
Trucks	0																														
Heavys	0																														
Totals	17																														
Cars	7	0	4	11																											
Trucks	0	0	0	0																											
Heavys	0	0	0	0																											
Totals	7	0	4																												

Comments

Accu-Traffic Inc.

Total Count Diagram

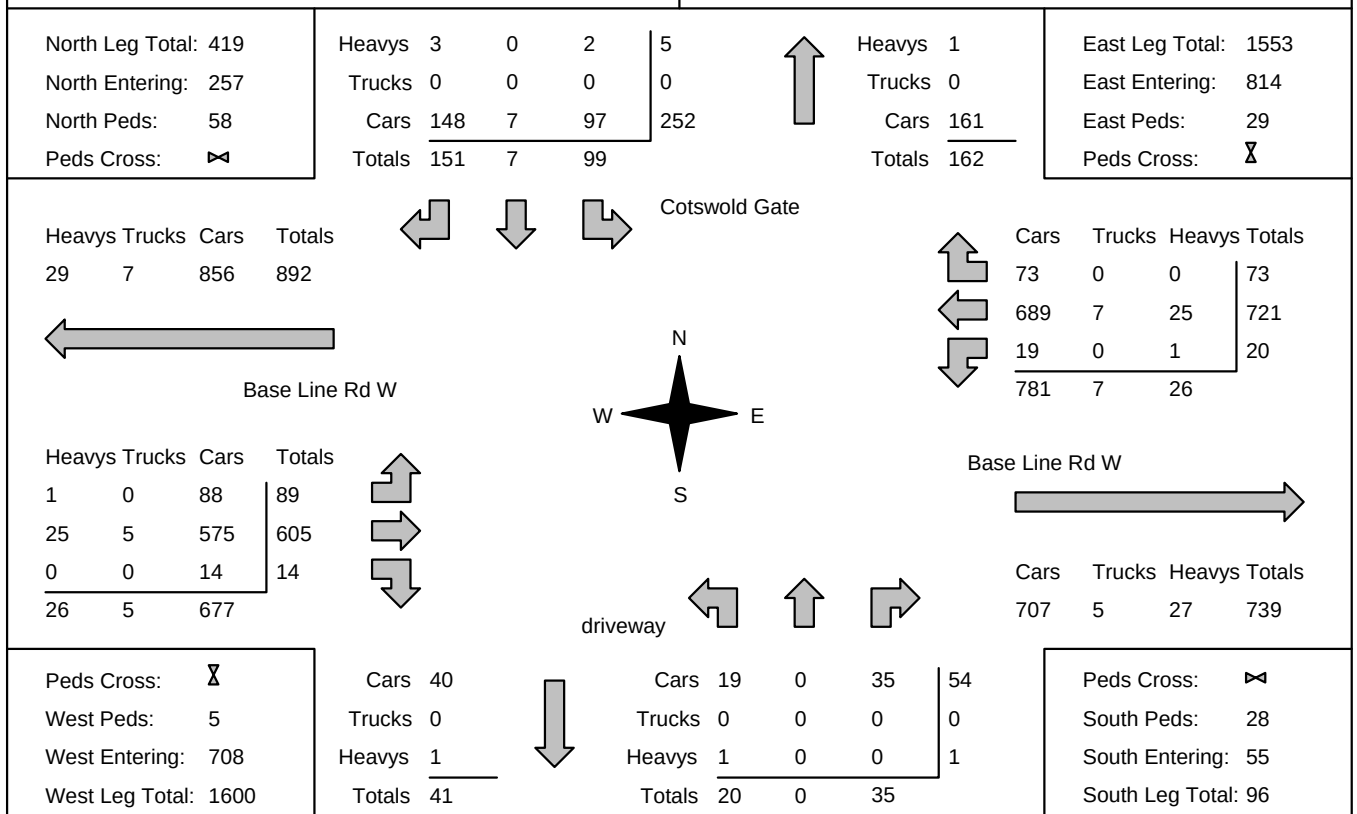
Municipality: London
Site #: 2601200005
Intersection: Base Line Rd W & Cotswold Gate
TFR File #: 1
Count date: 20-Jan-26

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Base Line Rd W runs W/E



Comments

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Base Line Rd W & Cotswold Gate Count Date: 20-Jan-26 Municipality: London

North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	27	1	24	52	11	68	8:00:00	3	0	13	16	9
9:00:00	22	0	43	65	22	81	9:00:00	5	0	11	16	9
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	22	4	46	72	11	82	17:00:00	7	0	3	10	3
18:00:00	28	2	38	68	14	81	18:00:00	5	0	8	13	7

[illegible]

[illegible]

[illegible]

[illegible]

Appendix B – Synchro Output Reports - Existing Traffic

HCM Unsignalized Intersection Capacity Analysis

2026 AM

1: Wharncliffe Rd S & Centre St/Driveway

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	0	33	0	0	0	17	1295	1	0	996	18
Future Volume (Veh/h)	9	0	33	0	0	0	17	1295	1	0	996	18
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	9	0	34	0	0	0	17	1321	1	0	1016	18
Pedestrians	9			7								
Lane Width (m)	3.7			3.7								
Walking Speed (m/s)	1.1			1.1								
Percent Blockage	1			1								
Right turn flare (veh)												
Median type							None			None		
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1728	2397	526	1904	2406	668	1043				1329	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1728	2397	526	1904	2406	668	1043				1329	
tC, single (s)	7.7	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	82	100	93	100	100	100	97				100	
cM capacity (veh/h)	50	33	497	38	32	403	669				523	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	43	0	678	662	508	526						
Volume Left	9	0	17	0	0	0						
Volume Right	34	0	0	1	0	18						
cSH	173	1700	669	1700	523	1700						
Volume to Capacity	0.25	0.00	0.03	0.39	0.00	0.31						
Queue Length 95th (m)	7.1	0.0	0.6	0.0	0.0	0.0						
Control Delay (s)	32.5	0.0	0.7	0.0	0.0	0.0						
Lane LOS	D	A	A									
Approach Delay (s)	32.5	0.0	0.3	0.0								
Approach LOS	D	A										
Intersection Summary												
Average Delay	0.8											
Intersection Capacity Utilization	57.8%			ICU Level of Service				B				
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

2026 AM

2: Driveway/Cotswold Gate & Base Line Rd W

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	172	3	3	123	11	5	0	11	22	0	43
Future Volume (Veh/h)	16	172	3	3	123	11	5	0	11	22	0	43
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	17	181	3	3	129	12	5	0	12	23	0	45
Pedestrians		2			25			9			22	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		0			2			1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	163			193			414	394	216	416	390	159
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	163			193			414	394	216	416	390	159
tC, single (s)	4.1			4.4			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.5			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	100	99	95	100	95
cM capacity (veh/h)	1399			1219			485	522	802	501	525	859
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	201	144	17	68								
Volume Left	17	3	5	23								
Volume Right	3	12	12	45								
cSH	1399	1219	673	692								
Volume to Capacity	0.01	0.00	0.03	0.10								
Queue Length 95th (m)	0.3	0.1	0.6	2.5								
Control Delay (s)	0.7	0.2	10.5	10.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.7	0.2	10.5	10.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.5									
Intersection Capacity Utilization			33.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

2026 PM

1: Wharncliffe Rd S & Centre St/Driveway

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	1	16	2	0	5	27	1153	5	0	1142	40
Future Volume (Veh/h)	3	1	16	2	0	5	27	1153	5	0	1142	40
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	3	1	16	2	0	5	28	1189	5	0	1177	41
Pedestrians	14			16								
Lane Width (m)	3.7			3.7								
Walking Speed (m/s)	1.1			1.1								
Percent Blockage	1			1								
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1867	2478	623	1868	2496	613	1232				1210	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1867	2478	623	1868	2496	613	1232				1210	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	93	96	96	95	100	99	95				100	
cM capacity (veh/h)	42	28	428	40	27	434	565				575	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	20	7	622	600	588	630						
Volume Left	3	2	28	0	0	0						
Volume Right	16	5	0	5	0	41						
cSH	138	113	565	1700	575	1700						
Volume to Capacity	0.14	0.06	0.05	0.35	0.00	0.37						
Queue Length 95th (m)	3.7	1.5	1.2	0.0	0.0	0.0						
Control Delay (s)	35.4	39.0	1.4	0.0	0.0	0.0						
Lane LOS	E	E	A									
Approach Delay (s)	35.4	39.0	0.7	0.0								
Approach LOS	E	E										
Intersection Summary												
Average Delay				0.7								
Intersection Capacity Utilization				61.4%	ICU Level of Service				B			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

2026 PM

2: Driveway/Cotswold Gate & Base Line Rd W

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	177	6	8	299	36	7	0	4	24	3	46
Future Volume (Veh/h)	31	177	6	8	299	36	7	0	4	24	3	46
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	32	182	6	8	308	37	7	0	4	25	3	47
Pedestrians					2			4			13	
Lane Width (m)					3.7			3.7			3.7	
Walking Speed (m/s)					1.1			1.1			1.1	
Percent Blockage					0			0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	358			192			644	627	191	610	612	340
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	358			192			644	627	191	610	612	340
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			99			98	100	100	94	99	93
cM capacity (veh/h)	1197			1388			346	384	851	387	392	699
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	220	353	11	75								
Volume Left	32	8	7	25								
Volume Right	6	37	4	47								
cSH	1197	1388	441	537								
Volume to Capacity	0.03	0.01	0.02	0.14								
Queue Length 95th (m)	0.6	0.1	0.6	3.7								
Control Delay (s)	1.4	0.2	13.4	12.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	1.4	0.2	13.4	12.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			37.2%		ICU Level of Service				A			
Analysis Period (min)			15									

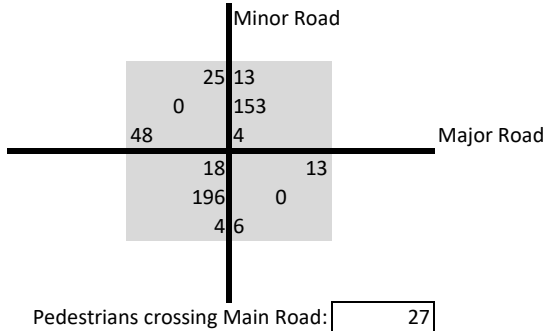
Appendix C – Traffic Signal Warrant Sheets

TRAFFIC SIGNAL WARRANT ANALYSIS - PROJECTED VOLUMES

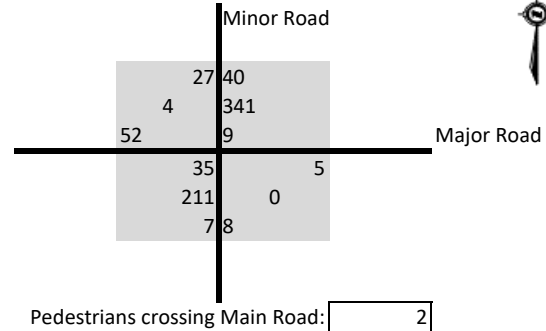
Analysis Year/Condition: 2033 Background Location: Base Line Road West & Cotswold Gate / Driveway

Scenario: Existing Intersection with Future Traffic
Main Road Direction: East / West Number of Lanes on Main Road: 1
Tee Intersection?: No Flow Condition: Restricted Flow (Urban)

AM Peak Hour Volumes



PM Peak Hour Volumes



Ontario Traffic Manual Book 12 - Justification 7 - Projected Volumes:

Justification 1: Minimum Vehicular Volume		Lane Condition	1 Lanes		2 or More Lanes		Percent Fulfilled	Minimum Requirement	Signals Warranted?
		Flow Condition	FREE FLOW	RESTR. FLOW	FREE FLOW	RESTR. FLOW			
	1A (All Approaches)	Volume Requirement	480	720	600	900	42%	120%	NO
		Average Hourly Volume		X					
	1B (Minor Street Approaches)	Volume Requirement	120	170	120	170	28%	120%	
Average Hourly Volume			X						

Justification 2: Delay to Cross Traffic		Lane Condition	1 Lanes		2 or More Lanes		Percent Fulfilled	Minimum Requirement	Signals Warranted?
		Flow Condition	FREE FLOW	RESTR. FLOW	FREE FLOW	RESTR. FLOW			
	2A (Main Road Approaches)	Volume Requirement	480	720	600	900	36%	120%	NO
				X					
		Average Hourly Volume		258					
	2B (Traffic Crossing Main Road)	Volume Requirement	50	75	50	75	33%	120%	
			X						
Average Hourly Volume			25						

Results

Traffic signals are not warranted.

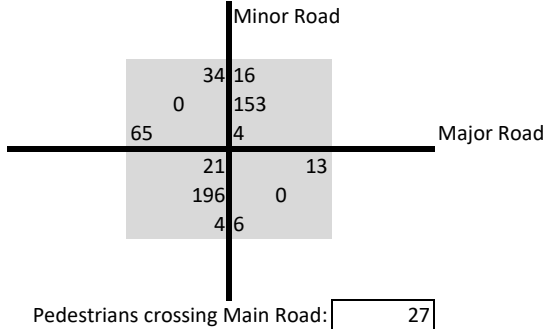
Project: S252168

TRAFFIC SIGNAL WARRANT ANALYSIS - PROJECTED VOLUMES

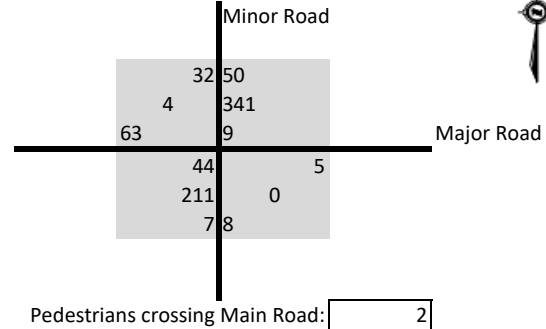
Analysis Year/Condition: 2033 Total Location: Base Line Road West & Cotswold Gate / Driveway

Scenario: Existing Intersection with Future Traffic
Main Road Direction: East / West Number of Lanes on Main Road: 1
Tee Intersection?: No Flow Condition: Restricted Flow (Urban)

AM Peak Hour Volumes



PM Peak Hour Volumes



Ontario Traffic Manual Book 12 - Justification 7 - Projected Volumes:

Justification 1: Minimum Vehicular Volume		Lane Condition	1 Lanes		2 or More Lanes		Percent Fulfilled	Minimum Requirement	Signals Warranted?
		Flow Condition	FREE FLOW	RESTR. FLOW	FREE FLOW	RESTR. FLOW			
	1A (All Approaches)	Volume Requirement	480	720	600	900	45%	120%	NO
		Average Hourly Volume		X					
	1B (Minor Street Approaches)	Volume Requirement	120	170	120	170	34%	120%	
		Average Hourly Volume		X					

Justification 2: Delay to Cross Traffic		Lane Condition	1 Lanes		2 or More Lanes		Percent Fullfilled	Minimum Requirement	Signals Warranted?
		Flow Condition	FREE FLOW	RESTR. FLOW	FREE FLOW	RESTR. FLOW			
	2A (Main Road Approaches)	Volume Requirement	480	720	600	900	37%	120%	NO
				X					
		Average Hourly Volume		264					
	2B (Traffic Crossing Main Road)	Volume Requirement	50	75	50	75	37%	120%	
			X						
Average Hourly Volume			28						

Results

Traffic signals are not warranted.

Project: S252168

Appendix D – Synchro Output Reports - 2033 Background Traffic

HCM Unsignalized Intersection Capacity Analysis

1: Wharncliffe Rd S & Centre St/Driveway

2033 Background AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	37	0	0	0	19	1438	2	0	1106	20
Future Volume (Veh/h)	10	0	37	0	0	0	19	1438	2	0	1106	20
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	10	0	38	0	0	0	19	1467	2	0	1129	20
Pedestrians	9			7								
Lane Width (m)	3.7			3.7								
Walking Speed (m/s)	1.1			1.1								
Percent Blockage	1			1								
Right turn flare (veh)												
Median type							None			None		
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1920	2662	584	2116	2671	742	1158				1476	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1920	2662	584	2116	2671	742	1158				1476	
tC, single (s)	7.7	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	72	100	92	100	100	100	97				100	
cM capacity (veh/h)	35	22	456	26	22	361	605				459	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	48	0	752	736	564	584						
Volume Left	10	0	19	0	0	0						
Volume Right	38	0	0	2	0	20						
cSH	131	1700	605	1700	459	1700						
Volume to Capacity	0.37	0.00	0.03	0.43	0.00	0.34						
Queue Length 95th (m)	11.5	0.0	0.7	0.0	0.0	0.0						
Control Delay (s)	47.4	0.0	0.9	0.0	0.0	0.0						
Lane LOS	E	A	A									
Approach Delay (s)	47.4	0.0	0.4	0.0								
Approach LOS	E	A										
Intersection Summary												
Average Delay	1.1											
Intersection Capacity Utilization	63.2%			ICU Level of Service					B			
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

2: Driveway/Cotswold Gate & Base Line Rd W

2033 Background AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	196	4	4	153	13	6	0	13	25	0	48
Future Volume (Veh/h)	18	196	4	4	153	13	6	0	13	25	0	48
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	19	206	4	4	161	14	6	0	14	26	0	51
Pedestrians		2			25			9			22	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		0			2			1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	197			219			484	460	242	483	455	192
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	197			219			484	460	242	483	455	192
tC, single (s)	4.1			4.4			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.5			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	100	98	94	100	94
cM capacity (veh/h)	1359			1191			430	478	776	451	481	823
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	229	179	20	77								
Volume Left	19	4	6	26								
Volume Right	4	14	14	51								
cSH	1359	1191	626	644								
Volume to Capacity	0.01	0.00	0.03	0.12								
Queue Length 95th (m)	0.3	0.1	0.8	3.1								
Control Delay (s)	0.8	0.2	10.9	11.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.8	0.2	10.9	11.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.6									
Intersection Capacity Utilization			35.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

2033 Background PM

1: Wharncliffe Rd S & Centre St/Driveway

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	2	18	3	0	6	30	1280	6	0	1268	45
Future Volume (Veh/h)	4	2	18	3	0	6	30	1280	6	0	1268	45
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	4	2	19	3	0	6	31	1320	6	0	1307	46
Pedestrians	14			16								
Lane Width (m)	3.7			3.7								
Walking Speed (m/s)	1.1			1.1								
Percent Blockage	1			1								
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	2072	2748	690	2074	2768	679	1367				1342	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2072	2748	690	2074	2768	679	1367				1342	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	86	89	95	88	100	98	94				100	
cM capacity (veh/h)	29	18	387	25	18	393	502				512	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	25	9	691	666	654	700						
Volume Left	4	3	31	0	0	0						
Volume Right	19	6	0	6	0	46						
cSH	84	68	502	1700	512	1700						
Volume to Capacity	0.30	0.13	0.06	0.39	0.00	0.41						
Queue Length 95th (m)	8.4	3.3	1.5	0.0	0.0	0.0						
Control Delay (s)	64.6	66.2	1.8	0.0	0.0	0.0						
Lane LOS	F	F	A									
Approach Delay (s)	64.6	66.2	0.9	0.0								
Approach LOS	F	F										
Intersection Summary												
Average Delay	1.3											
Intersection Capacity Utilization	67.1%			ICU Level of Service				C				
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis 2: Driveway/Cotswold Gate & Base Line Rd W

2033 Background PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	211	7	9	341	40	8	0	5	27	4	52
Future Volume (Veh/h)	35	211	7	9	341	40	8	0	5	27	4	52
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	36	218	7	9	352	41	8	0	5	28	4	54
Pedestrians					2			4			13	
Lane Width (m)					3.7			3.7			3.7	
Walking Speed (m/s)					1.1			1.1			1.1	
Percent Blockage					0			0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	406			229			744	722	228	704	704	386
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	406			229			744	722	228	704	704	386
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			99			97	100	99	92	99	92
cM capacity (veh/h)	1150			1346			290	337	812	333	344	659
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	261	402	13	86								
Volume Left	36	9	8	28								
Volume Right	7	41	5	54								
cSH	1150	1346	385	484								
Volume to Capacity	0.03	0.01	0.03	0.18								
Queue Length 95th (m)	0.7	0.2	0.8	4.9								
Control Delay (s)	1.4	0.2	14.7	14.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	1.4	0.2	14.7	14.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.4									
Intersection Capacity Utilization			41.8%		ICU Level of Service				A			
Analysis Period (min)			15									

Appendix E – Synchro Output Reports - 2033 Total Traffic

HCM Unsignalized Intersection Capacity Analysis

2033 Total AM

1: Wharncliffe Rd S & Centre St/Driveway

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	51	0	0	0	23	1438	2	0	1106	24
Future Volume (Veh/h)	15	0	51	0	0	0	23	1438	2	0	1106	24
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	15	0	52	0	0	0	23	1467	2	0	1129	24
Pedestrians	9			7								
Lane Width (m)	3.7			3.7								
Walking Speed (m/s)	1.1			1.1								
Percent Blockage	1			1								
Right turn flare (veh)												
Median type							None			None		
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1930	2672	586	2138	2683	742	1162				1476	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1930	2672	586	2138	2683	742	1162				1476	
tC, single (s)	7.7	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	57	100	89	100	100	100	96				100	
cM capacity (veh/h)	35	21	455	24	21	361	603				459	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	67	0	756	736	564	588						
Volume Left	15	0	23	0	0	0						
Volume Right	52	0	0	2	0	24						
cSH	122	1700	603	1700	459	1700						
Volume to Capacity	0.55	0.00	0.04	0.43	0.00	0.35						
Queue Length 95th (m)	20.0	0.0	0.9	0.0	0.0	0.0						
Control Delay (s)	65.2	0.0	1.1	0.0	0.0	0.0						
Lane LOS	F	A	A									
Approach Delay (s)	65.2	0.0	0.5	0.0								
Approach LOS	F	A										
Intersection Summary												
Average Delay	1.9											
Intersection Capacity Utilization	66.8%			ICU Level of Service				C				
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

2033 Total AM

2: Driveway/Cotswold Gate & Base Line Rd W

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	196	4	4	153	16	6	0	13	34	0	65
Future Volume (Veh/h)	21	196	4	4	153	16	6	0	13	34	0	65
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	22	206	4	4	161	17	6	0	14	36	0	68
Pedestrians		2			25			9			22	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		0			2			1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	200			219			508	469	242	490	462	194
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	200			219			508	469	242	490	462	194
tC, single (s)	4.1			4.4			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.5			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			99	100	98	92	100	92
cM capacity (veh/h)	1356			1191			404	471	776	445	475	822
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	232	182	20	104								
Volume Left	22	4	6	36								
Volume Right	4	17	14	68								
cSH	1356	1191	609	635								
Volume to Capacity	0.02	0.00	0.03	0.16								
Queue Length 95th (m)	0.4	0.1	0.8	4.4								
Control Delay (s)	0.9	0.2	11.1	11.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.9	0.2	11.1	11.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			3.1									
Intersection Capacity Utilization			37.0%		ICU Level of Service				A			
Analysis Period (min)			15									

3: Site Access & Centre St

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↘	↗
Traffic Volume (veh/h)	39	6	8	39	26	19
Future Volume (Veh/h)	39	6	8	39	26	19
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)	42	7	9	42	28	21
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			49		106	46
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			49		106	46
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	98
cM capacity (veh/h)			1571		892	1030
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	49	51	49			
Volume Left	0	9	28			
Volume Right	7	0	21			
cSH	1700	1571	946			
Volume to Capacity	0.03	0.01	0.05			
Queue Length 95th (m)	0.0	0.1	1.2			
Control Delay (s)	0.0	1.3	9.0			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.3	9.0			
Approach LOS			A			
Intersection Summary						
Average Delay			3.4			
Intersection Capacity Utilization			18.9%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

1: Wharncliffe Rd S & Centre St/Driveway

2033 Total PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	2	22	3	0	6	38	1280	6	0	1268	56
Future Volume (Veh/h)	5	2	22	3	0	6	38	1280	6	0	1268	56
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	5	2	23	3	0	6	39	1320	6	0	1307	58
Pedestrians	14			16								
Lane Width (m)	3.7			3.7								
Walking Speed (m/s)	1.1			1.1								
Percent Blockage	1			1								
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	2094	2770	696	2094	2796	679	1379				1342	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2094	2770	696	2094	2796	679	1379				1342	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	82	89	94	87	100	98	92				100	
cM capacity (veh/h)	27	18	383	24	17	393	497				512	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	30	9	699	666	654	712						
Volume Left	5	3	39	0	0	0						
Volume Right	23	6	0	6	0	58						
cSH	84	64	497	1700	512	1700						
Volume to Capacity	0.36	0.14	0.08	0.39	0.00	0.42						
Queue Length 95th (m)	10.5	3.5	1.9	0.0	0.0	0.0						
Control Delay (s)	69.8	70.4	2.3	0.0	0.0	0.0						
Lane LOS	F	F	A									
Approach Delay (s)	69.8	70.4	1.2	0.0								
Approach LOS	F	F										
Intersection Summary												
Average Delay	1.6											
Intersection Capacity Utilization	73.0%			ICU Level of Service				D				
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

2: Driveway/Cotswold Gate & Base Line Rd W

2033 Total PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	211	7	9	341	50	8	0	5	32	4	63
Future Volume (Veh/h)	44	211	7	9	341	50	8	0	5	32	4	63
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	45	218	7	9	352	52	8	0	5	33	4	65
Pedestrians					2			4			13	
Lane Width (m)					3.7			3.7			3.7	
Walking Speed (m/s)					1.1			1.1			1.1	
Percent Blockage					0			0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	417			229			778	750	228	728	728	391
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	417			229			778	750	228	728	728	391
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			99			97	100	99	90	99	90
cM capacity (veh/h)	1139			1346			268	321	812	319	331	654
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	270	413	13	102								
Volume Left	45	9	8	33								
Volume Right	7	52	5	65								
cSH	1139	1346	361	475								
Volume to Capacity	0.04	0.01	0.04	0.21								
Queue Length 95th (m)	0.9	0.2	0.9	6.1								
Control Delay (s)	1.7	0.2	15.4	14.6								
Lane LOS	A	A	C	B								
Approach Delay (s)	1.7	0.2	15.4	14.6								
Approach LOS			C	B								
Intersection Summary												
Average Delay			2.8									
Intersection Capacity Utilization			48.2%		ICU Level of Service				A			
Analysis Period (min)			15									

3: Site Access & Centre St

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↘↙	
Traffic Volume (veh/h)	39	19	19	75	16	5
Future Volume (Veh/h)	39	19	19	75	16	5
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)	42	21	21	82	17	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			63		176	52
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			63		176	52
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	100
cM capacity (veh/h)			1553		807	1021
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	63	103	22			
Volume Left	0	21	17			
Volume Right	21	0	5			
cSH	1700	1553	847			
Volume to Capacity	0.04	0.01	0.03			
Queue Length 95th (m)	0.0	0.3	0.6			
Control Delay (s)	0.0	1.6	9.4			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.6	9.4			
Approach LOS			A			
Intersection Summary						
Average Delay		2.0				
Intersection Capacity Utilization		21.7%	ICU Level of Service	A		
Analysis Period (min)		15				

