



Proposed Residential Development

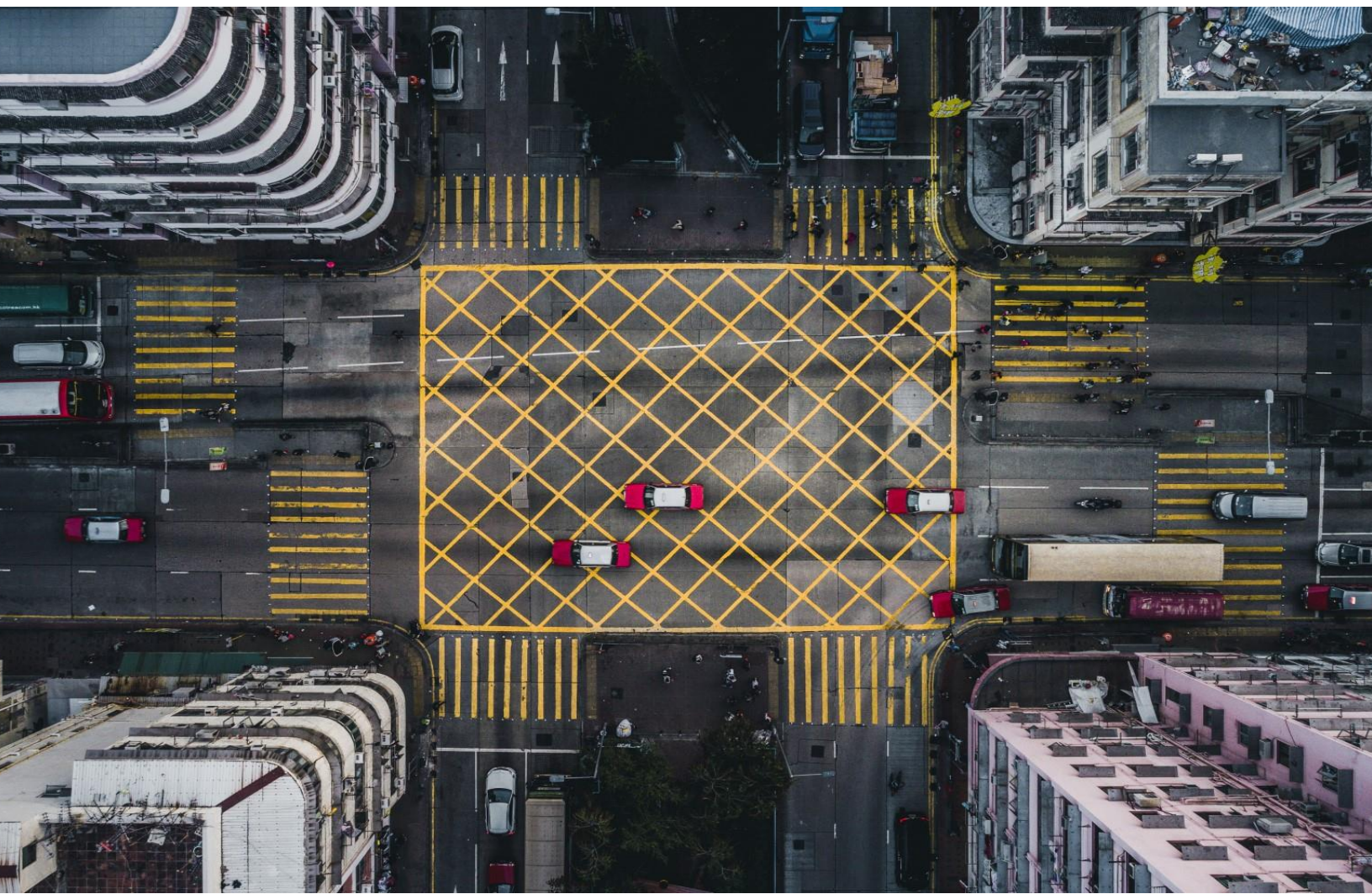
192-196 Central Avenue, City of London

Transportation Impact Study

Farhi Holdings Corporation

November 16, 2023

→ **The Power of Commitment**



140 Allstate Parkway, Unit 210
Markham, Ontario L3R 5Y8
Canada
www.ghd.com



Our ref: 12607476

November 16, 2023

Mr. Jim Bujouves
Farhi Holdings Corporation
201-620 Richmond St
London, ON
N6A 5J9

Subject: **Transportation Impact Study**
Proposed Residential Development
192-196 Central Avenue, City of London

Dear Mr. Bujouves,

GHD is pleased to provide the enclosed Transportation Impact Study for the proposed residential development located at 192-196 Central Avenue, generally in the northwest quadrant with Richmond Street in the City of London. The subject site is in the downtown and rapid transit corridor areas. There are two existing accesses on Central Avenue to an existing surface parking lot.

The purpose of this study is to determine the traffic-related impacts on the roadway system due to the proposed development traffic, and to determine the proposed parking supply is adequate to accommodate the future site parking demands. It is also to determine the appropriate Transportation Demand Management (TDM) measures and to demonstrate that the subject site has adequate pedestrian and cycling linkages to existing/proposed infrastructure.

Based on the site plan, the proposed development consists of a 13-storey building with a total of 126 residential apartment units and with 68 parking spaces provided. The development proposes one access on Central Avenue at the western end of the property.

The study assumes a 5-year horizon beyond the expected build-out, as per the City's TIS Guidelines. Due to the size and nature of the proposed development, 2026 is the expected year of full build-out. Therefore, the study horizon will be 2031, 5 years beyond full build-out.

This study concludes that under the future traffic forecasts, the traffic generated by the proposed development along with non-site related traffic growth can be accommodated by the abutting street system. Traffic generated by the proposed development does not add

significant adverse impacts on the study intersections. No additional road improvements are triggered by the proposed development.

The Vehicle Circulation Review confirms that the proposed site plan is sufficient to accommodate the circulation requirements of garbage trucks and medium single unit trucks.

Based on our review of the City of London Zoning By-law Z-1 parking requirements, the By-law requires minimum 0.5 parking spaces per unit for apartment buildings. The proposed 68 parking spaces will meet and exceed the By-law requirements with 5 surplus parking spaces.

It is possible that through transit ridership, walking, cycling, and carpooling to reduce auto-dependency and parking demand since all or a combination of these Transportation Demand Management (TDM) practices can be implemented.

We trust the enclosed is sufficient for your needs, but please do not hesitate to contact the undersigned should you require clarification or additional assistance.

Sincerely,
GHD



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Executive summary

- The purpose of this study is to determine the traffic-related impacts on the roadway system from the proposed development located at 192-196 Central Avenue (Ave), generally in the northwest quadrant with Richmond Street (St) in the City of London. It is to determine that the proposed parking supply is adequate to accommodate the future site parking demands, and also to determine that appropriate Transportation Demand Management (TDM) measures and to demonstrate that the subject site has adequate pedestrian and cycling linkages to existing/proposed infrastructure.
- Based on the current site plan, the proposed development consists of a 13-storey building with a total of 126 residential apartment units and with 68 parking spaces provided.
- The development proposes one access on Central Avenue at the western end of the property.
- As confirmed by the City, the study intersections for capacity analysis are:
 - Central Avenue/Richmond Street (existing traffic signal),
 - Central Avenue/Talbot Street (existing STOP controlled and Pedestrian Crossing (PXO) at north leg of intersection), and
 - One proposed Central Avenue access.
- Most recent weekday turning movement counts were obtained from the City at the Central Avenue/Richmond Street intersection and at the Central Avenue/Talbot Street intersection in 2022.
- The study assumes a 5-year horizon beyond the expected build-out. Due to the size and nature of the proposed development, 2026 is the expected year of full build-out. Therefore, the study horizon will be 2031, 5 years beyond full build-out.
- In consultation with the City and similar with 200 Albert Street traffic study, the study assumed that an annual growth rate of 1.5% was applied to all movements of the 2022 counts to estimate the background traffic growth for the 2031 study horizon.
- To be conservative assuming no trip reductions due to other modes of travel such as transit, the subject development will generate a total of 12 inbound and 35 outbound automobile trips during morning (AM) peak hour, and 35 inbound and 21 outbound automobile trips during afternoon (PM) peak hour.
- The site trips generated by the proposed residential developments were distributed to the roadway system using the existing traffic patterns observed from the recent traffic counts at the study intersections.
- This study concludes that under the future traffic forecasts, the traffic generated by the proposed development along with non-site related traffic growth can be accommodated by the existing street system. Traffic generated by the proposed development does not add significant adverse impacts on the study intersections. No additional road improvements are triggered by the proposed development.
- The site access/intersection on Central Avenue can be expected to have good operational characteristics under the future 2031 total traffic conditions.
- The Vehicle Circulation Review confirms that the proposed site plan is sufficient to accommodate the circulation requirements of garbage trucks and medium single unit trucks.

- Based on our review of the City of London current Zoning By-law Z.-1 parking requirements, the By-law requires minimum 0.5 parking spaces per unit for apartment buildings. The proposed 68 parking spaces will meet and exceed the By-law requirements with 5 surplus parking spaces.
- The subject site is located in the City's downtown and rapid transit corridor areas. Based on a review of the walk, transit and bike scores for Central Avenue, the site's future residents and visitors can easily access to the surrounding pedestrian network, transit system and cycling network via existing and future sidewalks, bike lanes and transit buses along the study area roadways. Low vehicle ownership can be expected for the proposed development given close proximity to amenities and other modes of travel.
- Therefore, the proposed parking supply of 68 spaces can accommodate the future parking demand.
- Residents and visitors of the development can easily access the surrounding pedestrian network, transit system and cycling network via the proposed sidewalks along internal roadways to the sidewalks on Central Avenue and on Richmond Street.
- It is possible that through transit ridership, walking, cycling, and carpooling to reduce auto-dependency and parking demand since all or a combination of these Transportation Demand Management practices can be implemented.

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1. Introduction

1.1 Retainer and objective

GHD Limited (GHD) was retained by Farhi Holdings Corporation to prepare a Transportation Impact Study (TIS) to determine the traffic related impacts on the roadway system from the proposed residential development, and to determine the proposed parking supply is adequate to accommodate the future site parking demands. It is also to determine appropriate Transportation Demand Management measures and to demonstrate that the subject site has adequate pedestrian and cycling linkages to existing/proposed infrastructure.

The proposed development is located at 192-196 Central Avenue, generally in the northwest quadrant with Richmond Street (St) in the City of London. There are two existing accesses on Central Avenue (Ave) to the site – an existing surface parking lot. The site location is shown in Figure 1.

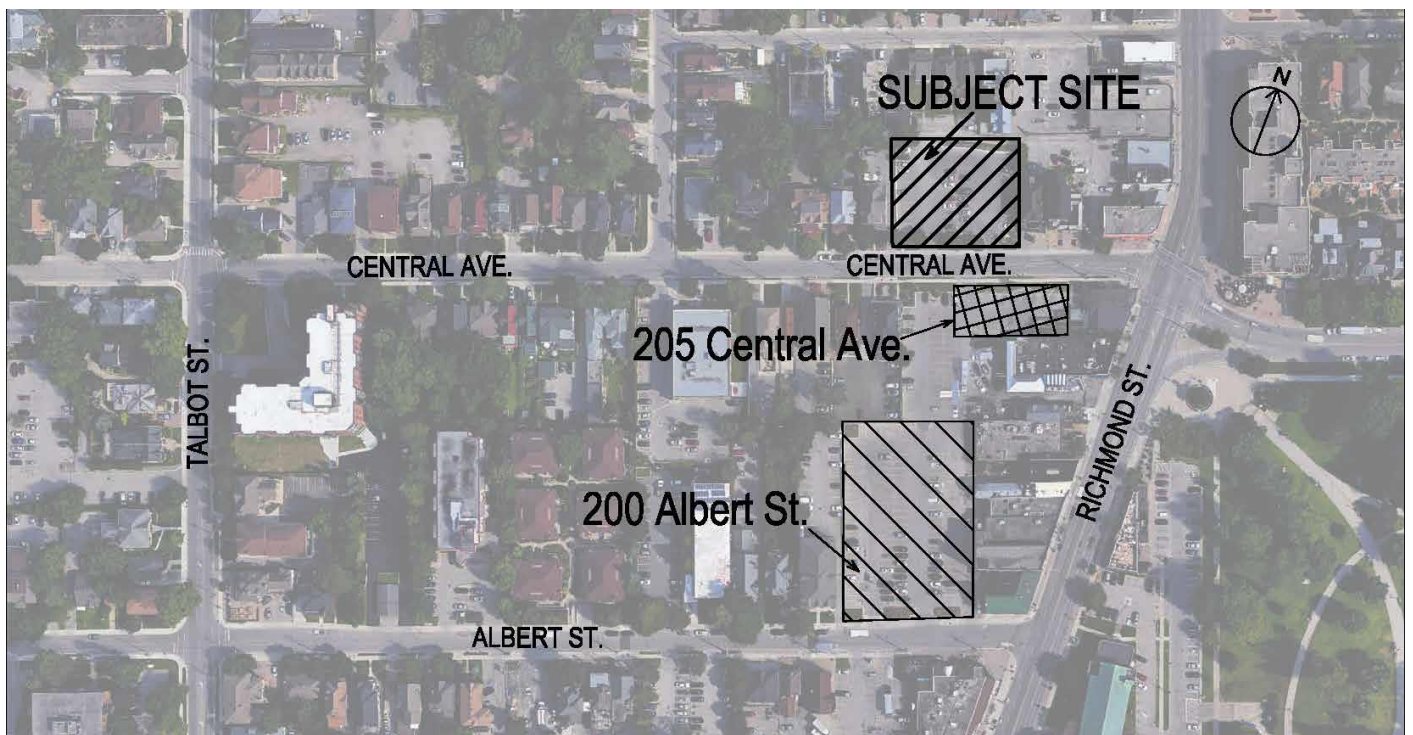


Figure 1 Site location

1.2 Study background

Based on the current site plan, the proposed development consists of a 13-storey building with a total of 126 residential apartment units and with 68 parking spaces provided. The development proposes one access on Central Avenue at the western end of the property.

Appendix A shows the proposed development and the access location as well as the detailed Site Plans.

Due to the size and nature of the proposed development, the expected year of full build-out is 2026. The study assumes a 5-year horizon beyond the expected build-out, as this is the standard approach in the City's TIS Guidelines. Therefore, the study horizon will be 2031, 5 years beyond full build-out.

This study establishes the existing traffic volumes and operating conditions for the weekday AM and PM peak hour periods; derives and assesses the future background traffic growth; estimates and assigns new site traffic volumes; and documents the expected site-related impacts on the road network.

Our findings, conclusions and recommendations are contained herein.

1.3 Study Team

The project team members involved in the preparation of this study are:

- Mr. Roland Roovers, Professional Engineer (P.Eng.), Senior Transportation Manager, Transportation Planning
- Mr. Hong Shen, Master of Engineering (M.Eng.), P.Eng., Senior Project Engineer, Transportation Planning

2. Site characteristics

2.1 Site environs

The property is currently a surface parking lot. It is bordered to the north and west by existing residential units, to the south by Central Avenue, and to the east by existing commercial buildings. The location of the subject site is shown in Figure 1.

The subject site is located in the City's downtown and rapid transit corridor areas. The site's future residents and visitors can easily access to the surrounding pedestrian network, transit system and cycling network via existing and future sidewalks, bike lanes and transit buses along the study area roadways.

London Transportation Master Plan recommends two bus rapid transit (BRT) routes operating north/south and east/west (provided in Appendix B). The north/south BRT will use Richmond/Wellington corridors and the east/west BRT will use Oxford/Dundas corridors. Both BRT routes will operate on the planned rapid transit (east side of Richmond Street) within the study area. The distance between subject site and the planned rapid transit is approximately 100 metres (m) via Central Avenue.

2.2 Study area

As confirmed by the City, the study intersections for capacity analysis are:

- Central Avenue/Richmond Street (existing traffic signal),
- Central Avenue/Talbot Street (existing STOP controlled and Pedestrian Crossing at north leg of intersection), and
- One proposed Central Avenue access.

2.3 Site plan

Based on the current site plan, the proposed development consists of a 13-storey building with a total of 126 residential apartment units and with 68 parking spaces provided.

The development proposes one access on Central Avenue at the western end of the property.

Appendix A shows the proposed development and the access location.

3. Existing traffic conditions

3.1 Existing road network

The following describes the existing road infrastructure in the study area. All study intersections are currently unsignalized. Figure 2 shows the existing lane configurations and traffic controls of the study intersections.

Richmond Street

Richmond Street is a north-south four-lane civic boulevard under the jurisdiction of the City of London. There are no posted speed limit signs within the study area, therefore the speed limit is assumed to be 50 kilometres per hour (km/h). There are sidewalks on both sides of the road within the study area. There are no bike lanes on the road.

The Richmond Street intersection at Albert Street is a currently unsignalized, with STOP control on Albert Street.

Central Avenue

Central Avenue is an east-west local road (neighbourhood connector) under the jurisdiction of the City of London. It has a two-lane urban cross-section with one lane per direction. There are no posted speed limit signs within the study area, therefore again the speed limit is assumed to be 50 km/h. There are sidewalks provided on both sides of the road.

The Central Avenue intersection at Talbot Street is currently STOP controlled (with STOP control on Central Avenue) and Pedestrian Crossing at north leg of intersection.

Talbot Street

Talbot Street is a north-south local road (neighbourhood connector) under the jurisdiction of the City of London. It has a two-lane urban cross-section with one lane per direction. There are no posted speed limit signs within the study area, therefore again the speed limit is assumed to be 50 km/h. There are sidewalks provided on both sides of the road. As indicated in London's 2022 Bike Map (provided in Appendix B), Talbot Street is signed a bikeway route with "Sharrows" for cycling.

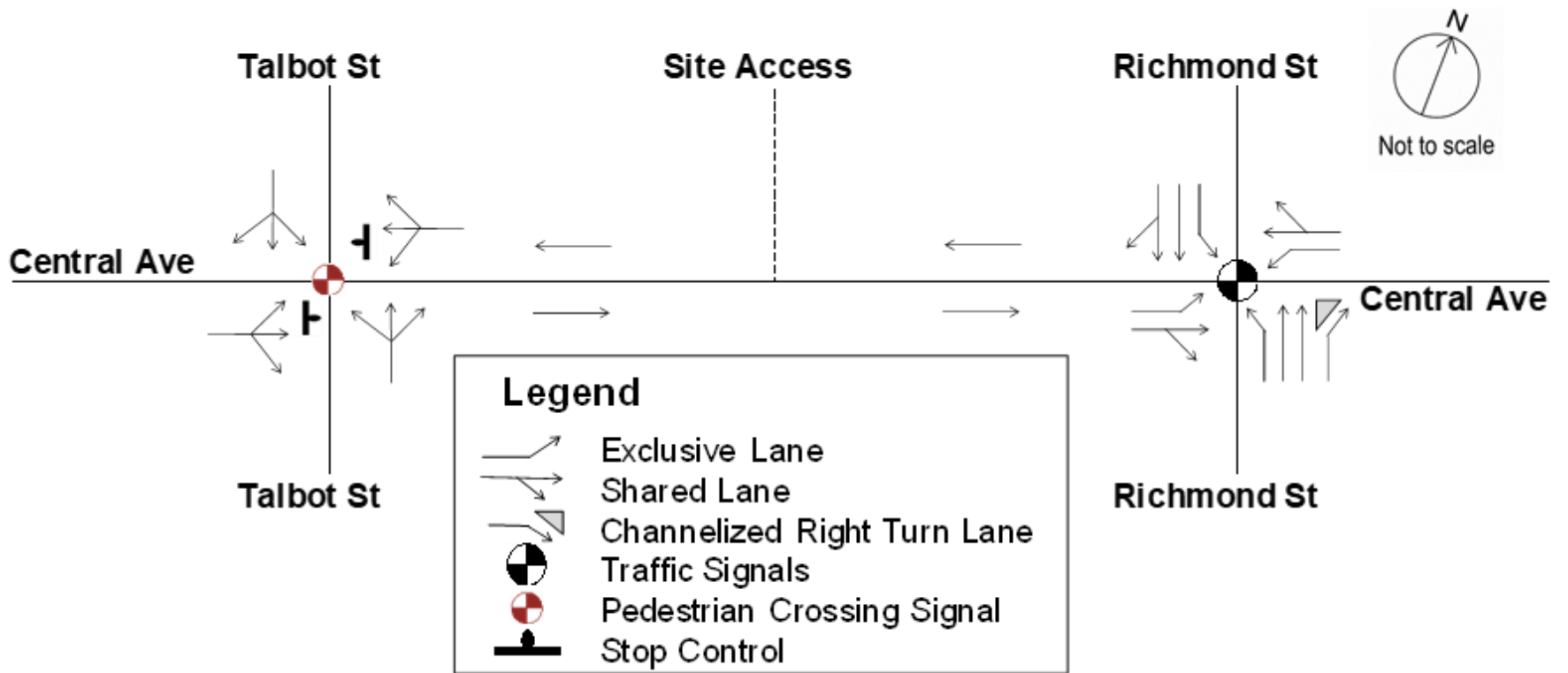


Figure 2 Existing lane configurations

3.2 Existing traffic data

Most recent weekday turning movement counts were obtained from the City at intersections of Central Avenue/Richmond Street and Central Avenue/Talbot Street in November and September 2022, as the City confirmed study intersections.

Figure 3 shows the existing 2022 traffic volumes for weekday AM and PM peak hours at the study area intersections. The traffic data are provided in Appendix B.

The existing signal timings for intersections of Central Avenue/Richmond Street and Central Avenue/Talbot Street were obtained from the City and is also provided in Appendix B.

3.3 Transit data

London Transit

London Transit (LT) provides bus service on Routes 4, 6, 13, 15 and 90 along Richmond Street.

Route 4

Fanshawe College-White Oaks Mall bus operates between Fanshawe College and White Oaks Mall (Loop). Bus 4 provides weekday services with 10 to 15 minute headways in the peak periods, and also provides Saturday and Sunday services with 25 to 30 minute headways in the peak periods.

Route 6

University Hospital-Parkwood Institute bus operates between University Hospital and Parkwood Institute. Bus 6 provides weekday services with 25 to 30 minute headways in the peak periods, and also provides Saturday and Sunday services with 25 to 30 minute headways in the peak periods.

Route 13

Masonville Place-White Oaks Mall bus operates between Masonville Place and White Oaks Mall. Bus 13 provides weekday services with 15-minute headways in the peak periods, and also provides Saturday and Sunday services with 15 to 20 minute headways in the peak periods.

Route 15

Huron Heights-Westmount Mall bus operates between Oakville at Huron and Westmount Mall area. Bus 15 provides weekday services with 16-minute headways in the peak periods, and also provides Saturday and Sunday services with 20 to 30 minute headways in the peak periods.

Route 90 Express

Masonville Place-White Oaks Mall bus operates between Masonville Place and White Oaks Mall. Bus 90 provides weekday services with 15-minute headways in the peak periods, and also provides Saturday and Sunday services with 30-minute headways in the peak periods.

There are bus stops on Richmond Street for Bus Routes 4, 6, 13 and 15 at the same locations. The distances between the subject site and Bus Stops are less than 150 m via Central Avenue and Richmond Street.

The detail transit route maps and service schedules are provided in Appendix B.

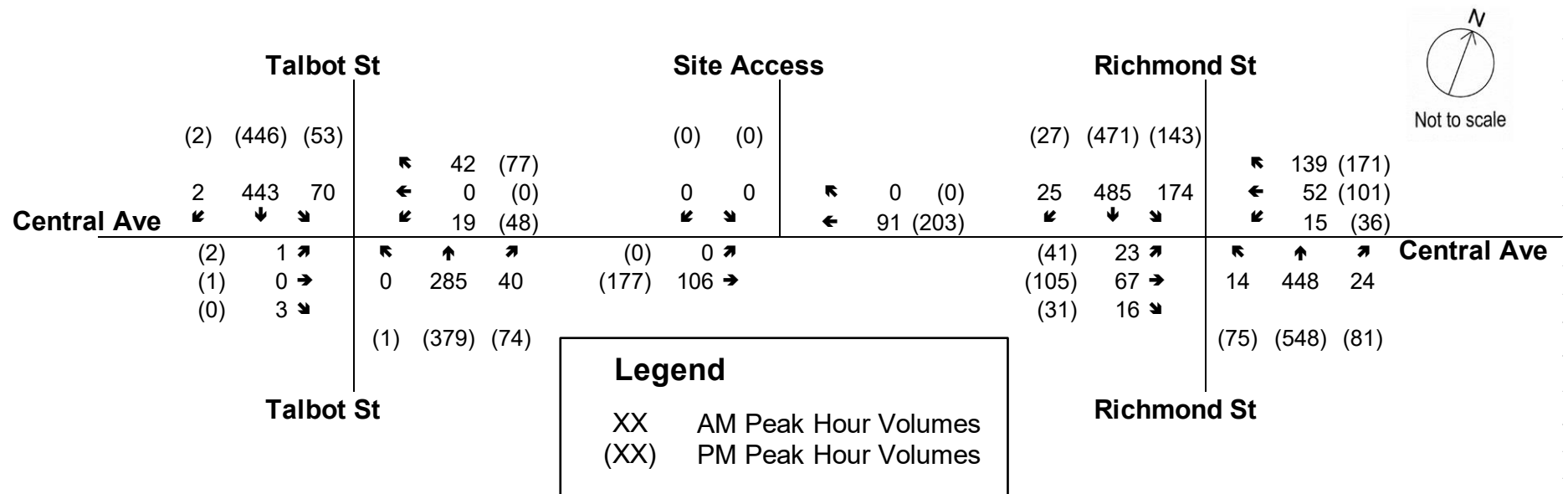


Figure 3 Existing traffic volumes

3.4 VIA Rail Canada

Via rail Canada operates the national passenger rail services on behalf of the Government of Canada, offering intercity rail services and ensuring rail transportation services to regional and remote communities.

Via Rail London (a Via Train Station) is located in the south-east corner of the Richmond Street/York Street intersection. The distance between the subject site and Via Rail London is approximately 1.25 kilometres (km) along Richmond Street.

3.5 Existing traffic conditions

The capacity analysis identifies how well the intersections and driveways are operating. The analyses are based on the methodology contained in the Highway Capacity Manual, which assigns an intersection Level of Service (LOS) based on the average control delay experienced by each vehicle passing through that intersection.

Synchro software was utilized to conduct the analysis using the existing signal timing plans. Peak hour factors for the study intersection were from the existing traffic data.

For analysis purposes, 'critical' intersection movements are defined as traffic movements where:

- Volume to capacity (v/c) ratio of through movement or shared through/turning movement exceeds 0.85; or
- Volume to capacity (v/c) ratio of an exclusive turning movement exceeds 1.0.

Table 1 summarizes the results of the existing intersection capacity analyses. Appendix C contains the detailed existing intersection capacity analysis reports.

The existing traffic conditions at the study intersections are as follows:

Richmond Street and Central Avenue

Under existing traffic conditions with existing lane configurations and existing signal timings, this signalized intersection is operating well at LOS 'B' and 'C' during the weekday AM and PM peak hours with overall delays of 14 and 20 seconds, respectively. The overall v/c ratios during the weekday AM and PM peak hours are 0.34 and 0.52. All individual movements are operating at levels of service (LOS 'D,' or better) and v/c ratios of 0.76, or less. No critical movements and queue issues are identified.

Talbot Street and Central Avenue (Pedestrian crossing signal at north leg)

Under existing traffic conditions with existing lane configurations and existing signal timings, this intersection is operating well at LOS 'A' and 'B' during the weekday AM and PM peak hours with overall delays of 9 and 10 seconds, respectively. The overall v/c ratios during the weekday AM and PM peak hours are 0.55 and 0.58. All individual movements are operating at levels of service (LOS 'C,' or better) and v/c ratios of 0.65, or less. No critical movements and queue issues are identified.

Table 1 Existing traffic conditions

Intersection	Control Type	Critical/ Key Movements	AM Peak Hour			PM Peak Hour		
			Overall v/c (LOS) Delay in Seconds	v/c (LOS) Delay in Seconds	95th %ile Queues (m)	Overall v/c (LOS) Delay in Seconds	v/c (LOS) Delay in Seconds	95th %ile Queues (m)
Richmond St & Central Ave	Signalized	Eastbound Left (EBL) Eastbound Through Right (EBTR) Westbound Left (WBL) Westbound Through Right (WBTR) Northbound Left (NBL) Northbound Through Right (NBTR) Southbound Left (SBL) Southbound Through Right (SBTR)	0.34 (B) 14	EBL = 0.37 (D) 44 EBTR = 0.40 (D) 42 WBL = 0.12 (D) 40 WBTR = 0.49 (D) 44 NBL = 0.04 (A) 7 NBTR = 0.32 (A) 9 SBL = 0.29 (A) 4 SBTR = 0.26 (A) 4	EBL = 15 m EBTR = 25 m WBL = 10 m WBTR = 35 m NBL = 5 m NBTR = 40 m SBL = 20 m SBTR = 25 m	0.52 (C) 20	EBL = 0.47 (D) 43 EBTR = 0.41 (D) 39 WBL = 0.19 (D) 37 WBTR = 0.76 (D) 53 NBL = 0.26 (B) 14 NBTR = 0.47 (B) 15 SBL = 0.31 (A) 6 SBTR = 0.29 (A) 7	EBL = 20 m EBTR = 40 m WBL = 15 m WBTR = 65 m NBL = 25 m NBTR = 75 m SBL = 25 m SBTR = 40 m
Talbot St & Central Ave	Signalized	Eastbound Through Left Right (EBTLR) Westbound Through Left Right (WBTLR) Northbound Through Left Right (NBTLR) Southbound Through Left Right (SBTLR)	0.55 (A) 9	EBTLR = 0 (C) 21 WBTLR = 0.15 (C) 22 NBTLR = 0.38 (A) 6 SBTLR = 0.65 (A) 10	EBTLR = 0 m WBTLR = 10 m NBTLR = 25 m SBTLR = 60 m	0.58 (B) 10	EBTLR = 0.02 (C) 21 WBTLR = 0.35 (C) 23 NBTLR = 0.53 (A) 8 SBTLR = 0.64 (A) 10	EBTLR = 5 m WBTLR = 20 m NBTLR = 40 m SBTLR = 55 m

4. Background traffic conditions

4.1 Study horizon

Due to the size and nature of the proposed development, the proposed development is expected to be completed in 2026. The study horizon will be 2031, five years beyond build-out as per the City's Transportation Impact Statement (TIA) Guidelines.

4.2 Future traffic growth

As indicated in the City's Transportation Planning comments, the study assumed that an annual growth rate of 1.5% was applied to all movements of the 2022 counts to estimate the background traffic growth for the 2031 study horizon.

The net growth traffic volumes (2022 to 2031) are shown in Figure 4.

4.3 Other background developments

The other background developments include the following nearby planned developments:

- 200 Albert Street: 12 story apartment building with 257 units; and
- 205 Central Avenue: 8 story apartment building with 57 units.

We have reviewed the following reports to aid in the preparation of this report:

- Transportation Impact Study for the Residential Development of 200 Albert Street, conducted by GHD, dated September 2022.

Other background development traffic

The traffic volumes generated by the 200 Albert Street residential development are based on traffic study prepared by GHD and the excerpt is provided in Appendix D.

The traffic volumes generated by the 205 Central Avenue residential development (no available traffic study at this time) are estimated based on ITE trip rates and summarized in Table 2 and ITE trip generation details are provided in Appendix D. The trips generated by the 205 Central Avenue development were distributed to the roadway system using the existing travel patterns observed from the recent traffic counts at the study intersections.

Table 2 summarizes the trip distribution adopted in the study for the weekday AM and weekday PM peak hours.

Table 2 Trip distribution

Trip Orientation		AM Peak Hour		PM Peak Hour	
		In	Out	In	Out
North	Richmond Street	12%	14%	8%	14%
	Talbot Street	35%	25%	16%	25%
South	Richmond Street	7%	10%	23%	10%
	Talbot Street	20%	11%	22%	16%
East	Central Avenue	26%	40%	31%	35%
Total		100%	100%	100%	100%

The traffic volumes for other nearby developments noted above are provided in Appendix D. The sum of all background development traffic volumes is shown in Figure 5.

4.4 Background traffic volumes

The estimated Future Background Traffic Volumes, shown in Figure 6, were derived by combining the existing 2022 traffic with net growth traffic volumes (Figure 4) and all background development traffic volumes (Figure 5).

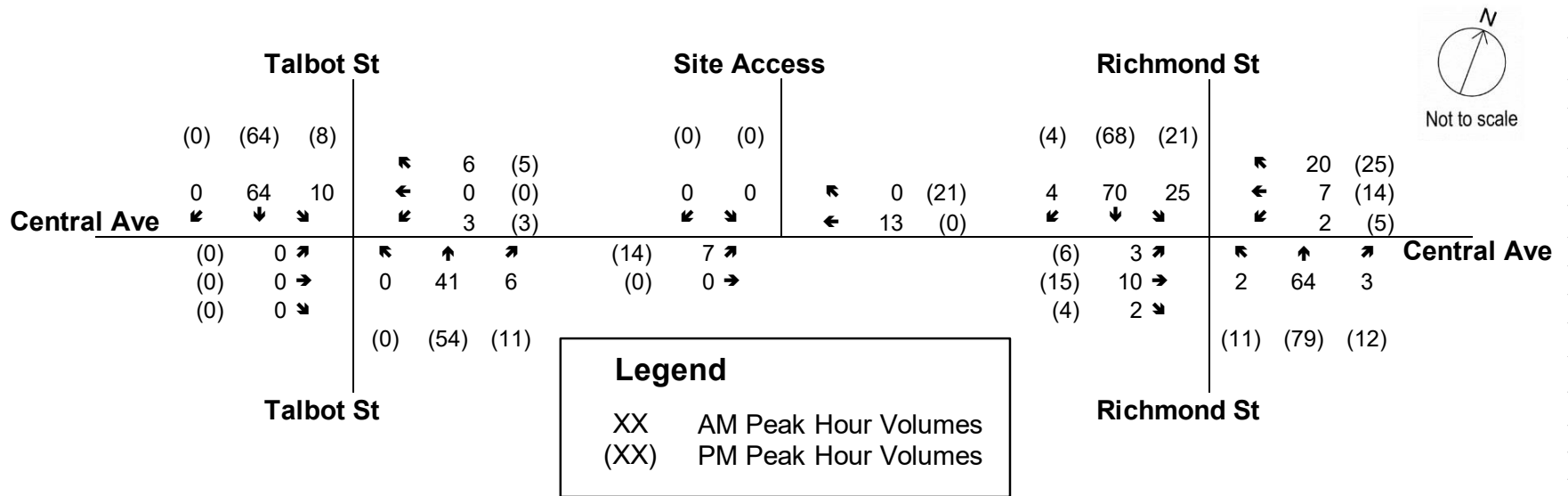


Figure 4 Net growth traffic volumes (2022 to 2031)

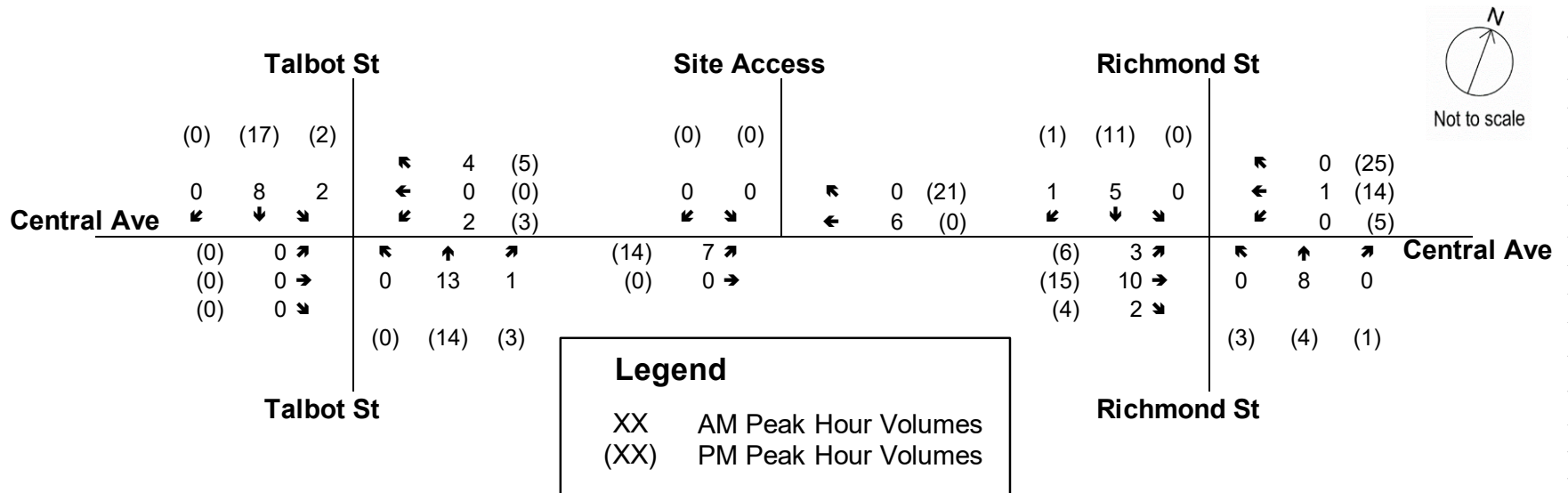


Figure 5 Sum of background development traffic volumes

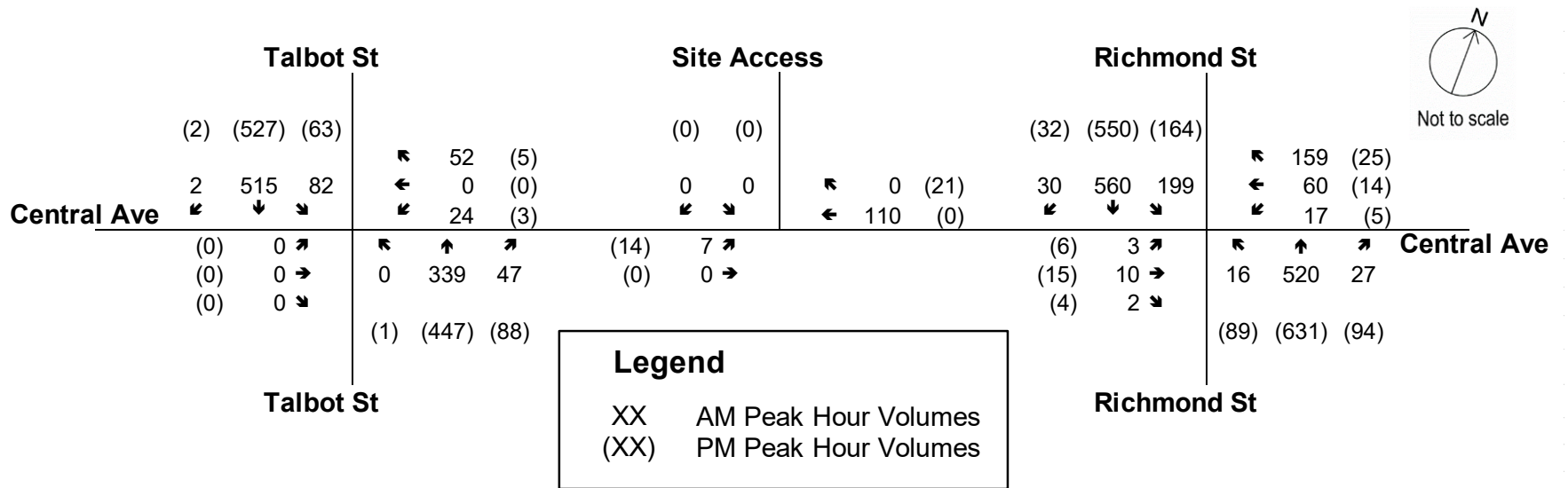


Figure 6 2031 background traffic volumes

4.5 Background traffic conditions

The future background 2031 traffic volumes (Figure 6) were subjected to intersection capacity analyses based on the same methodologies and existing lane configurations utilized for the existing conditions. Synchro software was utilized to conduct the analysis.

Peak hour factors for the study intersections were from the existing traffic data and used in the Synchro analysis.

Table 3 summarizes the results of the intersection capacity analysis. Appendix E contains the detailed background 2031 intersection capacity analysis reports.

The 2031 background traffic conditions are as follows:

Richmond Street and Central Avenue

Under background traffic conditions with existing lane configurations and existing signal timings, this signalized intersection is expected to operate at LOS 'B' and 'C' during the weekday AM and PM peak hours with overall delays of 15 and 23 seconds, respectively. The overall v/c ratios during the weekday AM and PM peak hours are 0.42 and 0.62. All individual movements are operating at levels of service (LOS 'D,' or better) and v/c ratios of 0.81, or less. No critical movements and queue issues are identified.

Talbot Street and Central Avenue (Pedestrian crossing signal at north leg)

Under background traffic conditions with existing lane configurations and existing signal timings, this intersection is expected to operate at LOS 'B' during both the weekday AM and PM peak hours with overall delays of 12 and 13 seconds, respectively. The overall v/c ratios during the weekday AM and PM peak hours are 0.65 and 0.70. All individual movements are operating at levels of service (LOS 'C,' or better) and v/c ratios of 0.77, or less. No critical movements and queue issues are identified.

Based on the above analysis, the study intersections with existing lane configurations and existing signal timings can accommodate the estimated future background traffic conditions.

Table 3 2031 background traffic conditions

Intersection	Control Type	Critical/Key Movements	AM Peak Hour			PM Peak Hour		
			Overall v/c (LOS) Delay in Seconds	v/c (LOS) Delay in Seconds	95th %ile Queues (m)	Overall v/c (LOS) Delay in Seconds	v/c (LOS) Delay in Seconds	95th %ile Queues (m)
Richmond St & Central Ave	Signalized	Eastbound Left (EBL) Eastbound Through Right (EBTR) Westbound Left (WBL) Westbound Through Right (WBTR) Northbound Left (NBL) Northbound Through Right (NBTR) Southbound Left (SBL) Southbound Through Right (SBTR)	0.42 (B) 15	EBL = 0.44 (D) 44 EBTR = 0.45 (D) 41 WBL = 0.12 (D) 38 WBTR = 0.59 (D) 46 NBL = 0.05 (A) 8 NBTR = 0.38 (B) 10 SBL = 0.36 (A) 4 SBTR = 0.31 (A) 5	EBL = 15 m EBTR = 30 m WBL = 10 m WBTR = 40 m NBL = 5 m NBTR = 55 m SBL = 25 m SBTR = 35 m	0.62 (C) 23	EBL = 0.52 (D) 42 EBTR = 0.42 (D) 37 WBL = 0.20 (C) 35 WBTR = 0.81 (D) 54 NBL = 0.36 (B) 19 NBTR = 0.58 (B) 19 SBL = 0.40 (A) 9 SBTR = 0.35 (A) 9	EBL = 20 m EBTR = 45 m WBL = 15 m WBTR = 80 m NBL = 35 m NBTR = 95 m SBL = 25 m SBTR = 50 m
Talbot St & Central Ave	Signalized	Eastbound Through Left Right (EBTLR) Westbound Through Left Right (WBTLR) Northbound Through Left Right (NBTLR) Southbound Through Left Right (SBTLR)	0.65 (B) 12	EBTLR = 0 (C) 21 WBTLR = 0.18 (C) 22 NBTLR = 0.45 (A) 6 SBTLR = 0.77 (B) 14	EBTLR = 0 m WBTLR = 15 m NBTLR = 30 m SBTLR = 105 m	0.70 (B) 13	EBTLR = 0.02 (C) 21 WBTLR = 0.41 (C) 24 NBTLR = 0.63 (A) 9 SBTLR = 0.77 (B) 14	EBTLR = 5 m WBTLR = 25 m NBTLR = 55 m SBTLR = 110 m

5. Proposed site development

5.1 Site traffic generation

Based on the current site plan, the proposed development consists of 126 apartment units.

Subject site vehicular trips were estimated based on the trip rates of Multifamily Housing – High-Rise (Land Use Code [LUC] #222) provided by Trip Generation, 11th Edition, published by the Institute of Transportation Engineers.

ITE Trip Generation provides two different methods to generate the trips: either using average rates or using the fitted curve equations. The estimated site trips are summarized in Table 4.

Table 4 Site trip generation

Site Development	Units	Parameter	Peak Hour Trip Generation					
			Weekday AM Peak			Weekday PM Peak		
			In	Out	Total	In	Out	Total
Residential (LUC 222)	126	New Trips (Average Rate)	9	25	34	25	15	40
		New Trips (Fitted Curve Equation)	12	35	47	35	21	56

To be conservative, this study uses the fitted curve equation (resulting in more trips during peak hours) to estimate the trips generated by the proposed development (provided in Appendix F).

Therefore, it is estimated that the proposed development will generate a total of 12 inbound and 35 outbound vehicle trips during AM peak hour, and 35 inbound and 21 outbound vehicle trips during PM peak hour.

Although there could be allowances for transit and active transportation modes, vehicle trip reductions were not considered for this analysis, to be conservative. Also, GHD did not remove traffic generated by the existing land uses that will be replaced by this development.

5.2 Directional distribution and assignment

The site trips generated by the proposed developments were distributed to the roadway system using the existing travel patterns observed from the recent traffic counts at the study intersections. The weekday AM and PM peak hour directional trip distributions are estimated and summarized in Table 3.

Figure 7 shows the site-generated traffic during the weekday AM and PM peak hours.

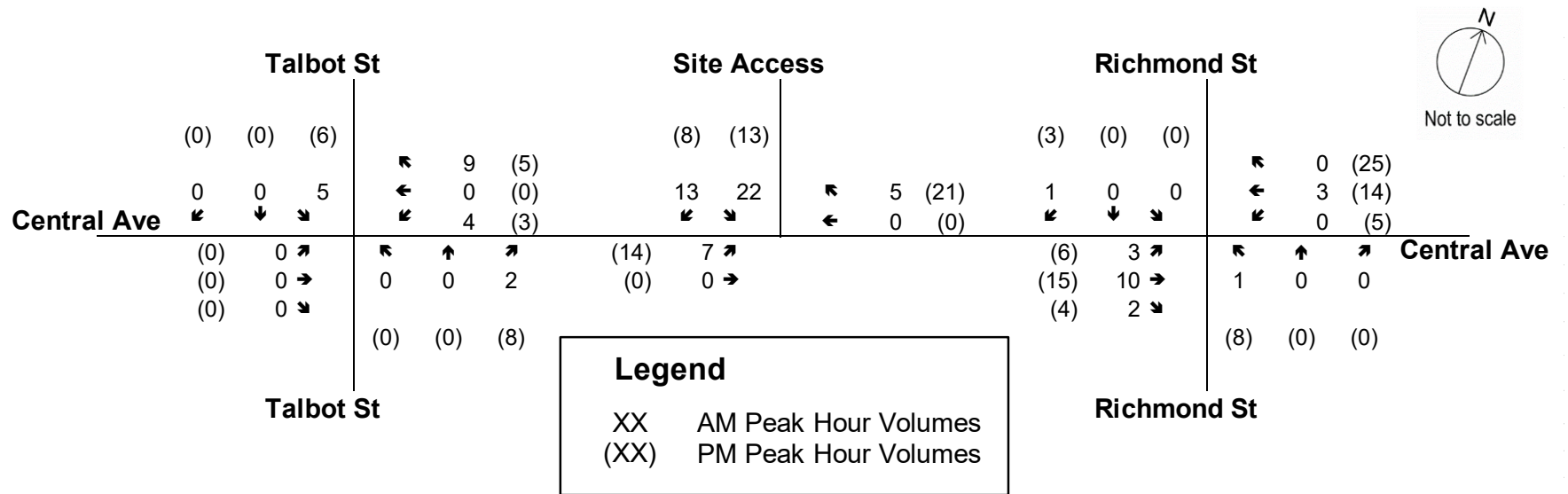


Figure 7 Site residential trips

6. Total traffic conditions

6.1 Total traffic volumes

In order to estimate the traffic impacts due to the introduction of site related trips, the background traffic flows (Figure 6) were combined with the estimated site trips (Figure 7) to get the estimate of the total (2031) traffic during the weekday AM and PM peak hours as illustrated in Figure 8.

6.2 Total traffic conditions

The future total (2031) traffic volumes (Figure 8) were subjected to intersection capacity analyses based on the same methodologies utilized for the background conditions. Figure 9 show the future lane configurations of the study area intersections including the proposed site access.

Synchro software were utilized to conduct the analysis using the existing signal timing plans. Peak hour factors for the study intersections were from the existing traffic data and used in the Synchro analysis.

Table 5 summarizes the results of the intersection capacity analysis. Appendix G contains the detailed total 2031 intersection capacity analysis reports.

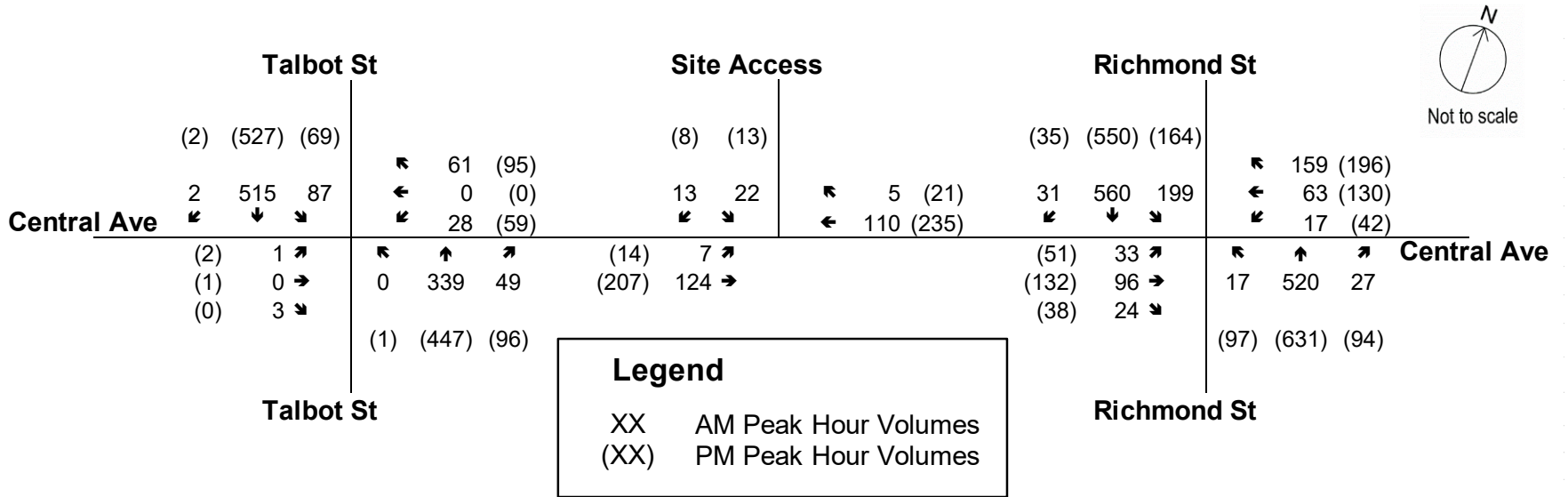


Figure 8 2031 total traffic volumes

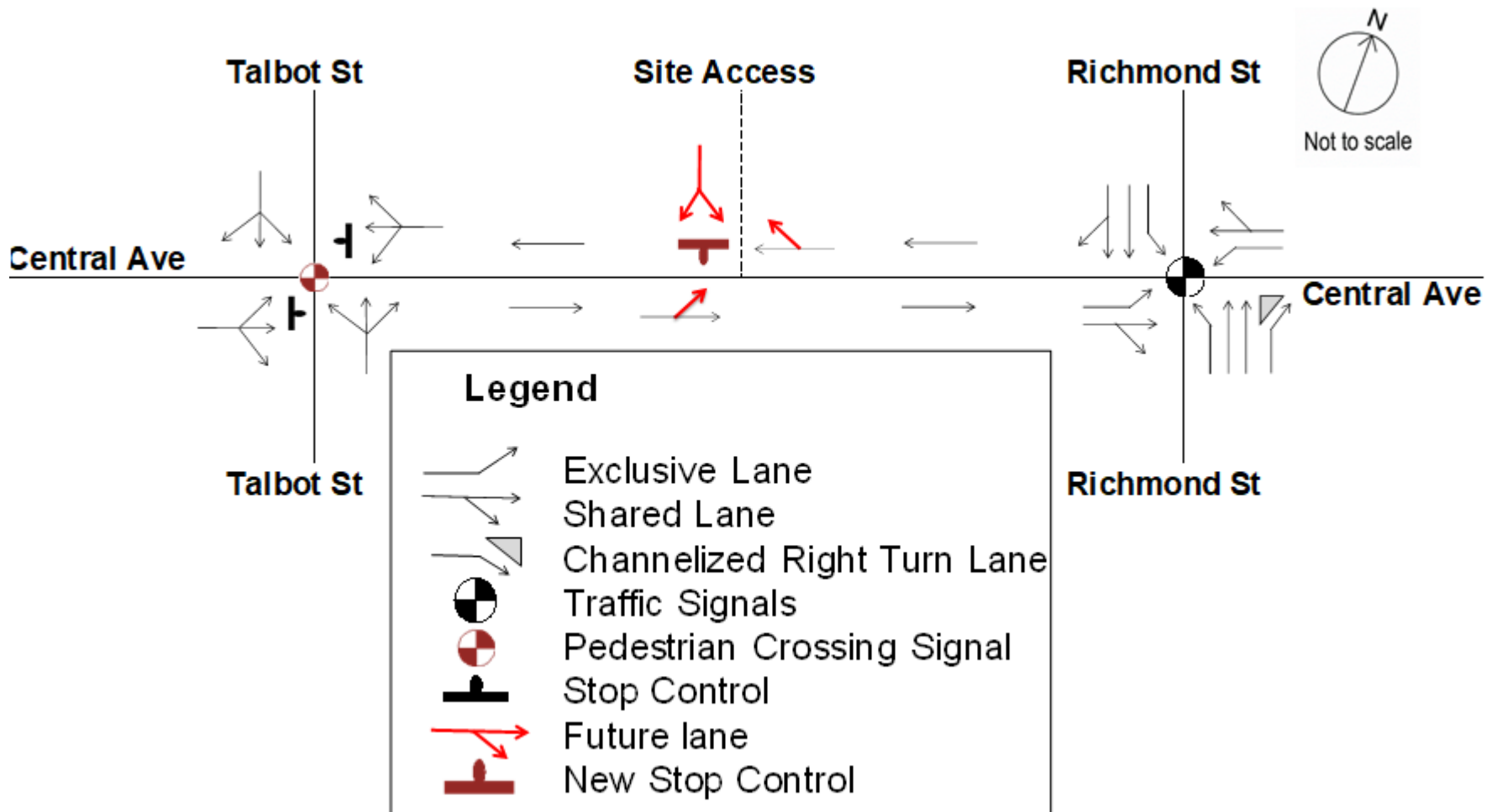


Figure 9 Future lane configurations

Table 5 Total traffic conditions

Intersection	Control Type	Critical/Key Movements	AM Peak Hour			PM Peak Hour		
			Overall v/c (LOS) Delay in Seconds	v/c(LOS) Delay in Seconds	95th %ile Queues (m)	Overall v/c (LOS) Delay in Seconds	v/c (LOS) Delay in Seconds	95th %ile Queues (m)
Richmond St & Central Ave	Signalized	Eastbound Left (EBL) Eastbound Through Right (EBTR) Westbound Left (WBL) Westbound Through Right (WBTR) Northbound Left (NBL) Northbound Through Right (NBTR) Southbound Left (SBL) Southbound Through Right (SBTR)	0.43 (B) 16	EBL = 0.49 (D) 45 EBTR = 0.50 (D) 42 WBL = 0.12 (D) 38 WBTR = 0.61 (D) 46 NBL = 0.06 (A) 8 NBTR = 0.39 (B) 11 SBL = 0.36 (A) 4 SBTR = 0.31 (A) 5	EBL = 15 m EBTR = 35 m WBL = 10 m WBTR = 40 m NBL = 5 m NBTR = 55 m SBL = 25 m SBTR = 35 m	0.64 (C) 24	EBL = 0.55 (D) 44 EBTR = 0.44 (D) 36 WBL = 0.20 (C) 34 WBTR = 0.83 (D) 55 NBL = 0.40 (C) 20 NBTR = 0.59 (B) 20 SBL = 0.41 (A) 9 SBTR = 0.36 (A) 9	EBL = 25 m EBTR = 45 m WBL = 15 m WBTR = 85 m NBL = 35 m NBTR = 95 m SBL = 25 m SBTR = 50 m
Talbot St & Central Ave	Signalized	Eastbound Through Left Right (EBTLR) Westbound Through Left Right (WBTLR) Northbound Through Left Right (NBTLR) Southbound Through Left Right (SBTLR)	0.67 (B) 12	EBTLR = 0 (C) 21 WBTLR = 0.21 (C) 22 NBTLR = 0.45 (A) 6 SBTLR = 0.78 (B) 14	EBTLR = 0 m WBTLR = 15 m NBTLR = 30 m SBTLR = 110 m	0.72 (B) 14	EBTLR = 0.02 (C) 21 WBTLR = 0.43 (C) 24 NBTLR = 0.64 (A) 9 SBTLR = 0.79 (B) 15	EBTLR = 5 m WBTLR = 30 m NBTLR = 55 m SBTLR = 110 m
Central Ave & Site Access	Unsignalized	Eastbound Through Left (EBTL) Westbound Through Right (WBTR) Southbound Left Right (SBLR)	SBLR 0.05 (A) 10	EBTL = 0.01 (A) 0 WBTR = 0.07 (A) 0 SBLR = 0.05 (A) 10	EBTL = 5 m WBTR = 0 m SBLR = 5 m	SBLR 0.04 (B) 11	EBTL = 0.01 (A) 1 WBTR = 0.16 (A) 0 SBLR = 0.04 (B) 11	EBTL = 5 m WBTR = 0 m SBLR = 5 m

The 2031 total traffic conditions are as follows:

Richmond Street and Central Avenue

Under total traffic conditions with existing lane configurations and existing signal timings, this signalized intersection is expected to continue to operate at LOS 'B' and 'C' during the weekday AM and PM peak hours with overall delays of 15 and 23 seconds (**an increase of 1 second, respectively when compared to the 2031 background condition AM and PM peak hours**). The overall v/c ratios during the weekday AM and PM peak hours are 0.43 and 0.64. **Compared to the background conditions, the overall v/c ratios increase by 0.01 and 0.02 during the AM and PM peak hours, respectively.** All individual movements are operating at levels of service (LOS 'D,' or better) and v/c ratios of 0.83, or less. No critical movements and queue issues are identified.

Talbot Street and Central Avenue (Pedestrian crossing signal at north leg)

Under total traffic conditions with existing lane configurations and existing signal timings, this intersection is expected to continue to operate at LOS 'B' during both the weekday AM and PM peak hours with overall delays of 12 and 14 seconds (**no change and an increase of 1 second, respectively when compared to the 2030 background condition AM and PM peak hours**). The overall v/c ratios during the weekday AM and PM peak hours are 0.67 and 0.72. **Compared to the background conditions, the overall v/c ratios increase by 0.02 during both the AM and PM peak hours, respectively.** All individual movements are operating at levels of service (LOS 'C,' or better) and v/c ratios of 0.79, or less. No critical movements and queue issues are identified.

Central Avenue and Site Access

Under total traffic conditions, all movements are expected to operate at levels of service (LOS 'B' or better) and v/c ratios of 0.16 or less. No critical movements and queuing issues are identified.

From a review of Table 5, the future background traffic plus the site traffic can be accommodated by the abutting street system. Traffic generated by the proposed development does not add significant adverse impacts on the nearby road network and no road improvements are triggered as a result of this development.

7. Site vehicle circulation review

The site plan was reviewed with respect to design vehicle circulation using AutoTURN software.

Based on the analysis, the Vehicle Circulation Review confirms that the proposed site plan is sufficient to accommodate the circulation requirements of garbage trucks and medium single unit (MSU) trucks as illustrated in Appendix H.

8. Parking supply review

The proposed development consists of 126 residential apartment units and with 68 parking spaces provided. The proposed parking supply rate is 0.54 spaces per unit ($68/126=0.54$).

8.1 Review of City's Bylaw parking requirements

Based on our review of the City of London current Zoning By-law Z.-1 parking requirements (excerpt 4.19.10 attached in Appendix I), City Bylaw requires minimum 0.5 parking spaces per unit for apartment buildings. Table 6 summarizes the City's requirements for the site parking spaces.

Table 6 City's parking requirements

Land Use	Units	City's By-Law Requirement	
		Parking Rate	Minimum Parking Spaces
Apartment	126	0.5 space/unit	63

Therefore, the proposed parking supply of 68 spaces meets and exceeds the City's By-law minimum requirements of 63 spaces with 5 surplus parking spaces.

9. Pedestrian, cycling and transit facilities

Pedestrian

As indicated in Section 3.1, there are sidewalks on both sides of all study area roadways.

The site plan proposes internal sidewalks connecting to Central Avenue and City's pedestrian network system.

Cycling

Talbot Street is signed a bikeway route with "Sharrows" for cycling as indicated in London's 2022 Bike Map. The site plan proposes a total of 114 bicycle parking spaces including 101 long-term spaces and 13 short-term spaces for the development.

Transit

As indicated in Section 3.3, London Transit (LT) provides bus service on Routes 4, 6, 13, 15 and 90 along Richmond Street. The distances between the subject site and bus stops are less than 150 m via Central Avenue and Richmond Street.

London Transportation Master Plan recommends two bus rapid transit (BRT) routes operating north/south and east/west. The north/south BRT will use Richmond/Wellington corridors and the east/west BRT will use Oxford/Dundas corridors. Both BRT routes will operate on the planned rapid transit (east side of Richmond Street) within the study area. The distance between subject site and the planned rapid transit is approximately 100 metres via Central Avenue.

VIA Rail Canada

Via Rail London (a Via Train Station) is located in the south-east corner of the Richmond Street/York Street intersection. The distance between the subject site and Via Rail London is approximately 1.25 km along Richmond Street.

10. Transportation demand management

Transportation Demand Management (TDM) is the term used to describe initiatives, policies and recommendations to reduce the public's dependence on the car and use alternate modes of transportation (transit, carpooling, and active transportation such as walking and cycling) which will contribute to the reduction of overall site congestion and parking requirements.

10.1 Background

The subject site is located in the City's downtown and rapid transit corridor areas. There are sidewalks provided on both sides of the study area roads. Talbot Street is signed a bikeway route with "Sharrows" for cycling.

London Transit (LT) provides bus service on Richmond Street. London Transportation Master Plan also recommends two bus rapid transit (BRT) routes operating north/south and east/west. Both BRT routes will operate on the planned rapid transit (east side of Richmond Street) within the study area.

Therefore, the composition and location of the subject development is ideally suited for the application of TDM initiatives.

10.2 Objectives

Development of site specific TDM measures for the proposed site has been done in the context that the primary objective is to reduce single occupancy vehicle use and parking demand, the plan will review opportunities to set realistic targets for increased use of transit, cycling, and walking trips.

10.3 Travel demand management

Travel Demand Management (TDM) refers to a variety of strategies to reduce congestion, minimize the number of single-occupant vehicles, encourage non-auto modes of travel, and reduce vehicle dependency to create a sustainable transportation system. TDM strategies have multiple benefits including the following:

- Reduced auto-related emissions to improve air quality,
- Decreased traffic congestion to reduce travel time,
- Increased travel options for businesses and commuters,
- Reduced personal transportation costs and energy consumptions, and
- Support Provincial smart growth objectives.

The combined benefits listed above will assist in creating a more active and livable community through improvements to overall active transportation standards for the local businesses and surrounding community.

10.4 Existing TDM opportunities

Walking

Sidewalks are provided on both sides of both sides of Central Avenue, Richmond Street and Talbot Street within the study area.

The variety of nearby transit stops are conveniently accessible by pedestrians residing at the subject development through a complete network of pedestrian sidewalks.

Cycling

Talbot Street is signed a bikeway route with “Sharrows” for cycling. The site plan proposes a total of 114 bicycle parking spaces including 101 long-term spaces and 13 short-term spaces for the development.

Transit

London Transit (LT) provides bus service on Routes 4, 6, 13, 15 and 90 along Richmond Street. There are bus stops on Richmond Street for Bus Routes 4, 6, 13 and 15 approximately 35m south of Central Avenue (southbound buses) and approximately 75m north of Central Avenue (northbound buses).

Also, London Transportation Master Plan recommends two bus rapid transit (BRT) routes operating north/south and east/west. Both BRT routes will operate on the planned rapid transit (east side of Richmond Street) within the study area. The distance between subject site and the planned rapid transit is approximately 100 meters via Central Avenue.

The surrounding transit facilities are considered accessible and excellent with respect to transit amenities.

10.5 Proposed TDM opportunities

The TDM plan proposes a mix of hard and soft measures to meet the objectives and targets to reduce vehicular demand and encourage passenger, transit, cycling, and walking. For the subject site development, the following TDM measures are proposed:

Walking

- As shown in the site plan in Appendix A, the proposed site plan includes convenient access to the residential building via the existing sidewalk on the north side of Central Avenue and the proposed internal site walkways.
- Wherever possible, building main accesses should face the street, especially along arterial roads. Safe and direct access from buildings to the street for pedestrians should be included in the site plan process.

Cycling

- The site plan proposes a total of 114 bicycle parking spaces including 101 long-term spaces and 13 short-term spaces for the development.
- Provide connections between site to the City’s cycling network.

Transit

- Enhance walking routes between main building entrances and Central Avenue sidewalks.
- Provide transit information on-site.

Parking

- Reduced minimum parking requirements based on proximity to transit.
- Shared parking with nearby developments or on-street.
- Reduced minimum parking requirements based on provision of dedicated car share vehicle parking spaces.

Unbundled Resident Parking

- Separate (or unbundle) resident parking to separate the cost of parking from the cost of each residential unit. This will make the hidden cost of driving visible and encourage residents to make more informed active transportation decisions and may create opportunities for the use of more sustainable modes of transportation.
- In other municipalities, unbundled parking is used to support a parking reduction of 10 percent of the required resident parking supply.

Travel Planning

- Educate and inform residents by providing informational package including transit maps, schedules and fares, bicycle route maps and other brochures.

Promotion

- Provide subsidized transit passes for new home purchase.
- It is recommended that, upon request, the developer provides pre-charged transit cards or reimburse transit fares for three of months to transit-riding residents.

10.6 Implementation and monitoring costs

The possibilities are there through transit ridership, walking, cycling, and carpooling to reduce auto-dependency and parking demand since all or a combination of these Transportation Demand Management (TDM) practices can be implemented.

Costs to implement and monitor the proposed “soft” and “hard” TDM measures are the responsibility of the applicant. The applicant will be responsible for implementing, marketing, and monitoring the TDM measures and working with the property manager of the building and other TDM stakeholders to ensure success and adjust as necessary.

11. Findings, conclusion and recommendations

- The purpose of this study is to determine the traffic-related impacts on the roadway system from the proposed development located at 192-196 Central Avenue, generally in the northwest quadrant with Richmond Street in the City of London. It is to determine that the proposed parking supply is adequate to accommodate the future site parking demands, and also to determine that appropriate Transportation Demand Management measures and to demonstrate that the subject site has adequate pedestrian and cycling linkages to existing/proposed infrastructure.
- Based on the current site plan, the proposed development consists of a 13-storey building with a total of 126 residential apartment units and with 68 parking spaces provided.
- The development proposes one access on Central Avenue at the western end of the property.
- As confirmed by the City, the study intersections for capacity analysis are:
 - Central Avenue/Richmond Street (existing traffic signal),
 - Central Avenue/Talbot Street (existing STOP controlled and Pedestrian Crossing at north leg of intersection), and
 - One proposed Central Avenue access.
- Most recent weekday turning movement counts were obtained from the City at the Central Avenue/Richmond Street intersection and at the Central Avenue/Talbot Street intersection in 2022.
- The study assumes a 5-year horizon beyond the expected build-out. Due to the size and nature of the proposed development, 2026 is the expected year of full build-out. Therefore, the study horizon will be 2031, 5 years beyond full build-out.
- In consultation with the City and similar with 200 Albert Street traffic study, the study assumed that an annual growth rate of 1.5% was applied to all movements of the 2022 counts to estimate the background traffic growth for the 2031 study horizon.
- To be conservative assuming no trip reductions due to other modes of travel such as transit, the subject development will generate a total of 12 inbound and 35 outbound automobile trips during AM peak hour, and 35 inbound and 21 outbound automobile trips during PM peak hour.
- The site trips generated by the proposed residential developments were distributed to the roadway system using the existing traffic patterns observed from the recent traffic counts at the study intersections.
- This study concludes that under the future traffic forecasts, the traffic generated by the proposed development along with non-site related traffic growth can be accommodated by the existing street system. Traffic generated by the proposed development does not add significant adverse impacts on the study intersections. No additional road improvements are triggered by the proposed development.
- The site access/intersection on Central Avenue can be expected to have good operational characteristics under the future 2031 total traffic conditions.
- The Vehicle Circulation Review confirms that the proposed site plan is sufficient to accommodate the circulation requirements of garbage trucks and medium single unit trucks.

- Based on our review of the City of London current Zoning By-law Z.-1 parking requirements, the By-law requires minimum 0.5 parking spaces per unit for apartment buildings. The proposed 68 parking spaces will meet and exceed the By-law requirements with 5 surplus parking spaces.
- The subject site is located in the City's downtown and rapid transit corridor areas. Based on a review of the walk, transit and bike scores for Central Avenue, the site's future residents and visitors can easily access to the surrounding pedestrian network, transit system and cycling network via existing and future sidewalks, bike lanes and transit buses along the study area roadways. Low vehicle ownership can be expected for the proposed development given close proximity to amenities and other modes of travel.
- Therefore, the proposed parking supply of 68 spaces can accommodate the future parking demand.
- Residents and visitors of the development can easily access the surrounding pedestrian network, transit system and cycling network via the proposed sidewalks along internal roadways to the sidewalks on Central Avenue and on Richmond Street.
- It is possible that through transit ridership, walking, cycling, and carpooling to reduce auto-dependency and parking demand since all or a combination of these Transportation Demand Management practices can be implemented.

