TRANSPORTATION IMPACT STUDY

0 & 8673 EIGHTH LINE
TOWN OF HALTON HILLS,
HALTON REGION

PREPARED FOR:
MAPLE MIST DEVELOPMENT CORP.
C/O TRINISON MANAGEMENT GROUP

PREPARED BY:
C.F. CROZIER & ASSOCIATES INC.
211 YONGE STREET, SUITE 600
TORONTO, ON M5B 2H1

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CFCA FILE NO. 2742-7218

CELEBRATING 20 YEARS · SINCE 2004 · CROZIER

Revision Number	Date	Comments
Rev.0	June 2025	Issued for Submission

Executive Summary

C.F. Crozier & Associates Inc. (Crozier) was retained by Maple Mist Development Corp. c/o Trinison Management Corp. to complete a Transportation Impact Study in support of an Official Plan Amendment application for an urban boundary expansion to include the lands located at 0 & 8673 Eighth Line (the "Subject Lands") within the boundary of the Town of Halton Hills, Region of Halton.

The analysis undertaken herein was completed using the latest Concept Plan prepared by Corbett Land Strategies Inc. dated October 2024. Any minor changes to the Concept Plan will not materially affect the conclusions set out within this report.

The Subject Lands envision development for employment uses. Access to the site is provided by a full-moves access directly via Eighth Line and a full-moves access via a Future Collector to the east of the site.

2024 Existing Conditions

Turning movement count (TMC) surveys were conducted on December 3, 2024, and were applied for the operational assessment of the study intersections. Intersections operations were modelled using Synchro 11 and SimTraffic modelling software, in accordance with relevant Municipal and Provincial guidelines, and were assessed based on "Highway Capacity Manual (HCM)" criteria.

Under the existing conditions scenario, the signalized study intersection of Eighth Line at Steeles Avenue is operating at a LOS "B" and "C" during the weekday a.m. and p.m. peak hours respectively Furthermore, no movements were identified to have a critical volume-to-capacity ratios.

The unsignalized study intersection of Eighth Line at 5 Side Road is operating at LOS "B" and "C" during the a.m. and p.m. peak hour, respectively. Furthermore, no movements were identified to have critical volume-to-capacity ratios.

2031 Future Background Conditions

For the Future Background conditions assessment, the 2031 horizon year was considered for the study, aligning with the proposed urban boundary expansion of the Town of Halton Hills Official Plan to include the Subject Lands and the planned Eighth Line Widening).

Multiple road improvements are proposed within the study network for the 2031 horizon year:

- Per the Eighth Line Environmental Assessment (EA) and the Town of Halton Hill 2024 Budget: Capital Budget
    - Eighth Line is to be widened throughout the study with a cross-section of three lanes, encompassing one travel lane in each direction and centre two-way left turn lane.
    - The intersection of Eighth Line at 5 Side Road is proposed to become a roundabout. Lastly, a new Collector Road D is proposed to form an intersection with Eighth Line approximately 1.2 km north of Steeles Avenue.
    - A new Collector Road D is proposed to form an intersection with Eighth Line approximately 1.2 km north of Steeles Avenue.
- Per the Region of Halton's 2025 Capital Budget

- Steeles Avenue (Regional Road 8) will be widening from four to six lanes.

The study intersections are projected to operate acceptably and similarly to existing conditions in the Future Background traffic operations scenario. All study intersections are projected to operate at a LOS "C" or better, with no movements exceeding the critical volume-to-capacity thresholds of the City.

Development Proposal and Trip Generation Estimate

Based on discussions with the client, they expect the development area to yield approximately 190,000 m2 of LUC 150 "Warehousing" Gross Floor Area. It is noted that the trip generation estimate is based on this preliminary yield approximation and will be refined as part of subsequent applications.

The proposed employment development is forecasted to generate an estimated 349 two-way (268 inbound and 81 outbound) trips during the weekday morning peak hour, and a trip generation of 368 (103 inbound and 265 outbound) trips during the weekday afternoon peak hour. A Site Plan will be prepared in the future and as part of this process total trip generation will be finalized in a new study to support development applications for the Subject Lands.

2031 Future Total Conditions

The projected 2031 Future Total traffic operations within the study road network indicate that the study intersections are operating adequately and similar to the Future Background conditions in the weekday a.m. and p.m. peak hours.

The intersection of Eighth Line at Steeles Avenue is forecast to be the most operationally constrained at a LOS "C" and "E" during the weekday a.m. and p.m. peak hours respectively. The main delays at the intersection are attributed to the shared southbound through-right turn lane. The provision of a single auxiliary southbound right-turn lane at the intersection is expected to significantly improve operations. This lane could be introduced as part of the planned 2028 Steeles Avenue widening or the 2031 Eighth Line widening (See Section 3.2.1). The prospective southbound auxiliary right-turn lane will be addressed in detail as part of future development applications, such as Site Plan or Zoning By-Law applications.

The remaining study intersections are expected to operate well, with a LOS "B" or better being expected in the weekday peak hours and no queuing or capacity issues identified.

Sight Line Assessment

A sight line assessment was conducted for the potential industrial development. The assessment confirmed that sight lines are expected to be adequate and will allow for efficient vehicle movements within and around the site.

Conclusion

In conclusion, the proposed urban boundary expansion at 0 & 8673 Eight Line in the Town of Halton Hills, Region of Halton, can be supported from a transportation perspective.

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1.0 Introduction

C.F. Crozier & Associates Inc. (Crozier) was retained by Maple Mist Development Corp. c/o Trinison Management Corp to complete a Transportation Impact Study in support of an urban boundary expansion for the lands located at 0 & 8673 Eighth Line in the Town of Halton Hills, Region of Halton.

The purpose of the Transportation Impact Study is to evaluate the impacts of the potential industrial development on the surrounding road network and recommend transportation-related mitigation measures, if required.

This Transportation Impact Study is in support of an Official Plan Amendment application for an Urban Boundary Expansion to include the Subject Lands. As a result, the scope is reduced, with elements like Vehicle Maneuverability Diagrams and Parking Review to be included in future development applications.

A Terms of Reference (ToR) encompassing the scope of the Transportation Impact Study was circulated to the Town of Halton Hills (Town)and Halton Region on October 7, 2024. The Terms of Reference sent to the Town and Region is included in Appendix A.

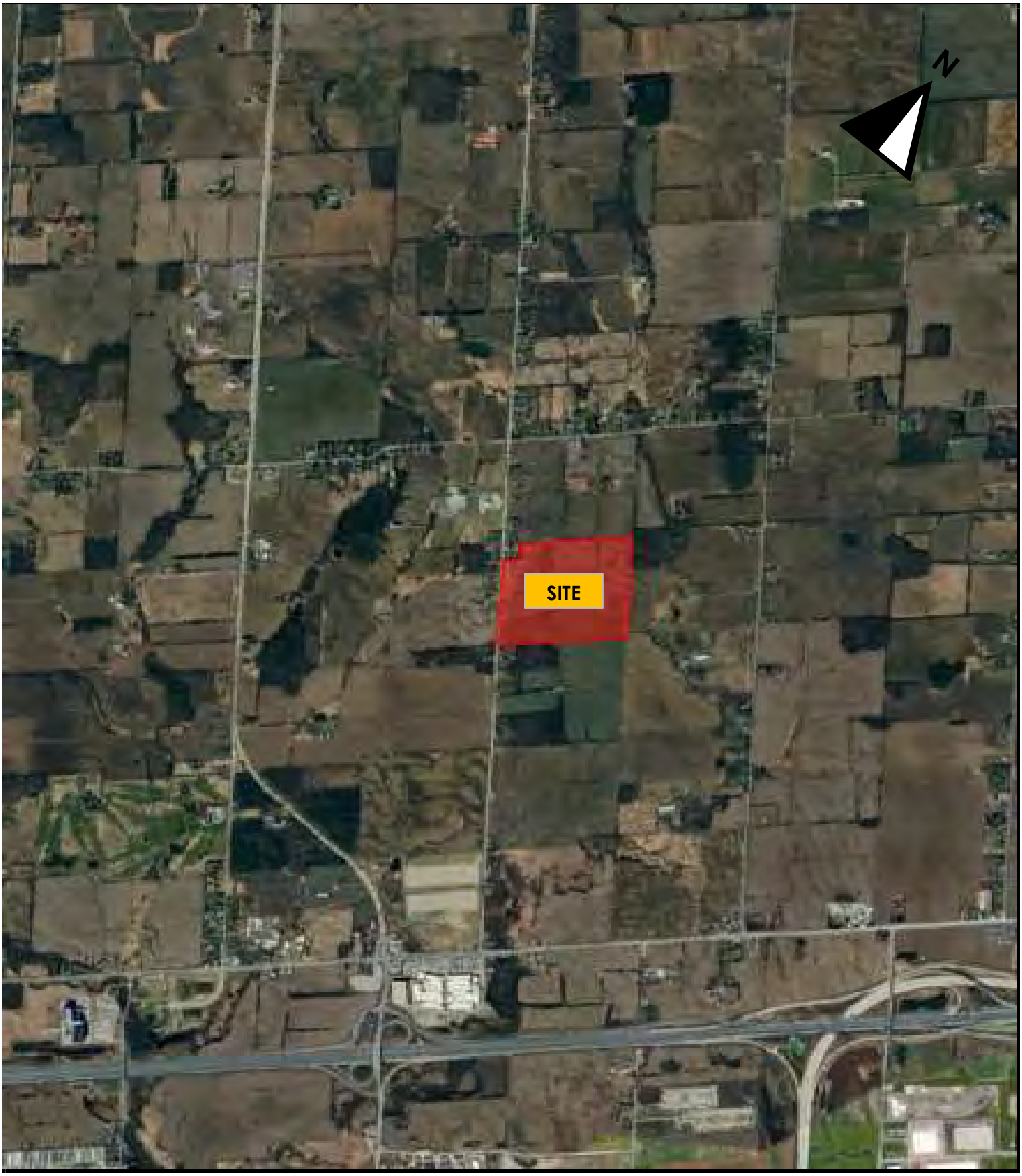
1.1 Development Lands

The subject property covers an area of approximately 41.12ha and currently consists of farmland. The site is located in an agricultural neighbourhood and is bounded by Eighth Line to the west, and agricultural lands to the north, east, and south. The subject lands are made up of two (2) land parcels: Parcel No. 1 (0 8th Line) and Parcel No.2 (8673 8th Line) and are located just outside the Urban Boundary as per the Town of Halton Hills's Official Plan. This site is adjacent to lands to the south that were recently brought into the Urban Boundary for Employment Use. The Site Location is included in Figure 1.

1.2 Development Proposal

The proposed Official Plan Amendment is proposing to expand the urban boundary to include the subject lands. It is envisioned that the development of the subject property will occur with employment uses, akin to the lands to the immediate south that form part of the Premier Gateway Employment Area to the south.

To facilitate the development, a full moves site access is proposed via Eighth Line, and a future local road running east-west through the middle of the development. A future north-south Collector Road is also proposed along the east limit of the site. The most recent Concept Plan prepared by Corbett Land Strategies Inc. dated October 2024, is included as Figure 2.



Legend	0 & 8673 Eighth Line	CROZIER CONSULTING ENGINEERS	Figure 1
Subject Lands	Site Location		Project No. 2742-7218 Date. 2024.12.13 Analyst. TDS

For Discussion Purposes Only

Maple Mist Development Corporation
0 & 8673 Eighth Line
Halton Hills, ON

Agricultural / Rural

Significant Woodlot

Future Collector Road

Future ROW Widening (35 m)

Naturalized

Future Collector Road

Agricultural / Rural

Future Local Road

Rechannelization

Agricultural / Rural

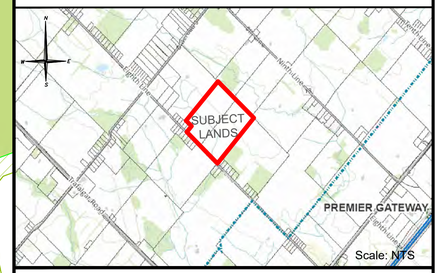
Eighth Line

Woodlot

Employment Area

Future Collector Road

KEY MAP



Legend

- Subject Property / Proposed Employment Area
- Urban Area / New Employment Area (Bill 162)
- Naturalized Creek Channel
- Significant Woodlot
- Vegetation Protection Zone (10 m)

Conceptual Land Use Plan

Scale 1:1500	Drawn by: LG
Date: October, 2024	Checked by: NW

Notes:
Issued for pre-consultation purposes; subject to change.

CORBETT LAND STRATEGIES INC.
VISION • EXPERTISE
5045 South Service Road, Suite 301
Burlington, Ontario L7L 5Y7
corbettlandstrategies.ca

FIG 2

2.0 Existing Conditions

The following intersections were reviewed as part of the study area:

- Eighth Line at Steeles Avenue (Regional Road 8)
- Eighth Line at 5 Side Road (Future Roundabout)
- Eighth Line and Proposed Collector Road D (from Eighth Line EA)
- Eighth Line and Proposed Local Road Access

The following section provides a description of the study area from a transportation context, as well as a traffic operations analysis of the study road network.

2.1 Study Road Network

The directional orientation of the study roadways is slightly skewed; however, it is generally understood that to/away from Lake Ontario are considered the north/south directions and parallel along the lake are considered the east/west directions. To ensure clarity and consistency in this report, the direction of Eighth Line is designated as north-south roadways while 5 Side Road and Steeles Avenue are designated as east-west roadways.

Eighth Line is a north/south roadway with a six-lane urban cross-section and a posted speed limit of 70 km/h. It is classified as Minor Arterial Roadway under the jurisdiction of the Town and has sidewalks on both sides of the roadway.

Steeles Avenue (Regional Road 8) is an east/west roadway with a six-lane urban cross-section and a posted speed limit of 60 km/h. It is classified as Major Arterial Roadway under the jurisdiction of the Region and has sidewalks on both sides of the roadway.

5 Side Road is an east/west roadway with a six-lane urban cross-section and a posted speed limit of 60 km/h. It is classified as Minor Arterial Roadway under the jurisdiction of the Town and has sidewalks on both sides of the roadway.

Excerpts from the Town of Halton Hills's Official Plan can be found in Appendix B.

2.2 Study Intersections

The intersection of Eighth Line/Private Access and Steeles Avenue (Regional Road 8) is a four-legged signalized intersection. The eastbound approach on Steeles Avenue consists of a single auxiliary left turn lane, two through lanes, and one single auxiliary right turn lane. The westbound approach on Steeles Avenue consists of a single auxiliary left turn lane, one through lane, and one shared through-right turn lane. The northbound approach consists of two auxiliary left turn lanes, a single through-right turn lane. The southbound approach on Eighth Line consists of a single auxiliary left turn lane, a single through lane, and a single through-right turn lane.

The intersection of Eighth Line at 5 Side Road is a four-legged stop-controlled intersection. The eastbound approach on 5 Side Road consists of a single shared through-right-left turn lane. The westbound approach on 5 Side Road consists of a single shared through-right-left turn lane. The southbound approach on Eighth Line consists of a single shared through-right-left turn lane. The northbound approach from the Eighth Line consists of a single shared through-right-left turn lane.

The existing lane configurations of the study network are shown in Figure 3.

2.3 Transit Network

The Town of Halton Hills in partnership with Milton Transit provides one bus route along the Steeles Avenue corridor from Milton GO Station to Lisgar GO Station in Mississauga. Table 1 below outlines the existing transit route, days of operation, peak hour headways, and the location of bus stops in the study area.

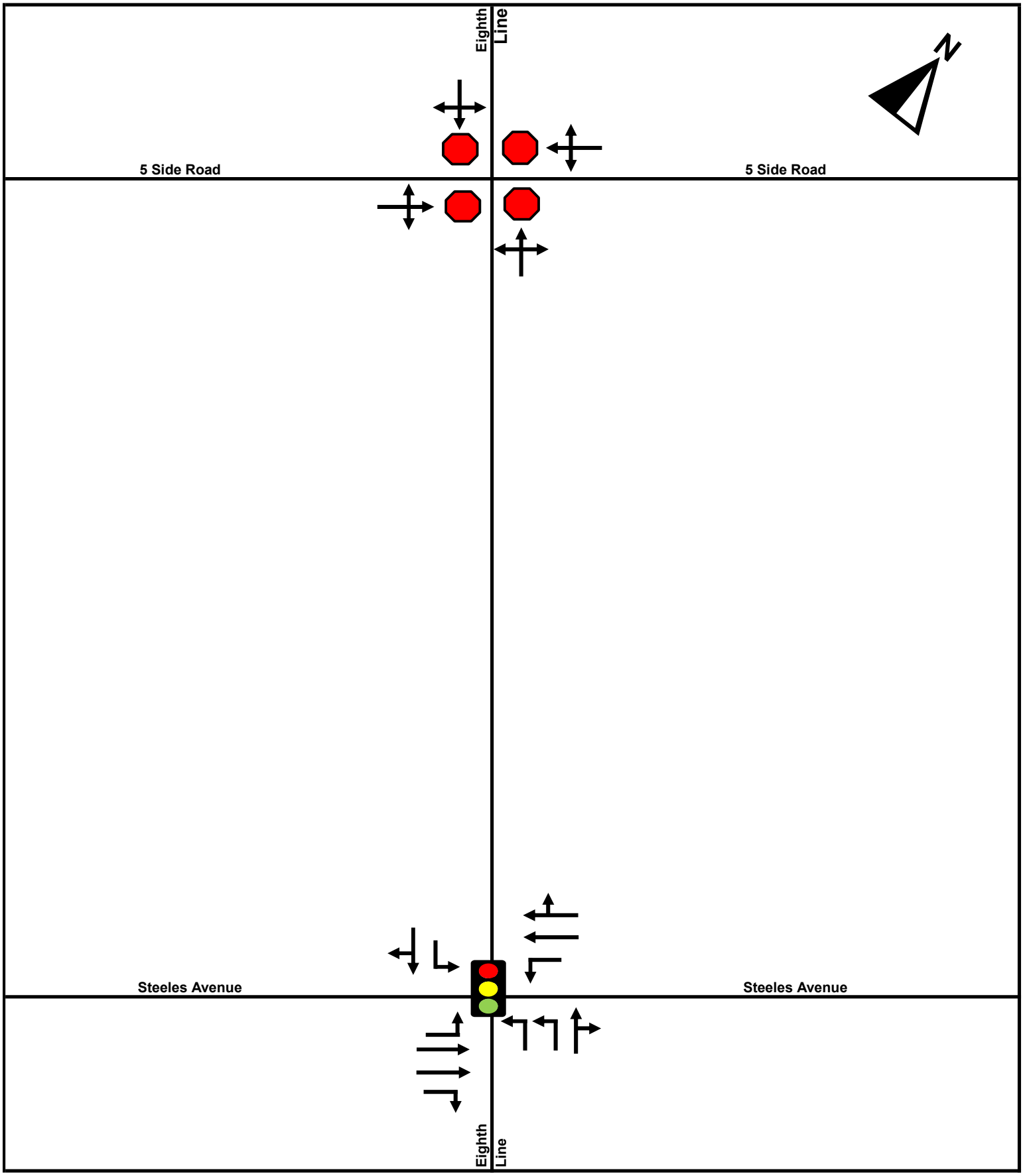
Table 1: Transit Routes

Route	Direction	Span	Days of Operation	Peak Hour Headways (min)	Transit and Connecting Stops in Study Area
Milton Transit, 21 Steeles	Two-Way East-West	Milton GO to Lisgar GO	Monday – Saturday	35 mins	Steeles Avenue at Eighth Line (2 km, 27 min walk)

As shown above, Milton Transit operates one local bus within the study area. The existing stops on Steeles Avenue at Eighth Line would provide limited access to the proposed site and would require long walking trips to and from the existing bus stops. Appendix C contains relevant transit information.

2.4 Active Transportation Network

There are currently no sidewalks or active transportation facilities along the roadways, although sidewalks are provided at the intersections to facilitate pedestrian crossing. Otherwise, the Study Area roadways only feature paved shoulders within their ROW. The Study Area is considered primarily automobile transportation mode driven. Section 3.2.3 outlines the planned development of Active Transportation facilities in the area as part of the planned Town of Halton Hills Urban Boundary Expansion.



Legend

Signalized Intersection

Stop-Controlled Intersection

0 & 8673 Eighth Line

2024 Existing Lane Configurations

CROZIER CONSULTING ENGINEERS

Figure 3

Project No. 2742-7218

Date. 2024.12.13

Analyst. TDS

2.5 Traffic Data

In accordance with the Town and the Region's Terms of Reference, new turning movement counts for the 2024 existing condition were collected at the following intersections by Spectrum Traffic Inc. at the associated timeframes as summarized in Table 2.

Signal timing plans for the study intersection were provided by Town of Halton Hills and Halton Region staff for modelling purposes.

Table 2: Traffic Data

Intersection	TMC Date	Signal Timing Plan Date
Eighth Line at Steeles Avenue (Regional Road 8)	December 3, 2024	December 12, 2024
Eighth Line at 5 Side Road	December 3, 2024	N/A

The traffic count data and signal timing plans are provided in Appendix D. Existing traffic volumes are illustrated in Figure 4.

2.6 Traffic Modelling

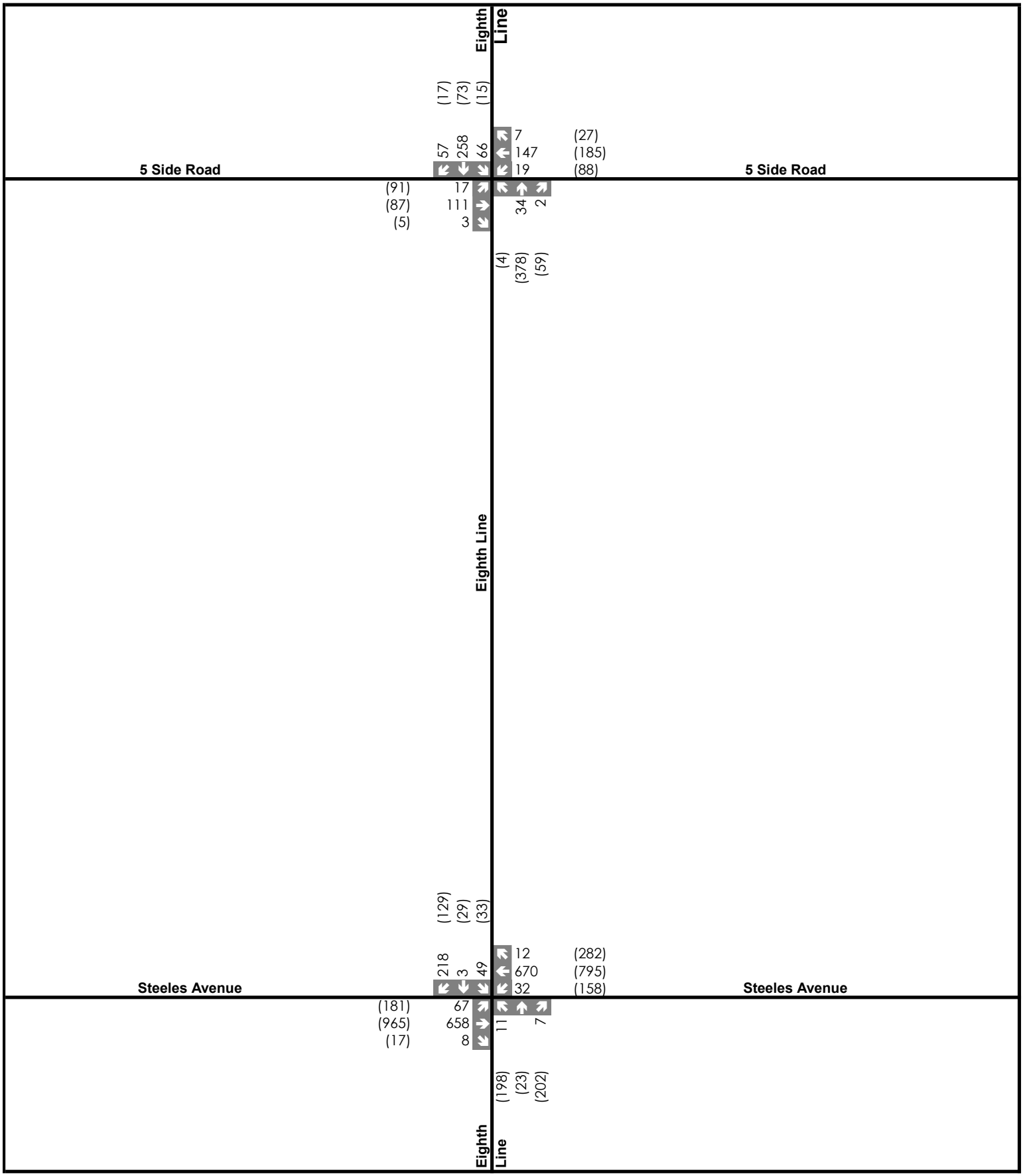
The assessment of intersections is based on the method outlined in the "Highway Capacity Manual, 2000" using Synchro 11 modelling software. Intersections are assessed using the Level of Service (LOS) metric, with ranges of delay designated a letter ranging from "A" to "F". For stop-controlled intersections, a LOS "A" or "B" would typically be expected during off-peak hours when there are lower traffic volumes on roadways. Levels of Service "C" to "F" would characteristically be measured during commuter peak hours when greater traffic volumes produce longer travel times. The LOS definitions for signalized and stop-controlled intersections are included in Appendix E.

For modelling purposes, Peak Hour Factors were calculated using volumes from the existing counts per Halton Region guidelines. The Peak Hour Factors used are shown in Table 3.

Table 3: Peak Hour Factors

Intersection	A.M.	P.M.
Eighth Line at Steeles Avenue (Regional Road 8)	0.89	0.88
Eighth Line at 5 Side Road	0.88	0.91

The turning movement count data is provided in Appendix D.



Legend	0 & 8673 Eighth Line	CROZIER CONSULTING ENGINEERS	Figure 4
xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes	2024 Existing Traffic Volumes		Project No. 2742-7218 Date. 2024.12.13 Analyst. TDS

2.7 Intersection Operations

The traffic operations at the study intersections were analyzed based on observed traffic volumes during the weekday A.M. and P.M. peak hours, as illustrated in Figure 4. Detailed capacity analyses are included in Appendix F. Table 4 summarizes the existing traffic operations within the study area.

Table 4: 2024 Existing Operations

Intersection (Control)	Performance Metric						
	Movement	LOS		Delay (s)		v/c ratio	
		AM	PM	AM	PM	AM	PM
Eighth Line at Steeles Avenue (Signalized)	Overall	B	C	15.2	29.5	0.60	0.85
	EBL	A	D	8.0	35.6	0.19	0.70
	EBT	B	C	13.9	27.4	0.46	0.71
	EBT2	B	C	13.9	27.4	0.46	0.71
	EBR	A	A	0.0	0.1	0.02	0.03
	WBL	A	B	7.5	18.8	0.08	0.58
	WBTR	B	C	19.0	33.0	0.60	0.85
	NBL	C	D	26.2	47.8	0.03	0.51
	NBL2	C	D	26.2	47.8	0.03	0.51
	NBT	A	A	0.0	7.6	0.01	0.41
	NBR	A	A	0.0	7.6	0.01	0.41
	SBL	C	E	26.6	58.1	0.21	0.38
	SBTR	A	C	8.7	27.4	0.50	0.67
Eighth Line at 5 Side Road (Unsignalized)	Overall	B	C	12.7	20.2	0.59	00.78
	EBTLR	B	B	10.2	13.6	0.23	0.37
	WBTLR	B	C	10.8	17.6	0.30	0.58
	NBTLR	A	D	9.1	26.7	0.07	0.78
	SBTLR	B	B	14.7	11.6	0.59	0.22

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU).
Note 2: All v/c ratios higher than 0.85 for through movements and 0.95 for exclusive movements are highlighted, per Region of Halton TIS Guidelines

In existing conditions, traffic operations within the study area are generally operating adequately based on the results of the Synchro model.

The signalized study intersection of Eighth Line at Steeles Avenue is operating at a LOS "B" and "C" during the weekday a.m. and p.m. peak hours respectively. During the weekday a.m. peak hour all movements operate at LOS "B" or better except for the northbound left-turn and southbound left-turn movements which reaches a LOS "C". Additionally, the weekday p.m. peak hours all operate at a LOS "D" or better with the exception of the southbound left-turn movement which operates at a LOS "E". These operational metrics results are typical of high-volume arterial roadway intersections in the peak hours, and operations are expected to improve during off-peak times.

The unsignalized study intersection of Eighth Line at 5 Side Road is operating at LOS "B" and "C" during the a.m. and p.m. peak hour, respectively. Specifically, the westbound and northbound movements during the weekday p.m. peak hours were identified to have long delays but are still operating under capacity.

3.0 Future Background Conditions

3.1 Study Horizons

Following consultation with the Town and Region Staff, the horizon year of 2031 was determined for purposes of this study.

3.2 Future Roadway Improvements

Multiple improvements are planned within the study road network, as indicated below.

3.2.1 Future Roadways

Per the Eighth Line EA, Eighth Line is to be widened throughout the study are. As part of the widening, the Eighth Line cross-section will increase to three lanes, encompassing on travel lane in each direction and centre two-way left turn lane. Additionally, the intersection of Eighth Line at 5 Side Road is proposed to become a roundabout. Lastly, a new Collector Road D is proposed to form an intersection with Eighth Line approximately 1.2km north of Steeles Avenue. Per the Environmental Assessment, the intersection is proposed to be stop-controlled but could operate as a roundabout in the future. The intersection has been modelled as a stop-controlled intersection for this analysis. Per the Town of Halton Hill 2024 Budget: Capital Budget and Forecast, the reconstruction of the roadway is proposed to take place in the time horizon of 2025-2029.

As indicated in the Eighth Line EA, and according to the Region's 2025 Capital Budget, Steeles Avenue (Regional Road 8) will be widening from four to six lanes (with a reserved bus lane) from Trafalgar Road to Winston Churchill Boulevard by 2028.

Relevant excerpts of the Eighth Line EA, Town of Halton Hill 2024 Budget: Capital Budget and Forecast, and Halton Region Budget and Business Plan Capital Report 2025 have been included in Appendix G.

3.2.2 Future Intersections

The intersection of Eighth Line at Proposed Collector Road D is a three-legged stop-controlled intersection. The eastbound approach on Collector Road D consists of a single shared right-left turn lane and bicycle lanes on both sides of the road. The southbound approach on Eighth Line consists of a single shared through-right turn lane. The northbound approach from the Eighth Line consists of a single through lane and a center two-way left turn lane.

The intersection of Eighth Line at 5 Side Road is a four-legged intersection proposed to operate as a roundabout in the 2031 horizon year. The roundabout geometries used for analysis are provided in Section 4.1.1.

The 2031 Future Lane Configurations are illustrated in Figure 6.

3.2.3 Future Active Transportation

Per the Eighth Line EA, 3.0 m Multi-Use Paths are proposed for both sides of the roadway throughout the Study Area.

Additionally, the proposed Collector Road D cross-section includes bicycle lanes on both sides of the roadway.

Relevant excerpts of the Eighth Line EA have been included in Appendix G.

3.2.4 Future Transit

As mentioned in Section 3.2.1, a reserved bus lane is planned as part of the 2028 Steeles Avenue widening. No other transit improvements in the study were identified.

3.3 Background Developments

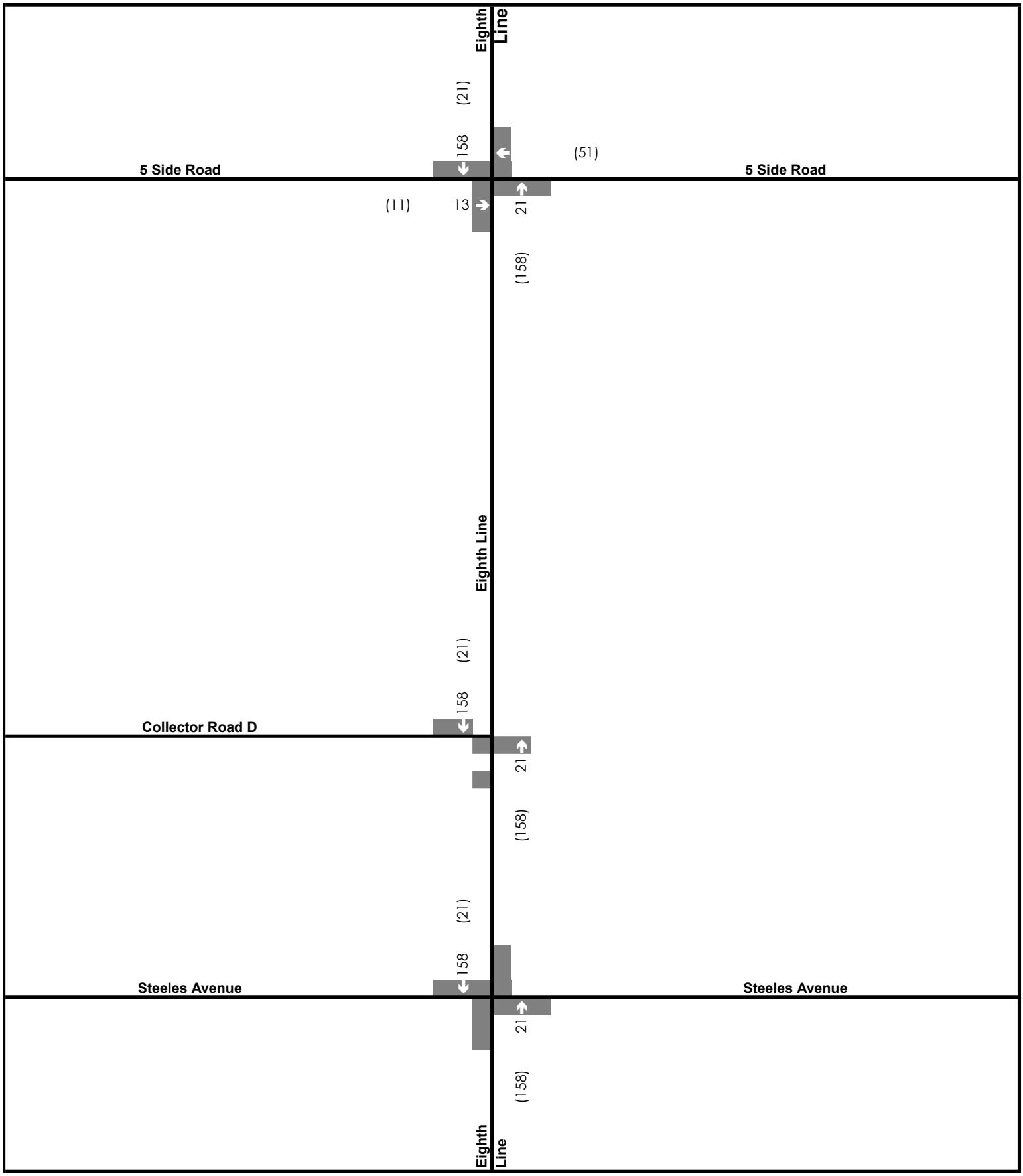
Per consultation with the Town of Halton Hills and a review of the Town of Halton Hills Development Applications, the background development listed in Table 5 were identified as part of the study area.

Table 5: Background Developments

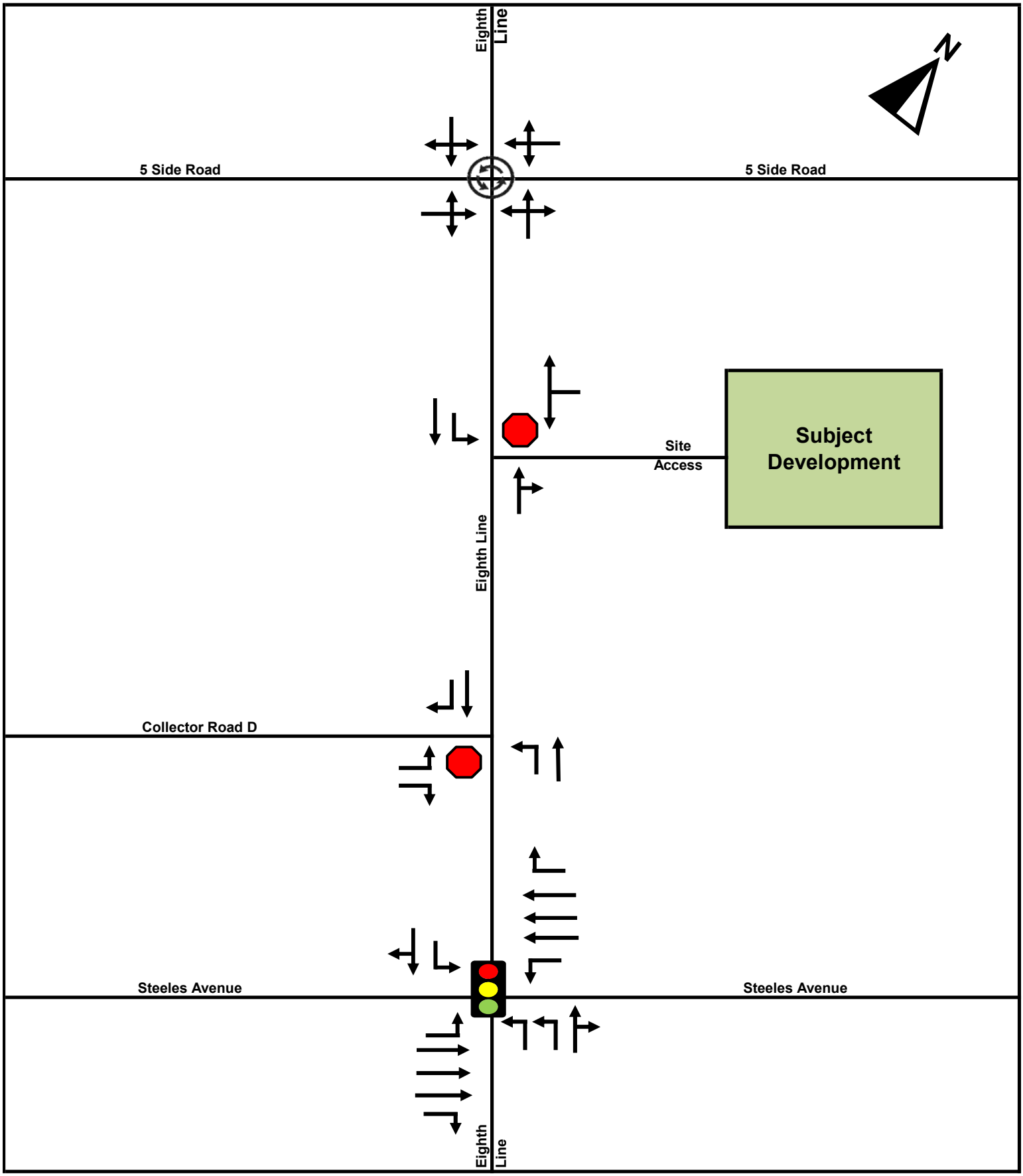
No.	Development Name	Proposed Development	Buildout Horizon	Source
1	Vision Georgetown	Community including a population 17,749 people and an employment of 1,465 jobs.	2031	Town of Halton Hills Vision Georgetown Transportation Analysis (April 2018)

In addition to the development outlined in Table 5, developments at 8250 Eighth Line, 8079 Eighth Line, and Steeles Ave, 8154, 8170, 8178 & 8192 Eighth Line were identified within the study area. Due to a lack of sufficient information on the developments at the time this analysis was conducted, these developments will be addressed in detail as part of future development applications. The analysis provided herein is sufficient to support the Official Plan Amendment application for Urban Boundary Expansion for the development of the Subject Lands.

Details on the background development are included in Appendix H, the background development volumes are illustrated in Figure 5.



Legend	0 & 8673 Eighth Line	CROZIER CONSULTING ENGINEERS	Figure 5
xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes	Background Development Volumes		Project No. 2742-7218 Date. 2024.12.13 Analyst. TDS



Legend

- Signalized Intersection
- Stop-Controlled Intersection
- Rounabout Intersection

0 & 8673 Eighth Line

2031 Future Lane Configurations

CROZIER CONSULTING ENGINEERS

Figure 6

Project No. 2742-7218
Date. 2024.12.13
Analyst. TDS

4.0 Traffic Growth Rates

Due to the Terms of Reference being established with the Town and Region at the time of this analysis, the background growth rates used in analysis were as per the established Terms of Reference (ToR) for the Vision Georgetown (as seen in Section 3.3), and all growth rates have been compounded annually. The study roadways of Eighth Line at 5 Side Road were both captured in the Vision Georgetown ToR, the same growth rate was used for those reports in the analysis herein for through movements. Steeles Avenue was not captured in the correspondence, therefore the growth rate utilised for through movements on Steeles Avenue is the maximum growth rate for Halton Region roadways as indicated in the Vision Georgetown ToR. Also, per the Vision Georgetown ToR, an annual compounded growth rate of 0.5% was applied to all turning movements.

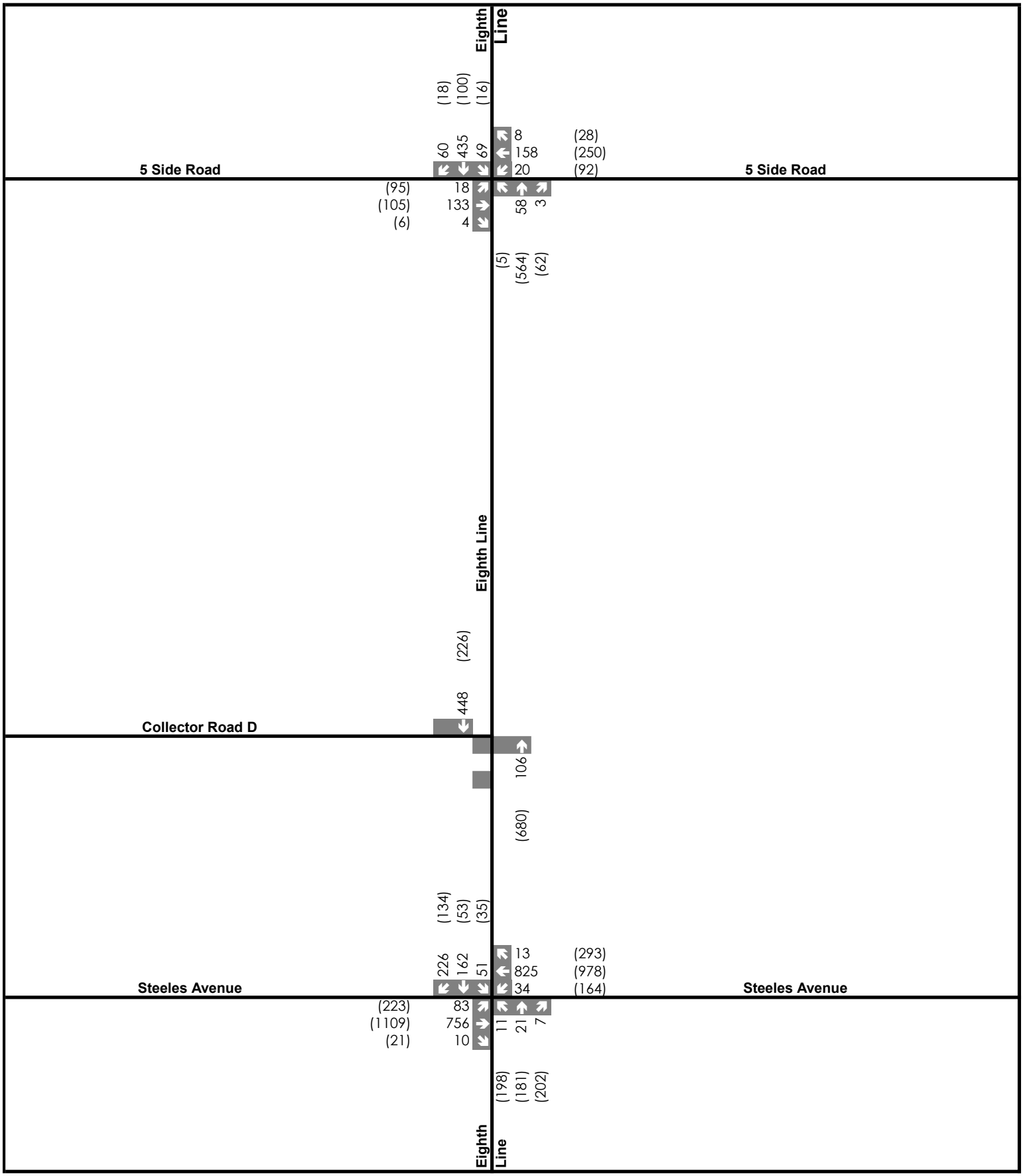
Appendix I contains excerpts from the Vision Georgetown Correspondence outlining growth rates used for Halton Region roadways and Town of Halton Hills roadways.

The growth rates used are provided in Table 6 below.

Table 6: Background Growth Rates

Roadway	Growth Rates		
	Direction	A.M.	P.M.
Steeles Avenue (Regional Road 8)	EB	3.0 %	3.0 %
	WB	3.0 %	3.0 %
Eighth Line	NB	1.0 %	1.0 %
	SB	1.0 %	1.0 %
5 Side Road	EB	1.0 %	1.0 %
	WB	1.0 %	1.0 %

The 2031 Future Background traffic volumes are also illustrated in Figure 7.



Legend	0 & 8673 Eighth Line	CROZIER CONSULTING ENGINEERS	Figure 7
xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes	2029 Future Background Traffic Volumes		Project No. 2742-7218 Date. 2024.12.13 Analyst. TDS

4.1 Intersection Modelling

The intersections were modelled per the planned roadway improvements summarized in Section 3.2 above. The modelling parameters surrounding these improvements are discussed below.

4.1.1 Eighth Line at 5 Side Road Future Roundabout

Roundabout analysis at the intersection of Eighth Line at 5 Side Road was completed based on the parameters shown below.

As identified in the Eighth Line EA, the intersection of Eighth Line at 5 Side Road is planned for a future roundabout. The ARCADY model using the ARCADY Junctions 8 analysis software was used to assess the operational performance of the intersection under the future horizon scenarios. The roundabout geometrics inputs used to calibrate the model are outlined in Table 7. These geometrics were determined through a review of the design description and drawing within the Eighth Line Environmental Assessment as well as the parameters used in the ARCADY analysis supporting the EA.

Table 7: 5 Eighth Line at 5 Side Road – Roundabout Geometry

Leg/Approach	Approach Road Half-Width (m)	Entry Width (m)	Effective Flare Length (m)	Entry Radius (m)	Inscribed Circle Diameter (m)	Conflict (Entry) Angle (Deg)
Eight Line (North)	3.5	4.5	30.0	20.0	40.0	25.0
Eighth Line (South)	3.5	4.5	30.0	20.0	40.0	25.0
5 Side Road (East)	3.5	4.5	30.0	20.0	40.0	25.0
5 Side Road (West)	3.5	4.5	30.0	20.0	40.0	25.0

Moreover, a y-intercept value of 95% was also used as consistent with the Eighth Line EA, which was used to account for the unfamiliarity of roundabouts to motorists in the GTA compared to in the United Kingdom.

Relevant Excerpts from the Eighth Line EA can be found in Appendix G.

4.2 Intersection Operations

Traffic operations at the study intersections were analyzed following the addition of volumes from the associated growth rates in the vicinity of the subject development. The traffic modelling approach was maintained from existing conditions.

The Future Background intersection operations at the study intersections were analyzed using the 2031 Future Background traffic volumes illustrated previously in Figure 7.

Table 8 and Table 9 summarize the 2031 Future Background traffic operations. Detailed capacity analyses are included in Appendix J.

Table 8: 2031 Future Background Conditions

Intersection (Control)	Performance Metric						
	Movement	LOS		Delay (s)		v/c ratio	
		AM	PM	AM	PM	AM	PM
Eighth Line at Steeles Avenue (Signalized)	Overall	C	C	24.2	29.3	0.68	0.76
	EBL	B	C	15.4	34.9	0.32	0.76
	EBT	C	C	22.1	30.4	0.51	0.73
	EBT2	C	C	22.1	30.4	0.51	0.73
	EBT3	C	C	22.1	30.4	0.51	0.73
	EBR	A	A	0.1	0.1	0.03	0.04
	WBL	B	C	13.2	25.2	0.12	0.63
	WBT	C	C	26.9	30.5	0.66	0.70
	WBT2	C	C	26.9	30.5	0.66	0.70
	WBT3	C	C	26.9	30.5	0.66	0.70
	WBR	A	A	0.2	4.9	0.03	0.46
	NBL	C	D	33.3	42.3	0.04	0.47
	NBL2	C	D	33.3	42.3	0.04	0.47
	NBT	B	C	12.5	29.0	0.04	0.67
	NBR	B	C	12.5	29.0	0.04	0.67
	SBL	C	D	21.0	46.2	21.0	0.31
	SBTR	C	D	27.6	39.7	27.6	0.71
Eighth Line at Collector Road D	Overall	A	A	0.0	0.0	0.29	0.43
	EBLR	A	A	0.0	0.0	0.00	0.00
	NBL	A	A	0.0	0.0	0.00	0.00
	NBT	A	A	0.0	0.0	0.07	0.43
	SBTR	A	A	0.0	0.0	0.29	0.14

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU).
Note 2: All v/c ratios higher than 0.85 for through movements and 0.95 for exclusive movements are highlighted, per Region of Halton TIS Guidelines

Table 9: Eighth Line at 5 Side Road Roundabout Future Background Level of Service

Weekday A.M. Peak Hour						Weekday P.M. Peak Hour					
Overall	App.[1]	Delay	LOS	V/C[2]	95th % Queue[3]	Overall	App.[1]	Delay	LOS	V/C[2]	95th % Queue[3]
Delay: 5.71s LOS: A	East	3.66s	A	0.18	~1	Delay: 6.93s LOS: A	East	8.16s	A	0.48	~1
	North	6.85s	A	0.55	2		North	4.20s	A	0.15	~1
	South	3.82s	A	0.07	~1		South	7.78s	A	0.61	3
	West	4.90s	A	0.19	~1		West	4.03s	A	0.20	~1

Note 1: App. – Intersection Approach.
Note 2: Volume-to-capacity column for roundabouts displays ratio of flow to capacity ratio.
Note 3: The 95th Percentile Queue units are in vehicles.

Under Future Background conditions in the 2031 horizon year, traffic operations at the study intersections are satisfactory in the weekday peak hours. Detailed capacity analyses are included in Appendix J.

The signalized intersection of Eighth Line at Steeles Avenue is operating at a LOS "C" during the weekday a.m. and p.m. peak hours. During the weekday a.m. peak hour all movements operate at LOS "C" or better. The weekday p.m. peak hours all operate at a LOS "C" or better apart from the

northbound left-turn and all southbound movements which operate at a LOS "D". These operational metrics results are expected to improve during off-peak times.

The un-signalized intersection of Eighth Line at Collector Road D is expected to operate at LOS "A" during the a.m. and p.m. peak hours. This intersection is expected to operate at the most optimal LOS.

Traffic operations are more than acceptable at the intersection of Eighth Line at 5 Side Road in Future Background conditions. A LOS "A" is forecast in both weekday peak hours, with no capacity or queuing issues projected as well.

4.3 Future Background Recommended Improvements

Overall, no significant changes in control delay, volume-to-capacity ratios, or queues were observed in the Future Background scenario compared with the existing conditions. Therefore, no recommendations differing from the already planned improvements are expected to be needed to accommodate Future Background traffic.

5.0 Site Generated Traffic

The potential industrial development will result in additional vehicles on the surrounding network that previously did not exist, and the following section outlines the methodology used to estimate the generation and distribution of trips expected to be generated by the potential industrial development.

5.1 ITE Trip Generation

The trip generation at the potential industrial development was forecasted using the rates provided in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition. Land Use Code (LUC) 150 "Warehousing" was used to generate the estimated site trips generated by the proposed industrial development. The R^2 provided for LUC 150 "Warehousing" for the fitted curve equation is less than 0.70. As such, the average rate was used to forecast trip generation for the potential industrial development during the a.m. and p.m. peak periods.

ITE Excerpts have been included in Appendix K.

Based on discussions with the client, they expect the development area to yield approximately 190,000 m^2 of LUC 150 "Warehousing" Gross Floor Area. It is noted that the trip generation estimate is based on this preliminary yield approximation and will be refined as part of subsequent applications. The assumed trip generation of the potential industrial development is summarized in Table 10.

Table 10: Total Vehicle Trip Generation Estimate

GFA	A.M. Peak Trip Generation			P.M. Peak Trip Generation		
	In	Out	Total	In	Out	Total
190,000 m^2 (2,045,140 ft^2)	268	81	349	103	265	368

The Subject Site is expected to generate approximately 349 two-way (268 inbound and 81 outbound) trips during the weekday morning peak hour, and 368 (103 inbound and 265 outbound) trips during the weekday afternoon peak hour.

5.2 Trip Distribution and Assignment

The Transportation Tomorrow Survey (TTS) is a comprehensive travel data survey conducted in the Greater Toronto and Hamilton Area. Data from the 2016 TTS was used to determine the peak hour trip distribution at the site for the industrial land use proposed at the site.

The inbound and outbound industrial trip distributions were derived by filtering TTS data with a trip purpose of "Work", destined to and originating from the subject GTA Zone 5154, 4152, and 4151. A.M. and P.M. distributions were determined by filtering for trips starting during the periods of 6:30 A.M. – 9:30 A.M. and 3:30 P.M. – 6:30 P.M., respectively. Table 11 summarizes the site trip distribution.

Appendix L provides the TTS query used to determine the site trip distribution.

Table 11: Site Trip Distribution

Direction	A.M. Peak Hour		P.M. Peak Hour	
	In	Out	In	Out
Northwest	0%	0%	7%	4%
North	0%	0%	12%	9%
Northeast	0%	0%	0%	13%
East	0%	0%	37%	14%
Southeast	53%	0%	5%	24%
South	0%	0%	4%	9%
Southwest	47%	0%	31%	12%
West	0%	100%	4%	15%
Total	100%	100%	100%	100%

Based on the directional trip distribution, site traffic was then assigned to the road network. A summary of the major route assignments is included in Table 12.

Table 12: Site Trip Assignment

Direction	A.M. Peak Hour		P.M. Peak Hour	
	In	Out	In	Out
North via Eighth Line	0.0%	0%	6%	5%
East via 5 Side Road	0.0%	0%	7%	6%
East via Steeles Avenue	0.0%	0%	4%	1%
West via 5 Side Road	0.0%	20%	5%	7%
West via Steeles Avenue	29.4%	50%	16%	19%
West via Collector Road D	0.0%	0%	0%	0%
South via Eighth Line	70.6%	30%	61%	61%

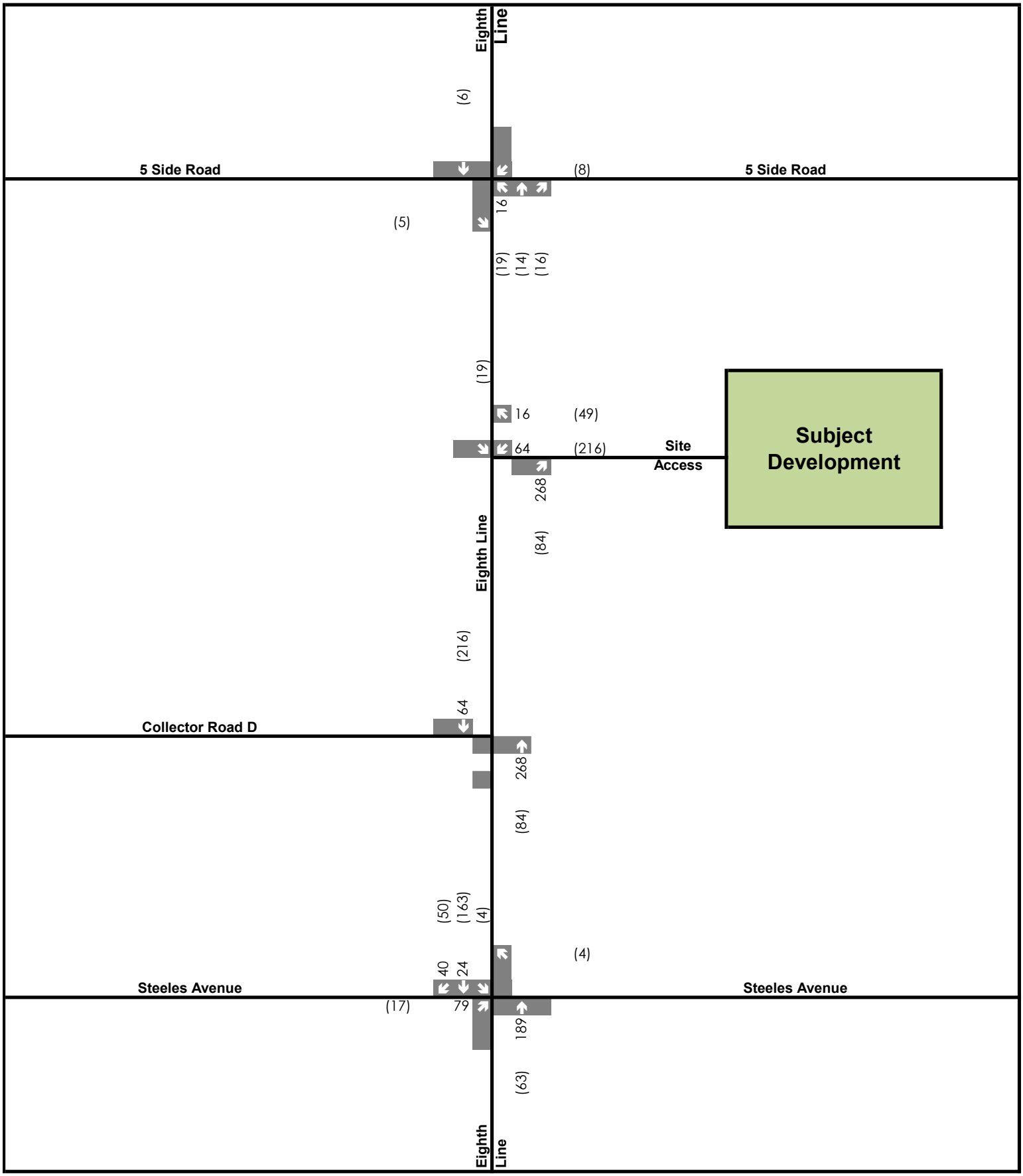
The trip assignment for the potential industrial development is illustrated in Figure 8.

6.0 Future Total Traffic Conditions

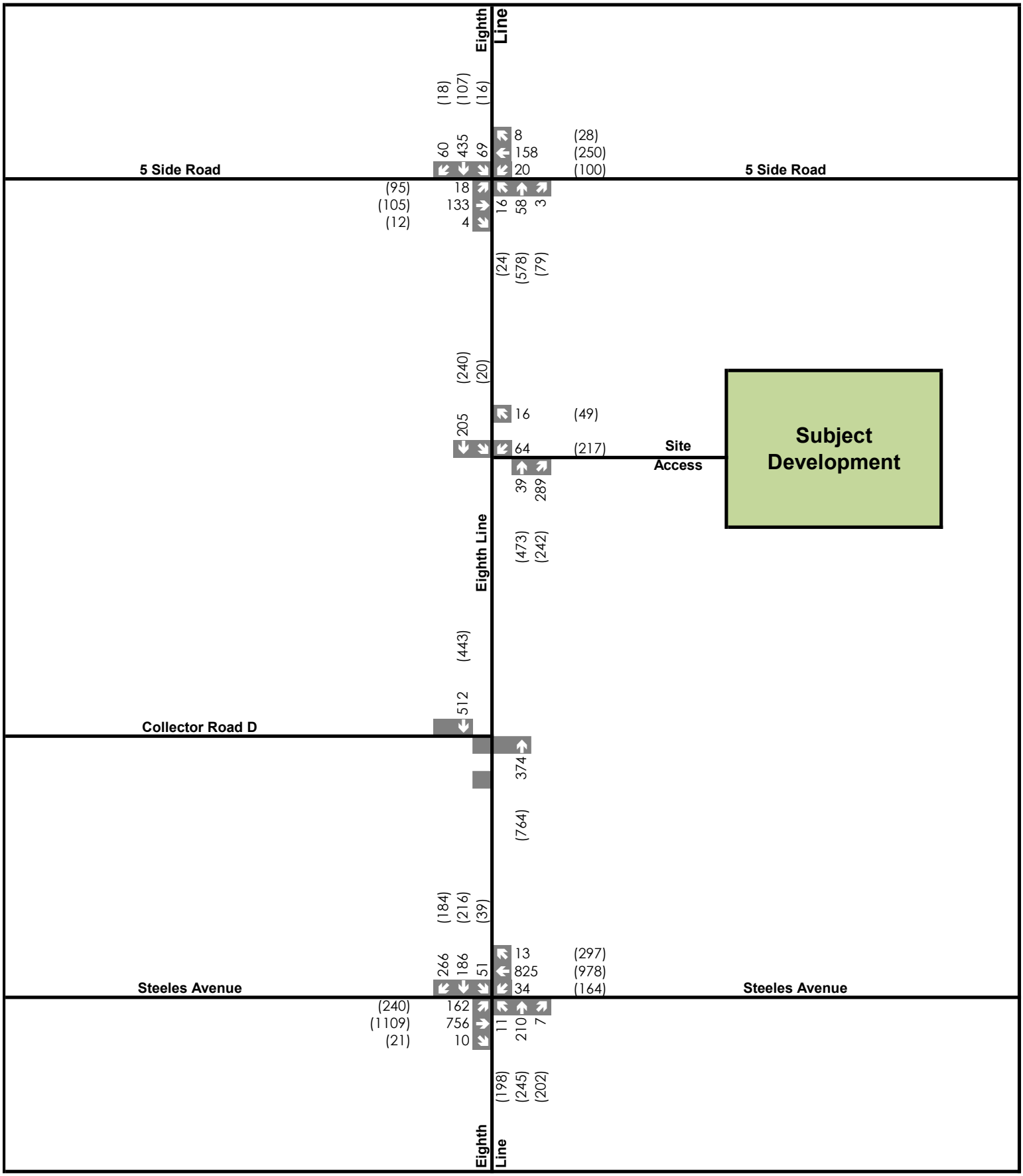
6.1 Intersection Operations

Traffic operations at the study intersections were analyzed with the addition of the site generated traffic to the Future Background traffic.

Table 13 and Table 14 summarize the 2031 Future Total traffic operations. Detailed capacity analyses are included in Appendix M. The 2031 Future Total Traffic Volumes are shown in Figure 9.



Legend	0 & 8673 Eighth Line	CROZIER CONSULTING ENGINEERS	Figure 8
xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes	Site Generated Traffic		Project No. 2742-7218 Date. 2024.12.13 Analyst. TDS



Legend	0 & 8673 Eighth Line	CROZIER CONSULTING ENGINEERS	Figure 9
xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes	2029 Future Total Traffic Volumes		Project No. 2742-7218 Date. 2024.12.13 Analyst. TDS

Table 13: 2031 Future Total Conditions

Intersection (Control)	Movement	Performance Metric					
		LOS		Delay (s)		v/c ratio	
		AM	PM	AM	PM	AM	PM
Eighth Line at Steeles Avenue (Signalized)	Overall	C	E	26.7	57.1	0.85	1.52
	EBL	B	D	19.3	54.0	0.55	0.83
	EBT	C	C	20.8	32.1	0.45	0.73
	EBT2	C	C	20.8	32.1	0.45	0.73
	EBT3	C	C	20.8	32.1	0.45	0.73
	EBR	A	A	0.1	0.1	0.02	0.04
	WBL	B	C	13.1	28.8	0.11	0.66
	WBT	C	C	29.9	32.3	0.71	0.70
	WBT2	C	C	29.9	32.3	0.71	0.70
	WBT3	C	C	29.9	32.3	0.71	0.70
	WBR	A	A	0.2	5.1	0.03	0.47
	NBL	C	D	34.5	45.4	0.04	0.48
	NBL2	C	D	34.5	45.4	0.04	0.48
	NBT	B	C	19.7	34.0	0.35	0.75
	NBR	B	C	19.7	34.0	0.35	0.75
	SBL	C	D	23.0	46.3	0.15	0.32
	SBTR	D	F	39.3	280.5	0.85	1.52
Eighth Line at Collector Road D	Overall	A	A	0.0	0.0	0.33	0.49
	EBLR	A	A	0.0	0.0	0.00	0.00
	NBL	A	A	0.0	0.0	0.00	0.00
	NBT	A	A	0.0	0.0	0.24	0.49
	SBTR	A	A	0.0	0.0	0.33	0.28
Eighth Line at Site Access	Overall	B	B	1.4	5.3	0.21	0.61
	WBLR	B	C	10.5	23.9	0.12	0.61
	NBT	A	A	0.0	0.0	0.21	0.46
	SBL	A	A	0.0	9.4	0.00	0.03
	SBT	A	A	0.0	0.0	0.13	0.15

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU).
Note 2: All v/c ratios higher than 0.85 for through movements and 0.95 for exclusive movements are highlighted, per Region of Halton TIS Guidelines

Table 14: Eighth Line at 5 Side Road Roundabout Future Total Level of Service

Weekday A.M. Peak Hour						Weekday P.M. Peak Hour					
Overall	App.[1]	Delay	LOS	V/C	95th % Queue[1]	Overall	App.[1]	Delay	LOS	V/C	95th % Queue[1]
Delay: 5.76s LOS: A	East	3.70s	A	0.18	~1	Delay: 7.57s LOS: A	East	8.62s	A	0.50	1
	North	6.99s	A	0.56	2		North	4.31s	A	0.16	~1
	South	3.80s	A	0.08	~1		South	8.78s	A	0.65	4
	West	4.90s	A	0.19	~1		West	4.09s	A	0.21	~1

Note 1: App. – Intersection Approach.
Note 2: Volume-to-capacity column for roundabouts displays ratio of flow to capacity ratio.
Note 3: The 95th Percentile Queue units are in vehicles.

The projected 2031 Future Total traffic operations within the study road network indicate that the study intersections are expected to operate adequately and similar to the Future Background conditions in the weekday a.m. and p.m. peak hours.

The intersection of Eighth Line at Steeles Avenue is forecast to be the most operationally constrained at a LOS "C" and "E" during the weekday a.m. and p.m. peak hours respectively. The main delays at the intersection are attributed to the shared southbound through-right turn lane. The provision of a single auxiliary southbound right-turn lane at the intersection is expected to significantly improve operations. This lane could be introduced as part of the planned 2028 Steeles Avenue widening or the 2031 Eighth Line widening (See Section 3.2.1). The prospective southbound auxiliary right-turn lane will be addressed in detail as part of future development applications, such as Site Plan or Zoning By-Law Amendment applications.

Compared to the Future Background conditions, the Future Total traffic operations are generally similar. A minor change in intersection LOS was recorded in the Future Total scenario when compared to the Future Background. Further, the projected control delay increment as a result of the site traffic additions is a slight increase at all study intersections during each of the peak hour periods considered with the exception of the southbound through and right-turn movements during the p.m. peak hour which had a considerable increase of control delay.

Under Future Total conditions, traffic operations are projected to remain effectively the same at the intersection of Eighth Line at 5 Side Road when compared to Future Background conditions. A LOS "A" is forecast in both weekday peak hours, with no capacity or queuing issues projected.

The proposed site access connection to Eighth Line is forecast to be operationally acceptable at a LOS "B" during the a.m. and p.m. peak hours. A maximum volume-to-capacity ratio of 0.61 is forecast at the intersection during the weekday peak hours. In addition, no queuing issues are projected at the access.

Based on the analysis and discussion, the study road network is predominantly operationally acceptable in the future based on the traffic model forecast.

6.2 Future Total Recommended Improvements

The addition of site generated traffic is expected to have a moderate impact on the operations of the intersections within the study area when compared to 2031 Future Background conditions. It is noted that the trip generation estimate is based on this preliminary yield approximation as discussed in Section 5.1.

At the intersection of Eighth Line at Steeles Avenue, the shared southbound through-right turn lane is expected to produce significant delay. The provision of a single auxiliary southbound right-turn lane at the intersection is expected to significantly improve operations. This lane could be introduced as part of the planned 2028 Steeles Avenue widening or the 2031 Eighth Line widening (See Section 3.2.1). The prospective southbound auxiliary right-turn lane will be addressed in detail as part of future development applications, such as Site Plan or Zoning By-Law Amendment applications.

Therefore, the application can be supported from a transportation perspective with consideration given to the potential auxiliary southbound right-turn lane at the intersection of Eighth Line at Steeles Avenue which will be reviewed in detail as part of future applications.

7.0 Parking & Loading Review

For the development of the Subject Site there is a requirement to provide minimum parking as outlined in the Town of Halton Hills Zoning By-Law 2010-0050. The assessment of parking and loading requirements is not required for the Official Plan Amendment application to expand the urban boundary. These aspects will be addressed in detail as part of future development applications, such as Site Plan or Zoning By-Law Amendment applications to confirm the adequacy of the proposed parking supply.

8.0 Sight Access Review

This section reviews the proposed Site Access at Eighth Line from a safety and operations perspective.

8.1 Sight Distance

The available sightlines at the existing full-moves access at Eighth Line were measured and compared to the standards set out in the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR). Sight distance was measured from the proposed site accesses using the following assumptions:

- A standard driver eye height of 1.08 metres for a passenger car; and
- A 5.4 metre setback from the approximate extension of the outer curb to represent a vehicle waiting to exit the site.

Intersection sight distance is calculated using equation 9.9.1 from the GDGCR as outlined below:

ISD = 0.278 * V major * tg

Where;

ISD = Intersection Sight Distance
V major = design speed of major roadway (km/h)
tg = assumed time gap for vehicles to turn from stop onto major roadway (s)

The posted speed limit on Eighth Line at the site frontage is 70 km/h. Therefore, a design speed of 80 km/h was conservatively assumed for the sight distance analysis.

Table 15 summarizes the required and available sight lines at the proposed site access. Figure 10 illustrates the sight lines at the site.

Table 15: Sight Distance Analysis

Feature	Site Access at Eighth Line (2031)
Access Type	Full-Moves
Posted Speed Limit of Roadway	70 km/h
Assumed Design Speed	80 km/h
Base Time Gap [1,2]	6.5 s (right) 7.5 s (left)
Grade of Roadway	Less than 3%
Horizontal Alignment of Roadway	Straight
Sight Distance Required [3]	Left Turn[3]: 170 m Right Turn[3]: 145 m
Measured Sight Distance	Left Turn: 200 + m Right Turn: 200 + m
Minimum Sight Distances Satisfied?	Yes

Note 1: Time gap for left-turning vehicles from a stop onto a highway and with a grade less than 3%. Value from Table 9.9.3 in the TAC-GDGCR.
Note 2: Time gap for right-turning vehicles from a stop onto a highway and with a grade less than 3%. Value from Table 9.9.5 in the TAC-GDGCR.
Note 3: Sight distance values calculated from Intersection Sight Distance equation 9.9.1 in the GDGCR.

As outlined in Table 15, the minimum sight distance requirements are satisfied at the proposed full-moves access at Eighth Line. Left turning egress vehicles have over 200 metres of sightline distance to the right. Right turning egress vehicles have over 200 metres of sightline distance to the left. Therefore, the proposed site access at Eighth Line meets sight distance requirements and provide sufficient visibility to drivers on the road.

FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION

LEGEND:
- REQUIRED SIGHT DISTANCE
- AVAILABLE SIGHT DISTANCE

No.	ISSUE	DATE: MM/DD/YYYY
0	ISSUED FOR SUBMISSION	12/13/2024

Project
0 & 8673 EIGHTH LINE
TOWN OF HALTON HILLS,
HALTON REGION

Drawing
SIGHT DISTANCE ANALYSIS

CROZIER CONSULTING ENGINEERS
211 YONGE STREET
SUITE 600
TORONTO, ON. M5B 1M4
416.477.3392 T
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

Drawn By: T.D.S.	Design By:	Project:	2742-7218
Check By: T.D.S.	Check By: B.B.	Scale: 1:1000	Drawing: FIG 10

9.0 Fiscal Impact Discussion

As identified in the sections above, the addition of site generated traffic is expected to have a moderate impact on the operations of the intersections within the study area and does not require significant new or additional infrastructure.

Eighth Line is planned to be widened by 2029 per the 2024 Town of Halton Hills Budget, and Steeles Avenue (Regional Road 8) is planned to be widened by 2028 per the Region of Halton 2025 Capital Budget. Section 6.2 recommends a Southbound Right Turn lane be added to the intersection of Eighth Line at Steeles Avenue, this could be accommodated during either the already planned 2029 Eighth Line widening or the planned 2028 Steeles Avenue widening and is therefore not anticipated to have a significant financial impact.

The budgets allocated for the planned widening projects is shown in Table 5.

Table 16: Fiscal Impact

Road	Improvement	Span	Budget Allocated for Improvements	Buildout Horizon	Source
Eighth Line	Road Re-Construction	Steeles Avenue to Maple Avenue	$83,000,000	2025-2029	Town of Halton Hill 2024 Budget: Capital Budget and Forecast
Steeles Avenue	Widening from 4-6 Lanes	Trafalgar Road to Winston Churchill Boulevard	$51,551,000	2027-2028	Halton Region Budget and Business Plan Capital Report 2025

As shown in Table 5, the widening of Eighth Line and Steeles Avenue already has a budget allocated for the improvements, and the recommended southbound right turn lane at the intersection of Eighth Line at Steeles avenue can be accommodated as part of the widening,

Relevant excerpts from the Town of Halton Hill 2024 Budget: Capital Budget and Forecast and the Halton Region Budget and Business Plan Capital Report 2025 can be found in Appendix G.

10.0 Conclusion

The findings and recommendations of the Transportation Impact Study are summarized below:

- Under the 2024 existing conditions scenario:
    - The signalized study intersection of Eighth Line at Steeles Avenue is operating at a LOS "B" and "C" during the weekday a.m. and p.m. peak hours respectively. Furthermore, no movements were identified to have a critical volume-to-capacity ratios; and
    - The unsignalized study intersection of Eighth Line at 5 Side Road is operating at LOS "B" and "C" during the a.m. and p.m. peak hours, respectively. Furthermore, no movements were identified to have a critical volume-to-capacity ratios.
- Under 2031 Future Background conditions:
    - Multiple improvements are planned for the study area road network including:
        - Eighth Line is to be widened throughout the study area with a cross section of three lanes, encompassing on travel lane in each direction and centre two-way left turn lane;
        - The intersection of Eighth Line at 5 Side Road is proposed to become a roundabout. Lastly, a new Collector Road D is proposed to form an intersection with Eighth Line approximately 1.2 km north of Steeles Avenue;
        - A new Collector Road D is proposed to form an intersection with Eighth Line approximately 1.2 km north of Steeles Avenue; and
        - Steeles Avenue (Regional Road 8) will be widening from four to six lanes.
    - The study intersections are projected to operate acceptably at a LOS "C" or better, with no movements exceeding the critical volume-to-capacity thresholds of the Town.
- The potential industrial development is forecasted to generate 349 two-way (268 inbound and 81 outbound) trips during the weekday morning peak hour, and a trip generation of 368 (103 inbound and 265 outbound) trips during the weekday afternoon peak hour. It is noted that the trip generation estimate is based on this preliminary yield approximation and will be refined as part of subsequent applications.
- Under 2031 Future Total conditions:
    - The projected 2031 Future Total traffic operations within the study road network indicate that the study intersections are operating adequately and similar to the Future Background conditions in the weekday a.m. and p.m. peak hours;
    - The intersection of Eighth Line at Steeles Avenue is forecast to be the most operationally constrained at a LOS "C" and "E" during the weekday a.m. and p.m. peak hours respectively;

- The main delays at the intersection are attributed to the shared southbound through-right turn lane. The provision of a single auxiliary southbound right-turn lane at the intersection is expected to significantly improve operations. This lane could be introduced as part of the planned 2028 Steeles Avenue widening or the 2031 Eighth Line widening. The prospective southbound auxiliary right-turn lane will be addressed in detail as part of future development applications, such as Site Plan or Zoning By-Law applications; and

- The remaining study intersections are expected to operate well, with a LOS "B" or better being expected in the weekday peak hours and no queuing or capacity issues identified for the development of these lands; and

- A sight line assessment was conducted for the potential industrial development. The assessment confirmed that sight lines are expected to be adequate and will allow for efficient vehicle movements within and around the site.

In conclusion, the proposed employment uses at 0 & 8673 Eighth Line in the Town of Halton Hills, Region of Halton, can be supported from a transportation perspective given the effects of the trip generation estimates can be mitigated effectively.

Should you have any questions or require any further information, please do not hesitate to contact the undersigned.

Respectfully submitted,

C.F. CROZIER & ASSOCIATES INC.

Brandon Bradt, M.Eng. CEM, P.Eng.
Manager, Transportation

C.F. CROZIER & ASSOCIATES INC

Theshantha De Silva, E.I.T.
Engineering Intern, Transportation

ADR / AH / TDS
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