Premier Gateway Phase 1B Employment Area Secondary Plan Transportation Study

Paradigm Transportation Solutions Limited

July 2017

Project Summary

Project Number
150770

July 2017

Client
Town of Halton Hills
c/o Macaulay Shiomi Howson Ltd
600 Annette Street,
Toronto, Ontario, M6S 2C4

Client Contact
Lorelei Jones, MCIP, RPP
Principal
Macaulay Shiomi Howson Ltd

Consultant Project Team
Gene Chartier, M.A.Sc., P.Eng., FITE
Andrew Evans, M.Sc.
Peter Kelly, EIT

Paradigm Transportation Solutions Limited
22 King Street South Suite 300
Waterloo ON N2J 1N8
p: 519.896.3163
www.ptsl.com

Premier Gateway Phase 1B Employment Area Secondary Plan Transportation Study

List of Revisions

Version	Date	Description
1	5 July 2017	Draft for Comment

Signatures

Signature

Disclaimer

Executive Summary

Content

The Premier Gateway Phase 1B Employment Area Secondary Plan Study is developing appropriate land use designations and policies for the Phase 1B Employment Area and identifying the location of up to 75 hectares of land to be designated for employment and added to the Premier Gateway Employment Area. The subject lands are bounded by Steeles Avenue to the south, Eighth Line to the east, Sixth Line to the west, and agricultural lands to the north (approximately 1250 metres north of Steeles Avenue). The lands are predominantly agricultural land uses currently, and bisected by Trafalgar Road and Hornby Road.

The Town of Halton Hills initiated the **Premier Gateway Phase 1B Employment Area Secondary Plan Transportation Study** as part of the broader Secondary Plan study. The primary focus of the Study is the identification of road network improvements required to serve the proposed Premier Gateway Phase 1B development. The plan also outlines the internal road network and provides direction for transit, walking and cycling use.

Development Concept

The proposed Premier Gateway Phase 1B development comprises a mix of commercial and employment uses. The land mass is approximately 300 hectares (741 acres) in size, with approximately 156.3 hectares of industrial park (386.4 acres) and 35,600 square metres of commercial space (383,200 square feet). The subject lands are forecast to generate approximately 3,535 trips (2,855 inbound and 680 outbound) during the AM peak hour, and 4,720 trips (1,375 inbound and 3,345 outbound) during the PM peak hour at build out.

The plan shows two (2) primary road connections providing access to/within the secondary plan lands:

- Street A is proposed to extend from Steeles Avenue, opposite existing Sixth Line South, to Hornby Road.
- Street B is proposed to connect Eighth Line to Steeles Avenue, with an intersection on Trafalgar Road approximately 500 metres north of Steeles Avenue. The new road would intersect Steeles Avenue about 350 metres west of Trafalgar Road.

Existing Transportation Network

The Premier Gateway Phase 1B lands are served by a comprehensive road network featuring arterial, collector and local roads. The more significant routes serving the area – Steeles Avenue, Trafalgar Road and Ninth Lane – are under Halton Region jurisdiction. The remaining roads are under the

jurisdiction of the Town of Halton Hills. The subject lands are also proximate to Highway 401 and Highway 407.

The area is not well served by non-auto modes currently.

Conclusions

The following conclusions are drawn from the analyses completed for the Premier Gateway Phase 1B Secondary Plan Transportation Study:

- The existing road network serving the Premier Gateway Phase 1B lands is currently operating at satisfactory levels of service and within capacity, expect for a few locations where localized improvements would resolve critical movements.
- Several improvements to the road network will be required in the later horizon years (2026 and 2031) to serve the considerable volume of background traffic growth anticipated due to the increase in the population of Halton Region.
- The Premier Gateway Phase 1B lands are forecasted to generate approximately 3,540 trips during the AM peak hour and 4,720 trips during the PM peak hour at build-out. When combined with background traffic growth, the existing road network will need expansion to serve projected demands.
- Most significant road improvements will not be required until the 2026 horizon year, which is assumed to be 60% build out of the Premier Gateway Phase 1B lands. Further expansion will then be required by 2031, given background and development traffic forecasts and assuming full build out is achieved as planned.
- The more significant road improvement projects required to serve projected background and development traffic volumes, and the recommended timing for implementation, include:
  - Widening of Ninth Line widening from 2 to 4 lanes between Steeles Avenue and 5 Sideroad (by 2021)
  - Widening of Steeles Avenue from 4 to 6 lanes between Trafalgar Road and Ninth Line (by 2026)
  - Widening of 5 Sideroad from 2 to 4 lanes between Trafalgar Road and Ninth Line (by 2026)
  - Widening of Trafalgar Road from 2 to 4 lanes between Steeles Avenue and 5 Sideroad (by 2026)
  - Widening of Steeles Avenue from 4 to 6 lanes between Fifth Line and Trafalgar Road (by 2031)
  - Widening of Trafalgar Road from 4 to 6 lanes between Steeles Avenue and 5 Sideroad (by 2031)
  - Construction of new 6-lane 5½ Line between Britannia Road and Steeles Avenue (by 2031)

Many of these projects are already programmed in the 2017-2026 Halton Region Transportation Capital Forecast.

- Several of the identified intersection improvements can likely be constructed as part of broader corridor widening projects.
- Several intersections already or are projected to warrant traffic control signals, including:
  - Steeles Avenue and Sixth Line South/Street A
  - Trafalgar Road and Hornby Road
  - 5 Sideroad and Eighth Line
  - Steeles Avenue and Street B/Street C
  - Trafalgar Road and Street B
- The Study Area is not well served by non-auto modes currently. Targeted measures will be needed to facilitate and preserve the opportunity for use of more sustainable transportation options in the future.

Recommendations

Based on the foregoing, it is recommended that:

- The Premier Gateway Phase 1B development proceed in phases, subject to the provision of required infrastructure improvements to support the planned phase of development.
- A more detailed implementation plan be prepared once the development phasing strategy is better defined to articulate the timing of required infrastructure improvements.
- Opportunities to leverage planned road infrastructure improvements by Halton Region be pursued and the phasing plan for the Premier Gateway Phase 1B lands take these into consideration.
- A TDM program be implemented for the Premier Gateway Phase 1B lands to minimize vehicular traffic generation.

Contents

Appendices

Figures

Tables

1 Introduction

1.1 Study Background and Purpose

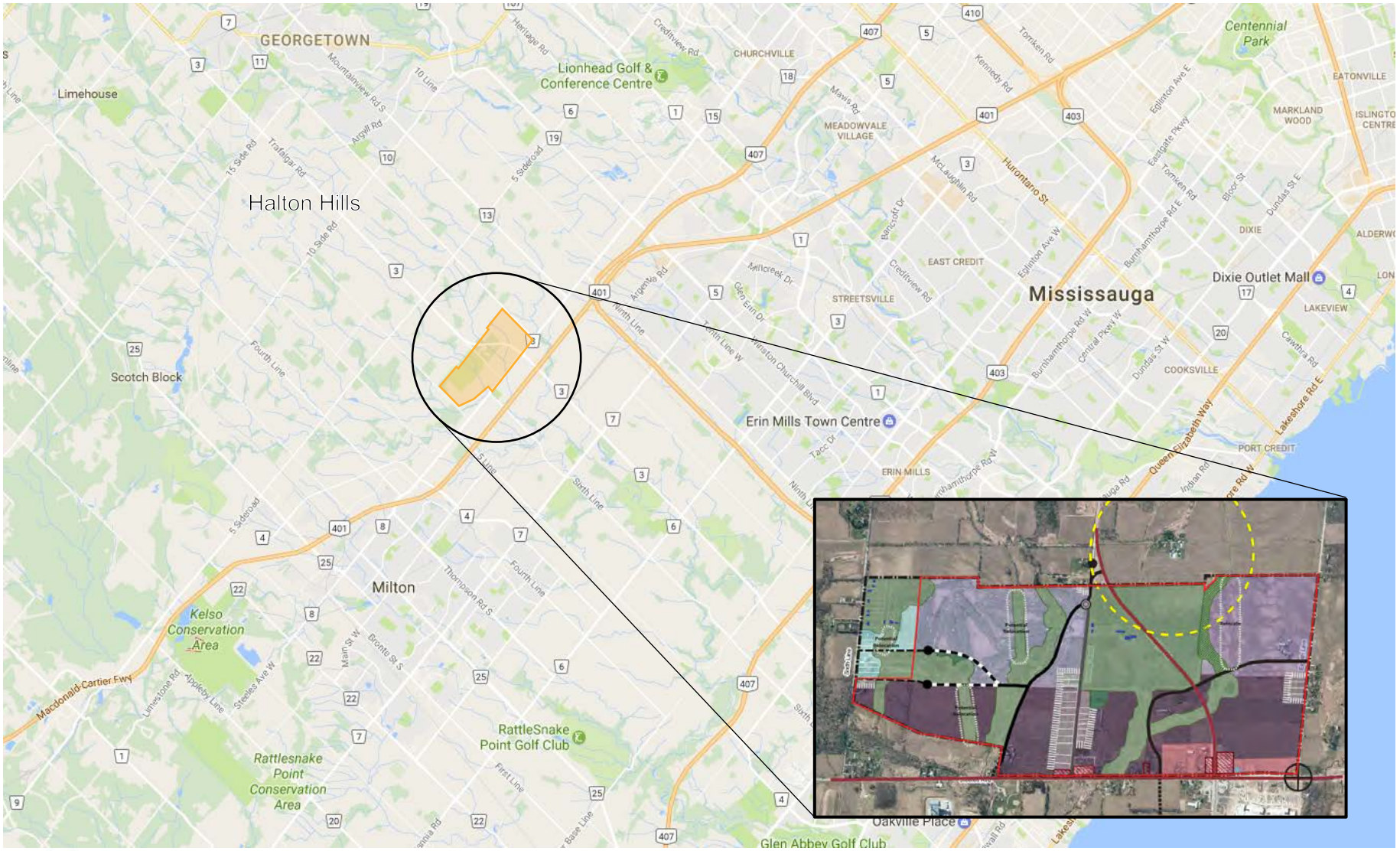
The Premier Gateway Employment Area is currently the Town of Halton Hills' major employment area. It is located between Steeles Avenue and Highway 401 in the south-eastern part of the municipality.

The Town, in conformity with the Halton Region Official Plan, has proposed through Town of Halton Hills Official Plan Amendment 10 (OPA 10) to designate an additional 340 gross hectares (840 acres) of land for employment on the north side of Steeles Avenue. The Region and the Town have now had to reconsider the location of the proposed expansion of the Employment Area. Lands which were previously to be designated for employment east of the Toronto Premium Outlets within the Town's Premier Gateway Employment Area will be unavailable for development until the GTA West Corridor Environmental Assessment process is completed by the Ministry of Transportation and it is determined what lands are/are not required for transportation purposes. It is anticipated that a significant amount of this land will be permanently precluded from development to accommodate a large highway interchange.

With the introduction of corridor protection for the GTA West Corridor, and the re-phasing of employment lands by the Region, the Town needs to re-phase the employment lands in the Premier Gateway Employment Area. This is being accomplished by modifications to OPA 10. However, the re-phasing does not entirely replace the employment lands made unavailable for development because of the GTA West Corridor protection. There is a shortfall of designated employment land prior to 2021, which must be identified and planned for in this area of Halton Hills.

The Premier Gateway Phase 1B Employment Area Secondary Plan Study is developing appropriate land use designations and policies for the Phase 1B Employment Area and identifying the location of up to 75 hectares of land to be designated for employment and added to the Premier Gateway Employment Area. **Figure 1.1** illustrates the location of the subject lands (herein referred to as the Premier Gateway Phase 1B), which are bounded by Steeles Avenue to the south, Eighth Line to the east, Sixth Line to the west, and agricultural lands to the north (approximately 1250 metres north of Steeles Avenue). The lands are predominantly agricultural land uses currently, and bisected by Trafalgar Road and Hornby Road.

The Town initiated the **Premier Gateway Phase 1B Employment Area Secondary Plan Transportation Study** (herein referred to as the Study) as part of the broader Secondary Plan study. The primary focus of the Study is the identification of road network improvements required to serve the proposed Premier Gateway Phase 1B development. The plan also outlines the internal road network and provides direction for transit, walking and cycling use.



Premier Gateway Phase 1B Area Context

Premier Gateway Phase 1B Employment Area Secondary Plan Transportation Study
150770

Figure 1.1

1.2 Study Area

The study area for the Transportation Master Plan, as shown in **Figure 1.2** (and herein referred to as the Study Area), encompasses transportation facilities likely to be impacted by the proposed development of Premier Gateway Phase 1B. The area is bound by Steeles Avenue to the south, Ninth Line to the east, Fifth Line to the west, and 5 Sideroad to the north.

1.3 Planning Context

1.3.1 Halton Region Transportation Master Plan

The Halton Region Transportation Master Plan (TMP)[1] – The Road to Change identifies the transportation policies, programs and infrastructure improvements required to support planned growth in Halton Region to the year 2031. The plan defines a sustainable, integrated transportation system that considers all modes of travel (automobiles, transit, cycling, walking) and supports the policies and objectives arising out of the Halton Region Official Plan Review (ROPA 38).

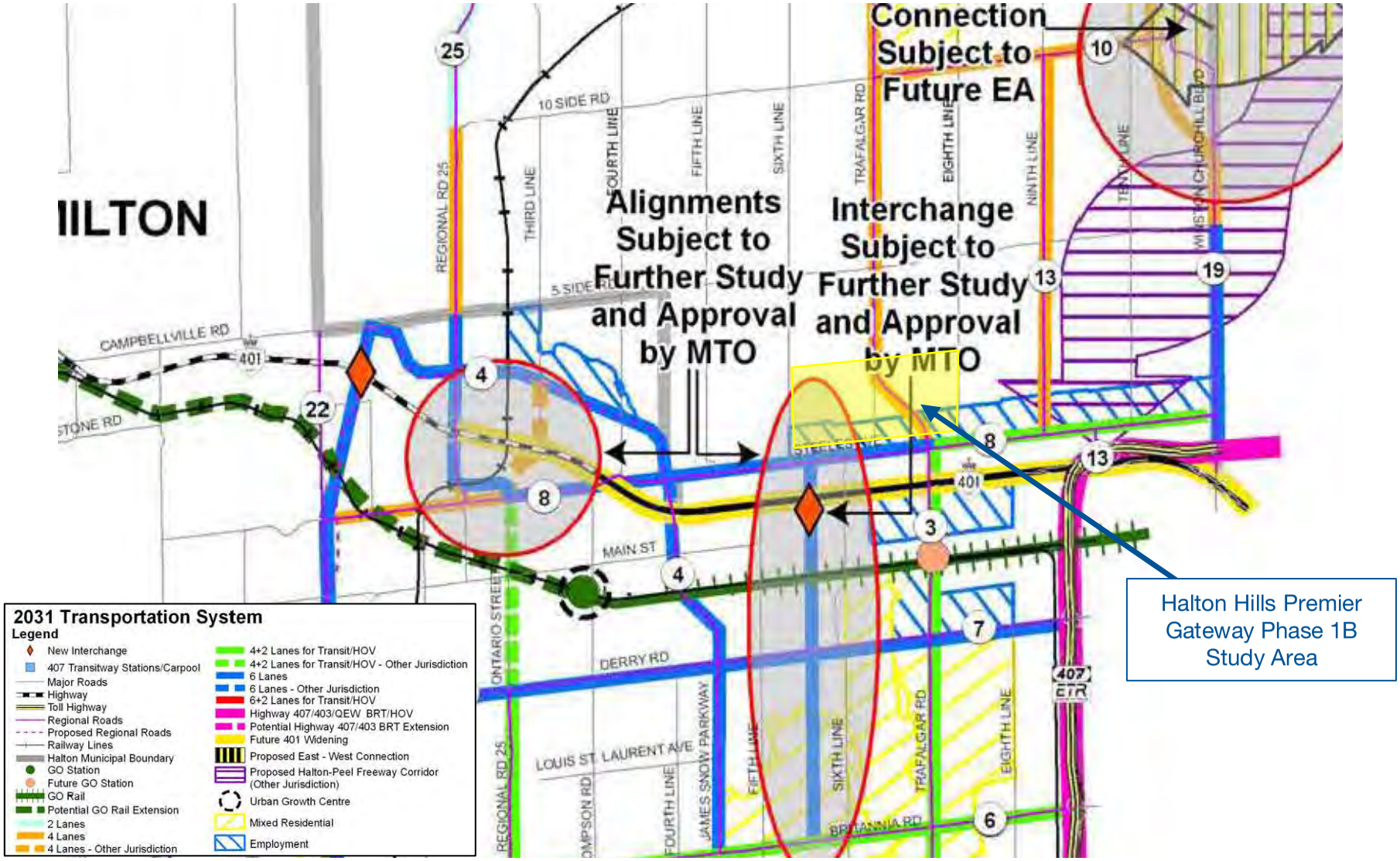
Figure 1.3 illustrates the proposed transportation network improvements identified in the TMP near the Study Area. Specific improvements and other initiatives of relevance denoted in the plan include:

- **Road Improvements:**
  - Widening of Steeles Avenue from 4 to 6 lanes from Regional Road 25 to Trafalgar Road beginning in 2025 (assumed complete by 2031), and addition of 2 transit (HOV) lanes from Trafalgar Road to Highway 407.
  - Widening of Trafalgar Road to 4 lanes from Steeles Avenue to Highway 7.
  - New 6-lane road corridor between Fifth and Sixth Lines, running from Steeles Avenue to Britannia Road (known as 5½ Line). Halton Region has initiated a Municipal Class Environmental Assessment (EA) study to identify the alignment for this new road, which is likely to include a Highway 401 interchange.
- **Transit** – The TMP recommends that transit-supportive land uses and densities be implemented among high priority and semi-exclusive transit corridors[1], such as Steeles Avenue. Additionally, the TMP assumes a significant increase in intra-regional transit, relying on the improvements recommended in the Metrolinx Regional Transit Plan[2].
- **Transportation Demand Management (TDM)** – The TMP targets a 3% reduction in auto trips through the implementation of TDM.

[1] Dillon Consulting and GHD, The Road to Change – Halton Region Transportation Master Plan, October 2011
[2] Metrolinx, The Big Move: Metrolinx Regional Transit Plan, November 2008

paradigm TRANSPORTATION SOLUTIONS LIMITED

Study Area



paradigm TRANSPORTATION SOLUTIONS LIMITED

Excerpt from Halton Region Transportation Master Plan

1.3.2 Halton Region Active Transportation Master Plan

In 2015, Halton Region released its Active Transportation Master Plan[3], which outlines the strategy, policies, infrastructure, programs and initiatives needed to achieve the active transportation targets for 2031 outlined in their TMP. This plan recommends the development of regional walking and cycling networks along major regional roads, as well as the creation of councils and education programs to promote the use of active transportation with Halton Region.

The Halton Region Active Transportation Master Plan recommends the following initiatives within the Study Area:

- **Regional Cycling Network** – Bike Lanes and Boulevard Multi-Use Trails along Steeles Avenue and Sixth Line (south of Steeles Avenue), and a Multi-Use Trail on Trafalgar Road (north of Steeles Avenue), as depicted in **Figure 1.4**.
- **Regional Walking Network** – Sidewalks and Boulevard Multi-Use Trails along Steeles Avenue, as shown in **Figure 1.5**.

1.3.3 Town of Halton Hills Transportation Master Plan

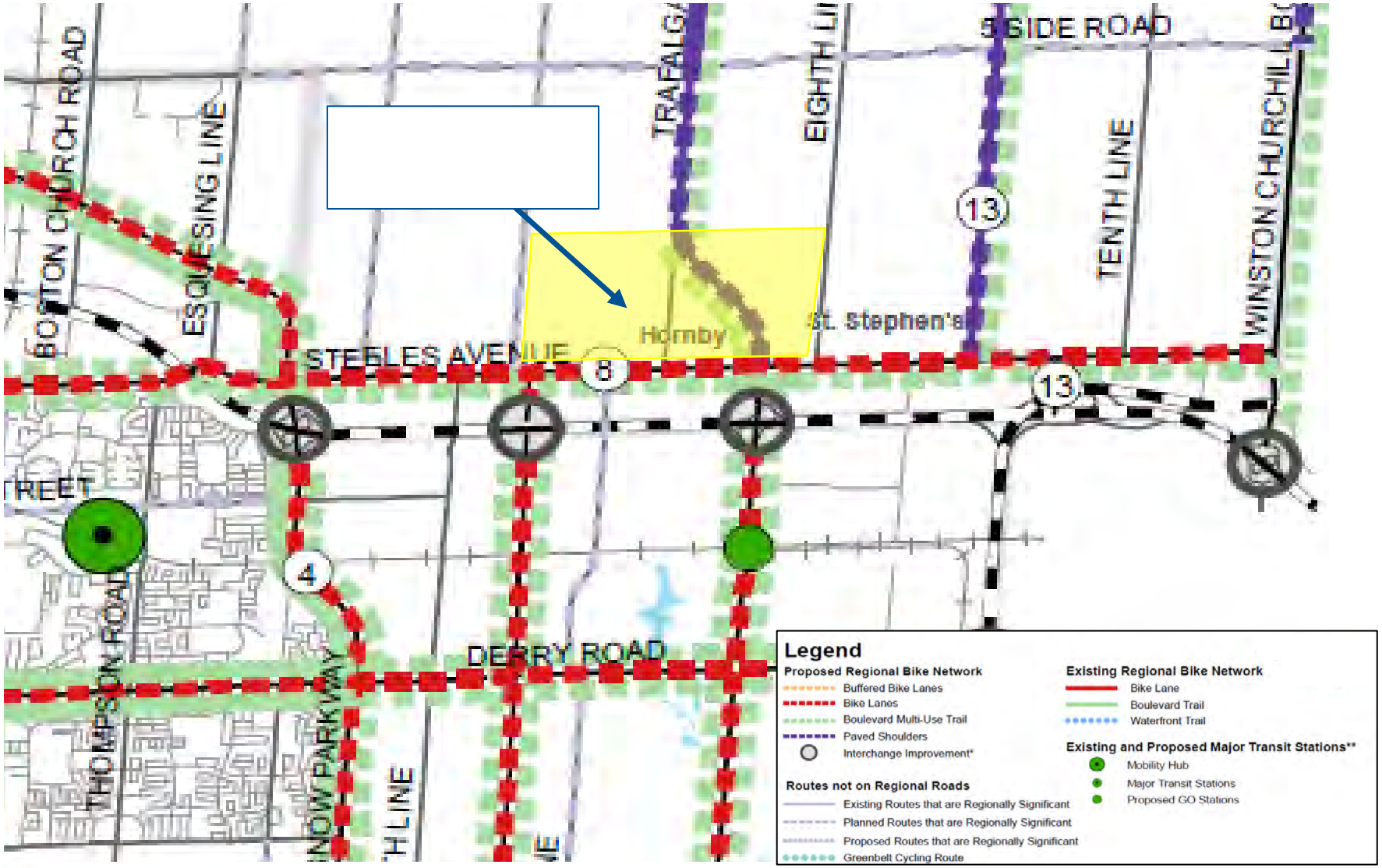
The 2011 Town of Halton Hills Transportation Master Plan[4] provides the strategies, policies and tools required to safely, effectively and cost efficiently meet the Town's transportation needs to the year 2031. The plan identifies an optimum transportation system that can accommodate the transportation needs of existing and future development within the municipality, including policies to promote transit and TDM.

1.3.4 Town of Halton Hills Cycling Master Plan

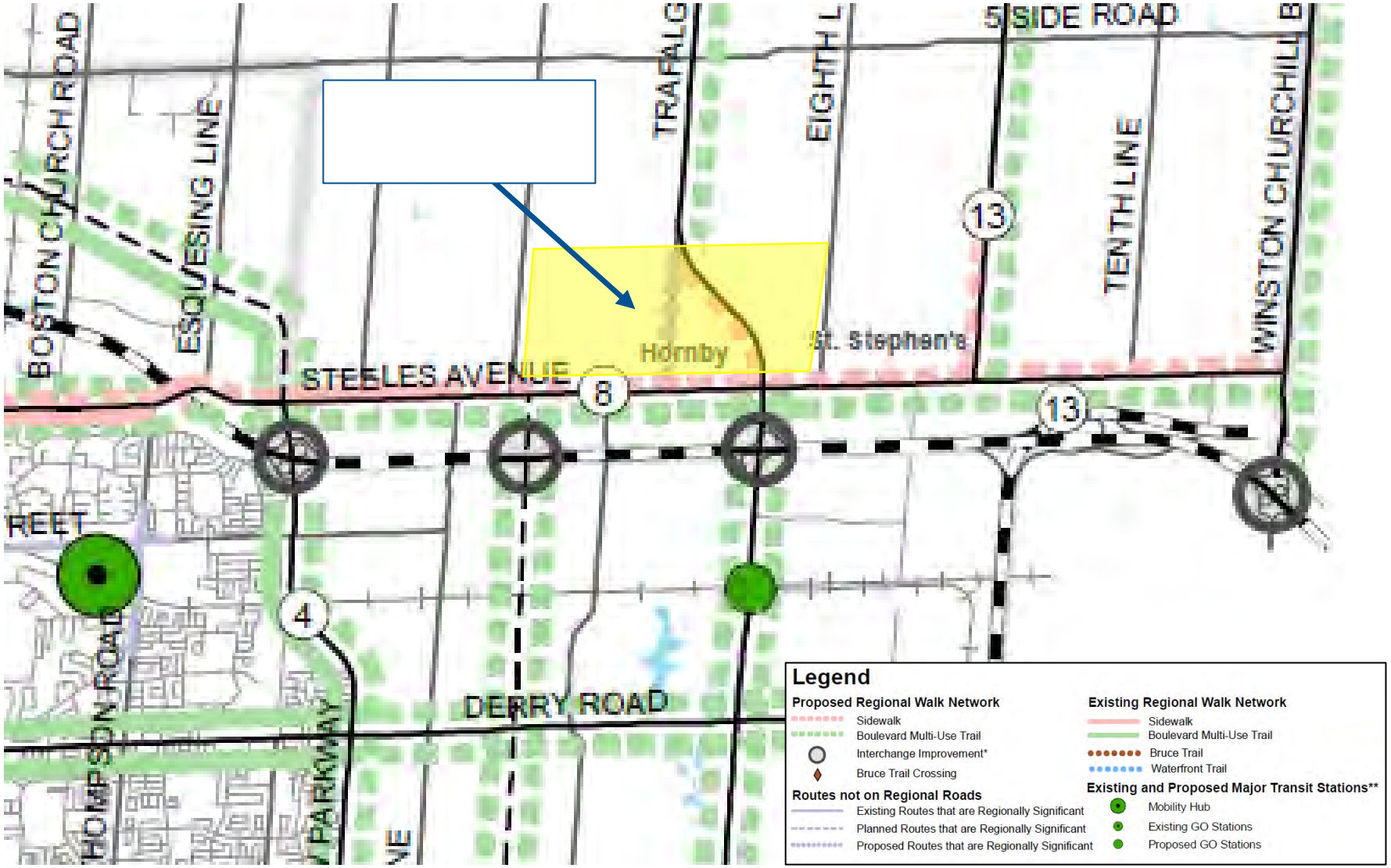
The 2010 Town of Halton Hills Cycling Master Plan[5] establishes short, mid and long-term actions and recommendations that support and encourage an improved level of cycling activity for residents and visitors within the Town. The plan provides a comprehensive, two-tiered Town-wide cycling network of both on-road and off-road routes, and outlines cycling supportive programs to the year 2021.

Within the Study Area, Steeles Avenue has been identified as an on-road component of the cycling network consistent with the Halton Region Active Transportation Master Plan.

[3] IBI Group, Halton Region Active Transportation Master Plan, May 2015
[4] Hatch Mott and McDonald and Halcrow, Town of Halton Hills Transportation Master Plan, November 2011
[5] MMM Group, Town of Halton Hills Cycling Master Plan, December 2010



Excerpt from Halton Region Active Transportation Master Plan – Cycling Network



Excerpt from Halton Region Active Transportation Master Plan – Walking Network

1.3.5 Trafalgar Road Class EA

In 2016, Halton Region completed a Schedule C Municipal Class EA for the Trafalgar Road corridor from Steeles Avenue to Highway 7[6]. The recommended undertaking for Trafalgar Road between Steeles Avenue and north of 10 Side Road includes:

- Widening Trafalgar Road from 2 to 4 lanes to adjoin the existing 4-lane section at Steeles Avenue, as well as the intersection at 5 Side Road.
- Providing active transportation facilities, as follows:
  - From Steeles Avenue to Hornby Road: 3.0 metre bi-directional multi-use path on the east side, 1.8 metre exclusive bike lane on the east side, 1.5 m paved shoulder on the west side available for use by cyclists.
  - From Hornby Road to north of 10 Side Road: 3.0 metre bi-directional multiuse path on the east side only and with 1.5 metre paved shoulder in each direction.

1.3.6 Ninth Line Corridor Study

In 2014, the Halton Region undertook a Municipal Class EA for the Ninth Line corridor from Highway 407 to 10 Sideroad[7]. The technically preferred design involves:

- Widening Ninth Line from 2 to 4 lanes, with auxiliary left turn lanes at 5 Side Road.
- Providing for cyclists and pedestrians in the form of 1.5 metre on-road bicycle lanes on both sides, and a 3.0 metre multi-use path on one side of the road.

The study also recommended that Ninth Line North and South (of Steeles Avenue) not be realigned due to the development freeze placed on the Premier Development Gateway Employment Area through Regional Official Plan Amendment 43 and Town of Halton Hills Official Plan Amendment 21. The report suggested that "the Region and the Town of Halton Hills may decide to assess this option in the future when more is known about the route that the GTA West corridor will take and the development freeze is lifted"[8].

1.4 Technical Analysis Approach

The technical analyses for the Study were conducted in accordance with the Transportation Impact Study guidelines for Halton Region (Town of Halton

[6] MMM Group, Trafalgar Road EA – Steeles Avenue to Highway 7, July 2016
[7] UEM, Class 'C' EA – Ninth Line Transportation Corridor Improvements from Highway 407 to 10 Side Road (Regional Road 10), May 2016
[8] Ibid, p. 106

Hills follows same guidelines). The general approach to completing the analyses is summarized as follows:

1. Establish base year traffic volumes for the Study Area intersections shown in **Figure 1.2** for the AM and PM peak hours based on observed count information (herein referred to as Existing Conditions). Saturday peak hour conditions were not studied since the proposed Premier Gateway Phase 1B development will be predominately employment uses, with most trips anticipated on weekdays.

2. Factor base year traffic volumes (Existing Conditions) to 2021, 2026, and 2031 horizon years using an average annual growth rate; and account for (add on) traffic generated by other planned development in proximity to the Study Area (herein referred to as Future Background Conditions).

3. Estimate traffic generated by the proposed Premier Gateway Phase 1B land uses based on data provided in the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (9th Edition)[9], with appropriate modifications; assign the trips to the Study Area network; and add the future background volumes (Future Background Conditions) to determine total traffic volumes for the 2021, 2026, and 2031 horizon years (herein referred to as Future Total Conditions).

4. Analyze Existing, Future Background and Future Total Conditions for the intersections within the Study Area to identify road network improvements required to serve the proposed development.

[9] Institute of Transportation Engineers, Trip Generation Manual, 9th Edition, 2012, Washington, D.C.

2 Existing Transportation Conditions

2.1 Existing System

2.1.1 Roads

The main roadways in the Study Area include:

- **Steeles Avenue (Regional Road 8)**, which is an east-west arterial road under Halton Region jurisdiction with a four-lane cross-section through most of the Study Area. Steeles Avenue connects to Mississauga and Brampton in the east, and Milton in the west. It has a posted speed limit of 60 kilometres per hour. Key intersections along Steeles Avenue within the Study Area include Fifth Line, Trafalgar Road and Eighth Line.
- **Trafalgar Road (Regional Road 3)**, which is a north-south arterial road under Halton Region jurisdiction with a two-lane cross-section from 400 metres north of Steeles Avenue northwards, and a four-lane cross-section through the remainder of the Study Area. Trafalgar Road connects to Georgetown in the north, and Mississauga and Oakville in the south. It has a posted speed limit of 60 to 80 kilometres per hour. Key intersections along Trafalgar Road within the Study Area include Steeles Avenue and 5 Sideroad.
- **Ninth Line North (Regional Road 13)**, which is a north-south arterial road under Halton Region jurisdiction with a two-lane cross-section. Ninth Line provides access to local residential and agricultural properties, and connects to Georgetown in the north. It has a posted speed limit of 80 kilometres per hour. Key intersections along Ninth Line within the Study Area include Steeles Avenue and 5 Sideroad.
- **Hornby Road**, which is a north-south local road under Town of Halton Hills jurisdiction with a two-lane cross-section. Hornby Road provides access to local residential dwellings, as well as the Hornby Glen Golf Course. It has a posted speed limit of 60 kilometres per hour.
- **Fifth Line**, which is a north-south rural road under Town of Halton Hills jurisdiction with a two-lane cross-section. Fifth Line predominantly provides access to local residential and agricultural properties. At its south end, access is provided to various industrial properties. It has a posted speed limit of 60 kilometres per hour.
- **Sixth Line**, which is a north-south rural road under Town of Halton Hills jurisdiction with a two-lane cross-section. Sixth Line predominantly provides access to local residential and agricultural properties. It has a posted speed limit of 70 kilometres per hour.
- **Eighth Line**, which is a north-south rural road under Town of Halton Hills jurisdiction with a two-lane cross-section. Eighth Line provides access to local residential and agricultural properties, and connects

to Georgetown in the north. It has a posted speed limit of 70 kilometres per hour.

- **5 Sideroad**, which is an east-west rural road under Town of Halton Hills jurisdiction with a two-lane cross-section. 5 Sideroad connects to northern Milton in the west and Brampton in the east. It has a posted speed limit of 50-80 kilometres per hour in the Study Area.

Figure 2.1 shows the lane configurations and traffic control provisions for the signalized and unsignalized intersections within the Study Area.

2.1.2 Transit

The Town of Halton Hills does not currently provide conventional transit services within the municipality. "ActiVan" Accessible Transit service is available for both seniors age 65 and older, and individual with disabilities living within Halton Hills. The service operates Monday through Friday from 8:30 AM to 4:30 PM.

A carpool lot with approximately 500 parking spaces is located on the east side of Trafalgar Road, 250 metres south of Steeles Avenue. The lot is currently being relocated to the west side of the road with the construction of a parking garage for the Toronto Premier Outlets mall.

2.1.3 Active Transportation

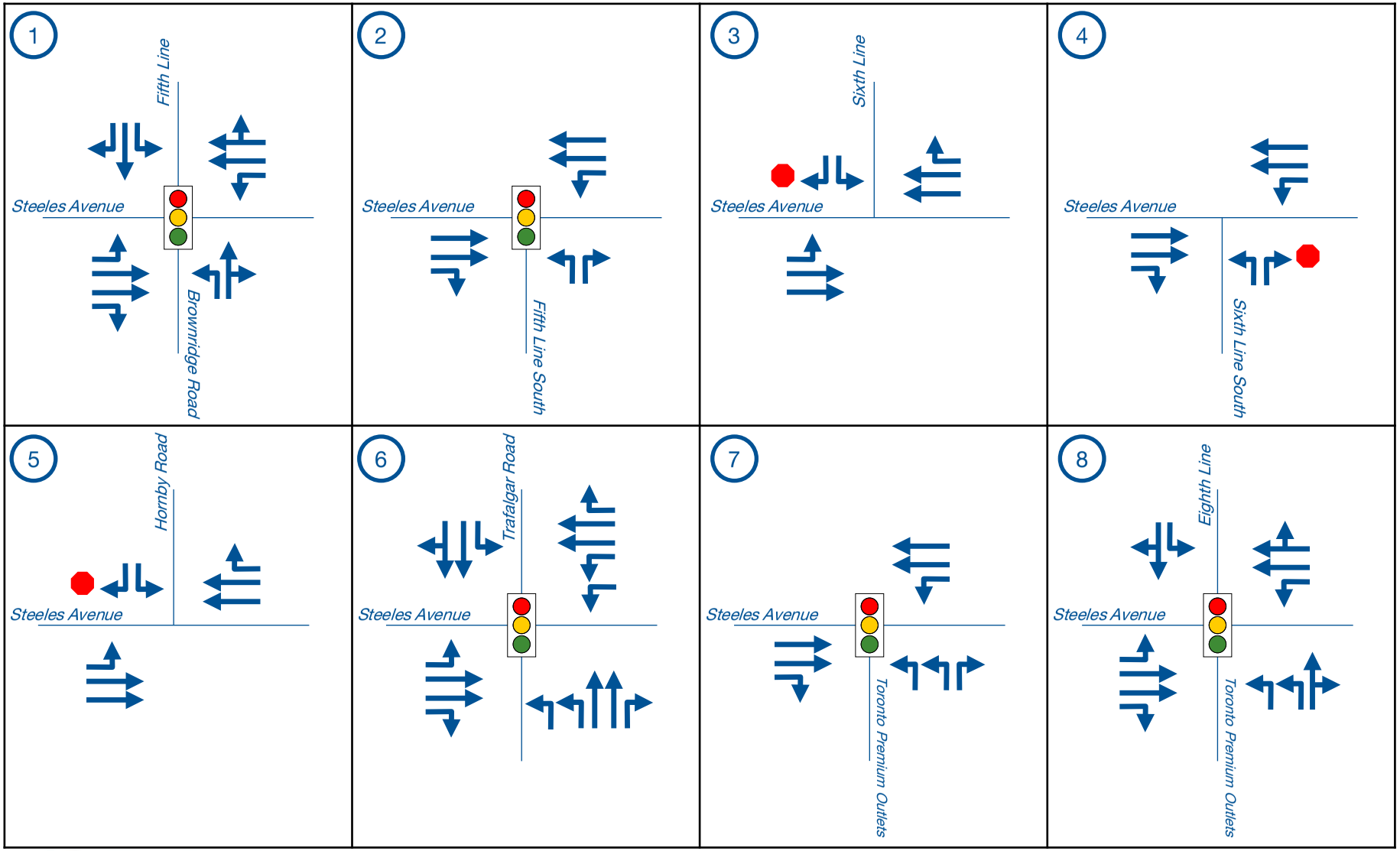
Minimal pedestrian and cycling infrastructure is currently available within the Study Area, making it less conducive to travel by active transportation modes. Facilities are present only on Steeles Avenue, intermittently, from Fifth Line North to Fifth Line South (on the north side of the street), from Hornby Road to 80 metres east of Hornby Road, and from 250 metres west of Trafalgar Road to 400 metres east of Eighth Line (on the south side of the street primarily).

2.2 Existing Traffic Volumes

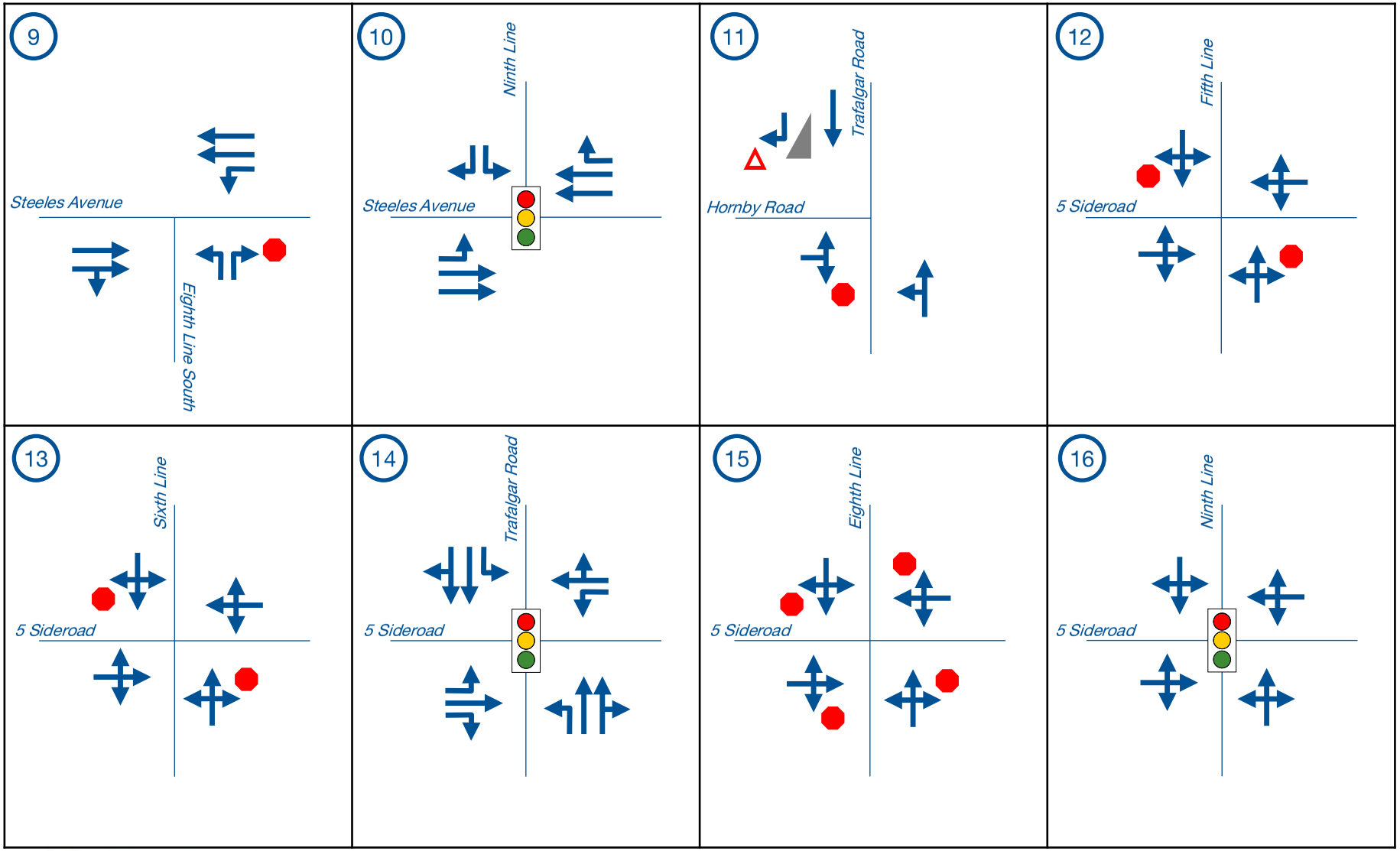
Paradigm collected turning movement counts for most Study Area intersections during the weekday morning and afternoon peak hours in December 2016 and May 2017. The Town of Halton Hills provided count data for all other intersections, from 2014 and 2015. **Table 2.1** shows the count date for each intersection.

For traffic counts dated 2014 and 2015, turning movement distributions were used to synthesize volumes matching traffic flows at adjacent intersections. At the intersection of Steeles Avenue and Sixth Line South, the 2014 count was utilized due to ongoing construction on Steeles Avenue and the temporary road closure of Sixth Line South.

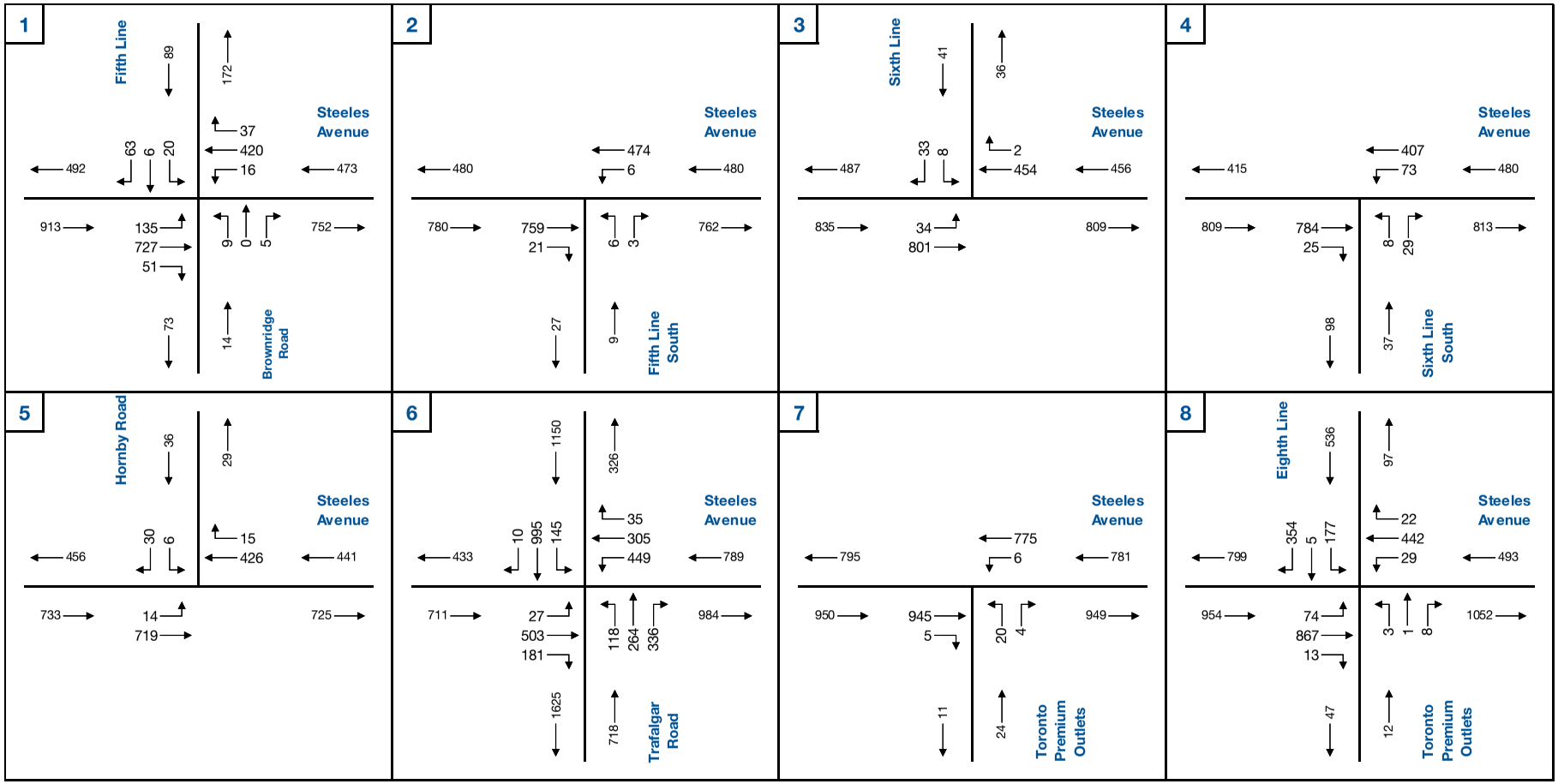
Figures 2.2 and **2.3** display the Existing Conditions traffic volumes. **Appendix A** contains the detailed traffic counts.



Existing Lane Configuration and Intersection Control (1)

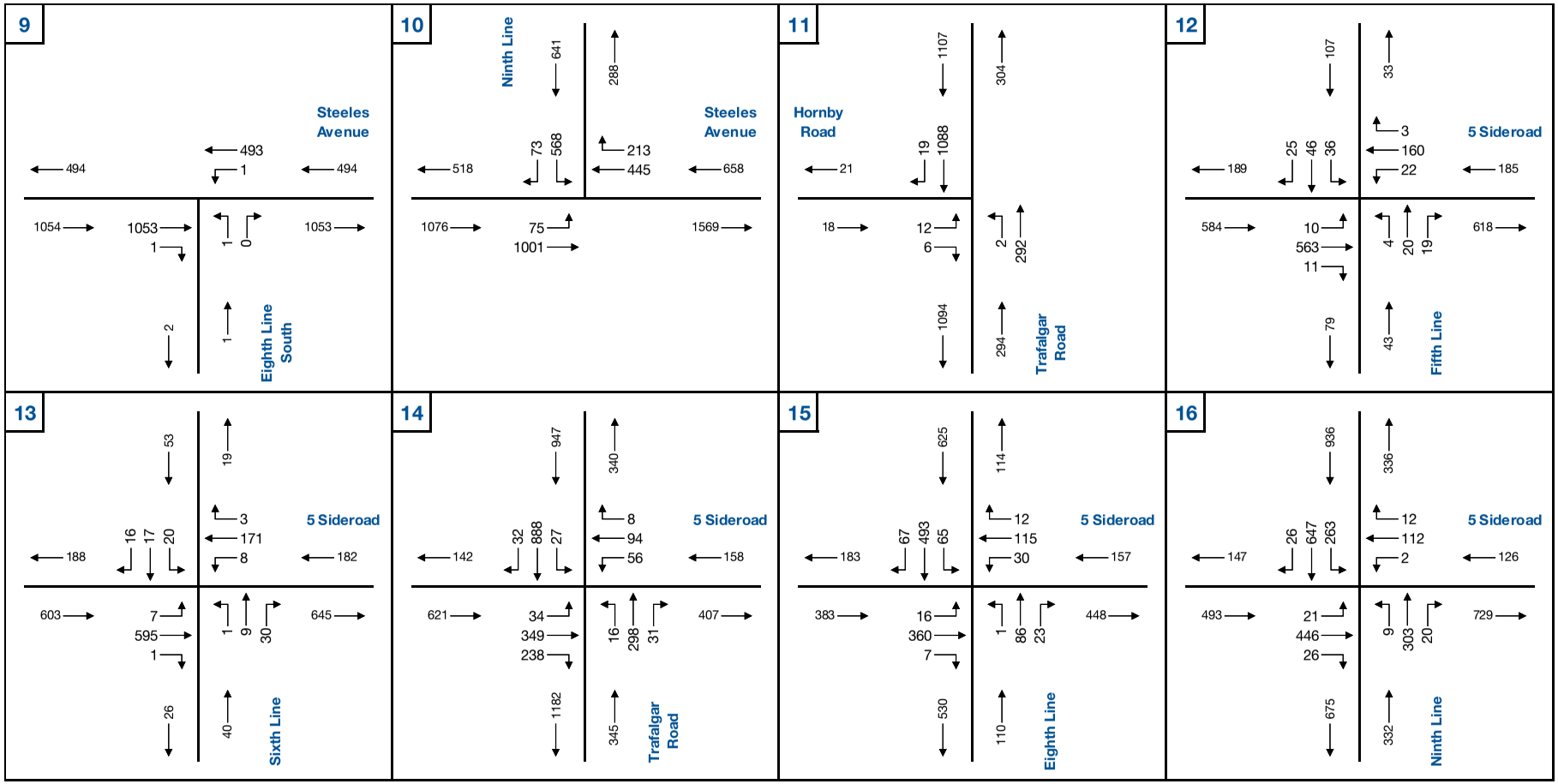


Existing Lane Configuration and Intersection Control (2)



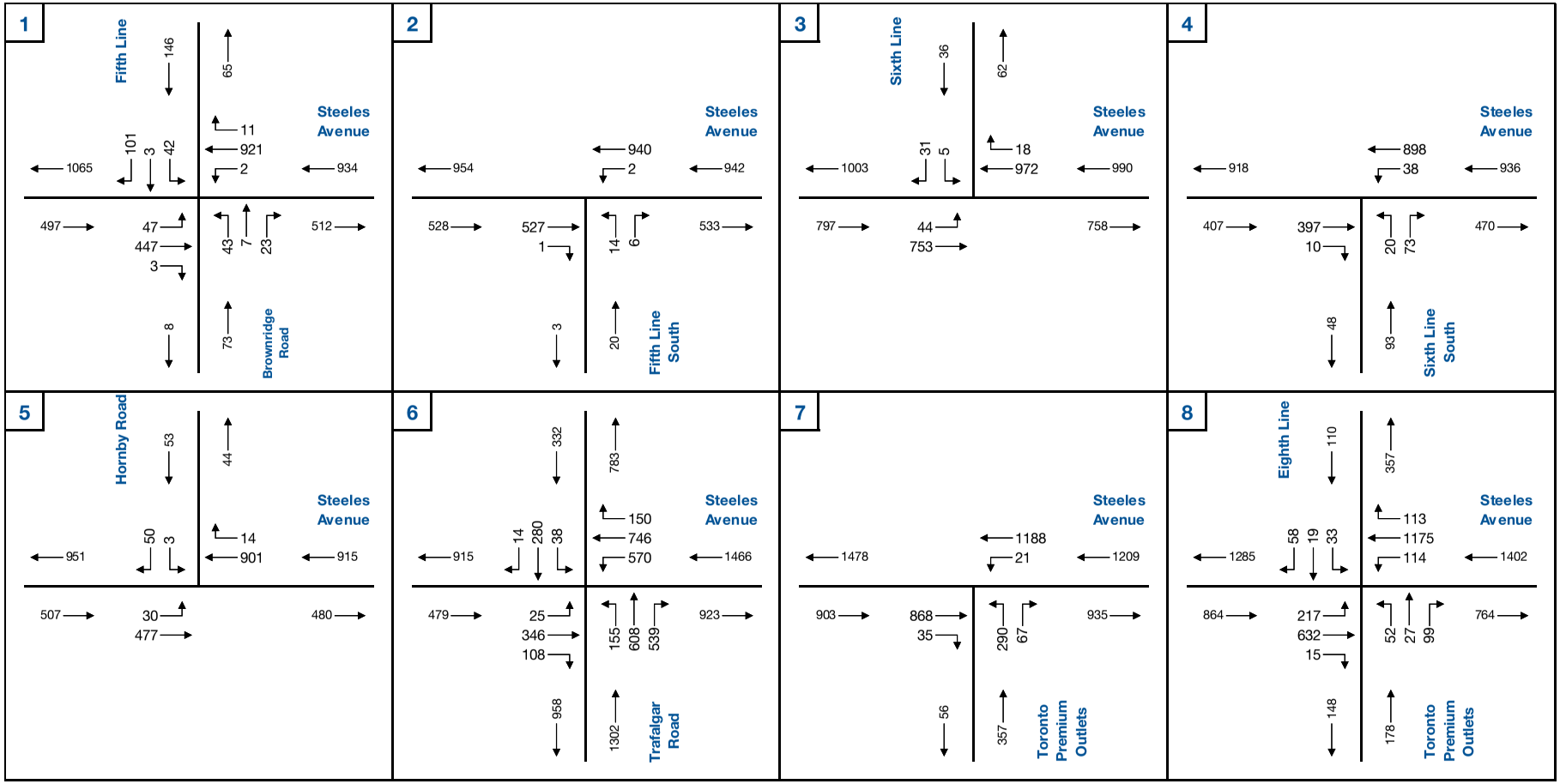
Existing AM Peak Hour Traffic Volumes (1)

Figure 2.2a



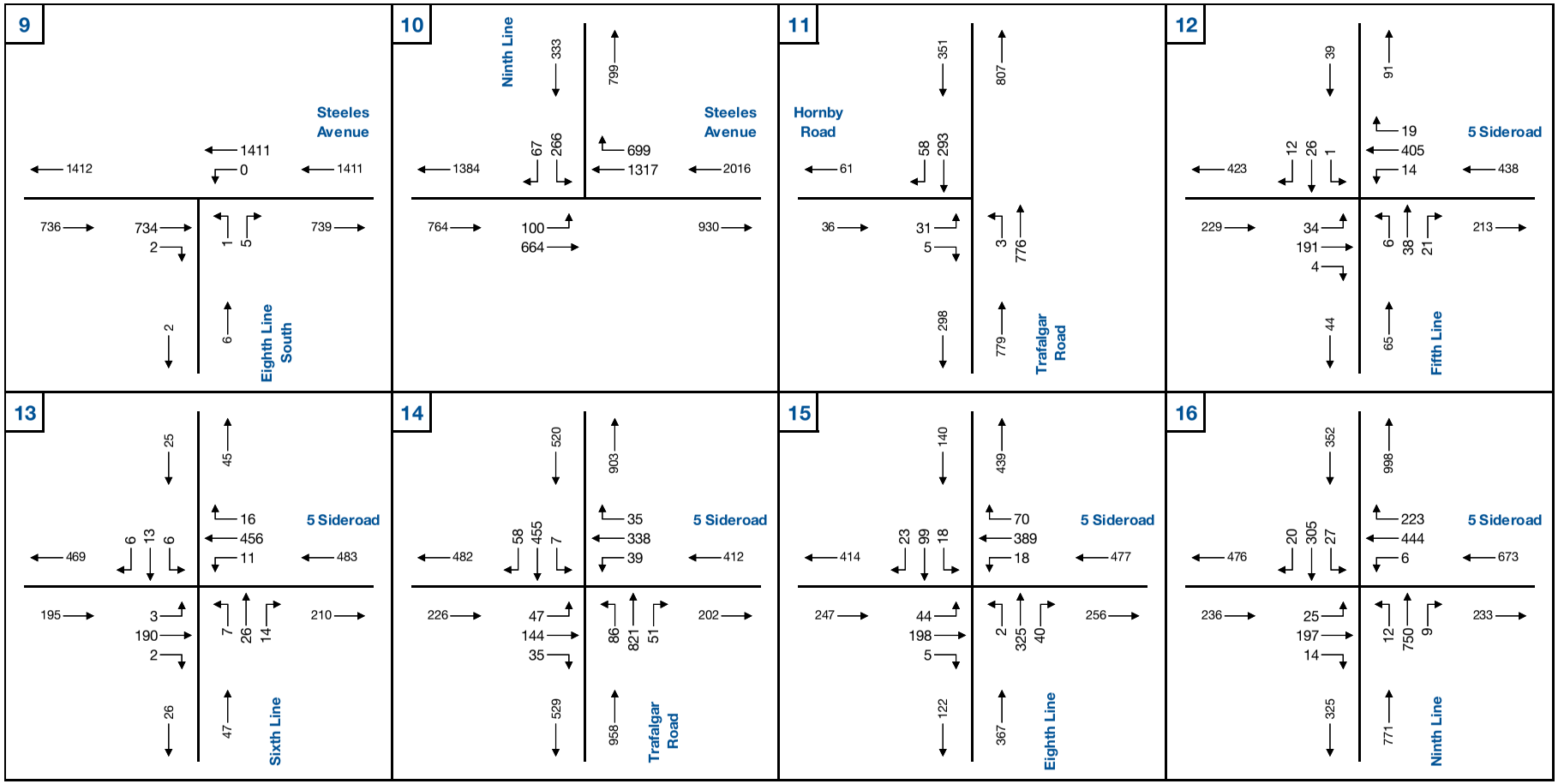
Existing AM Peak Hour Traffic Volumes (2)

Figure 2.2b



Existing PM Peak Hour Traffic Volumes (1)

Figure 2.3a



Existing PM Peak Hour Traffic Volumes (2)

Figure 2.3b

TABLE 2.1: TRAFFIC COUNT DATES

Intersection	Count Date
1. Steeles Avenue & Fifth Line/Brownridge Road	2017-05-04
2. Steeles Avenue & Fifth Line South	2017-05-04
3. Steeles Avenue & Sixth Line	2017-05-04
4. Steeles Avenue & Sixth Line South	2014-11-04
5. Steeles Avenue & Hornby Road	2017-05-04
6. Steeles Avenue & Trafalgar Road	2017-05-16
7. Steeles Avenue & Toronto Premium Outlets	2016-12-13
8. Steeles Avenue & Eighth Line/Toronto Premium Outlets	2017-05-04
9. Steeles Avenue & Eighth Line South	2017-05-04
10. Steeles Avenue & Ninth Line	2017-05-04
11. Trafalgar Road & Hornby Road	2017-05-04
12. 5 Sideroad & Fifth Line	2016-12-13
13. 5 Sideroad & Sixth Line	2016-12-13
14. 5 Sideroad & Trafalgar Road	2015-05-27
15. 5 Sideroad & Eighth Line	2014-09-23
16. 5 Sideroad & Ninth Line	2015-05-26

2.3 Existing Traffic Conditions

2.3.1 Methodology

Intersection capacity analyses were completed for intersections within the Study Area to assess existing and future operating conditions, identify potential traffic impacts due to the proposed Premier Gateway Phase 1B development, and confirm future infrastructure requirements. The analyses were undertaken based on Highway Capacity Manual (HCM) methodologies and used Synchro 9 software.

Signalized Intersections

For signalized intersections, operation analysis focuses on performance measures such as level of service (LOS), volume-to-capacity ratios (v/c) and control delay (measured in seconds). LOS is a qualitative measure of operational performance based on control delay. LOS A is represented by a control delay of less than 10 seconds per vehicles (referred to as free-flow operating conditions), while LOS F is represented by a control delay greater than 80 seconds per vehicles (referred to as restricted flow operating conditions). In determining the LOS performance for signalized intersections, the average control delay per vehicle is estimated for each lane group, and aggregated for each approach and for the entire intersection.

Table 2.2 provides the criteria specified in the Halton Region Transportation Impact Study Guidelines for determining acceptable signalized intersection operations. The Town of Halton Hills typically follows the same guidelines. Individual movements experiencing a v/c ratio greater than the values specified in the table are deemed to be "critical" in terms of operation, indicating that the movement may be considered for geometric or other improvement, such as signal optimization.

TABLE 2.2: CRITICAL MOVEMENT CRITERIA

Jurisdiction	Critical Movement Criteria	
	Signalized Intersection	Unsignalized Intersection
Halton Region	Through >0.85	LOS on Individual Movements > D
	Shared Through/ Turning >0.85	95th Percentile Queue > Exceed Storage
	Exclusive Turn >0.95	
	95th Percentile Queue > Exceed Storage	
Town of Halton Hills	Same as Halton Region	Same as Halton Region

Unsignalized Intersections

For unsignalized intersections, LOS is determined by the computed or measured control delay and is defined for each minor ("critical") movement. In determining the performance of unsignalized intersections, the average control delay per vehicle is estimated for each lane group and aggregated for each approach. Control delay includes the initial deceleration delay, queue move-up time, stopped delay and the final acceleration delay. The LOS criteria for unsignalized intersections are somewhat different than the criteria used for signalized intersections, primarily because different transportation facilities create different driver perceptions. The expectation is that a signalized intersection is designed to carry higher volumes of traffic and experience greater delay than that of an unsignalized intersection.

Table 2.2 also notes the criteria specified in the Halton Region guidelines for determining acceptable unsignalized intersection operations. LOS F occurs where there are not enough gaps of suitable size to allow the minor street demand to safely cross, turn into or through, traffic on the major street. This is evident from long control delays experienced by minor street traffic and by queuing on the minor street approaches. LOS E represents effective capacity of a movement.

Caution should be exercised when using the HCM methodology to assess unsignalized intersections. Even under low-volume traffic conditions, the HCM delay equation will often predict greater than 50 seconds of delay (LOS F) for unsignalized intersections that permit minor street left-turn

movements. LOS F is commonly predicted regardless of the volume of minor street left-turning traffic. The HCM notes that "even with a LOS F estimate, most low volume minor-street approaches would not meet any of the Manual on Uniform Traffic Control Devices (MUTCD) volume or delay warrants for signalization. As a result, analysts that use the HCM level of service thresholds to determine the design adequacy of two-way stop controlled intersections should do so with caution."

2.3.2 Traffic Operations with Existing Lane Configurations

Intersection capacity analyses were undertaken to assess existing peak hour traffic conditions for the Study Area intersections with existing lane configurations. The parameters used in the analysis included:

- Heavy vehicle percentages as derived from the collected traffic counts.
- Current traffic signal timings for the signalized intersections as provided by Halton Region. Signal timings for the Steeles Avenue and Fifth Line South intersection were not available, so were assumed based on the surrounding signal timings.
- Synchro default values for all other inputs.

Tables 2.3 and **2.4** summarize the analysis results for the AM and PM peak hours with existing traffic volumes, respectively (**Figures 2.2** and **2.3**). The tables denote LOS, delay, v/c ratios and 95% queue length for the Study Area intersections**. Appendix B** provides the Synchro analysis output. The following critical movements were identified:

- **Steeles Avenue and Trafalgar Road:**
  - The westbound left movement operates at LOS F (v/c = 1.10) during the AM peak hour.
- **Steeles Avenue and Eighth Line/Toronto Premium Outlets:**
  - The westbound shared through-right movement operates at LOS D (v/c = 0.93) during the PM peak hour.
  - The southbound left-turn lane 95th percentile queue length exceeds available storage by 55 metres during the AM peak hour.
- **Steeles Avenue and Ninth Line:**
  - The westbound through movement operates at LOS F (v/c = 1.13) during the PM peak hour.
  - The southbound left-turn lane 95th percentile queue length exceeds available storage by 75 metres during the AM peak hour.
- **5 Sideroad and Eighth Line:**
  - The southbound shared left-through-right movement operates at LOS F (v/c = 1.04) during the AM peak hour.

- **5 Sideroad and Ninth Line:**
  - The eastbound shared left-through-right movement operates at LOS D (v/c = 0.85) during the AM peak hour.
  - The westbound shared left-through-right movement operates at LOS E (v/c = 0.99) during the PM peak hour.
- **Steeles Avenue and Sixth Line:**
  - The southbound left-turn movement operates at LOS E (v/c = 0.04) during the PM peak hour.

2.3.3 Traffic Operations with Remedial Measures

The operational analyses of existing traffic conditions identified critical movements at six (6) intersections within the Study Area currently. The following improvements were incorporated to address these concerns:

- **Steeles Avenue and Eighth Line/Toronto Premium Outlets:**
  - Extension of the southbound left-turn lane storage to 60 metres
- **Steeles Avenue and Ninth Line:**
  - Addition of a second southbound left-turn lane with 90 metres storage
- **5 Sideroad and Eighth Line:**
  - Installation of traffic control signals. **Figure 2.4** shows that signals are warranted at the intersection based on Ontario Traffic Manual Book 12 (Traffic Signals)[10] justifications.
- **5 Sideroad and Ninth Line:**
  - Addition of a westbound right-turn lane with 30 metres storage
  - Addition of a southbound left-turn lane with 40 metres storage

No remedial measures are recommended at the other two (2) intersections.

Table 2.5 summarizes the capacity analyses completed for the intersections with the above-noted improvements, based on the existing AM and PM peak hour traffic volumes. **Appendix C** provides the Synchro analysis output. The table illustrates that the intersections would operate at satisfactory levels of service if these road improvements were implemented.

[10] Queen's Printer for Ontario, Ontario Traffic Manual Book 12 (Traffic Signals), March 2012

TABLE 2.3: EXISTING AM PEAK HOUR TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																	
				Eastbound				Westbound				Northbound				Southbound				OVERALL
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	
AM Peak Hour	1 - Steeles Avenue and Fifth Line/Brownridge Road	TCS	LOS	A	A	A	A	A	A	A	A	C	C	C	C	D	C	C	C	A
			Delay	4	4	3	4	3	4	4	4	34	34	34	34	35	34	34	34	6
			V/C	0.21	0.33	0.03		0.04	0.24	0.24		0.08	0.00	0.00		0.20	0.03	0.04		
			Q	13	29	3		2	17	17		5	0	0		9	4	10		
			Ex	150	800	70		50	650	650		35	250	250		50	250	50		
			Avail	137	771	67		48	633	633		30	250	250		41	246	40		
	2 - Steeles Avenue and Fifth Line South	TCS	LOS		A	A	A	A	A		A	D		D	D					A
			Delay		2	2	2	2	2		2	43		40	42					3
			V/C		0.32	0.01		0.01	0.22			0.19		0.00						
			Q		29	2		1	17			5		3						
			Ex		600	600		60	450			20		400						
			Avail		571	598		59	433			15		397						
	3 - Steeles Avenue and Sixth Line	TWSC	LOS	A	A		A		A	A	A					D		A	B	
			Delay	8	0		0		0	0	0					29		10	14	1
			V/C	0.03	0.24				0.13	0.00						0.05		0.04		
			Q	1	0				0	0						1		1		
			Ex	60	400				900	30						30		500		
			Avail	59	400				900	30						29		499		
	4 - Steeles Avenue and Sixth Line South	TWSC	LOS		A	A	A	A	A		A	D		B	C					
			Delay		0	0	0	10	0		2	28		11	15					1
			V/C		0.23	0.01		0.09	0.12			0.05		0.05						
			Q		0	0		2	0			1		1						
			Ex		800	30		60	500			30		350						
			Avail		800	30		58	500			29		349						
	5 - Steeles Avenue and Hornby Road	TWSC	LOS	A	A		A		A	A	A					C		A	B	
			Delay	8	0		0		0	0	0					18		10	11	0
			V/C	0.01	0.21				0.13	0.01						0.02		0.04		
			Q	0	0				0	0						1		1		
			Ex	60	450				850	30						30		500		
			Avail	60	450				850	30						29		499		
	6 - Steeles Avenue and Trafalgar Road	TCS	LOS	D	D	D	D	F	C	C	F	E	C	C	C	C	D	D	D	D
			Delay	35	49	40	46	130	33	30	88	56	27	27	32	22	44	44	41	51
			V/C	0.12	0.74	0.19		1.10	0.34	0.02		0.53	0.22	0.22		0.27	0.83	0.83		
			Q	10	80	22		102	45	0		25	39	22		33	185	185		
			Ex	115	850	50		140	250	75		100	300	100		250	500	500		
			Avail	105	770	28		38	205	75		75	261	78		217	315	315		
	7 - Steeles Avenue and Toronto Premium Outlets	TCS	LOS		B	B	B	B	B		B	C		C	C					B
			Delay		17	12	17	11	13		13	24		24	24					15
			V/C		0.54	0.00		0.03	0.42			0.02		0.00						
			Q		99	2		2	63			4		2						
			Ex		250	250		50	150			40		40						
			Avail		151	248		48	87			36		38						
	8 -Steeles Avenue and Eighth Line/Toronto Premium Outlets	TCS	LOS	A	B	A	B	B	B	B	B	D	C	C	C	E	C	C	D	C
			Delay	8	15	10	14	11	14	14	14	42	24	24	29	63	34	34	44	22
			V/C	0.14	0.52	0.01		0.09	0.32	0.32		0.06	0.01	0.01		0.82	0.24	0.24		
			Q	12	87	0		6	45	45		2	4	4		75	28	28		
			Ex	110	150	65		125	850	850		135	200	200		20	500	500		
			Avail	98	63	65		119	805	805		133	196	196		-55	472	472		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

TABLE 2.3: EXISTING AM PEAK HOUR TRAFFIC OPERATIONS (CONTINUED)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																
				Eastbound				Westbound				Northbound				Southbound				OVERALL
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	
AM Peak Hour	9 - Steeles Avenue and Eighth Line South	TWSC	LOS		A	A	**A**	A	A		**A**	D		A	**D**					**0**
			Delay		0	0	**0**	10	0		**0**	28		0	**28**					
			V/C		0.41	0.21		0.00	0.14			0.01		0.00						
			Q		0	0		0	0			0		0						
			Ex		800	800		90	500			30		500						
			Avail		800	800		90	500			30		500						
	10 - Steeles Avenue and Ninth Line	TCS	LOS	B	C		**C**		C	C	**C**					D		B	**C**	**C**
			Delay	15	22		**22**		26	22	**25**					36		18	**34**	**26**
			V/C	0.20	0.66				0.42	0.14						0.81		0.06		
			Q	15	100				52	16						165		9		
			Ex	65	500				750	75						90		500		
			Avail	50	400				698	59						-75		491		
	11 - Trafalgar Road and Hornby Road	TWSC	LOS	D		D	**D**					A	A		**A**		A	A	**A**	**0**
			Delay	30		30	**30**					0	0		**0**		0	0	**0**	
			V/C	0.11		0.11						0.00	0.00				0.65	0.65		
			Q	3		3						0	0				0	0		
			Ex	500		500						500	500				500	500		
			Avail	497		497						500	500				500	500		
	12 - 5 Sideroad and Fifth Line	TWSC	LOS	A	A	A	**A**	A	A	A	**A**	C	C	C	**C**	C	C	C	**C**	**4**
			Delay	0	0	0	**0**	1	1	1	**1**	17	17	17	**17**	21	21	21	**21**	
			V/C	0.01	0.01	0.01		0.02	0.02	0.02		0.12	0.12	0.12		0.32	0.32	0.32		
			Q	0	0	0		1	1	1		3	3	3		11	11	11		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	500	500	500		499	499	499		497	497	497		489	489	489		
	13 - 5 Sideroad and Sixth Line	TWSC	LOS	A	A	A	**A**	A	A	A	**A**	B	B	B	**B**	C	C	C	**C**	**2**
			Delay	0	0	0	**0**	1	1	1	**1**	14	14	14	**14**	17	17	17	**17**	
			V/C	0.01	0.01	0.01		0.01	0.01	0.01		0.09	0.09	0.09		0.15	0.15	0.15		
			Q	0	0	0		0	0	0		3	3	3		4	4	4		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	500	500	500		500	500	500		497	497	497		496	496	496		
	14 - 5 Sideroad and Trafalgar Road	TCS	LOS	C	D	C	**D**	C	C	C	**C**	A	B	B	**B**	A	B	B	**B**	**C**
			Delay	28	40	29	**35**	34	29	29	**30**	10	12	12	**12**	8	14	14	**14**	**21**
			V/C	0.11	0.75	0.22		0.41	0.22	0.22		0.06	0.21	0.21		0.05	0.50	0.50		
			Q	13	95	25		22	29	29		4	28	28		5	87	87		
			Ex	45	500	80		75	500	500		100	500	500		175	500	500		
			Avail	32	405	55		53	471	471		96	472	472		170	413	413		
	15 - 5 Sideroad and Eighth Line	TWSC	LOS	C	C	C	**C**	B	B	B	**B**	B	B	B	**B**	F	F	F	**F**	**45**
			Delay	23	23	23	**23**	13	13	13	**13**	12	12	12	**12**	71	71	71	**71**	
			V/C	0.70	0.70	0.70		0.31	0.31	0.31		0.21	0.21	0.21		1.04	1.04	1.04		
			Q	-	-	-		-	-	-		-	-	-		-	-	-		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	-	-	-		-	-	-		-	-	-		-	-	-		
	16 - 5 Sideroad and Ninth Line	TCS	LOS	D	D	D	**D**	B	B	B	**B**	B	B	B	**B**	F	F	F	**F**	**F**
			Delay	35	35	35	**35**	19	19	19	**19**	13	13	13	**13**	147	147	147	**147**	**86**
			V/C	0.85	0.85	0.85		0.20	0.20	0.20		0.39	0.39	0.39		0.65	0.65	0.65		
			Q	110	110	110		25	25	25		52	52	52		273	273	273		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	390	390	390		475	475	475		448	448	448		227	227	227		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

TABLE 2.4: EXISTING PM PEAK HOUR TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																	
				Eastbound				Westbound				Northbound				Southbound				OVERALL
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	
PM Peak Hour	1 - Steeles Avenue and Fifth Line/Brownridge Road	TCS	LOS	A	A	A	A	A	A	A	A	C	C	C	C	C	C	C	C	A
			Delay	4	4	3	4	3	5	5	5	34	32	32	33	34	32	32	33	8
			V/C	0.12	0.20	0.00		0.00	0.39	0.39		0.31	0.06	0.06		0.33	0.02	0.06		
			Q	6	17	0		1	40	40		15	8	8		15	3	13		
			Ex	150	800	70		50	650	650		35	250	250		50	250	50		
			Avail	144	783	70		49	610	610		20	242	242		35	247	37		
	2 - Steeles Avenue and Fifth Line South	TCS	LOS		A	A	A	A	A		A	D		D	D					A
			Delay		2	2	2	2	3		3	41		39	40					3
			V/C		0.22	0.00		0.00	0.36			0.20		0.00						
			Q		19	0		0	36			8		4						
			Ex		600	600		60	450			20		400						
			Avail		581	600		60	414			12		396						
	3 - Steeles Avenue and Sixth Line	TWSC	LOS	B	A		A		A	A	A					E		B	C	1
			Delay	11	0		1		0	0	0					37		12	16	
			V/C	0.06	0.22				0.29	0.01						0.04		0.06		
			Q	2	0				0	0						1		2		
			Ex	60	400				900	30						30		500		
			Avail	58	400				900	30						29		498		
	4 - Steeles Avenue and Sixth Line South	TWSC	LOS		A	A	A	A	A		A	C		A	B					1
			Delay		0	0	0	8	0		0	20		10	12					
			V/C		0.12	0.01		0.03	0.26			0.08		0.09						
			Q		0	0		1	0			2		2						
			Ex		800	30		60	500			30		350						
			Avail		800	30		59	500			28		348						
	5 - Steeles Avenue and Hornby Road	TWSC	LOS	A	A		A		A	A	A					D		B	B	1
			Delay	10	0		1		0	0	0					33		12	13	
			V/C	0.04	0.14				0.27	0.01						0.02		0.09		
			Q	1	0				0	0						1		2		
			Ex	60	450				850	30						30		500		
			Avail	59	450				850	30						29		498		
	6 - Steeles Avenue and Trafalgar Road	TCS	LOS	D	D	D	D	F	D	C	F	E	C	C	C	C	C	C	C	E
			Delay	36	43	39	42	244	41	31	119	56	25	26	29	23	28	28	28	67
			V/C	0.17	0.50	0.09		1.39	0.73	0.09		0.52	0.40	0.37		0.11	0.24	0.24		
			Q	9	53	11		138	110	15		31	84	34		12	43	43		
			Ex	115	850	50		140	250	75		100	300	100		250	500	500		
			Avail	106	797	39		2	140	60		69	216	66		238	457	457		
	7 - Steeles Avenue and Toronto Premium Outlets	TCS	LOS		B	B	B	B	B		B	C		C	C					B
			Delay		18	13	18	11	16		16	26		24	26					18
			V/C		0.53	0.02		0.07	0.62			0.26		0.04						
			Q		91	6		5	108			32		9						
			Ex		250	250		50	150			40		40						
			Avail		159	244		45	42			8		31						
	8 -Steeles Avenue and Eighth Line/Toronto Premium Outlets	TCS	LOS	C	C	B	C	B	D	D	D	D	C	C	C	D	D	D	D	C
			Delay	32	20	15	23	13	39	39	37	41	25	25	30	39	37	37	38	32
			V/C	0.75	0.45	0.01		0.26	0.93	0.93		0.19	0.12	0.12		0.19	0.12	0.12		
			Q	61	64	0		18	176	176		11	17	17		15	17	17		
			Ex	110	150	65		125	850	850		135	200	200		20	500	500		
			Avail	49	86	65		107	674	674		124	183	183		5	483	483		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

TABLE 2.4: EXISTING PM PEAK HOUR TRAFFIC OPERATIONS (CONTINUED)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																
				Eastbound				Westbound				Northbound				Southbound				OVERALL
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	
PM Peak Hour	9 - Steeles Avenue and Eighth Line South	TWSC	LOS		A	A	**A**	A	A		**A**	D		B	**C**					**0**
			Delay		0	0	**0**	0	0		**0**	34		11	**15**					
			V/C		0.29	0.15		0.00	0.41			0.01		0.01						
			Q		0	0		0	0			0		0						
			Ex		800	800		90	500			30		500						
			Avail		800	800		90	500			30		500						
	10 - Steeles Avenue and Ninth Line	TCS	LOS	C	B		**B**		F	C	**E**					C		B	**C**	**E**
			Delay	23	19		**19**		102	31	**77**					23		18	**22**	**57**
			V/C	0.48	0.44				1.13	0.60						0.39		0.04		
			Q	19	60				213	72						61		9		
			Ex	65	500				750	75						90		500		
			Avail	46	440				537	3						29		491		
	11 - Trafalgar Road and Hornby Road	TWSC	LOS	C		C	**C**					A	A		**A**		A	A	**A**	**1**
			Delay	21		21	**21**					0	0		**0**		0	0	**0**	
			V/C	0.14		0.14						0.00	0.00				0.21	0.21		
			Q	4		4						0	0				0	0		
			Ex	500		500						500	500				500	500		
			Avail	496		496						500	500				500	500		
	12 - 5 Sideroad and Fifth Line	TWSC	LOS	A	A	A	**A**	A	A	A	**A**	C	C	C	**C**	C	C	C	**C**	**3**
			Delay	2	2	2	**2**	0	0	0	**0**	15	15	15	**15**	15	15	15	**15**	
			V/C	0.03	0.03	0.03		0.01	0.01	0.01		0.16	0.16	0.16		0.10	0.10	0.10		
			Q	1	1	1		0	0	0		4	4	4		3	3	3		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	499	499	499		500	500	500		496	496	496		497	497	497		
	13 - 5 Sideroad and Sixth Line	TWSC	LOS	A	A	A	**A**	A	A	A	**A**	B	B	B	**B**	C	C	C	**C**	**2**
			Delay	0	0	0	**0**	0	0	0	**0**	14	14	14	**14**	15	15	15	**15**	
			V/C	0.00	0.00	0.00		0.01	0.01	0.01		0.11	0.11	0.11		0.06	0.06	0.06		
			Q	0	0	0		0	0	0		3	3	3		2	2	2		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	500	500	500		500	500	500		497	497	497		498	498	498		
	14 - 5 Sideroad and Trafalgar Road	TCS	LOS	D	C	C	**C**	C	D	D	**D**	A	B	B	**B**	A	B	B	**B**	**C**
			Delay	37	31	28	**32**	29	46	46	**44**	8	13	13	**12**	10	13	13	**13**	**21**
			V/C	0.44	0.31	0.02		0.13	0.80	0.80		0.16	0.44	0.44		0.02	0.28	0.28		
			Q	20	40	1		14	102	102		13	80	80		2	43	43		
			Ex	45	500	80		75	500	500		100	500	500		175	500	500		
			Avail	25	460	79		61	398	398		87	420	420		173	457	457		
	15 - 5 Sideroad and Eighth Line	TWSC	LOS	C	C	C	**C**	D	D	D	**D**	C	C	C	**C**	B	B	B	**B**	**24**
			Delay	16	16	16	**16**	32	32	32	**32**	22	22	22	**22**	13	13	13	**13**	
			V/C	0.47	0.47	0.47		0.83	0.83	0.83		0.67	0.67	0.67		0.28	0.28	0.28		
			Q	-	-	-		-	-	-		-	-	-		-	-	-		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	-	-	-		-	-	-		-	-	-		-	-	-		
	16 - 5 Sideroad and Ninth Line	TCS	LOS	C	C	C	**C**	E	E	E	**E**	C	C	C	**C**	B	B	B	**B**	**C**
			Delay	20	20	20	**20**	58	58	58	**58**	27	27	27	**27**	15	15	15	**15**	**34**
			V/C	0.39	0.39	0.39		0.99	0.99	0.99		0.84	0.84	0.84		0.42	0.42	0.42		
			Q	46	46	46		175	175	175		173	173	173		55	55	55		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	454	454	454		325	325	325		327	327	327		445	445	445		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

Signal Justification Calculation for Forecasted Volumes
(OTM Book 12 - Justification 7)

Horizon Year: 2017
Region/City/Township: Town of Halton Hills

Major Street: Eighth Line
Minor Street: 5 Sideroad

North/South?: Y

Number of Approach Lanes: 1
Tee Intersection? N
Flow Conditions: Free

PM Forecast Only? N

Warrant Results		
150% Satisfied	No	Justification for new intersections with forecast traffic
120% Satisfied	Yes	Justification for existing intersections with forecast traffic

	Major Street						Minor Street						
	Eighth Line						5 Sideroad						
	Northbound			Southbound			Eastbound			Westbound			Peds
Time Period	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	Crossing
AM Peak Hour	1	86	23	65	493	67	16	360	7	30	115	12	
PM Peak Hour	2	325	40	18	99	23	44	198	5	18	389	70	
Average Hourly Volume	1	103	16	21	148	23	15	140	3	12	126	21	0

Warrant	AHV
1A - All	627
1B - Minor	316
2A - Major	311
2B - Cross	167

Warrant 1 - Minimum Vehicular Volume

	Approach Lanes	1		2 or more		Average Hourly Volume
1A	Flow Conditions	Free	Restricted	Free	Restricted	
		X				
	All Approaches	480	720	600	900	627
					% Fulfilled	130.5%

	Approach Lanes	1		2 or more		Average Hourly Volume
1B	Flow Conditions	Free	Restricted	Free	Restricted	
		X				
	Minor Street Approaches	120	170	120	170	316
					% Fulfilled	263.3%

Warrant 2 - Delay To Cross Traffic

	Approach Lanes	1		2 or more		Average Hourly Volume
2A	Flow Conditions	Free	Restricted	Free	Restricted	
		X				
	Major Street Approaches	480	720	600	900	311
					% Fulfilled	64.7%

	Approach Lanes	1		2 or more		Average Hourly Volume
2B	Flow Conditions	Free	Restricted	Free	Restricted	
		X				
	Traffic Crossing Major Street	50	75	50	75	167
					% Fulfilled	333.0%

Eighth Line and 5 Sideroad Traffic Signal Warrant

TABLE 2.5: EXISTING AM AND PM PEAK HOUR TRAFFIC OPERATIONS WITH REMEDIAL MEASURES

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																
				Eastbound				Westbound				Northbound				Southbound				
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	OVERALL
AM Peak Hour	6 - Steeles Avenue and Trafalgar Road	TCS	LOS	D	E	D	**D**	E	C	C	**D**	E	C	C	**D**	C	D	D	**D**	**D**
			Delay	41	58	45	**54**	65	34	30	**51**	70	31	31	**38**	24	47	47	**44**	**46**
			V/C	0.12	0.77	0.16		0.80	0.31	0.02		0.64	0.23	0.22		0.27	0.82	0.82		
			Q	10	92	22		84	46	0		47	44	24		38	164	164		
			Ex	115	850	50		140	250	75		100	300	100		250	500	500		
			Avail	105	758	28		56	204	75		53	256	76		212	336	336		
	8 -Steeles Avenue and Eighth Line/Toronto Premium Outlets	TCS	LOS	B	B	B	**B**	B	B	B	**B**	C	B	B	**C**	D	C	C	**C**	**C**
			Delay	11	19	12	**18**	12	16	16	**16**	33	16	16	**20**	39	25	25	**30**	**21**
			V/C	0.17	0.67	0.01		0.12	0.41	0.41		0.05	0.01	0.01		0.68	0.24	0.24		
			Q	13	98	0		6	44	44		1	3	3		60	24	24		
			Ex	110	150	65		125	850	850		135	200	200		60	500	500		
			Avail	97	52	65		119	806	806		134	197	197		0	476	476		
	10 - Steeles Avenue and Ninth Line	TCS	LOS	A	B		**B**		B	B	**B**					C		B	**C**	**B**
			Delay	8	11		**11**		14	12	**14**					26		18	**25**	**15**
			V/C	0.18	0.57				0.37	0.14						0.68		0.06		
			Q	8	55				32	12						45		9		
			Ex	65	500				750	75						90		500		
			Avail	57	445				718	63						45		491		
	15 - 5 Sideroad and Eighth Line	TCS	LOS	C	C	C	**C**	B	B	B	**B**	A	A	A	**A**	B	B	B	**B**	**B**
			Delay	21	21	21	**21**	15	15	15	**15**	6	6	6	**6**	12	12	12	**12**	**15**
			V/C	0.72	0.72	0.72		0.32	0.32	0.32		0.10	0.10	0.10		0.64	0.64	0.64		
			Q	57	57	57		23	23	23		11	11	11		78	78	78		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	443	443	443		477	477	477		489	489	489		422	422	422		
	16 - 5 Sideroad and Ninth Line	TCS	LOS	C	C	C	**C**	B	B	B	**B**	C	C	C	**C**	B	C	C	**C**	**C**
			Delay	27	27	27	**27**	15	14	14	**15**	23	23	23	**23**	15	22	22	**20**	**22**
			V/C	0.80	0.80	0.80		0.18	0.18	0.01		0.61	0.61	0.61		0.59	0.80	0.80		
			Q	87	87	87		20	20	0		66	66	66		38	147	147		
			Ex	500	500	500		500	500	30		500	500	500		40	500	500		
			Avail	413	413	413		480	480	30		434	434	434		2	353	353		
PM Peak Hour	6 - Steeles Avenue and Trafalgar Road	TCS	LOS	C	C	C	**C**	D	C	C	**D**	D	D	C	**D**	C	D	D	**D**	**D**
			Delay	29	34	31	**33**	52	23	30	**35**	45	36	32	**35**	29	36	36	**36**	**35**
			V/C	0.16	0.49	0.09		0.74	0.52	0.09		0.53	0.65	0.34		0.17	0.42	0.42		
			Q	6	49	0		81	63	10		27	83	31		12	41	41		
			Ex	115	850	50		140	250	75		100	300	100		250	500	500		
			Avail	109	801	50		59	187	65		73	217	69		238	459	459		
	8 -Steeles Avenue and Eighth Line/Toronto Premium Outlets	TCS	LOS	D	B	B	**C**	B	C	C	**C**	D	C	C	**C**	D	D	D	**D**	**C**
			Delay	36	16	12	**21**	12	27	27	**26**	43	29	29	**33**	46	42	42	**43**	**25**
			V/C	0.79	0.39	0.01		0.24	0.81	0.81		0.20	0.13	0.13		0.26	0.15	0.15		
			Q	62	59	0		16	150	150		11	18	18		16	18	18		
			Ex	110	150	65		125	850	850		135	200	200		60	500	500		
			Avail	48	91	65		109	700	700		124	182	182		44	482	482		
	10 - Steeles Avenue and Ninth Line	TCS	LOS	A	A		**A**		B	B	**B**					C		C	**C**	**B**
			Delay	8	6		**6**		16	12	**14**					33		27	**32**	**14**
			V/C	0.39	0.31				0.74	0.43						0.46		0.04		
			Q	7	25				99	16						29		10		
			Ex	65	500				750	75						90		500		
			Avail	58	475				651	59						61		490		
	15 - 5 Sideroad and Eighth Line	TCS	LOS	B	B	B	**B**	B	B	B	**B**	A	A	A	**A**	A	A	A	**A**	**B**
			Delay	11	11	11	**11**	16	16	16	**16**	10	10	10	**10**	8	8	8	**8**	**12**
			V/C	0.43	0.43	0.43		0.73	0.73	0.73		0.45	0.45	0.45		0.17	0.17	0.17		
			Q	27	27	27		53	53	53		38	38	38		14	14	14		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	473	473	473		447	447	447		462	462	462		486	486	486		
	16 - 5 Sideroad and Ninth Line	TCS	LOS	C	C	C	**C**	C	C	C	**C**	B	B	B	**B**	A	B	B	**A**	**C**
			Delay	24	24	24	**24**	31	31	20	**28**	19	19	19	**19**	9	11	11	**10**	**21**
			V/C	0.56	0.56	0.56		0.79	0.79	0.24		0.76	0.76	0.76		0.08	0.32	0.32		
			Q	50	50	50		93	93	23		168	168	168		7	47	47		
			Ex	500	500	500		500	500	30		500	500	500		40	500	500		
			Avail	450	450	450		407	407	7		332	332	332		33	453	453		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

3 Premier Gateway Phase 1B Development

3.1 Land Use and Road Network Assumptions

The proposed Premier Gateway Phase 1B development comprises a mix of commercial and employment uses, as **Figure 3.1** illustrates. **Table 3.1** lists the proposed land uses for the various components. **Figure 3.2** depicts the spatial distribution of the land uses corresponding to the table.

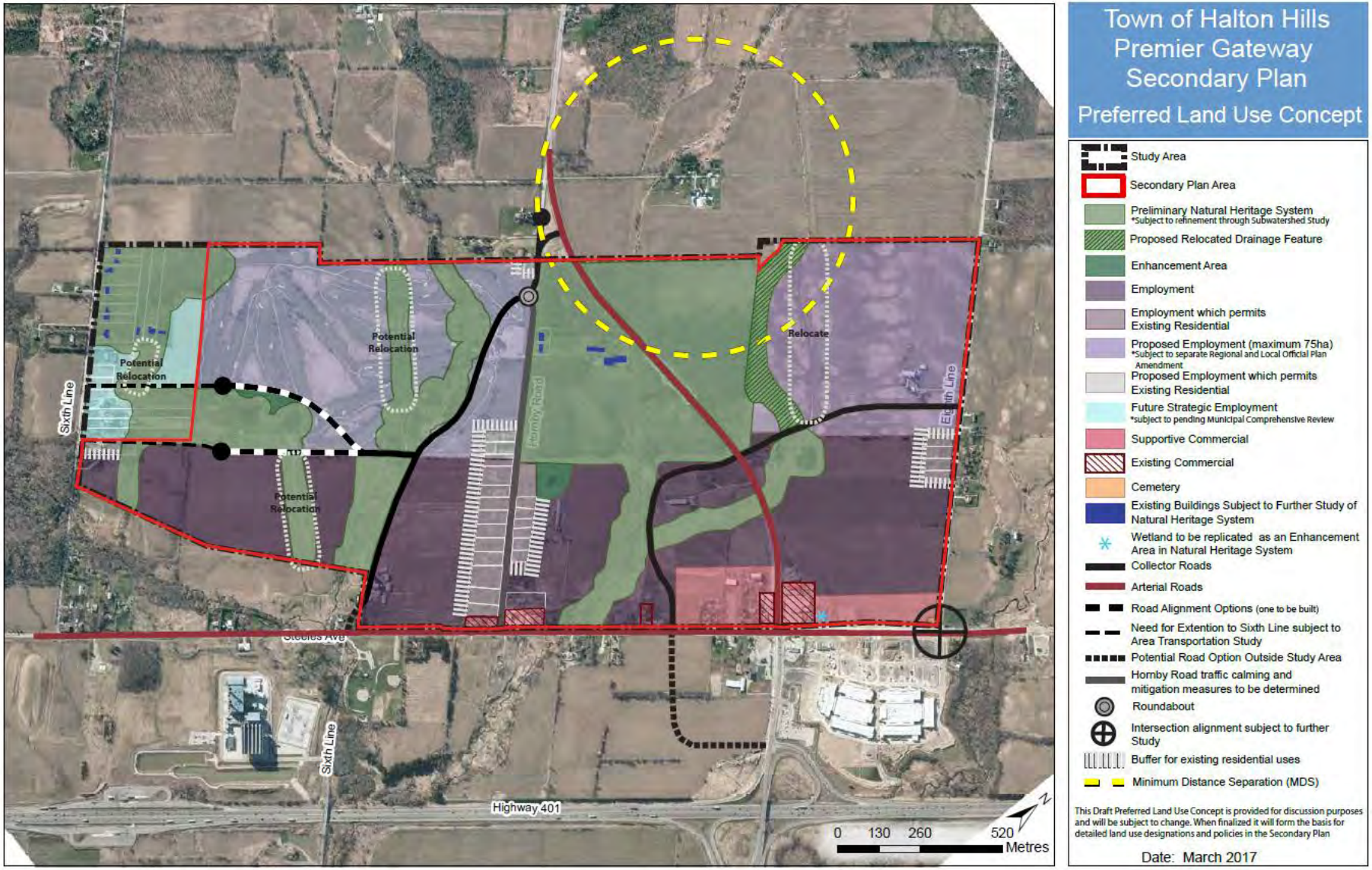
In total, the secondary plan area encompasses approximately 300 hectares (741 acres) of land, comprising approximately 156.3 hectares of industrial uses (386.4 acres) and 35,600 square metres of commercial space (383,200 square feet).

TABLE 3.1: PROPOSED LAND USES AND DEVELOPMENT YIELDS

Location	Land Use	Area
E1	130 – Industrial Park	1.4 ha (3.5 Ac.)
E2	130 – Industrial Park	74.1 ha (183.2 Ac.)
E3	130 – Industrial Park	11.2 ha (27.7 Ac.)
E4	130 – Industrial Park	10.7 ha (26.4 Ac.)
E5	130 – Industrial Park	58.9 ha (145.6 Ac.)
C1	820 – Shopping Centre	19,677 m2 (211,800 sq. ft.)
C2	820 – Shopping Centre	15,924 m2 (171,400 sq. ft.)

Figure 3.2 also illustrates the proposed road network for the Premier Gateway Phase 1B area. The plan shows two (2) primary road connections providing access to/within the secondary plan lands:

- Street A is proposed to extend from Steeles Avenue, opposite existing Sixth Line South, to Hornby Road.
- Street B is proposed to connect Eighth Line to Steeles Avenue, with an intersection on Trafalgar Road approximately 500 metres north of Steeles Avenue. The new road would intersect Steeles Avenue about 350 metres west of Trafalgar Road.



Proposed Premier Gateway Phase 1B Preferred Land Use Concept

Proposed Premier Gateway Phase 1B
Land Uses and Road Pattern

3.2 Trip Generation

The ITE Trip Generation Manual[11] (the ITE Manual) is a common source of data used to forecast the number of vehicle trips generated by a proposed development. The trip generation rates presented in the ITE Manual are based primarily on traffic surveys conducted at suburban locations with limited to no access to transit or active transportation modes. In most cases, the vehicle trip estimates derived from these rates can be considered conservative (high).

Trip generation rates for the following land use codes (LUC) were selected from the ITE Manual:

- **LUC 130 (Industrial Park)** was selected to estimate the trips generated by the "Employment" areas. The ITE Manual defines LUC 130 as follows: "Contains a number of industrial or related facilities. They are characterized by a mix of manufacturing, service and warehouse facilities with a wide variation in the proportion of each type of use from one location to another. Many industrial parks contain highly diversified facilities – some with a large number of small businesses and others with one or two dominant industries." The average rate data for the peak hour of adjacent street traffic were used as the fitted curve equations exhibited unsatisfactory R^2 values.
- **LUC 820 (Shopping Centre)** was selected to estimate the trips generated by the "Supportive Commercial" areas. The ITE Manual defines LUC 820 as follows: "Integrated group of commercial establishments that is planned, developed, owned and managed as a unit. The composition is related to its market area in terms of size, location and type of store. Provides on-site parking facilities sufficient to serve its own parking demands." The average rate data for the peak hour of adjacent street traffic were used as the fitted curve equations exhibited unsatisfactory R^2 values. A 40% land coverage was assumed to estimate building gross floor area (GFA).

No adjustments were made to the ITE Manual rates to account for non-auto mode use, pass-by trips or internal capture given the suburban location of the lands, the anticipated form of development, the absence of active transportation and transit services nearby, and the nature of the land uses.

Table 3.2 summarizes the vehicle trip generation based on the ITE Manual rates. The Premier Gateway Phase 1B lands are forecast to generate approximately:

- 3,535 vehicle trips (2,855 inbound and 680 outbound) during the AM peak hour.
- 4,720 vehicle trips (1,375 inbound and 3,345 outbound) during the PM peak hour.

[11] Institute of Transportation Engineers, Trip Generation Manual, 9th Edition, 2012, Washington, D.C.

TABLE 3.2: ESTIMATED TRIP GENERATION

Area	Land Use	Units		AM Peak Hour				PM Peak Hour			
				Rate	Total	In	Out	Rate	Total	In	Out
E1	130: Industrial Park	Acres	3.5	8.20	28	23	5	8.53	30	6	24
E2	130: Industrial Park	Acres	183.2	8.20	1502	1247	255	8.53	1562	328	1234
E3	130: Industrial Park	Acres	27.7	8.20	227	188	39	8.53	236	50	186
E4	130: Industrial Park	Acres	26.4	8.20	217	180	37	8.53	226	47	179
E5	130: Industrial Park	Acres	145.6	8.20	1194	991	203	8.53	1242	261	981
C1	820: Shopping Centre	Square Feet	211.8	0.96	203	126	77	3.71	786	377	409
C2	820: Shopping Centre	Square Feet	171.4	0.96	165	102	63	3.71	636	305	331
Total					**3536**	**2857**	**679**		**4718**	**1374**	**3344**

It is noted that these trip generation estimates may be conservatively high. The net land area available for development will likely be less than the values assumed for this analysis given local natural environmental features, public land requirements and other considerations that could impact the ultimate yield.

3.3 Trip Distribution and Assignment

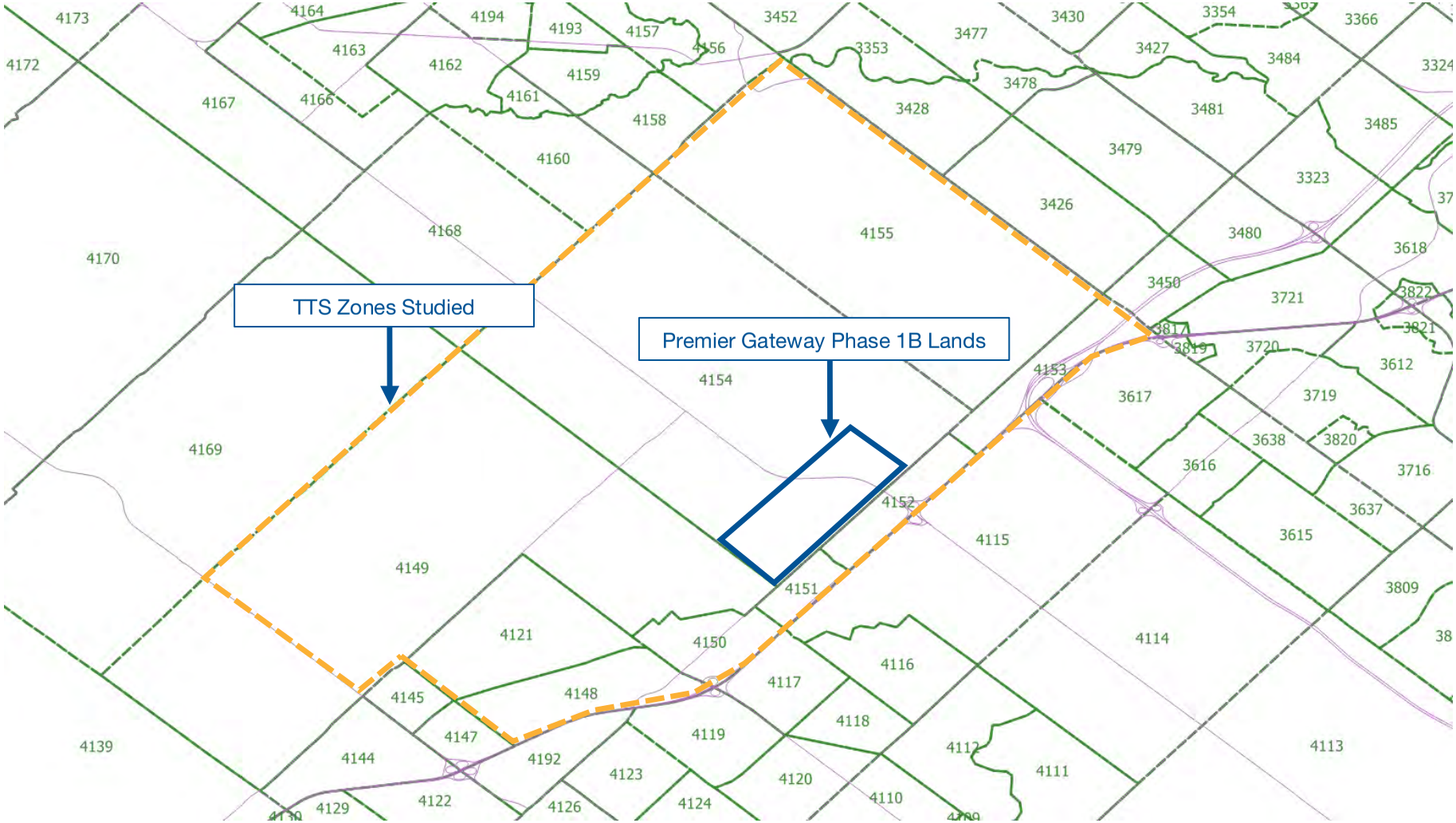
Trips generated by the Premier Gateway Phase 1B lands were distributed to the Study Area road network based on data from the 2011 Transportation Tomorrow Survey (TTS). The subject lands are located in TTS traffic zone 4154. Since there is limited development in the area currently, neighbouring zones 4121, 4148, 4149, 4150, 4151, 4152, 4153, and 4155 were also referenced in deriving the trip distribution pattern for the Study Area. **Figure 3.3** illustrates the location of the subject lands and the TTS zones used in the analysis.

A general trip distribution for north-south-east-west directions was derived by querying the TTS database for AM and PM peak hour trip origin-destination pairings. **Table 3.3** shows the estimated trip distribution based on this data.

TABLE 3.3: ESTIMATED TRIP DISTRIBUTION

General Travel Direction	AM Peak Hour		PM Peak Hour		Average Distrib.	Revised Distrib.
	Trips In	Trips Out	Trips In	Trips Out		
North	20%	31%	24%	17%	23%	25%
South	39%	32%	38%	39%	37%	35%
East	13%	12%	8%	12%	11%	10%
West	28%	25%	30%	32%	29%	30%

With several distinct parcels of land, all with different road connections, it was assumed that the trip distribution pattern would vary across the Study Area. As **Figure 3.4** shows, the Premier Gateway Phase 1B lands were segmented into five (5) blocks for trip assignment, with each block assumed to have a different trip distribution pattern.



paradigm TRANSPORTATION SOLUTIONS LIMITED

TTS Trip Distribution Zones

paradigm TRANSPORTATION SOLUTIONS LIMITED

Estimated Trip Distribution

3.4 Development Phasing

Given the size of the Premier Gateway Phase 1B area and the type of land uses being proposed, the lands are likely to develop in phases over time. For analysis purposes, three (3) phases of development were assumed:

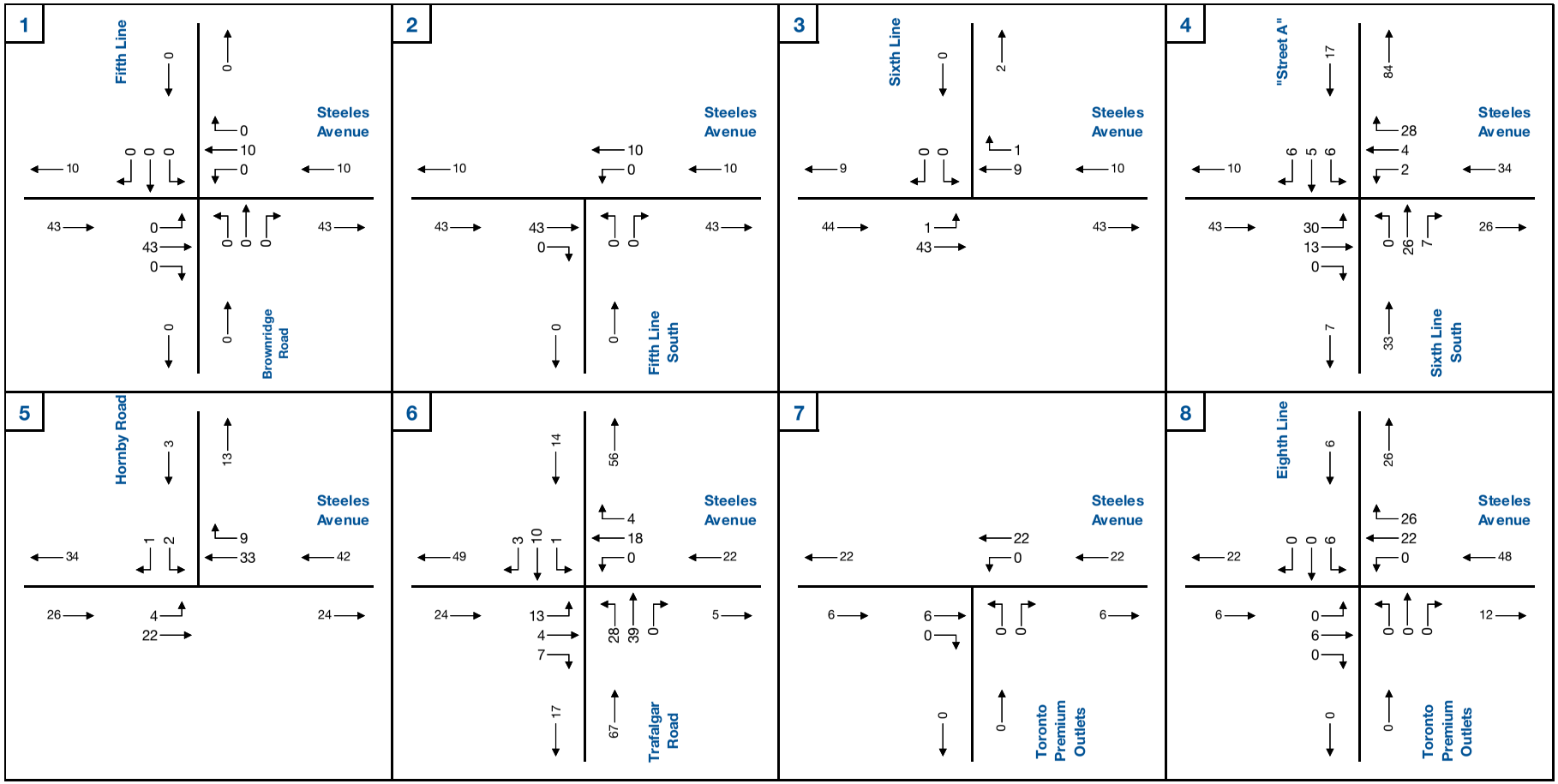
- 10% build out by 2021
- 60% build out by 2026
- 100% build out by 2031

Table 3.4 summarizes the estimated trip generation (cumulative) for the three (3) horizon years based on these phasing assumptions.

TABLE 3.4: ESTIMATED TRIP GENERATION BY HORIZON YEAR

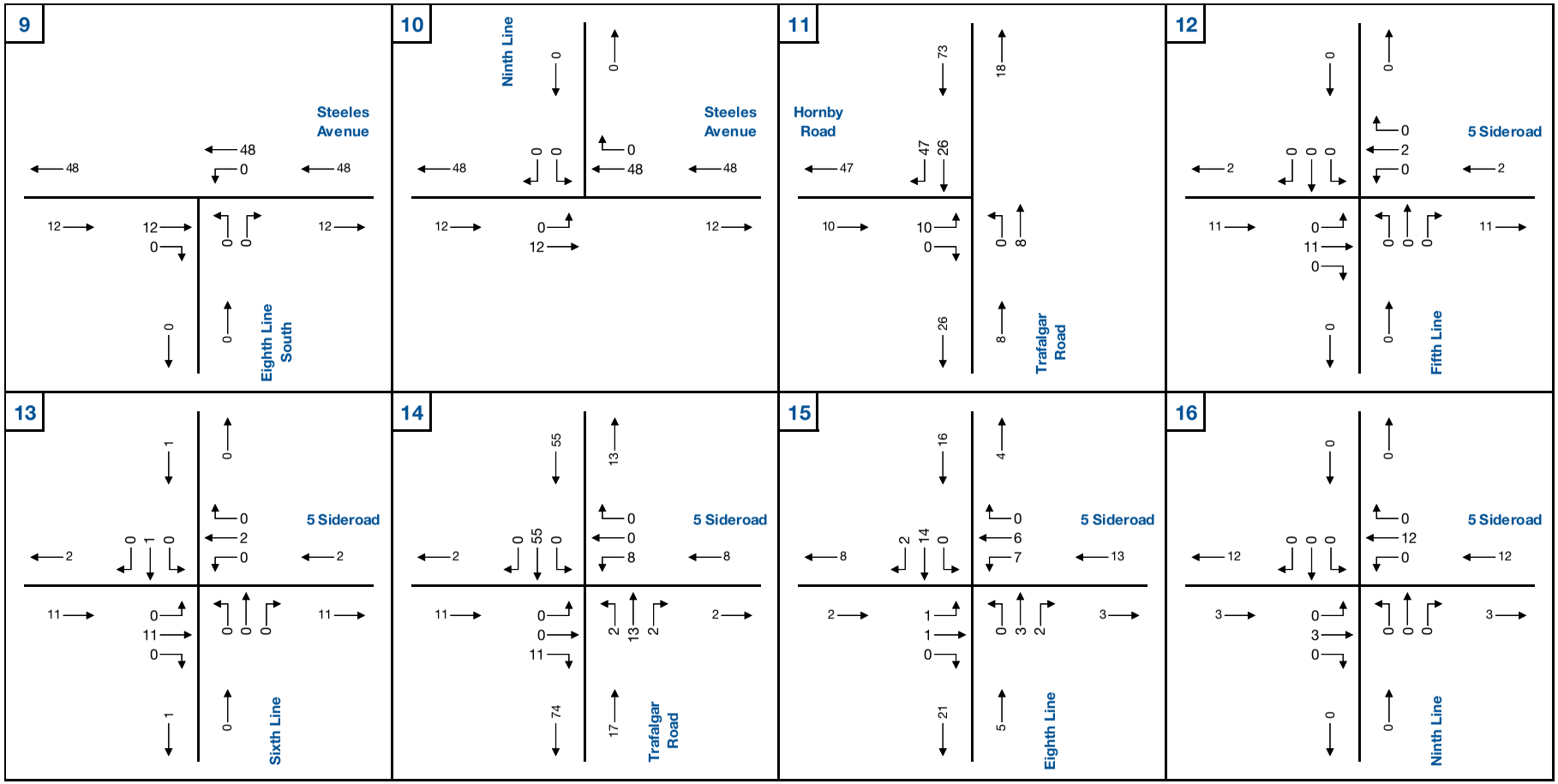
Horizon Year	AM Peak Hour			PM Peak Hour		
	Total	In	Out	Total	In	Out
2021	354	286	68	472	137	334
2026	2122	1714	407	2831	824	2006
2031	3536	2857	679	4718	1374	3344

The forecasted trips generated by the Premier Gateway Phase 1B lands summarized in **Table 3.4** were assigned by phase (horizon year) to the Study Area road network based on the trip distribution pattern shown in **Table 3.3** and **Figure 3.4**, and the area road network characteristics. **Figures 3.5** and **3.6** display the site generated traffic for the 2021 horizon. **Figures 3.7** and **3.8** display the site generated traffic for the 2026 horizon. **Figures 3.9** and **3.10** display the site generated traffic for the 2031 horizon.



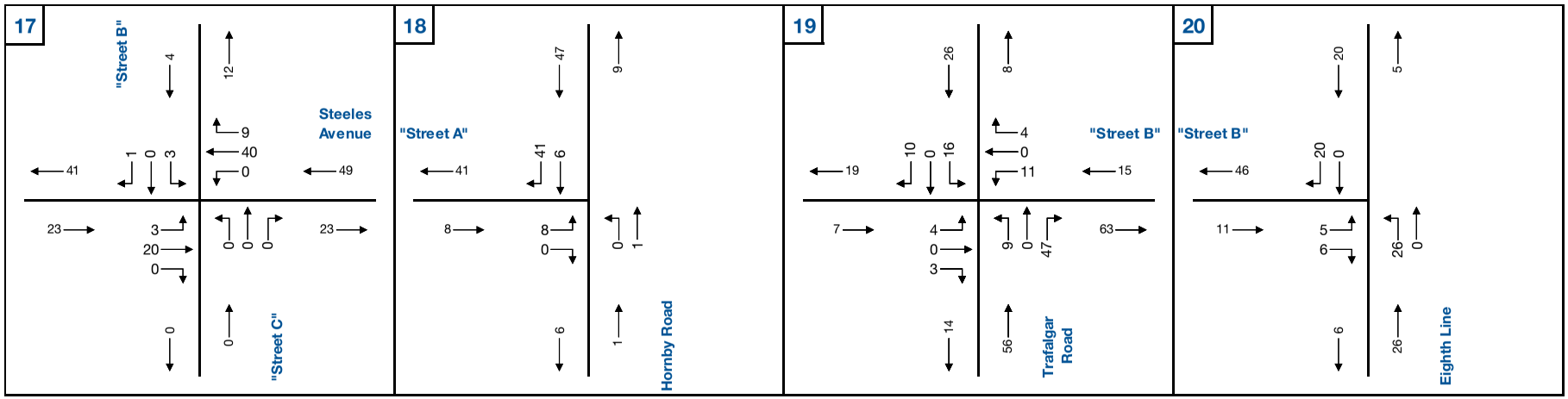
2021 AM Peak Hour

Site Generated Traffic Volumes (1)



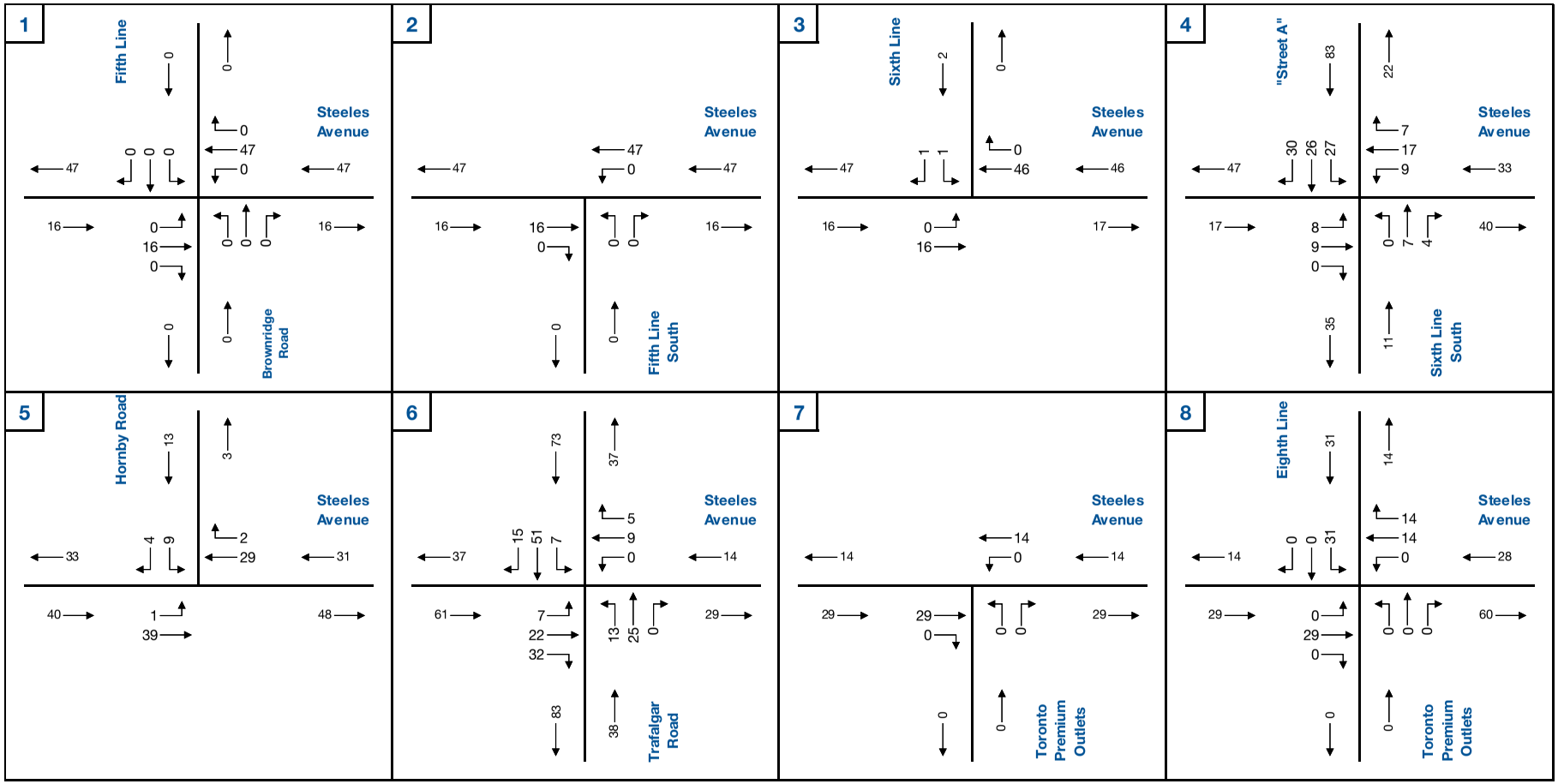
2021 AM Peak Hour

Site Generated Traffic Volumes (2)



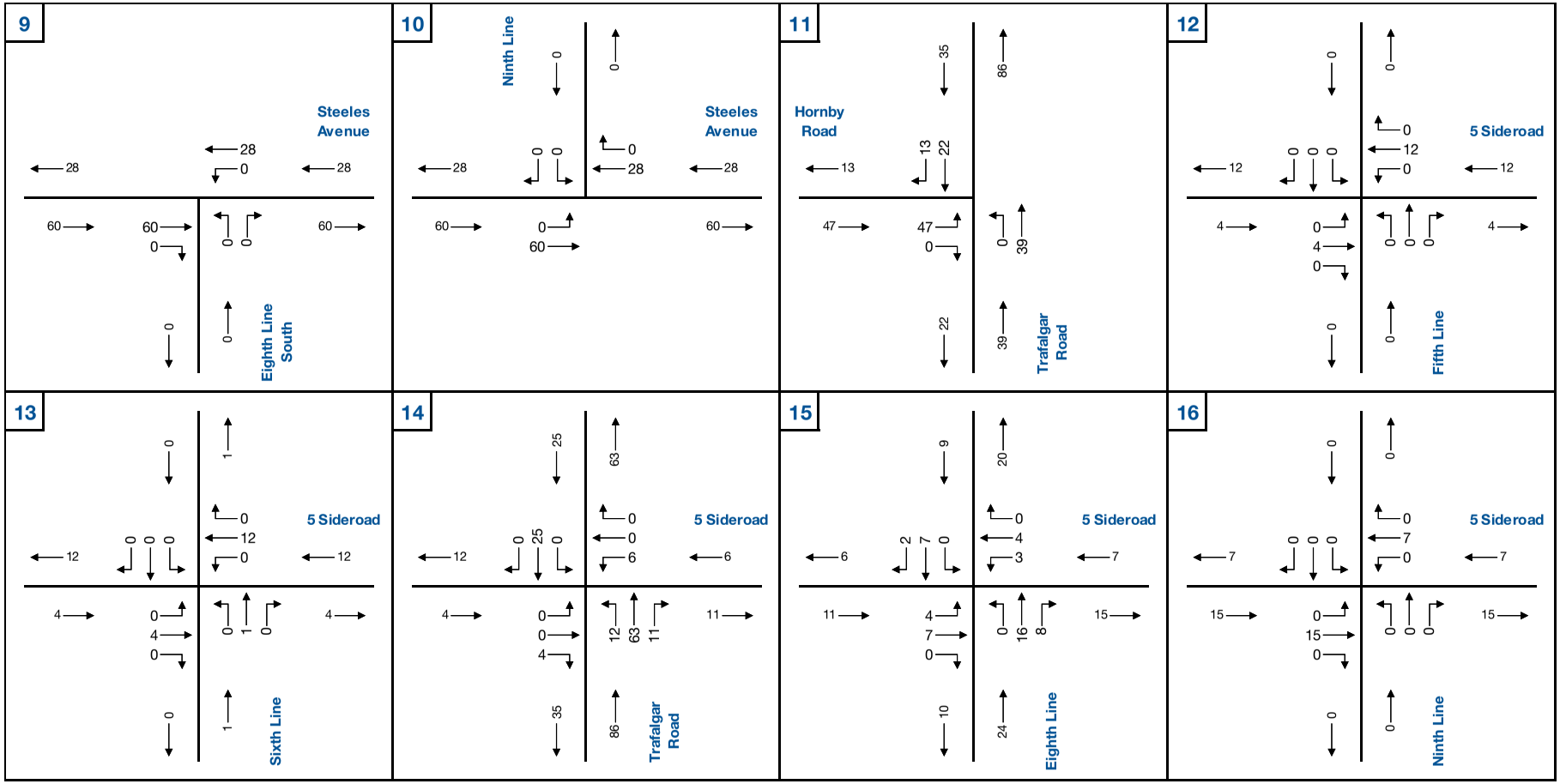
2021 AM Peak Hour

Site Generated Traffic Volumes (3)



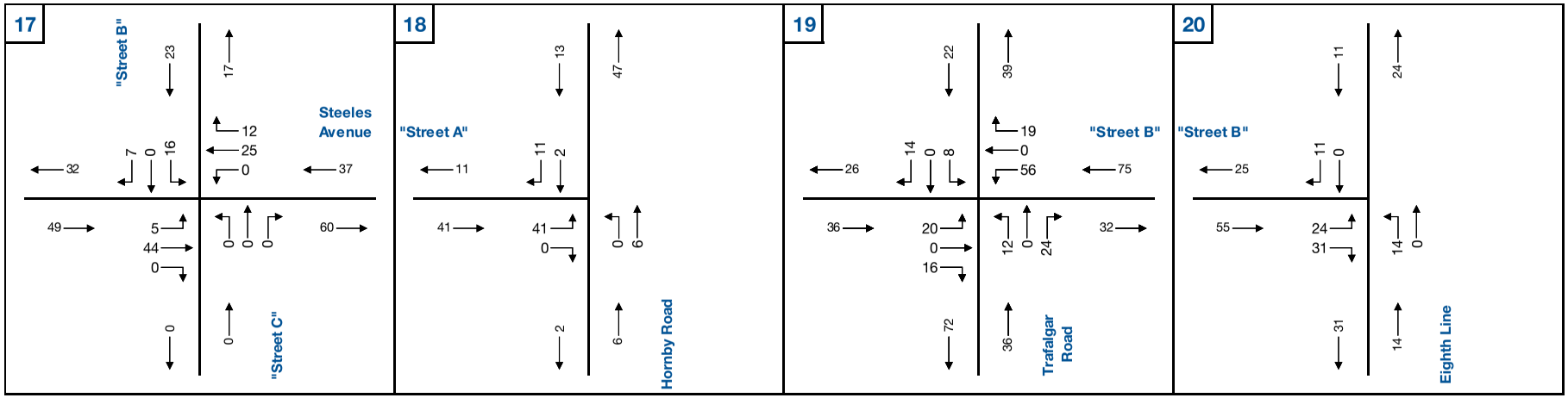
2021 PM Peak Hour

Site Generated Traffic Volumes (1)



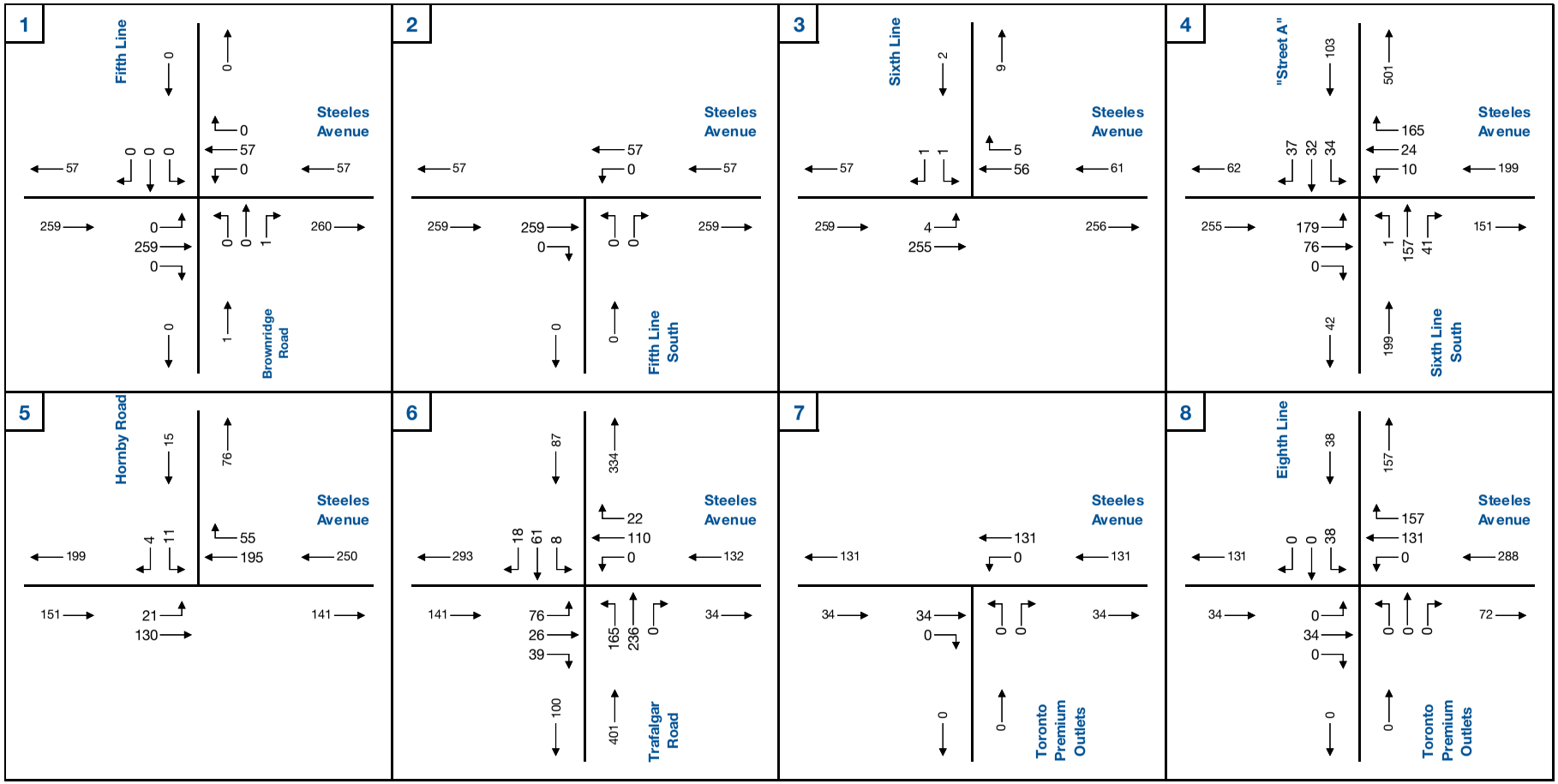
2021 PM Peak Hour

Site Generated Traffic Volumes (2)



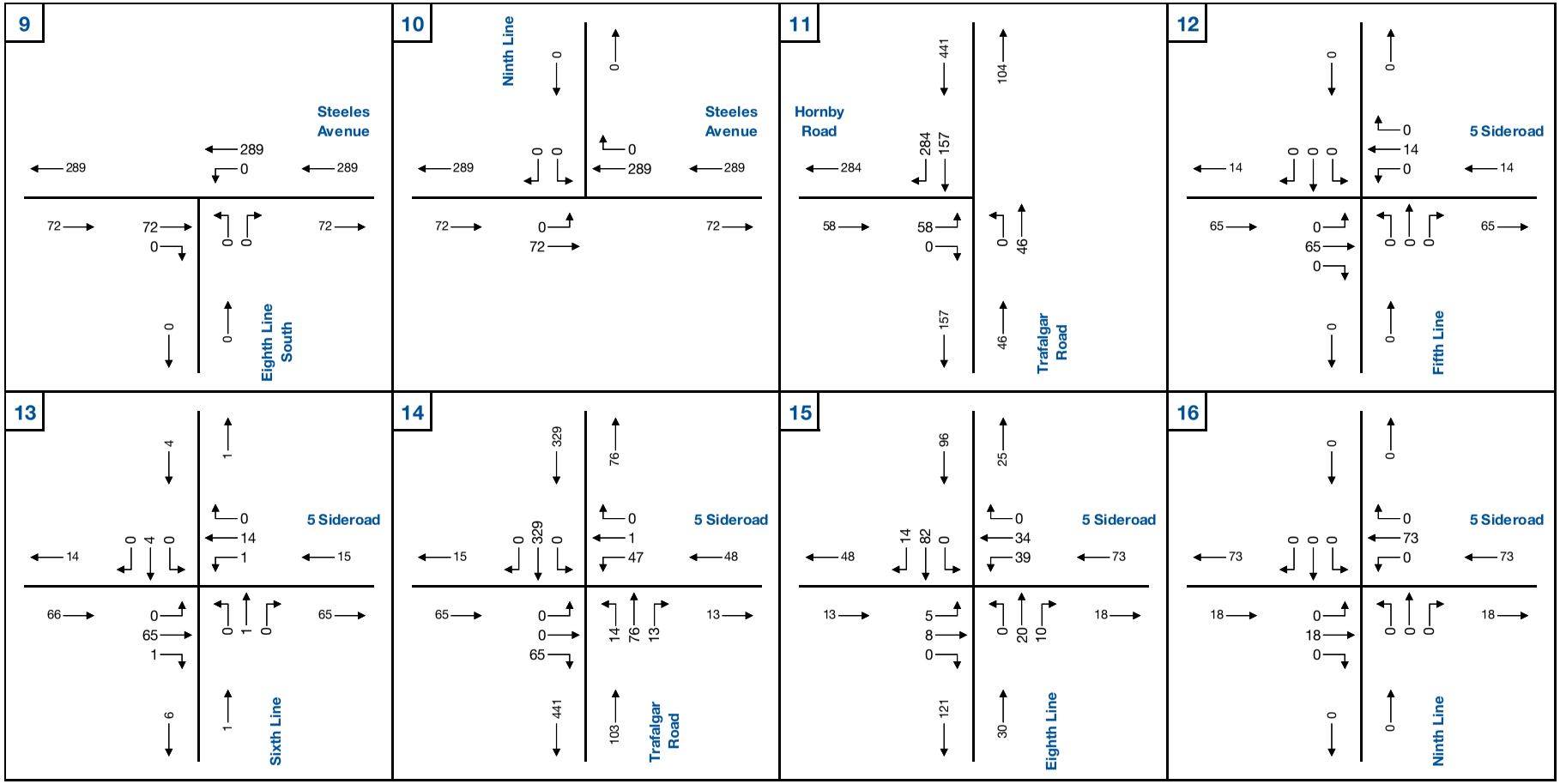
2021 PM Peak Hour

Site Generated Traffic Volumes (3)



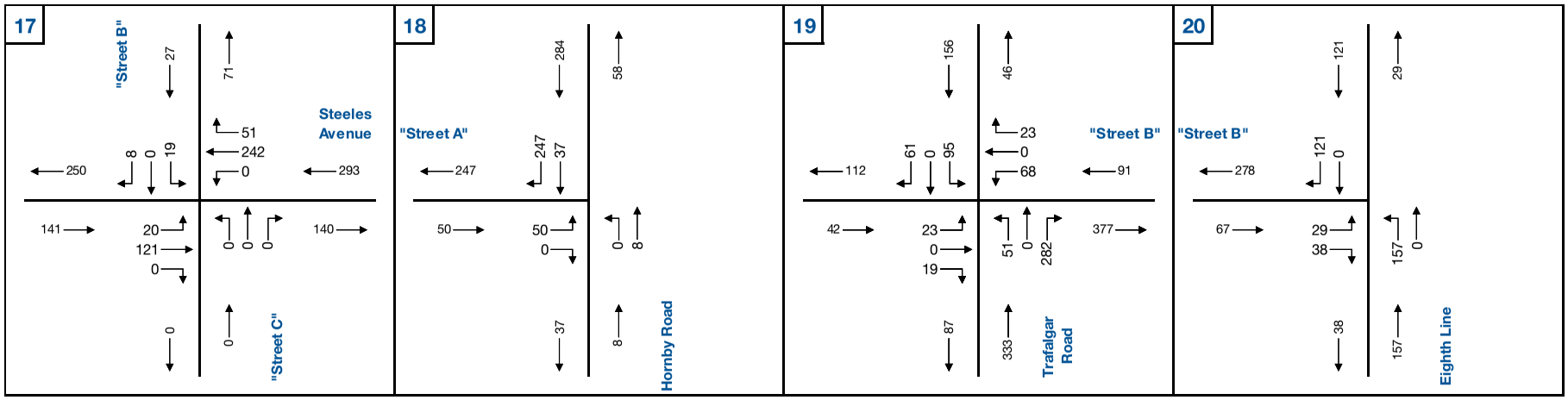
2026 AM Peak Hour

Site Generated Traffic Volumes (1)



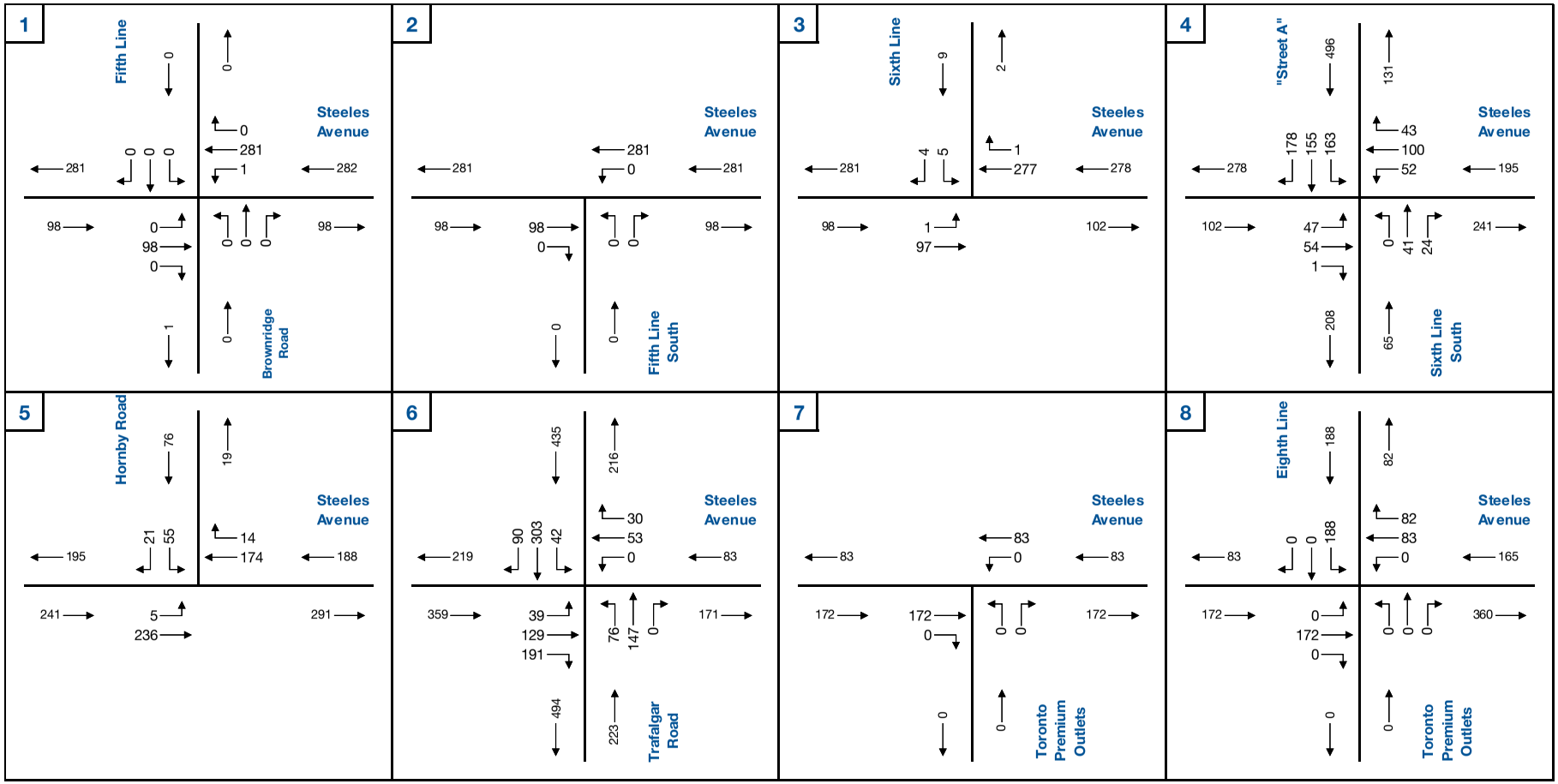
2026 AM Peak Hour

Site Generated Traffic Volumes (2)



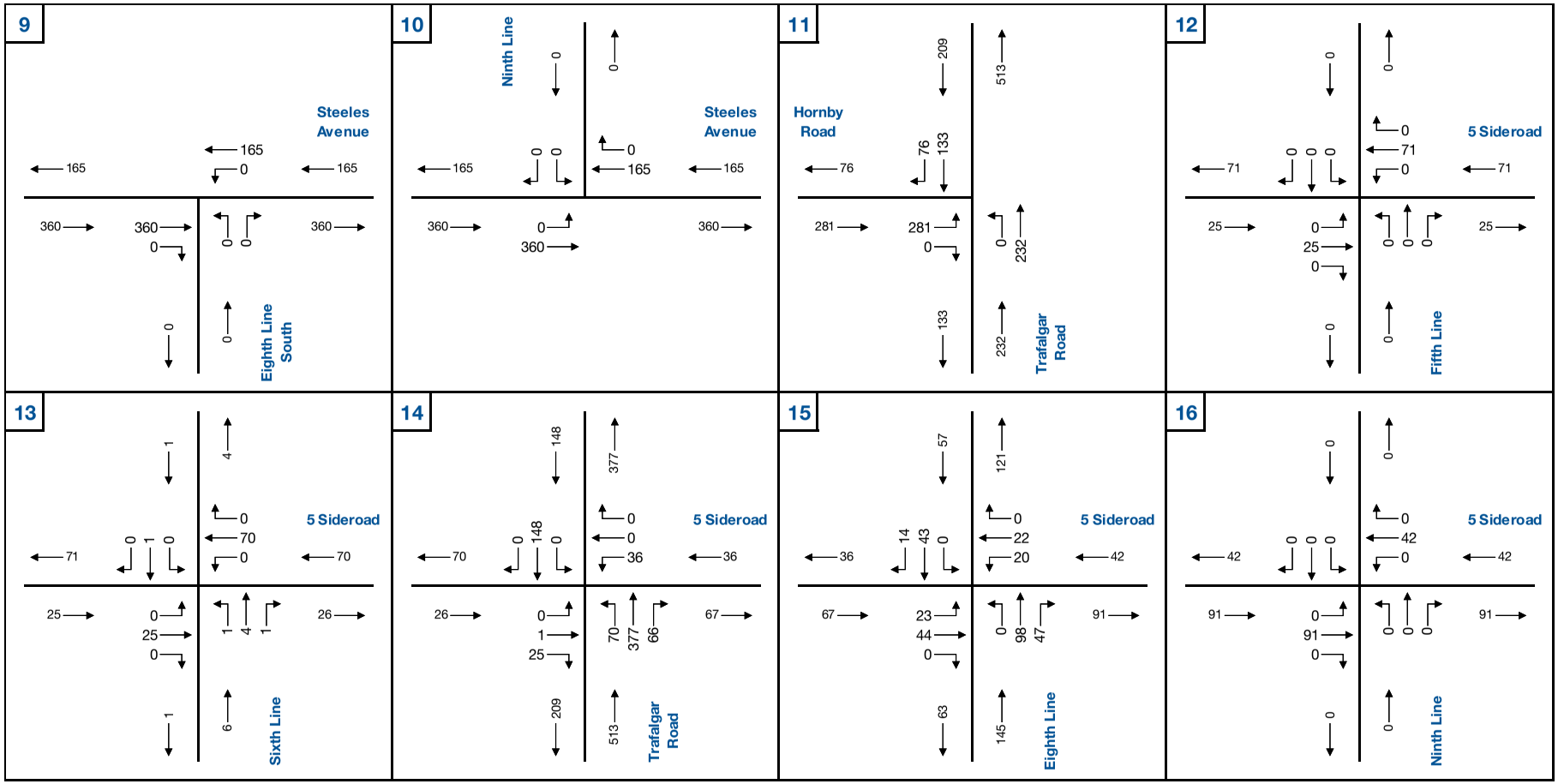
2026 AM Peak Hour

Site Generated Traffic Volumes (3)



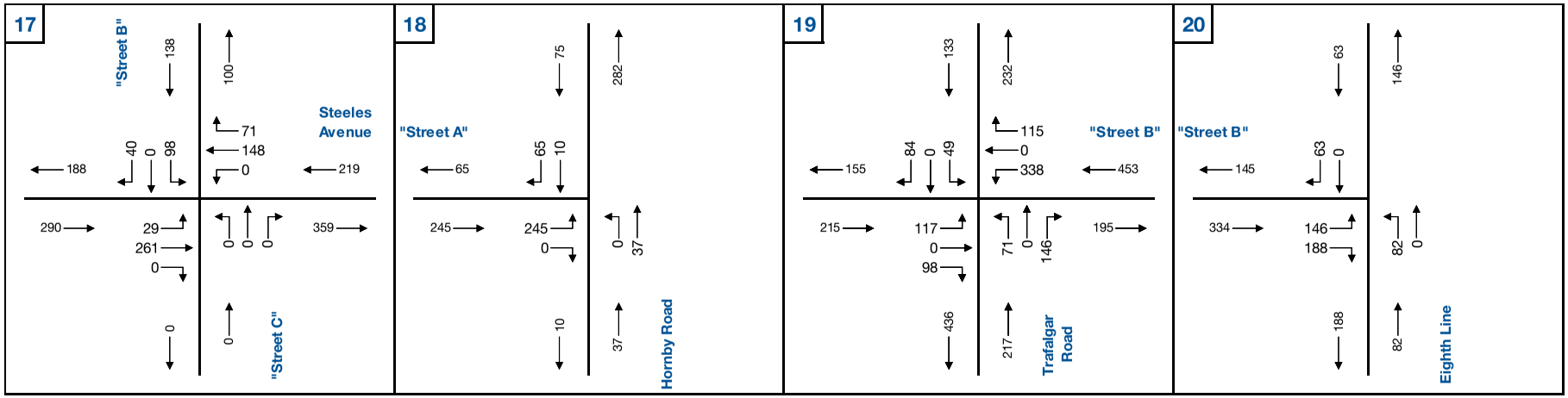
2026 PM Peak Hour

Site Generated Traffic Volumes (1)



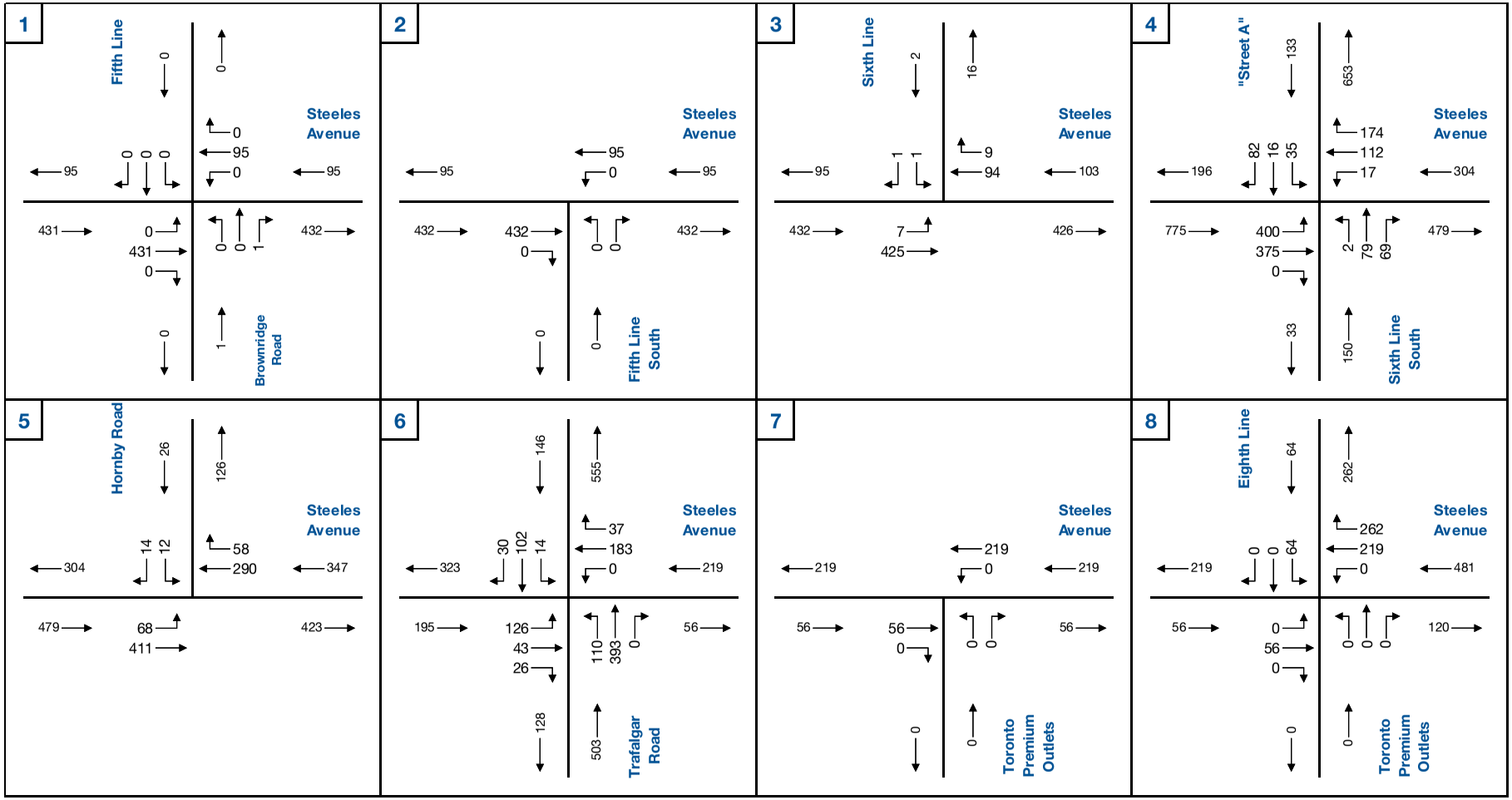
2026 PM Peak Hour

Site Generated Traffic Volumes (2)



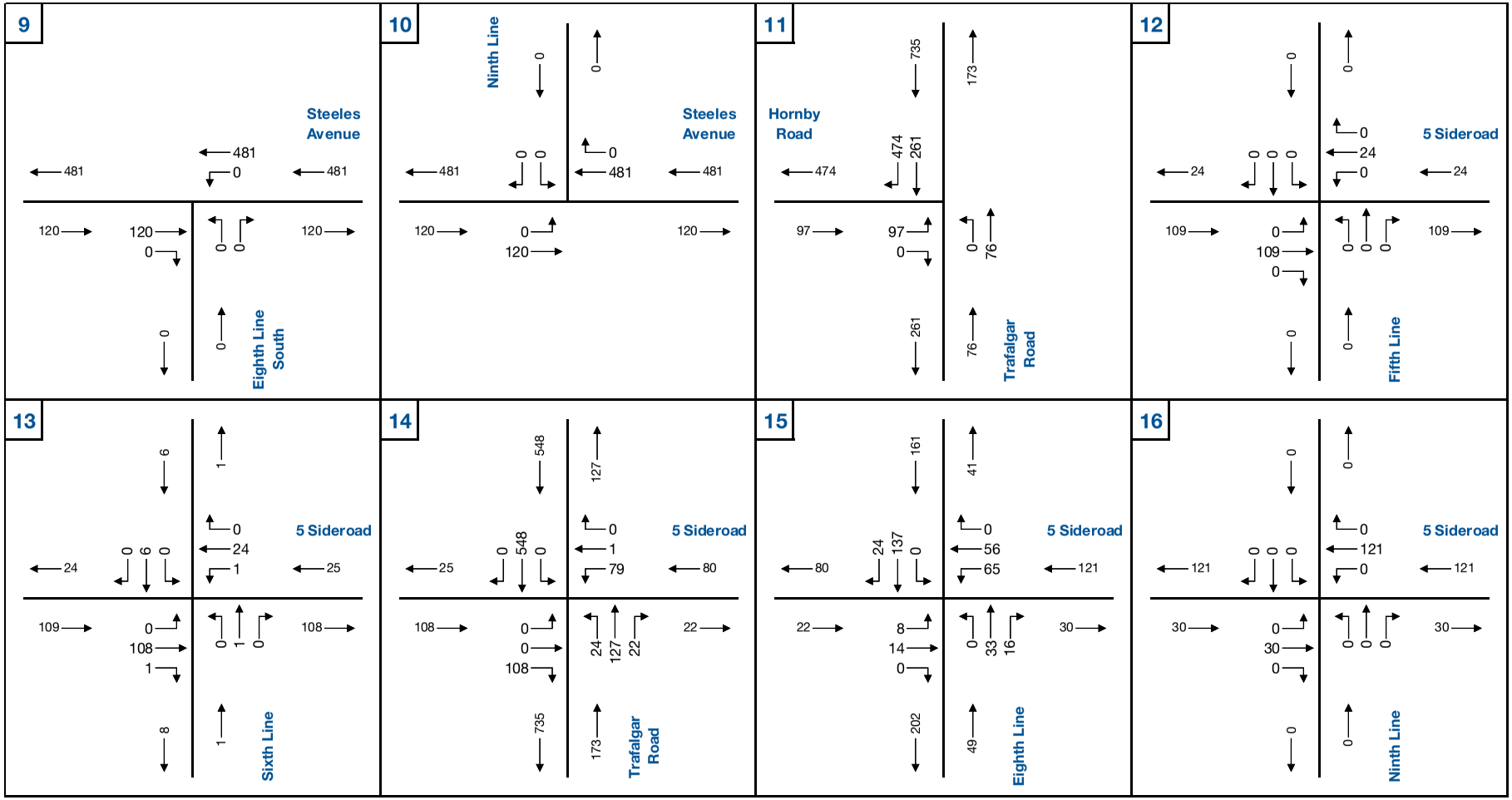
2026 PM Peak Hour

Site Generated Traffic Volumes (3)



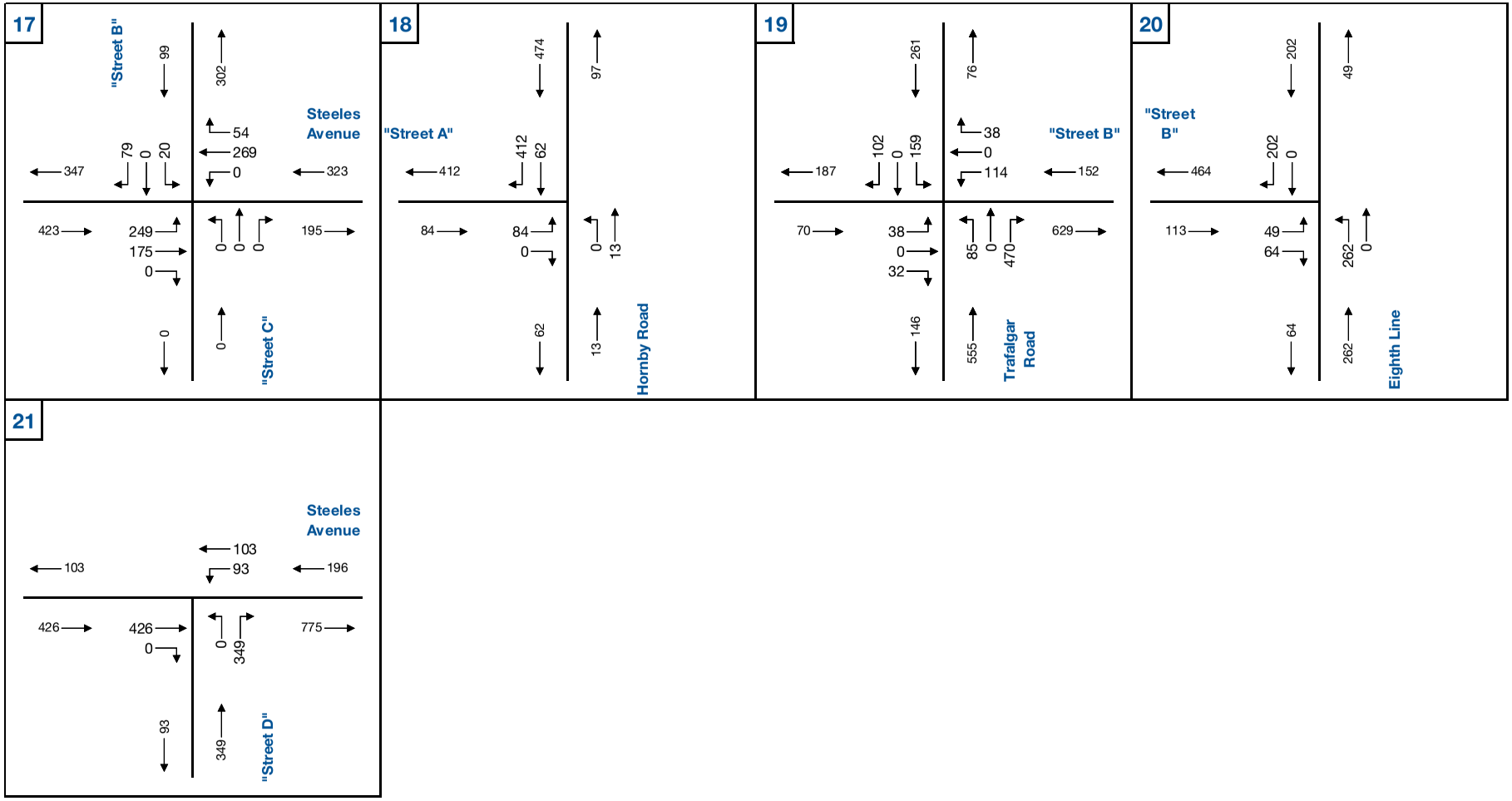
2031 AM Peak Hour

Site Generated Traffic Volumes (1)



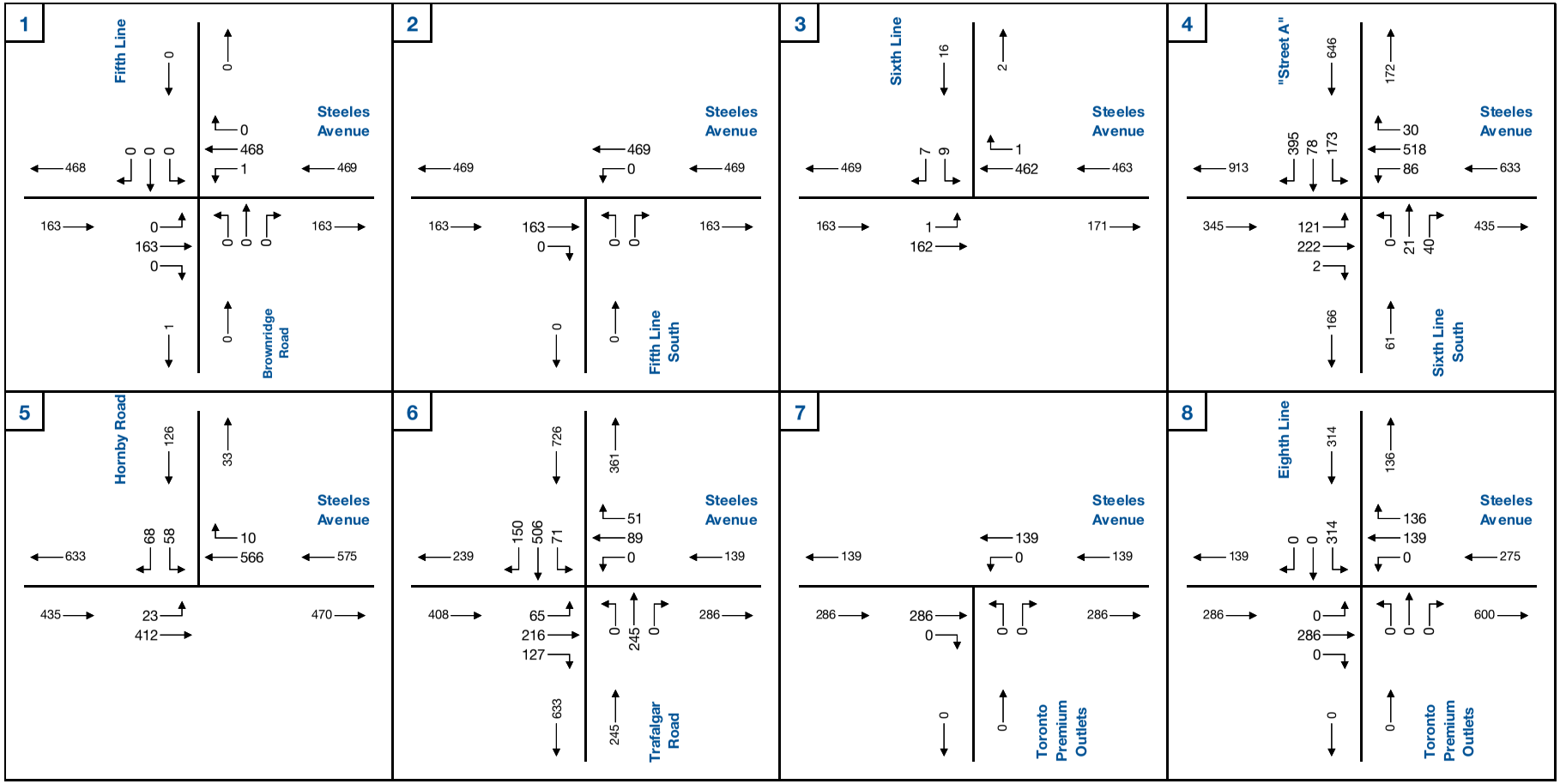
2031 AM Peak Hour

Site Generated Traffic Volumes (2)



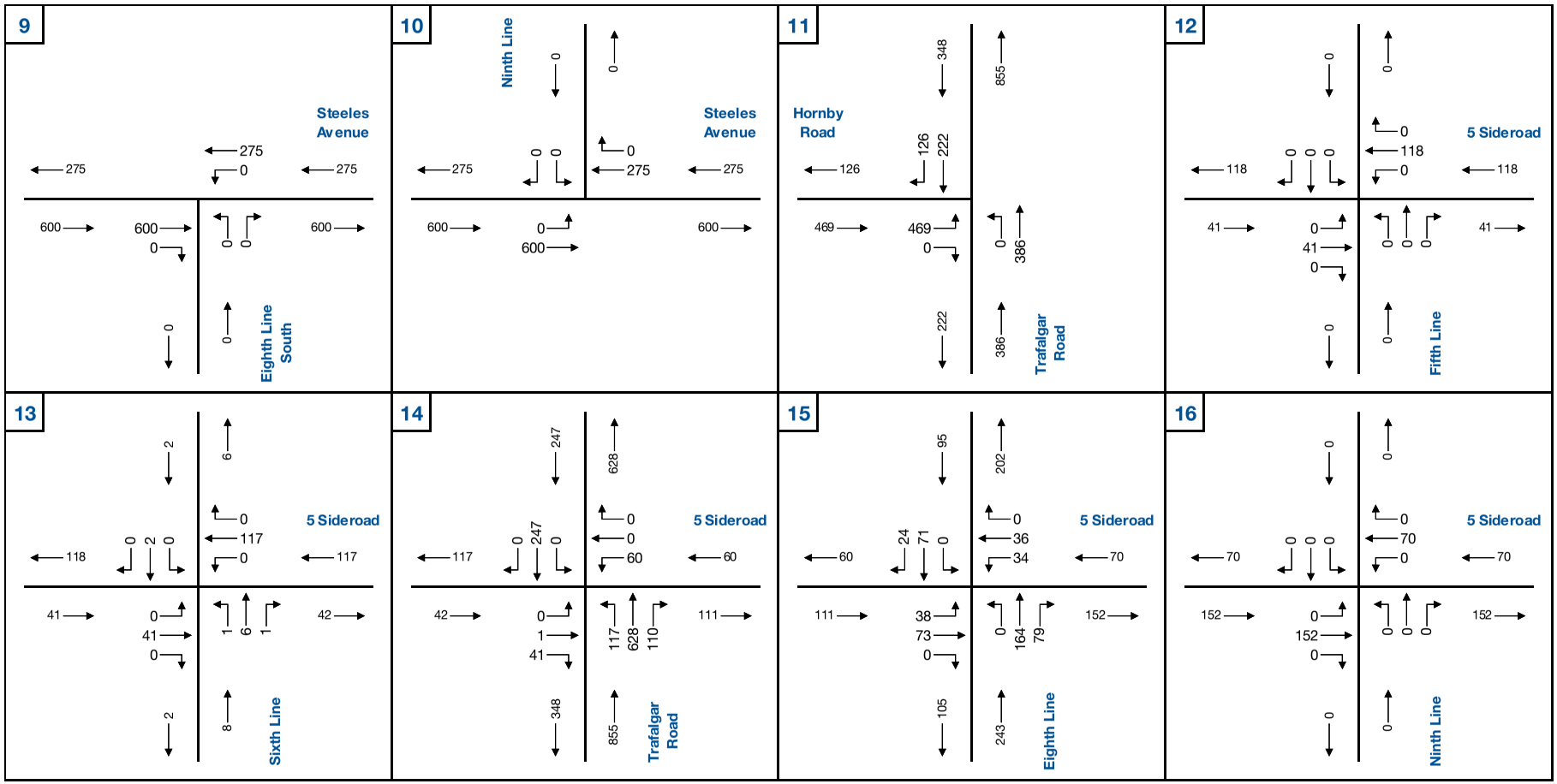
2031 AM Peak Hour

Site Generated Traffic Volumes (3)



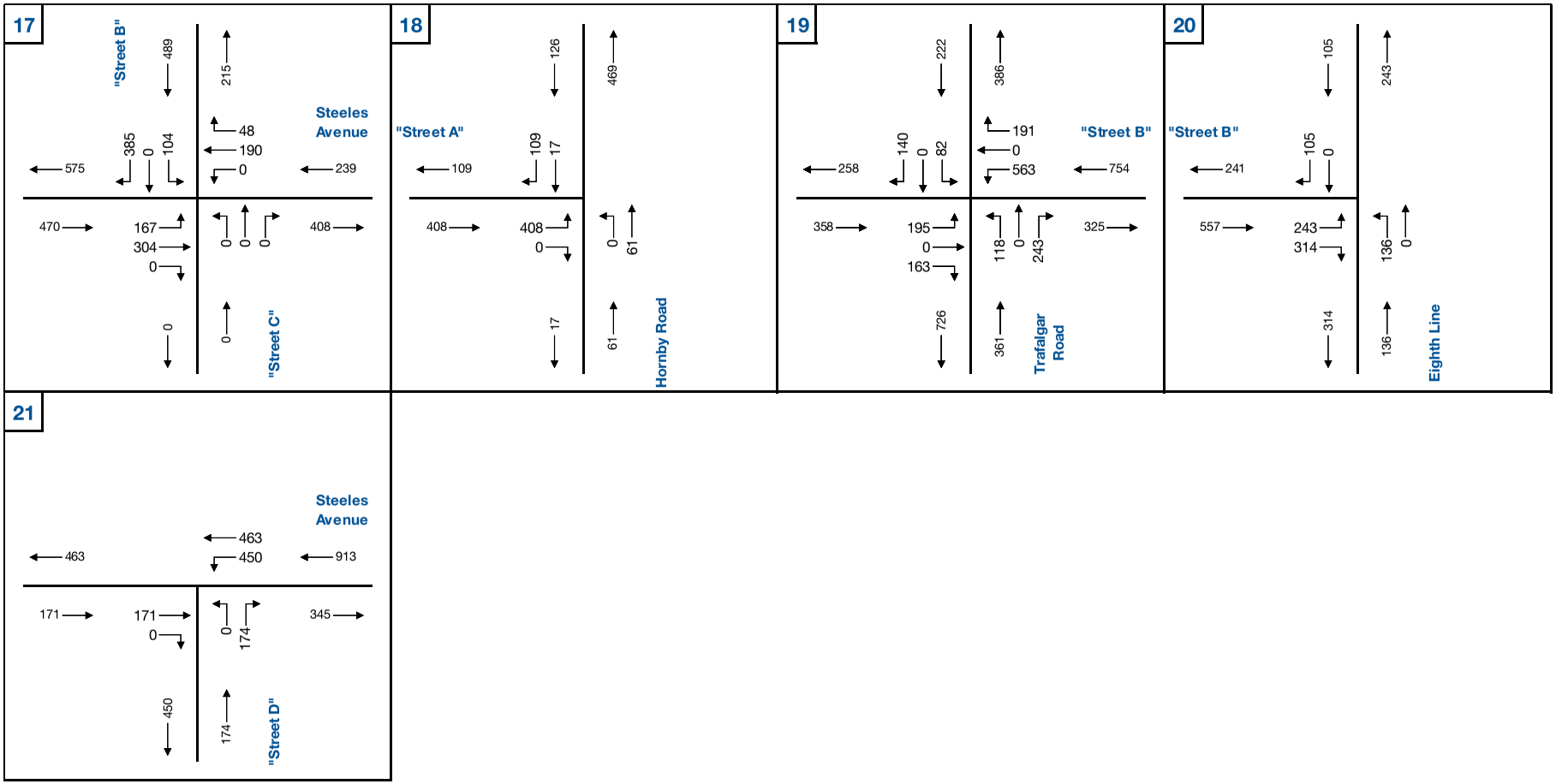
2031 PM Peak Hour

Site Generated Traffic Volumes (1)



2031 PM Peak Hour

Site Generated Traffic Volumes (2)



2031 PM Peak Hour

Site Generated Traffic Volumes (3)

4 Future Transportation Conditions

4.1 Horizon Years and Build Out Assumptions

The adequacy of existing and planned infrastructure to serve future travel demand generated by the proposed Premier Gateway Phase 1B development was assessed at different stages of build-out consistent with the assumptions stated in Section 3.4. The analysis examined three (3) horizon years – 2021, 2026 and 2031 – each with different build out and transportation network assumptions.

4.2 Road Network Assumptions

4.2.1 Improvements to Address Existing Critical Movements

The existing conditions analysis summarized in Section 2.3 recommended the following road improvements to address current critical traffic movements at the Study Area intersections:

- **Steeles Avenue and Eighth Line/Toronto Premium Outlets:**
  - Extension of the southbound left-turn lane storage to 60 metres
- **Steeles Avenue and Ninth Line:**
  - Addition of a second southbound left-turn lane with 90 metres storage
- **5 Sideroad and Eighth Line:**
  - Installation of traffic control signals
- **5 Sideroad and Ninth Line:**
  - Addition of a westbound right-turn lane with 30 metres storage
  - Addition of a southbound left-turn lane with 40 metres storage

These improvements were assumed to be in place for the horizon year operational analyses summarized below.

4.2.2 Planned and Programmed Improvements

Section 1.3 outlines the planning considerations for the Study, many of which relate to planned road network improvements within or near the Study Area. Notably, Halton Region has numerous planned road works in this area over the coming years. The project details are generally provided in Section 1.3. The 2017-2026 Transportation Capital Forecast contained within the approved 2017 Halton Region Budget and Business Plan denotes the anticipated year of construction for the Regional Road improvement projects, which include:

- Trafalgar Road (Regional Road 3) widening from 2 to 4 lanes between Steeles Avenue and 10 Sideroad (2018)
- Ninth Line (Regional Road 13) widening from 2 to 4 lanes between Steeles Avenue and 10 Sideroad (2020)
- Steeles Avenue (Regional Road 8) widening from 4 to 6 lanes between Regional Road 25 and Trafalgar Road (2024)
- Trafalgar Road (Regional Road 3) widening from 4 to 6 lanes between Britannia Road and Steeles Avenue (beyond 2026)
- Steeles Avenue (Regional Road 8) widening from 4 to 6 lanes (with Reserved Bus Lanes) between Trafalgar Road and Winston Churchill Boulevard (beyond 2026)
- "5½ Line" – New 6-lane road between Fifth and Sixth Lines from Britannia Road to Steeles Avenue, with an interchange at Highway 401, per the Halton Region Transportation Master Plan (beyond 2026). Section 1.3.1 provides further information about this new corridor, which is identified as Street D within this report.

These projects were assumed to be implemented in the noted timeframes for the horizon year operational analyses summarized below. Projects in the beyond 2026 category were assumed to be operational by 2031.

4.2.3 New Roadways within the Premier Gateway Phase 1B Lands

The proposed road network within the Premier Gateway Phase 1B lands illustrated in **Figure 3.2** was assumed in place for the analyses of the 2021, 2026 and 2031 total traffic conditions scenarios. Intersection configurations are detailed in Section 4.4.2.

4.3 2021 Background Traffic Conditions

4.3.1 Generalized Traffic Growth

Horizon year 2021 peak hour background traffic volumes were estimated by applying growth factors derived from population forecasts contained in the Halton Region Best Planning Estimates Report[12] to existing traffic volumes. Per the report, the population of Halton Region is projected to grow by approximately 1.3% per annum, or 5% in total, between 2017 and 2021.

Figures 4.1 and **4.2** summarize the 2021 AM and PM peak hour background traffic volumes attributed to generalized population growth, respectively.

4.3.2 Other Area Development

The 25-hectare block of land located on the southwest corner of Steeles Avenue and Trafalgar Road was the only development outside the Study Area explicitly accounted for in the background traffic forecasts. The

[12] Best Planning Estimates of Population, Occupied Dwelling Units and Employment, 2011-2031, Regional Municipality of Halton, June 2011

property owner envisions a commercial/retail and industrial development featuring the following land uses[13]:

- Restaurants – 2,787 square metres (30,000 square feet).
- Office – 5,574 square metres (60,000 square feet).
- Retail/Commercial – 9,290 square metres (100,000 square feet).
- Industrial – 74,322 square metres (800,000 square feet).

Figures 4.3 and **4.4** summarize the AM and PM peak hour traffic volumes that would be generated by this development concept, respectively. It is noted that the property owner has not submitted a planning application for approval to proceed with this development to date.

4.3.3 Background Traffic Volumes

Figures 4.5 and **4.6** summarize the 2021 AM and PM peak hour overall background traffic volumes, respectively, which were calculated by adding the volumes for generalized growth (**Figures 4.1** and **4.2**) and the other area developments (**Figures 4.3** and **4.4**).

4.3.4 Traffic Operations with Network Improvements

Intersection capacity analyses were undertaken to assess 2021 background peak hour traffic conditions for the Study Area intersections. The analyses applied the same methodology, parameters and lane configurations used for the existing conditions analysis in Section 2.3, and incorporated the following road network improvements noted in Section 4.2:

- Improvements to address existing critical traffic movements.
- Widening of Ninth Line from 2 to 4 lanes between Steeles Avenue and 5 Sideroad (needed to address background traffic growth to 2021).

Signal timings were also optimized using Synchro.

Tables 4.1 and **4.2** summarize the analysis results for the AM and PM peak hours with 2021 background traffic volumes, respectively (**Figures 4.5** and **4.6**). The tables denote LOS, delay, v/c ratios and 95% queue length for the Study Area intersections**. Appendix D** provides the Synchro analysis output. The following critical movements were identified:

- **Steeles Avenue and Sixth Line:**
  - The southbound left movement is projected to operate at LOS E (v/c = 0.09) during the AM peak hour and LOS F (v/c = 0.07) during the PM peak hour.

[13] Steeles Avenue & Trafalgar Road, Traffic Study, Paradigm Transportation Solutions Limited, June 2016

- **Steeles Avenue and Sixth Line South:**
  - The northbound left movement is projected to operate at LOS E (v/c = 0.09) during the AM peak hour and LOS E (v/c = 0.24) during the PM peak hour.
- **Steeles Avenue and Trafalgar Road:**
  - The eastbound through movement is projected to operate at LOS E (v/c = 0.86) during the AM peak hour and LOS F (v/c = 1.25) during the PM peak hour.
  - The westbound left movement is projected to operate at LOS F (v/c = 1.10) during the AM peak hour and LOS F (v/c = 1.24) during the PM peak hour.
  - The southbound shared through-right movement is projected to operate at LOS F (v/c = 1.14) during the AM peak hour and LOS F (v/c = 1.09) during the PM peak hour.
- **Steeles Avenue and Eighth Line/Toronto Premium Outlets:**
  - The eastbound left movement is projected to operate at LOS D (v/c = 0.85) during the PM peak hour.
  - The westbound through movement is projected to operate at LOS D (v/c = 0.94) during the PM peak hour.
  - The southbound left-turn lane 95th percentile queue length is projected to exceed available storage by 5 metres during the AM peak hour.
- **Steeles and Eighth Line South:**
  - The northbound left movement is projected to operate at LOS E (v/c = 0.01) during the AM peak hour and LOS F (v/c = 0.07) during the PM peak hour.
- **Steeles Avenue and Ninth Line:**
  - The westbound through movement is projected to operate at LOS C (v/c = 0.90) during the PM peak hour.
  - The southbound left movement is projected to operate at LOS E (v/c = 0.98) during the AM peak hour.
- **Trafalgar Road and Hornby Road:**
  - The eastbound shared left-right movement is projected to operate at LOS F (v/c = 0.23) during the AM peak hour and LOS E (v/c = 0.27) during the PM peak hour.
- **5 Sideroad and Trafalgar Road:**
  - The southbound through movement is projected to operate at LOS C (v/c = 0.85) during the AM peak hour.
- **5 Sideroad and Ninth Line:**
  - The eastbound shared through-right movement is projected to operate at LOS D (v/c = 0.88) during the AM peak hour.

- The westbound shared through-right movement is projected to operate at LOS F (v/c = 1.25) during the PM peak hour.

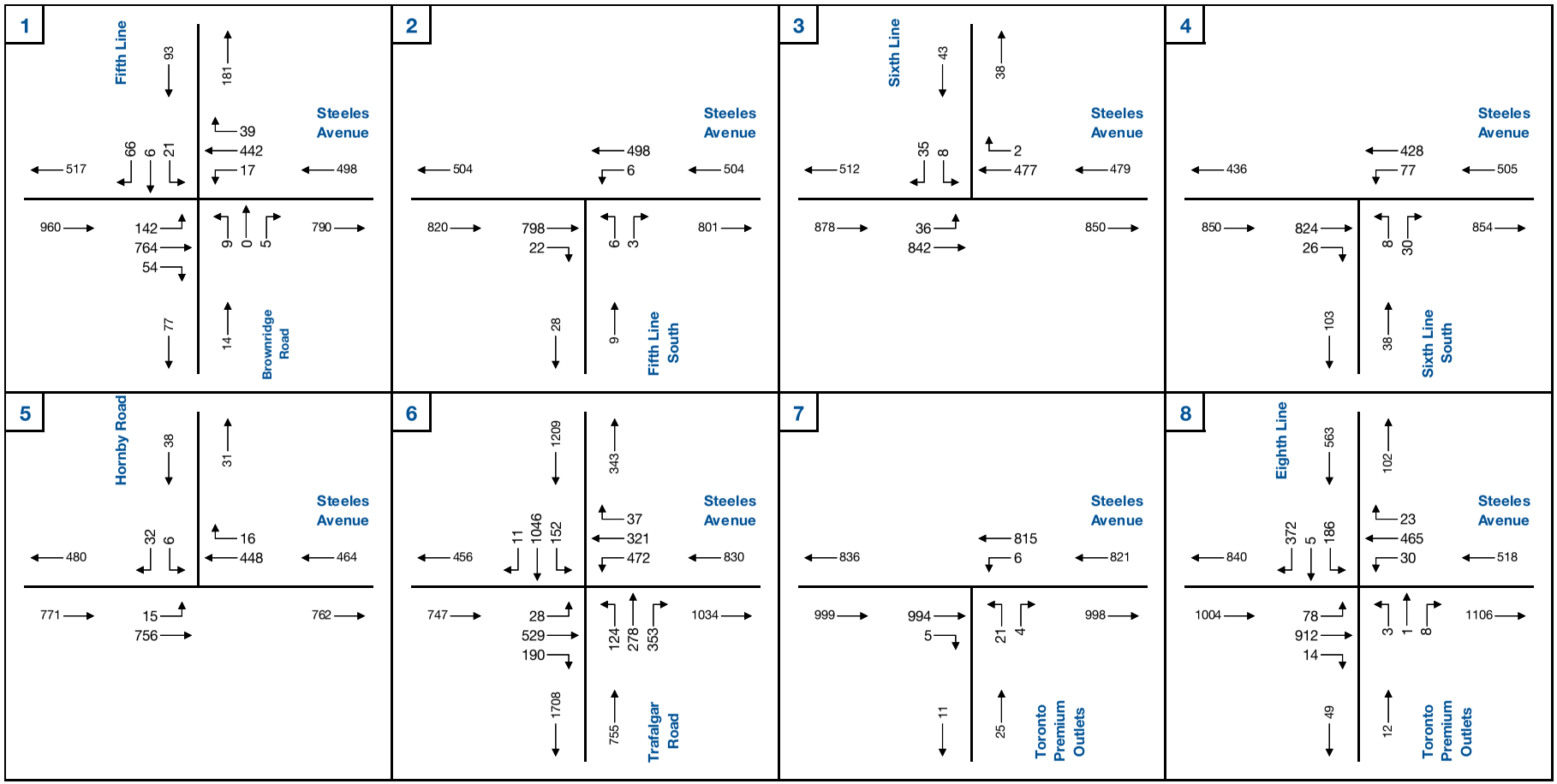
4.3.5 Traffic Operations with Remedial Measures

The operational analyses of 2021 background traffic conditions projected critical movements at nine (9) intersections within the Study Area. The following improvements were incorporated to address these concerns:

- **Steeles Avenue and Trafalgar Road:**
  - Addition of a second eastbound left-turn lane with 115 metres storage
  - Addition of a southbound right-turn lane with 80 metres storage
- **Steeles Avenue and Eighth Line/Toronto Premium Outlets:**
  - Addition of a westbound right-turn lane with 30 metres storage
  - Extension of the southbound left-turn lane storage to 70 metres
- **5 Sideroad and Trafalgar Road:**
  - Addition of a southbound right-turn lane with 30 metres storage
- **5 Sideroad and Ninth Line:**
  - Addition of a westbound right-turn lane with 40 metres storage

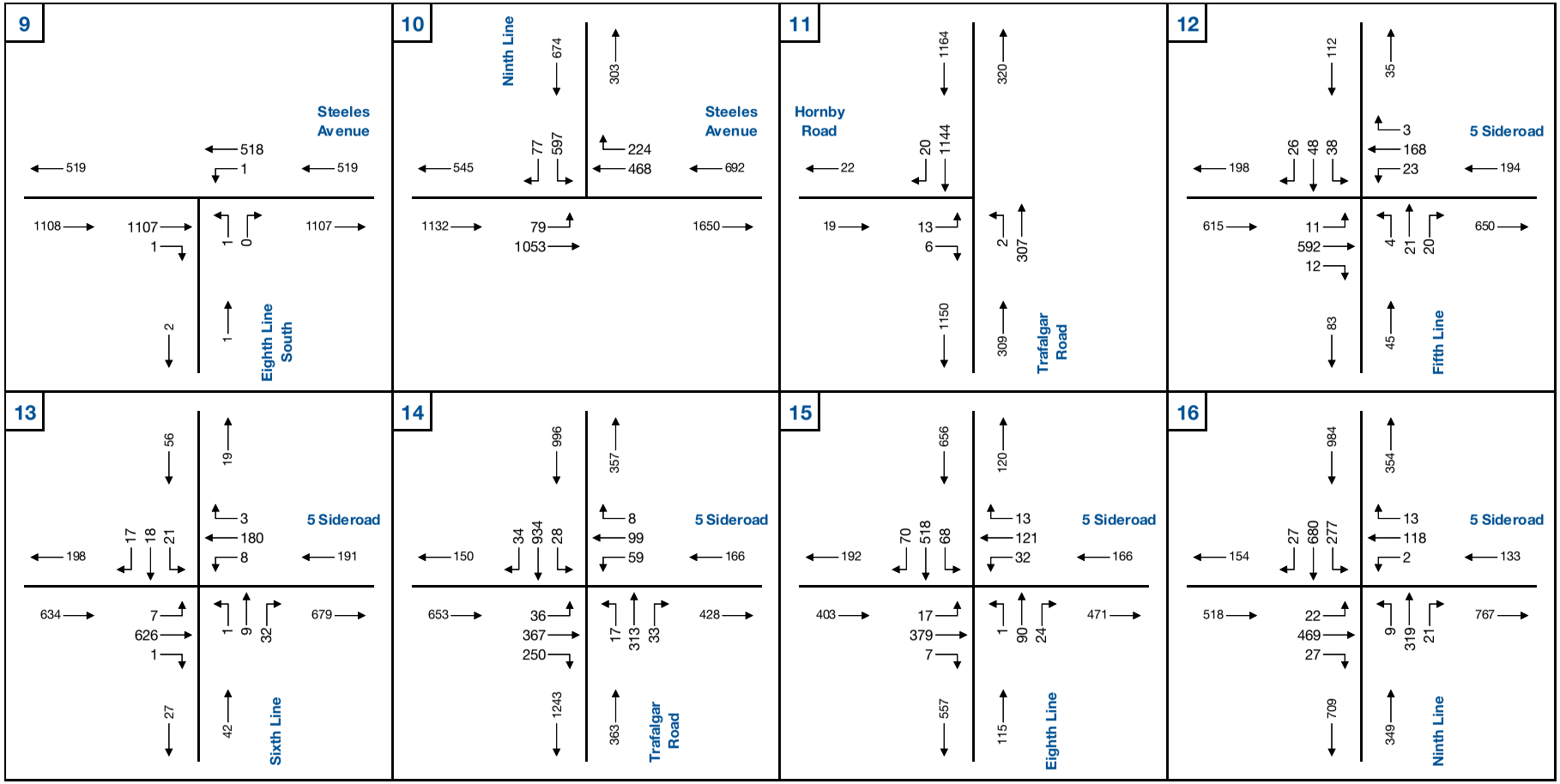
No remedial measures are recommended at the other five (5) intersections.

Table 4.3 summarizes the capacity analyses completed for the intersections with the above-noted improvements, based on the 2021 AM and PM peak hour background traffic forecasts. **Appendix E** provides the Synchro analysis output. The table illustrates that the intersections are projected to operate at or near satisfactory levels of service if these road improvements were implemented.



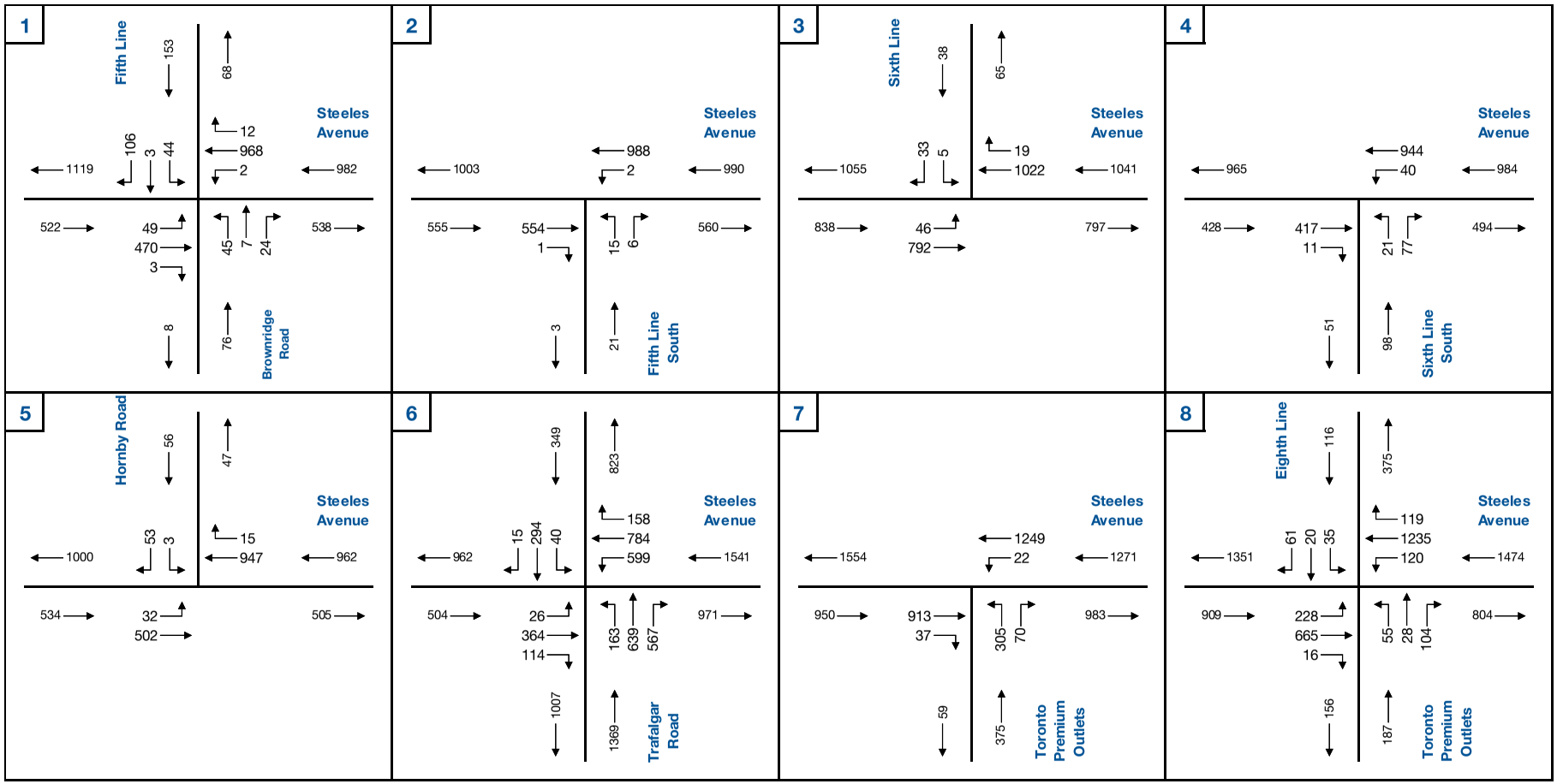
2021 AM Peak Hour

General Growth Background Traffic Volumes (1)



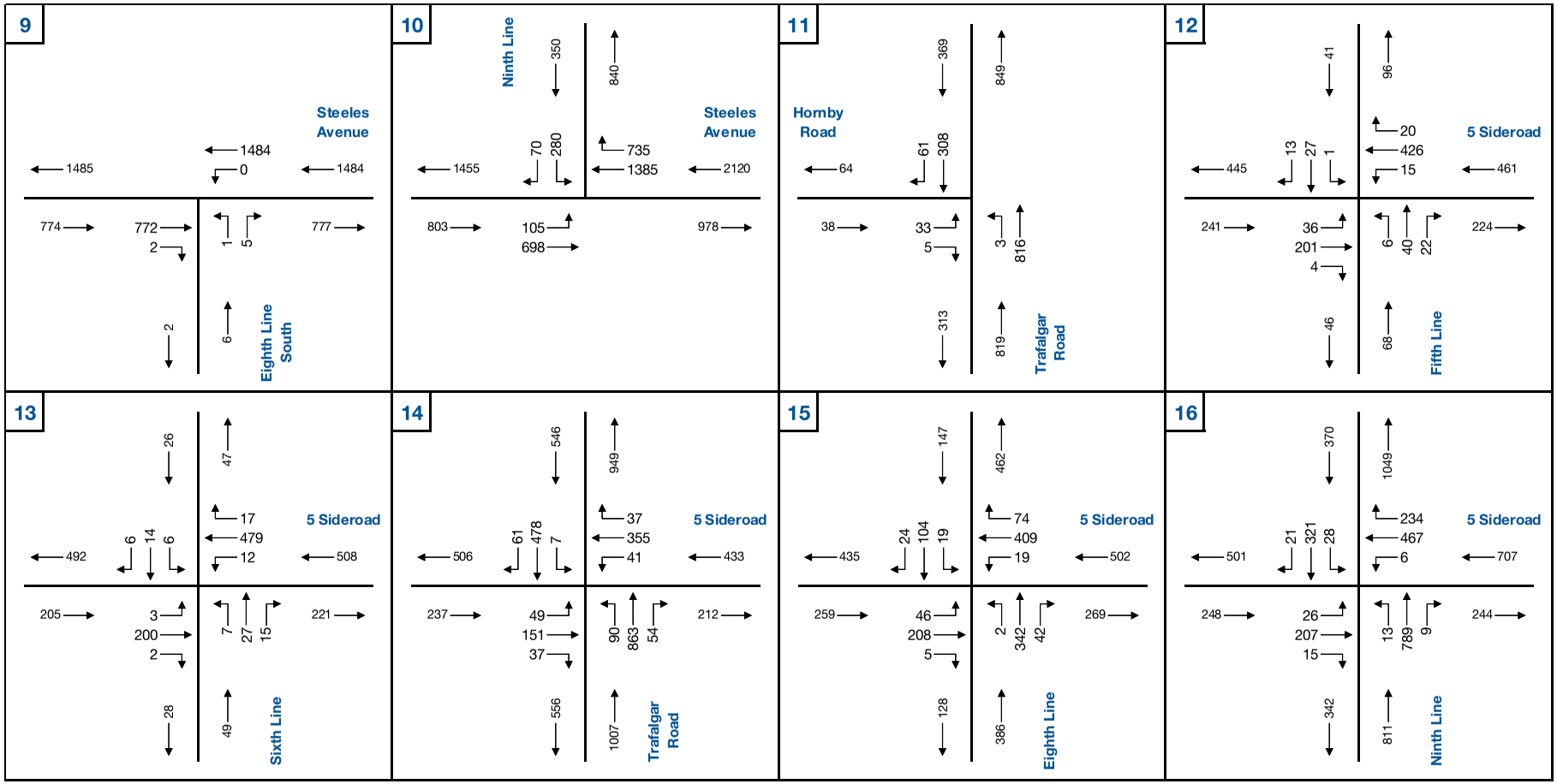
2021 AM Peak Hour

General Growth Background Traffic Volumes (2)



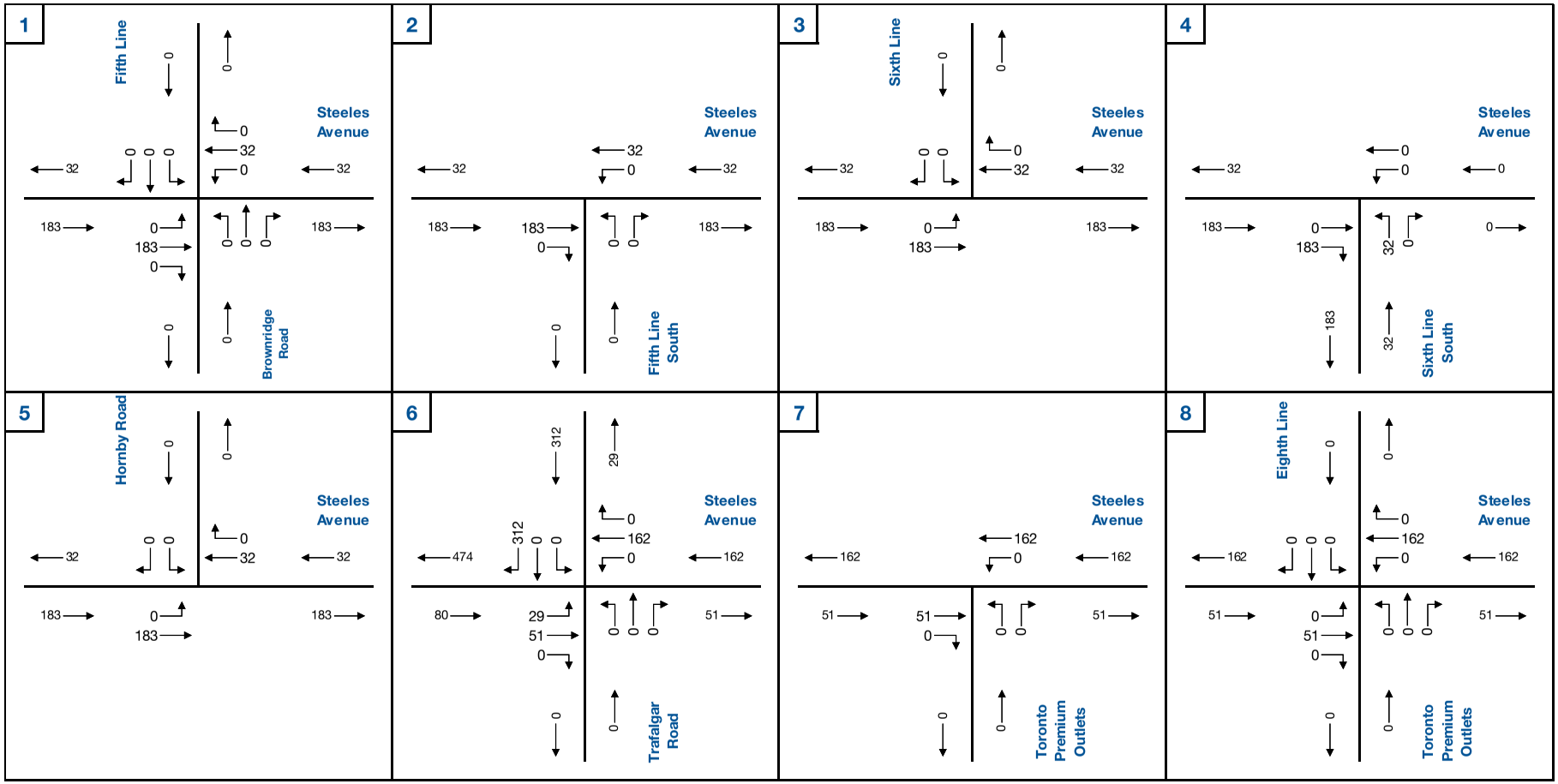
2021 PM Peak Hour

General Growth Background Traffic Volumes (1)



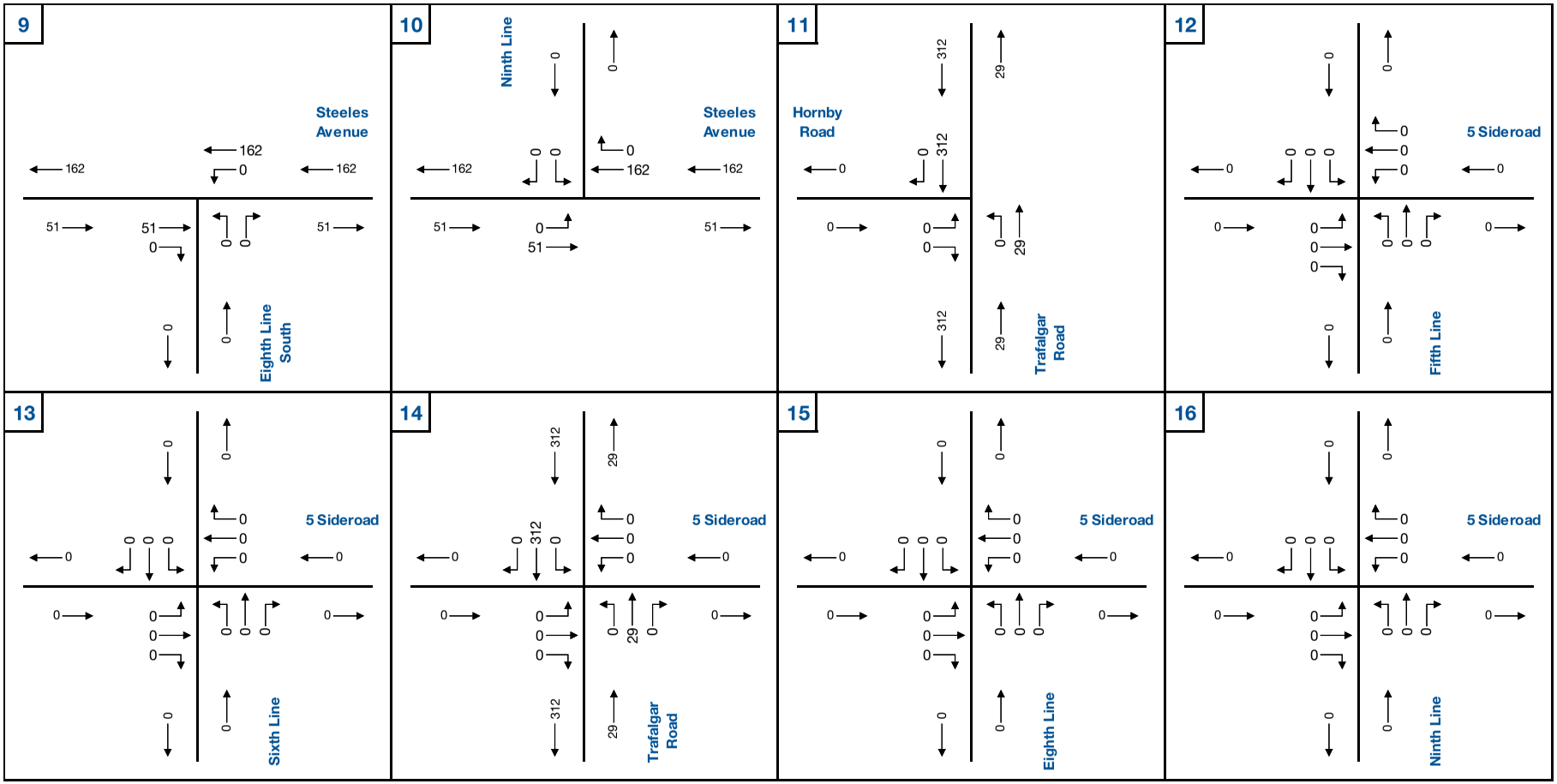
2021 PM Peak Hour

General Growth Background Traffic Volumes (2)



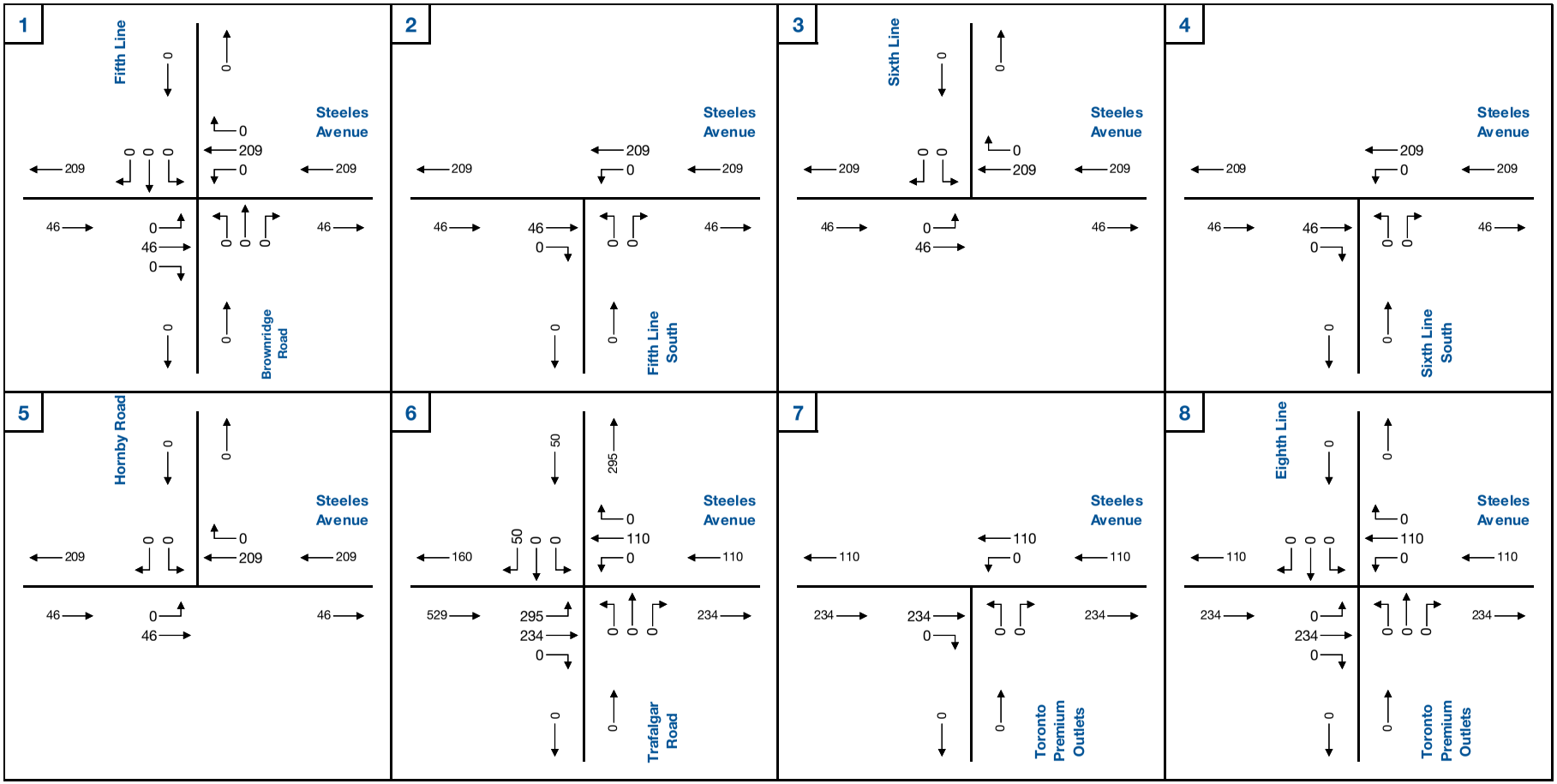
2021 AM Peak Hour

Other Development Background Traffic Volumes (1)



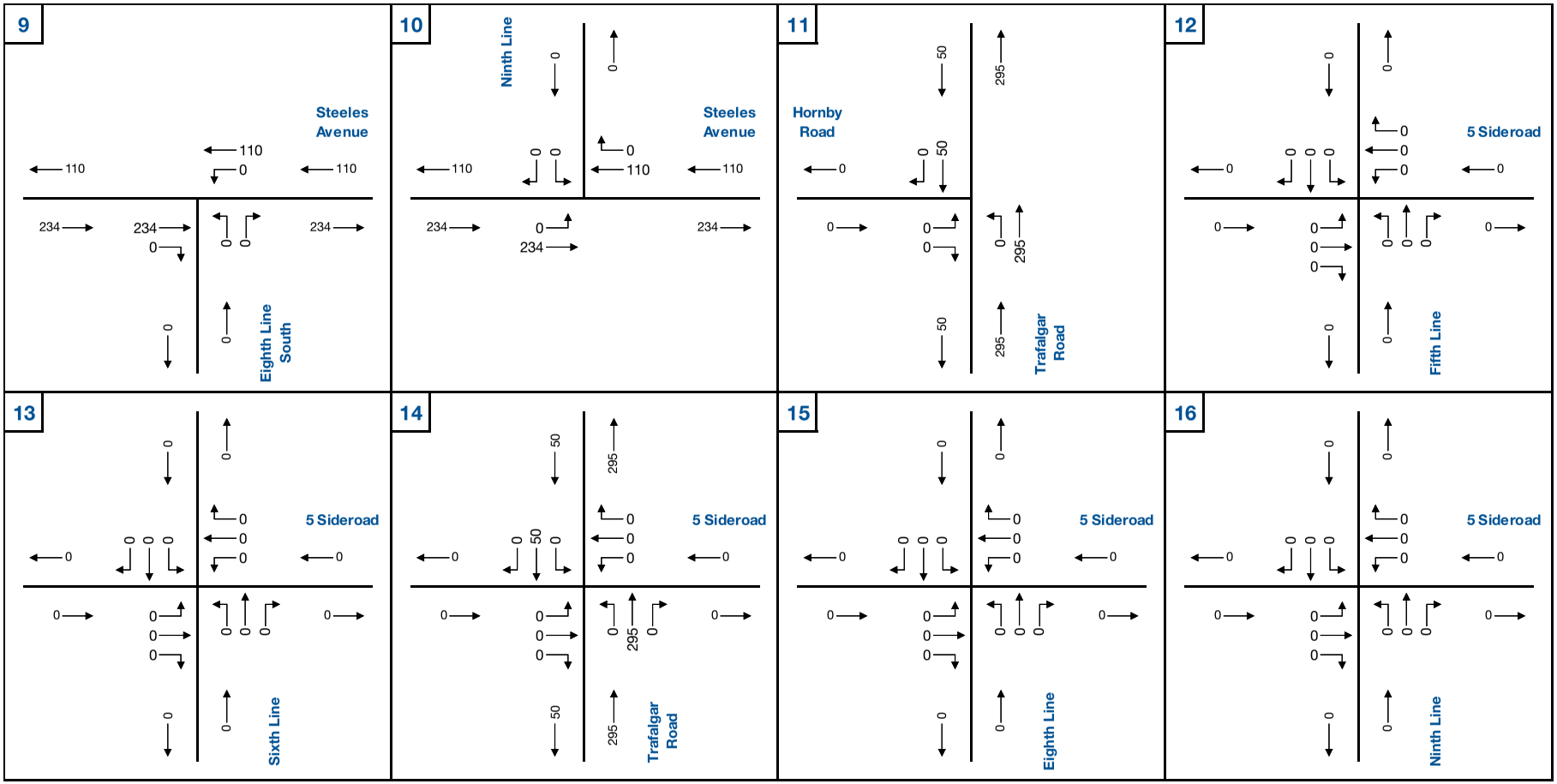
2021 AM Peak Hour

Other Development Background Traffic Volumes (2)



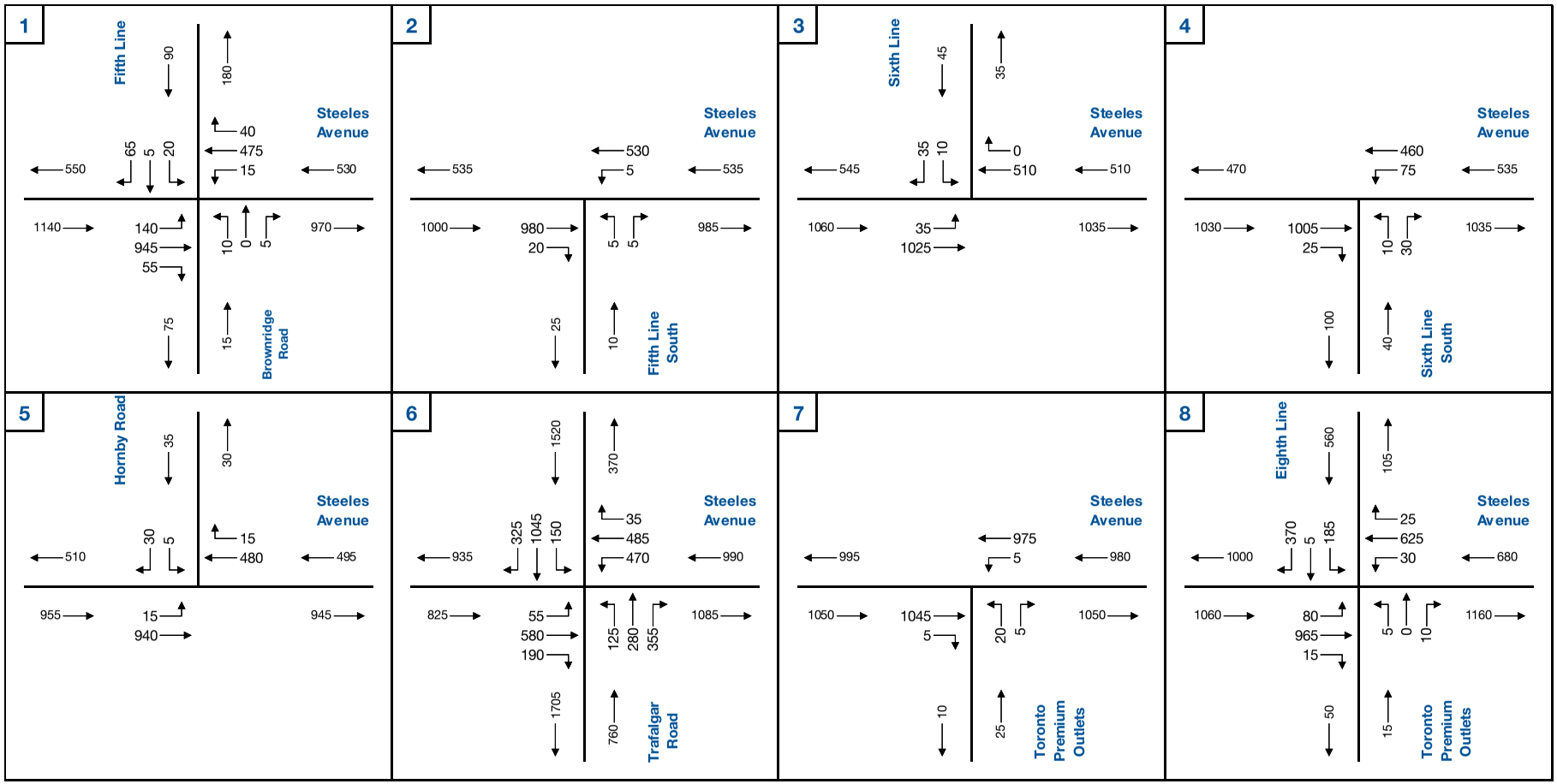
2021 PM Peak Hour

Other Development Background Traffic Volumes (1)

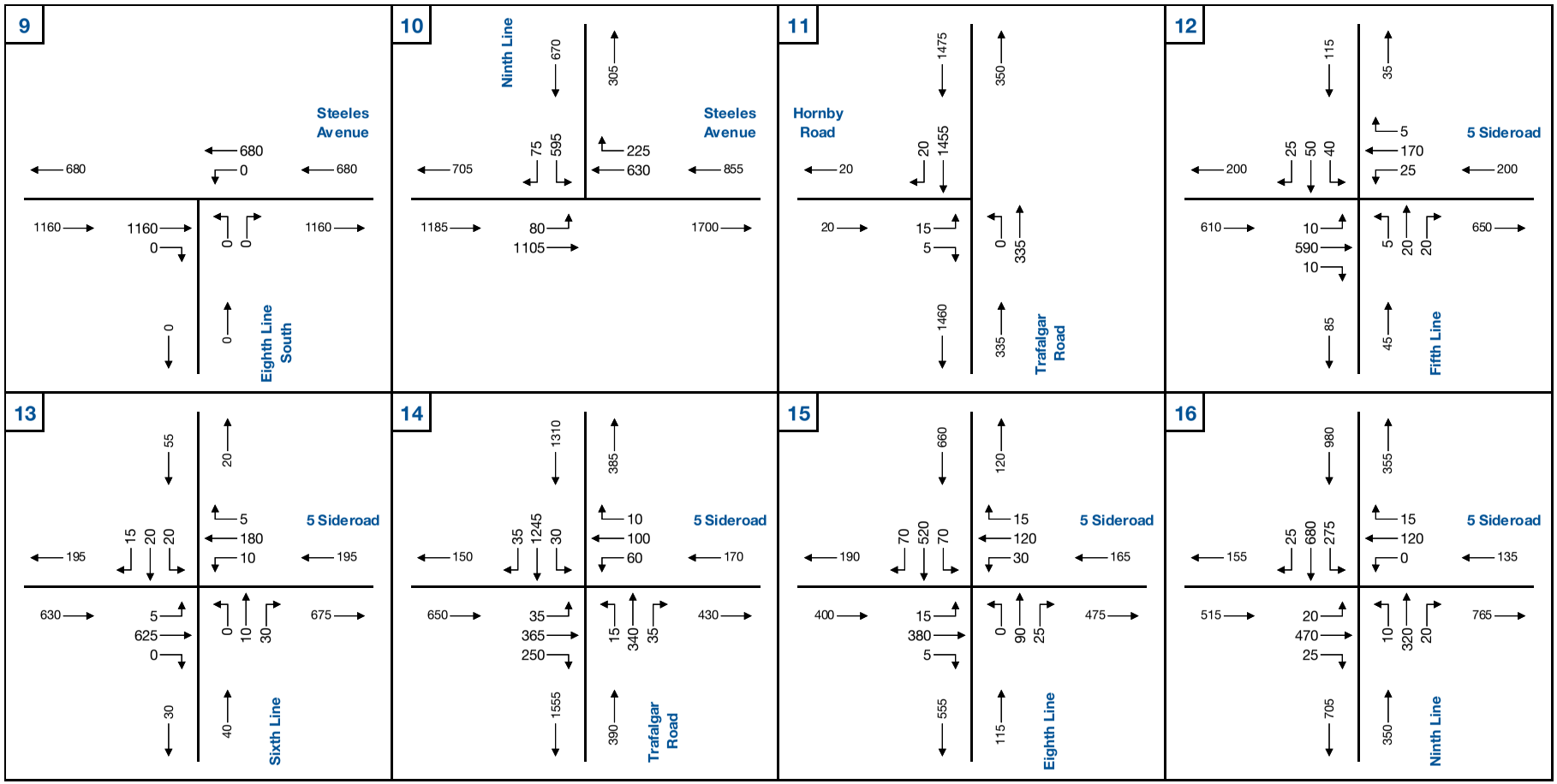


2021 PM Peak Hour

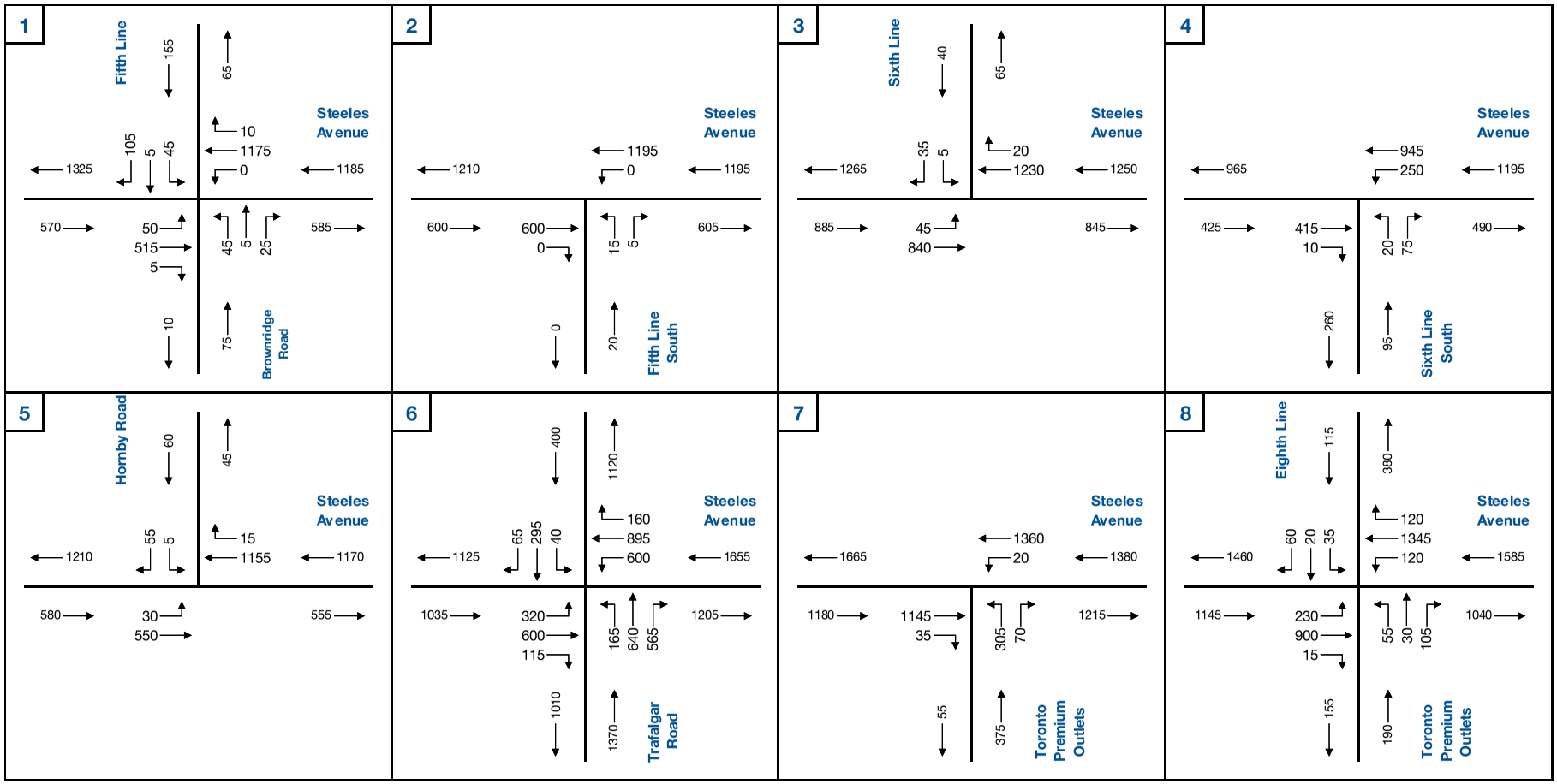
Other Development Background Traffic Volumes (2)



2021 AM Peak Hour Background Traffic Volumes (1)

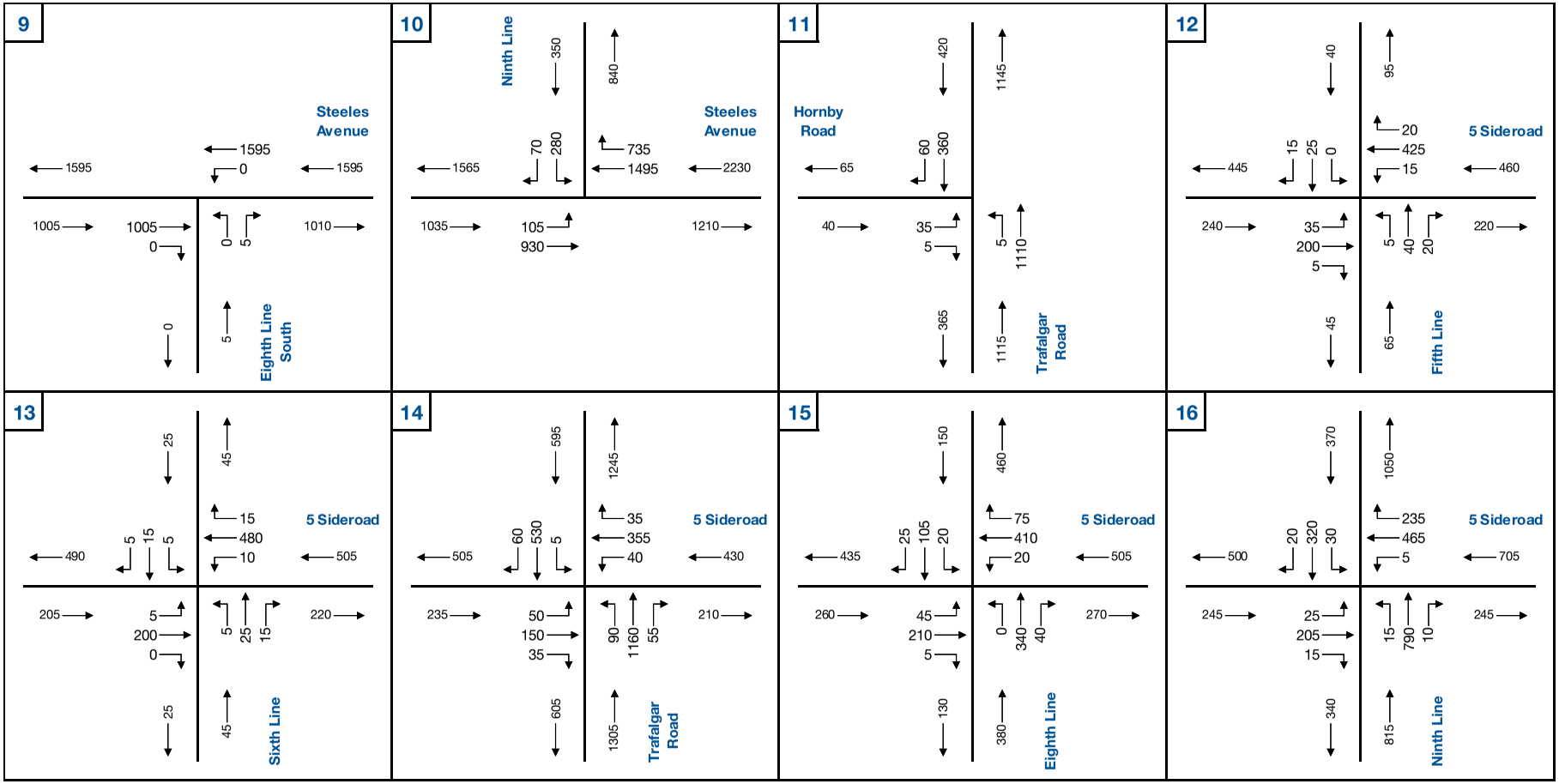


2021 AM Peak Hour Background Traffic Volumes (2)



2021 PM Peak Hour Background Traffic Volumes (1)

Figure 4.6a



2021 PM Peak Hour
Background Traffic Volumes (2)

TABLE 4.1: 2021 AM PEAK HOUR BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																
				Eastbound				Westbound				Northbound				Southbound				
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	OVERALL
AM Peak Hour	1 - Steeles Avenue and Fifth Line/Brownridge Road	TCS	LOS	A	A	A	**A**	A	A	A	**A**	C	C	C	**C**	C	C	C	**C**	**A**
			Delay	6	6	4	**6**	4	5	5	**5**	22	21	21	**21**	22	21	21	**22**	**7**
			V/C	0.27	0.51	0.04		0.05	0.31	0.31		0.08	0.00	0.00		0.18	0.02	0.04		
			Q	17	45	3		3	21	21		4	0	0		6	3	4		
			Ex	150	800	70		50	650	650		35	250	250		50	250	50		
			Avail	133	755	67		47	629	629		31	250	250		44	247	46		
	2 - Steeles Avenue and Fifth Line South	TCS	LOS		A	A	**A**	A	A		**A**	C		C	**C**					**A**
			Delay		4	2	**4**	2	3		**3**	28		27	**27**					**4**
			V/C		0.46	0.01		0.01	0.28			0.11		0.00						
			Q		45	2		1	21			3		3						
			Ex		600	600		60	450			20		400						
			Avail		555	598		59	429			17		397						
	3 - Steeles Avenue and Sixth Line	TWSC	LOS	A	A		**A**		A	A	**A**					E		A	**C**	
			Delay	9	0		**0**		0	0	**0**					39		10	**16**	**1**
			V/C	0.03	0.30				0.15	0.00						0.09		0.05		
			Q	1	0				0	0						2		1		
			Ex	60	400				900	30						30		500		
			Avail	59	400				900	30						28		499		
	4 - Steeles Avenue and Sixth Line South	TWSC	LOS		A	A	**A**	B	A		**A**	E		B	**C**					
			Delay		0	0	**0**	11	0		**2**	42		13	**20**					**1**
			V/C		0.30	0.01		0.11	0.14			0.09		0.06						
			Q		0	0		3	0			2		2						
			Ex		800	30		60	500			30		350						
			Avail		800	30		57	500			28		348						
	5 - Steeles Avenue and Hornby Road	TWSC	LOS	A	A		**A**		A	A	**A**					C		A	**B**	
			Delay	9	0		**0**		0	0	**0**					22		10	**12**	**0**
			V/C	0.01	0.28				0.14	0.01						0.02		0.04		
			Q	0	0				0	0						1		1		
			Ex	60	450				850	30						30		500		
			Avail	60	450				850	30						29		499		
	6 - Steeles Avenue and Trafalgar Road	TCS	LOS	D	E	D	**E**	F	D	C	**E**	F	C	C	**D**	C	F	F	**F**	**E**
			Delay	42	65	48	**60**	121	41	34	**79**	100	27	28	**39**	22	118	118	**109**	**78**
			V/C	0.28	0.86	0.30		1.06	0.54	0.02		0.84	0.21	0.23		0.27	1.14	1.14		
			Q	20	112	37		116	83	0		44	39	19		36	294	294		
			Ex	115	850	50		140	250	75		100	300	100		250	500	500		
			Avail	95	738	13		24	167	75		56	261	81		214	206	206		
	7 - Steeles Avenue and Toronto Premium Outlets	TCS	LOS		A	A	**A**	A	A		**A**	C		C	**C**					**A**
			Delay		10	6	**10**	4	6		**6**	21		20	**21**					**8**
			V/C		0.57	0.00		0.02	0.48			0.05		0.00						
			Q		69	2		1	41			3		2						
			Ex		250	250		50	150			40		40						
			Avail		181	248		49	109			37		38						
	8 -Steeles Avenue and Eighth Line/Toronto Premium Outlets	TCS	LOS	B	C	B	**B**	B	B	B	**B**	C	B	B	**C**	D	C	C	**C**	**C**
			Delay	11	20	12	**19**	12	18	18	**18**	33	16	16	**22**	47	26	26	**33**	**22**
			V/C	0.23	0.73	0.01		0.14	0.56	0.56		0.08	0.01	0.01		0.77	0.25	0.25		
			Q	13	113	0		6	63	63		2	0	0		65	25	25		
			Ex	110	150	65		125	850	850		135	200	200		60	500	500		
			Avail	97	37	65		119	787	787		133	200	200		-5	475	475		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

TABLE 4.1: 2021 AM PEAK HOUR BACKGROUND TRAFFIC OPERATIONS (CONTINUED)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																
				Eastbound				Westbound				Northbound				Southbound				OVERALL
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	
AM Peak Hour	9 - Steeles Avenue and Eighth Line South	TWSC	LOS		A	A	A	B	A		A	E		A	E					
			Delay		0	0	0	11	0		0	37		0	37					0
			V/C		0.45	0.23		0.00	0.20			0.01		0.00						
			Q		0	0		0	0			0		0						
			Ex		800	800		90	500			30		500						
			Avail		800	800		90	500			30		500						
	10 - Steeles Avenue and Ninth Line	TCS	LOS	A	A		A		B	A	B					E		C	D	C
			Delay	6	9		9		13	10	12					56		20	52	20
			V/C	0.20	0.58				0.48	0.15						0.98		0.06		
			Q	7	51				41	11						60		9		
			Ex	65	500				750	75						90		500		
			Avail	58	449				709	64						30		491		
	11 - Trafalgar Road and Hornby Road	TWSC	LOS	F		F	F					A	A		A		A	A	A	
			Delay	59		59	59					0	0		0		0	0	0	1
			V/C	0.23		0.23						0.01	0.01				0.87	0.87		
			Q	7		7						0	0				0	0		
			Ex	500		500						500	500				500	500		
			Avail	493		493						500	500				500	500		
	12 - 5 Sideroad and Fifth Line	TWSC	LOS	A	A	A	A	A	A	A	A	C	C	C	C	C	C	C	C	
			Delay	0	0	0	0	1	1	1	1	18	18	18	18	23	23	23	23	4
			V/C	0.01	0.01	0.01		0.03	0.03	0.03		0.14	0.14	0.14		0.37	0.37	0.37		
			Q	0	0	0		1	1	1		4	4	4		13	13	13		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	500	500	500		499	499	499		496	496	496		487	487	487		
	13 - 5 Sideroad and Sixth Line	TWSC	LOS	A	A	A	A	A	A	A	A	C	C	C	C	C	C	C	C	
			Delay	0	0	0	0	1	1	1	1	15	15	15	15	18	18	18	18	2
			V/C	0.00	0.00	0.00		0.01	0.01	0.01		0.10	0.10	0.10		0.17	0.17	0.17		
			Q	0	0	0		0	0	0		3	3	3		5	5	5		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	500	500	500		500	500	500		497	497	497		495	495	495		
	14 - 5 Sideroad and Trafalgar Road	TCS	LOS	B	C	B	C	C	B	B	B	B	B	B	B	A	C	C	C	C
			Delay	18	25	19	22	20	19	19	19	14	14	14	14	10	24	24	23	21
			V/C	0.10	0.64	0.21		0.28	0.20	0.20		0.14	0.30	0.30		0.07	0.85	0.85		
			Q	10	74	19		17	23	23		4	36	36		7	175	175		
			Ex	45	500	80		75	500	500		100	500	500		175	500	500		
			Avail	35	426	61		58	477	477		96	464	464		168	325	325		
	15 - 5 Sideroad and Eighth Line	TCS	LOS	C	C	C	C	B	B	B	B	A	A	A	A	B	B	B	B	B
			Delay	22	22	22	22	15	15	15	15	6	6	6	6	13	13	13	13	15
			V/C	0.75	0.75	0.75		0.34	0.34	0.34		0.11	0.11	0.11		0.68	0.68	0.68		
			Q	60	60	60		24	24	24		11	11	11		85	85	85		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	440	440	440		476	476	476		489	489	489		415	415	415		
	16 - 5 Sideroad and Ninth Line	TCS	LOS	B	D	D	C	B	B	B	B	B	B	B	B	B	B	B	B	B
			Delay	15	35	35	34	14	16	16	16	14	15	15	15	11	11	11	11	18
			V/C	0.06	0.88	0.88		0.01	0.23	0.23		0.06	0.31	0.31		0.55	0.42	0.42		
			Q	6	103	103		2	22	22		4	24	24		30	38	38		
			Ex	40	500	500		40	500	500		40	500	500		40	500	500		
			Avail	34	397	397		38	478	478		36	476	476		10	462	462		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

TABLE 4.2: 2021 PM PEAK HOUR BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																
				Eastbound				Westbound				Northbound				Southbound				
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	OVERALL
PM Peak Hour	1 - Steeles Avenue and Fifth Line/Brownridge Road	TCS	LOS	A	A	A	**A**	A	A	A	**A**	C	C	C	**C**	C	B	C	**C**	**A**
			Delay	8	6	5	**6**	5	9	9	**9**	21	20	20	**20**	21	19	20	**20**	**9**
			V/C	0.23	0.29	0.00		0.01	0.62	0.62		0.23	0.06	0.06		0.25	0.02	0.07		
			Q	8	21	0		1	59	59		10	7	7		11	3	10		
			Ex	150	800	70		50	650	650		35	250	250		50	250	50		
			Avail	142	779	70		49	591	591		25	243	243		39	247	40		
	2 - Steeles Avenue and Fifth Line South	TCS	LOS		A	A	**A**	A	A		**A**	C		C	**C**					**A**
			Delay		3	2	**3**	2	4		**4**	30		27	**29**					**4**
			V/C		0.27	0.00		0.01	0.50			0.30		0.01						
			Q		23	1		1	56			6		4						
			Ex		600	600		60	450			20		400						
			Avail		577	599		59	394			14		396						
	3 - Steeles Avenue and Sixth Line	TWSC	LOS	B	A		**A**		A	A	**A**					F		B	**C**	**A**
			Delay	12	0		**1**		0	0	**0**					60		14	**20**	**1**
			V/C	0.09	0.25				0.36	0.01						0.07		0.08		
			Q	2	0				0	0						2		2		
			Ex	60	400				900	30						30		500		
			Avail	58	400				900	30						28		498		
	4 - Steeles Avenue and Sixth Line South	TWSC	LOS		A	A	**A**	A	A		**A**	E		A	**C**					**A**
			Delay		0	0	**0**	9	0		**2**	49		10	**19**					**3**
			V/C		0.12	0.01		0.22	0.28			0.24		0.10						
			Q		0	0		7	0			7		3						
			Ex		800	30		60	500			30		350						
			Avail		800	30		53	500			23		347						
	5 - Steeles Avenue and Hornby Road	TWSC	LOS	B	A		**A**		A	A	**A**					F		B	**C**	**A**
			Delay	11	0		**1**		0	0	**0**					54		14	**17**	**1**
			V/C	0.06	0.16				0.34	0.01						0.06		0.12		
			Q	2	0				0	0						2		3		
			Ex	60	450				850	30						30		500		
			Avail	58	450				850	30						28		497		
	6 - Steeles Avenue and Trafalgar Road	TCS	LOS	F	D	C	**E**	F	F	C	**F**	C	D	C	**C**	C	C	C	**C**	**E**
			Delay	163	38	26	**75**	161	92	25	**111**	25	40	29	**28**	30	23	30	**29**	**70**
			V/C	1.25	0.81	0.09		1.24	1.09	0.10		0.57	0.63	0.46		0.15	0.45	0.45		
			Q	106	77	5		99	130	14		24	71	45		10	39	39		
			Ex	115	850	50		140	250	75		100	300	100		250	500	500		
			Avail	9	773	45		41	120	61		76	229	55		240	461	461		
	7 - Steeles Avenue and Toronto Premium Outlets	TCS	LOS		C	B	**C**	B	B		**B**	C		C	**C**					**C**
			Delay		22	13	**22**	13	18		**18**	26		24	**26**					**20**
			V/C		0.70	0.03		0.13	0.71			0.28		0.04						
			Q		134	6		6	134			34		10						
			Ex		250	250		50	150			40		40						
			Avail		116	244		44	16			6		30						
	8 -Steeles Avenue and Eighth Line/Toronto Premium Outlets	TCS	LOS	D	C	B	**C**	B	D	D	**D**	D	C	C	**C**	D	D	D	**D**	**C**
			Delay	48	20	13	**25**	12	37	37	**35**	43	28	28	**33**	46	42	42	**43**	**31**
			V/C	0.85	0.58	0.01		0.33	0.94	0.94		0.21	0.13	0.13		0.27	0.16	0.16		
			Q	71	91	0		17	203	203		11	19	19		17	18	18		
			Ex	110	150	65		125	850	850		135	200	200		60	500	500		
			Avail	39	59	65		108	647	647		124	181	181		43	482	482		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

TABLE 4.2: 2021 PM PEAK HOUR BACKGROUND TRAFFIC OPERATIONS (CONTINUED)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																
				Eastbound				Westbound				Northbound				Southbound				OVERALL
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	
PM Peak Hour	9 - Steeles Avenue and Eighth Line South	TWSC	LOS		A	A	A	A	A		A	F		B	E					
			Delay		0	0	0	0	0		0	59		13	36					0
			V/C		0.40	0.20		0.00	0.47			0.07		0.01						
			Q		0	0		0	0			2		0						
			Ex		800	800		90	500			30		500						
			Avail		800	800		90	500			28		500						
	10 - Steeles Avenue and Ninth Line	TCS	LOS	B	A		A		C	B	C					C		C	C	B
			Delay	11	7		7		23	13	20					30		24	29	17
			V/C	0.41	0.45				0.90	0.46						0.55		0.05		
			Q	9	39				141	17						28		10		
			Ex	65	500				750	75						90		500		
			Avail	56	461				609	58						62		490		
	11 - Trafalgar Road and Hornby Road	TWSC	LOS	E		E	E					A	A		A		A	A	A	
			Delay	39		39	39					0	0		0		0	0	0	1
			V/C	0.27		0.27						0.00	0.00				0.25	0.25		
			Q	8		8						0	0				0	0		
			Ex	500		500						500	500				500	500		
			Avail	492		492						500	500				500	500		
	12 - 5 Sideroad and Fifth Line	TWSC	LOS	A	A	A	A	A	A	A	A	C	C	C	C	C	C	C	C	
			Delay	2	2	2	2	0	0	0	0	17	17	17	17	17	17	17	17	3
			V/C	0.04	0.04	0.04		0.01	0.01	0.01		0.19	0.19	0.19		0.14	0.14	0.14		
			Q	1	1	1		0	0	0		6	6	6		4	4	4		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	499	499	499		500	500	500		494	494	494		496	496	496		
	13 - 5 Sideroad and Sixth Line	TWSC	LOS	A	A	A	A	A	A	A	A	C	C	C	C	C	C	C	C	
			Delay	0	0	0	0	0	0	0	0	16	16	16	16	16	16	16	16	2
			V/C	0.00	0.00	0.00		0.01	0.01	0.01		0.14	0.14	0.14		0.10	0.10	0.10		
			Q	0	0	0		0	0	0		4	4	4		3	3	3	3	
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	500	500	500		500	500	500		496	496	496		497	497	497		
	14 - 5 Sideroad and Trafalgar Road	TCS	LOS	C	C	B	C	C	C	C	C	A	B	B	B	B	B	B	B	C
			Delay	23	22	19	22	20	30	30	29	9	19	19	18	13	16	16	16	20
			V/C	0.30	0.28	0.03		0.12	0.71	0.71		0.21	0.74	0.74		0.08	0.41	0.41		
			Q	15	32	1		12	79	79		16	157	157		3	56	56		
			Ex	45	500	80		75	500	500		100	500	500		175	500	500		
			Avail	30	468	79		63	421	421		84	343	343		172	444	444		
	15 - 5 Sideroad and Eighth Line	TWSC	LOS	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	B
			Delay	11	11	11	11	17	17	17	17	11	11	11	11	8	8	8	8	13
			V/C	0.46	0.46	0.46		0.76	0.76	0.76		0.49	0.49	0.49		0.18	0.18	0.18		
			Q	30	30	30		61	61	61		42	42	42		15	15	15		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	470	470	470		439	439	439		458	458	458		485	485	485		
	16 - 5 Sideroad and Ninth Line	TCS	LOS	B	B	B	B	B	F	F	F	A	A	A	A	A	A	A	A	E
			Delay	17	17	17	17	15	147	147	145	8	10	10	10	9	9	9	9	55
			V/C	0.24	0.39	0.39		0.03	1.25	1.25		0.03	0.44	0.44		0.10	0.19	0.19		
			Q	9	37	37		4	162	162		3	41	41		6	17	17		
			Ex	40	500	500		40	500	500		40	500	500		40	500	500		
			Avail	31	463	463		36	338	338		37	459	459		34	483	483		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

TABLE 4.3: 2021 AM AND PM PEAK HOUR BACKGROUND TRAFFIC OPERATIONS WITH REMEDIAL MEASURES

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																
				Eastbound				Westbound				Northbound				Southbound				
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	OVERALL
AM Peak Hour	6 - Steeles Avenue and Trafalgar Road	TCS	LOS	E	E	D	**E**	E	D	C	**E**	E	C	C	**D**	C	D	D	**D**	**D**
			Delay	72	62	49	**59**	74	39	33	**56**	76	32	33	**40**	28	53	44	**49**	**51**
			V/C	0.43	0.82	0.31		0.86	0.50	0.02		0.67	0.23	0.23		0.30	0.86	0.52		
			Q	16	110	38		100	79	0		39	46	23		43	165	25		
			Ex	115	850	50		140	250	75		100	300	100		250	500	80		
			Avail	99	740	12		40	171	75		61	254	77		207	335	55		
	8 -Steeles Avenue and Eighth Line/Toronto Premium Outlets	TCS	LOS	A	C	B	**B**	B	B	B	**B**	C	B	B	**C**	D	C	C	**C**	**C**
			Delay	10	20	12	**19**	12	18	13	**17**	33	16	16	**20**	47	26	26	**33**	**22**
			V/C	0.23	0.73	0.01		0.14	0.54	0.02		0.08	0.02	0.02		0.77	0.25	0.25		
			Q	13	113	0		6	61	0		2	4	4		65	25	25		
			Ex	110	150	65		125	850	30		135	200	200		70	500	500		
			Avail	97	37	65		119	789	30		133	196	196		5	475	475		
	10 - Steeles Avenue and Ninth Line	TCS	LOS	A	B		**B**		C	B	**C**					C		B	**C**	**B**
			Delay	10	16		**15**		21	16	**20**					22		17	**21**	**18**
			V/C	0.24	0.69				0.61	0.15						0.57		0.06		
			Q	11	76				53	14						47		8		
			Ex	65	500				750	75						90		500		
			Avail	54	424				697	61						43		492		
	14 - 5 Sideroad and Trafalgar Road	TCS	LOS	B	C	B	**C**	C	B	B	**B**	B	B	B	**B**	A	C	B	**C**	**C**
			Delay	18	25	19	**22**	20	19	19	**19**	13	14	14	**14**	10	22	11	**22**	**20**
			V/C	0.10	0.64	0.21		0.28	0.20	0.20		0.14	0.30	0.30		0.07	0.82	0.03		
			Q	10	74	19		17	23	23		4	36	36		7	166	0		
			Ex	45	500	80		75	500	500		100	500	500		175	500	30		
			Avail	35	426	61		58	477	477		96	464	464		168	334	30		
	16 - 5 Sideroad and Ninth Line	TCS	LOS	B	C	C	**C**	B	B	B	**B**	B	B	B	**B**	B	B	B	**B**	**B**
			Delay	14	27	27	**27**	14	15	14	**15**	15	16	16	**16**	12	12	12	**12**	**17**
			V/C	0.05	0.81	0.81		0.01	0.19	0.01		0.60	0.32	0.32		0.57	0.44	0.44		
			Q	6	90	90		1	20	0		4	27	27		35	44	44		
			Ex	40	500	500		40	500	40		40	500	500		40	500	500		
			Avail	34	410	410		39	480	40		36	473	473		5	456	456		
PM Peak Hour	6 - Steeles Avenue and Trafalgar Road	TCS	LOS	E	D	D	**E**	E	D	C	**D**	E	D	D	**D**	D	D	D	**D**	**D**
			Delay	76	53	40	**59**	61	51	34	**53**	65	42	41	**44**	35	42	39	**41**	**50**
			V/C	0.86	0.76	0.09		0.82	0.84	0.12		0.58	0.57	0.45		0.16	0.32	0.06		
			Q	71	103	0		106	142	17		37	115	62		16	55	0		
			Ex	115	850	50		140	250	75		100	300	100		250	500	80		
			Avail	44	747	50		34	108	58		63	185	38		234	445	80		
	8 -Steeles Avenue and Eighth Line/Toronto Premium Outlets	TCS	LOS	D	B	B	**C**	B	C	B	**C**	D	C	C	**C**	D	D	D	**D**	**C**
			Delay	43	17	11	**22**	11	26	13	**24**	42	27	27	**32**	43	39	39	**40**	**24**
			V/C	0.85	0.55	0.01		0.33	0.84	0.08		0.32	0.14	0.14		0.28	0.16	0.16		
			Q	69	85	0		15	148	3		11	18	18		16	18	18		
			Ex	110	150	65		125	850	30		135	200	200		70	500	500		
			Avail	41	65	65		110	702	27		124	182	182		54	482	482		
	10 - Steeles Avenue and Ninth Line	TCS	LOS	B	A		**A**		B	B	**B**					C		C	**C**	**B**
			Delay	11	6		**7**		19	12	**17**					34		27	**32**	**15**
			V/C	0.44	0.44				0.84	0.46						0.59		0.05		
			Q	11	38				140	16						30		10		
			Ex	65	500				750	75						90		500		
			Avail	54	462				610	59						60		490		
	14 - 5 Sideroad and Trafalgar Road	TCS	LOS	C	C	B	**C**	C	C	C	**C**	A	B	B	**B**	B	B	B	**B**	**C**
			Delay	23	22	19	**22**	20	30	30	**29**	9	19	19	**18**	13	16	13	**15**	**20**
			V/C	0.30	0.28	0.03		0.12	0.71	0.71		0.20	0.74	0.74		0.08	0.36	0.04		
			Q	15	32	1		12	79	79		16	157	157		3	51	5		
			Ex	45	500	80		75	500	500		100	500	500		175	500	30		
			Avail	30	468	79		63	421	421		84	343	343		172	449	25		
	16 - 5 Sideroad and Ninth Line	TCS	LOS	B	B	B	**B**	B	C	B	**B**	A	B	B	**B**	A	A	A	**A**	**B**
			Delay	12	13	13	**13**	11	20	13	**17**	8	12	12	**12**	10	9	9	**9**	**13**
			V/C	0.15	0.35	0.35		0.03	0.75	0.34		0.03	0.53	0.53		0.12	0.23	0.23		
			Q	7	28	28		3	65	24		4	43	43		6	18	18		
			Ex	40	500	500		40	500	40		40	500	500		40	500	500		
			Avail	33	472	472		37	435	16		36	457	457		34	482	482		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

4.4 2021 Total Traffic Conditions

4.4.1 Total Traffic Volumes

Figures 4.7 and **4.8** summarize the 2021 AM and PM peak hour total traffic volumes, respectively, which were calculated by adding 2021 background traffic volumes (**Figures 4.5** and **4.6**) and the Premier Gateway Phase 1B lands traffic assignments (**Figures 3.5** and **3.6**).

4.4.2 Traffic Operations with Network Improvements

Intersection capacity analyses were undertaken to assess 2021 total peak hour traffic conditions for the Study Area intersections. The analyses applied the same methodology, parameters and lane configurations used for the existing conditions analysis in Section 2.3, and incorporated the following road network improvements noted in Sections 4.2 and 4.3.5:

- Improvements to address existing critical traffic movements.
- Widening of Ninth Line from 2 to 4 lanes between Steeles Avenue and 5 Sideroad (needed to address background traffic growth to 2021).
- Improvements to address critical traffic movements for 2021 background traffic conditions.

Signal timings were also optimized using Synchro.

The following configurations were assumed for new intersections within the Premier Gateway Phase 1B lands:

- **Steeles Avenue and Street B/Street C** – Signalized, with the following auxiliary lanes:
  - Eastbound left-turn and right-turn lanes with 30 metres storage each
  - Westbound dual left-turn and right-turn lanes with 60 metres and 30 metres storage, respectively
  - Northbound left-turn and right-turn lanes, with 30 metres and 100 metres storage, respectively
  - Southbound left-turn lane with 30 metres storage
- **Hornby Road and Street A** – Single lane roundabout
- **Trafalgar Road and Street B** – Two-way stop controlled (Street B), with the following lane configuration:
  - Eastbound and westbound shared left-through-right lanes on Street B
  - Northbound and southbound left-turn lanes on Trafalgar Road with 30 metres storage each

- **Eighth Line and Street B** – Two-way stop controlled (Street B), with no auxiliary turning lanes

Tables 4.4 and **4.5** summarize the analysis results for the AM and PM peak hours with 2021 total traffic volumes, respectively (**Figures 4.7** and **4.8**). The tables denote LOS, delay, v/c ratios and 95% queue length for the Study Area intersections**. Appendix F** provides the Synchro analysis output. The following critical movements were identified:

- **Steeles Avenue and Sixth Line:**
  - The southbound left movement is projected to operate at LOS E (v/c = 0.09) during the AM peak hour and LOS F (v/c = 0.08) during the PM peak hour.
- **Steeles Avenue and Sixth Line South/Street A:**
  - The northbound left movement is projected to operate at LOS F (v/c = 0.15) during the AM peak hour, and LOS F (v/c = 1.00) during the PM peak hour.
  - The northbound shared through-right movement is projected to operate at LOS E (v/c = 0.41) during the AM peak hour.
  - The southbound left movement is projected to operate at LOS F (v/c = 0.06) during the AM peak hour and LOS F (v/c = 0.97) during the PM peak hour.
  - The southbound shared through-right movement is projected to operate at LOS F (v/c = 0.70) during the PM peak hour.
- **Steeles Avenue and Hornby Road:**
  - The southbound left movement is projected to operate at LOS F (v/c = 0.21) during the PM peak hour.
- **Steeles Avenue and Trafalgar Road:**
  - The southbound through movement is projected to operate at LOS E (v/c = 0.90) during the AM peak hour and LOS E (v/c = 0.90) during the PM peak hour.
- **Steeles Avenue and Eighth Line South:**
  - The northbound left movement is projected to operate at LOS E (v/c = 0.05) during the AM peak hour and LOS F (v/c = 0.08) during the PM peak hour.
- **Steeles Avenue and Eighth Line/Toronto Premium Outlets:**
  - The westbound through movement is projected to operate at LOS C (v/c = 0.85) during the PM peak hour.
- **Steeles Avenue and Ninth Line:**
  - The westbound through movement is projected to operate at LOS C (v/c = 0.85) during the PM peak hour.

- **Trafalgar Road and Hornby Road:**
  - The eastbound shared left-right movement is projected to operate at LOS F (v/c = 0.45) during the AM peak hour and LOS F (v/c = 0.67) during the PM peak hour.
- **5 Sideroad and Trafalgar Road:**
  - The southbound through movement is projected to operate at LOS C (v/c = 0.85) during the AM peak hour.
- **Steeles Avenue and Street B/Street C:**
  - The eastbound through movement is projected to operate at LOS D (v/c = 0.89) during the PM peak hour.
  - The westbound left-turn lane 95th percentile queue length is projected to exceed available storage by 4 metres during the AM peak hour.
- **Trafalgar Road and Street B:**
  - The eastbound shared left-through-right movement is projected to operate at LOS F (v/c = 0.15) during the AM peak hour and LOS E (v/c = 0.29) during the PM peak hour.
  - The westbound shared left-through-right movement is projected to operate at LOS E (v/c = 0.13) during the AM peak hour and LOS F (v/c = 0.77) during the PM peak hour.

4.4.3 Traffic Operations with Remedial Measures

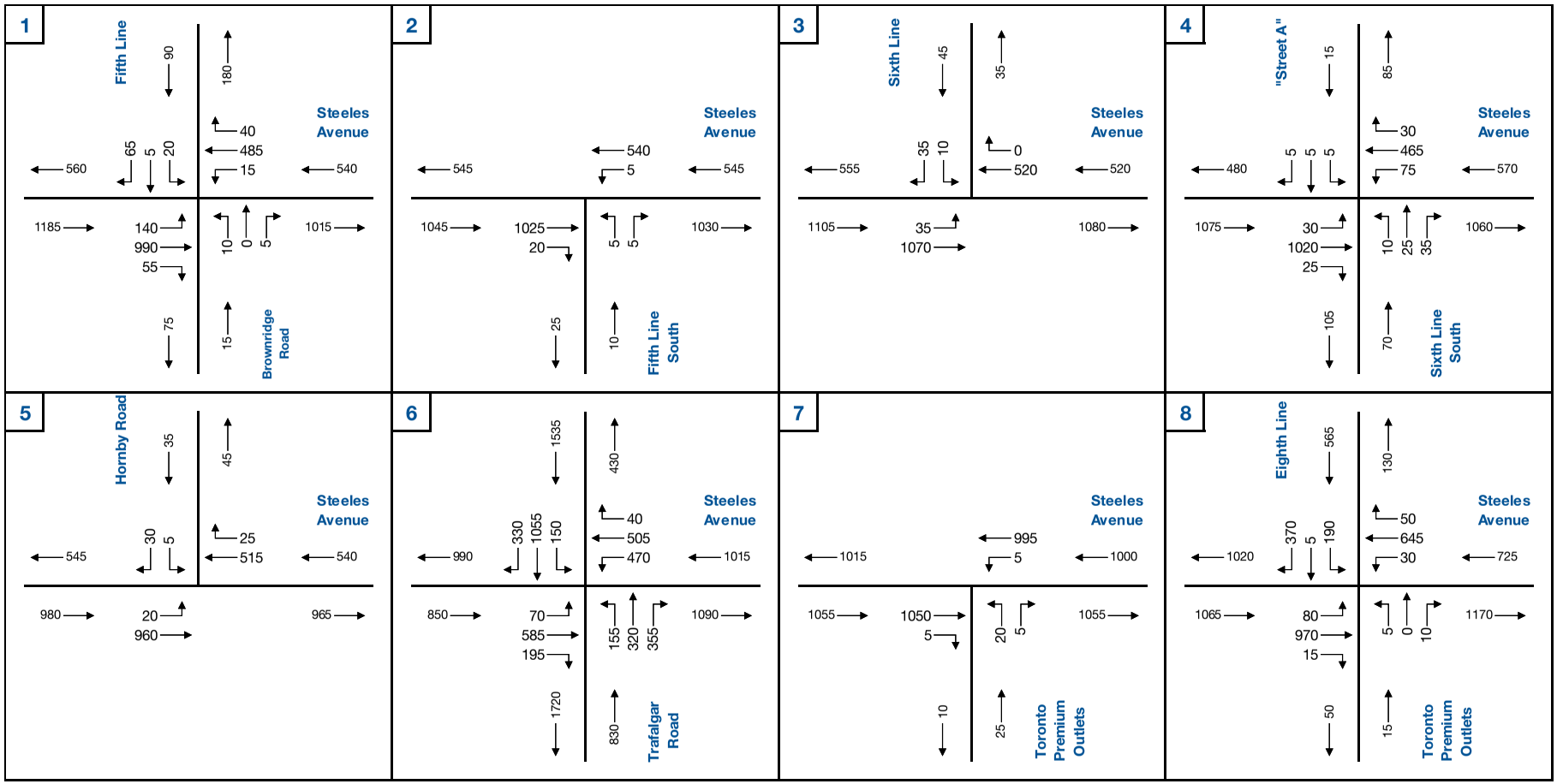
The operational analyses of 2021 total traffic conditions projected critical movements at 11 intersections within the Study Area. However, the difference in operations between 2021 background and total traffic conditions was not considered significant enough to warrant any additional remedial measures. This is attributed to the assumption that only 10% of the area development would be built out by 2021. With limited growth, no further roadway improvements, aside from the planned roads within the Premier Gateways Phase 1B lands, would be required to serve projected 2021 total traffic conditions.

As part of the analysis, the need for traffic control signals was assessed at the following intersections based on Ontario Traffic Manual Book 12 (Traffic Signals)[14] and found not to be justified:

- Steeles Avenue and Sixth Line South/Street A
- Trafalgar Road and Hornby Road
- Trafalgar Road and Street B

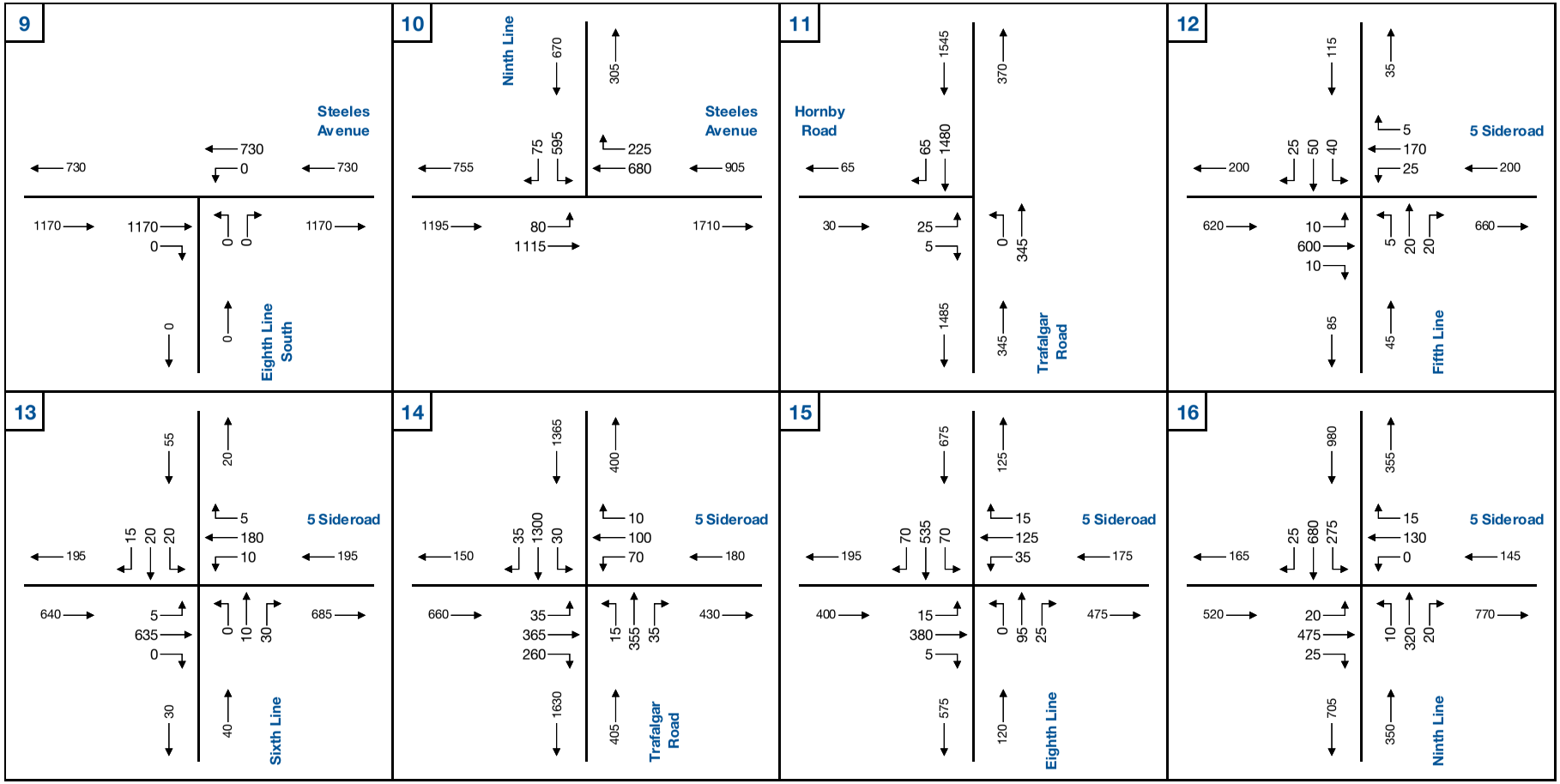
Appendix G provides the signal warrant calculations.

[14] Queen's Printer for Ontario, Ontario Traffic Manual Book 12 (Traffic Signals), March 2012

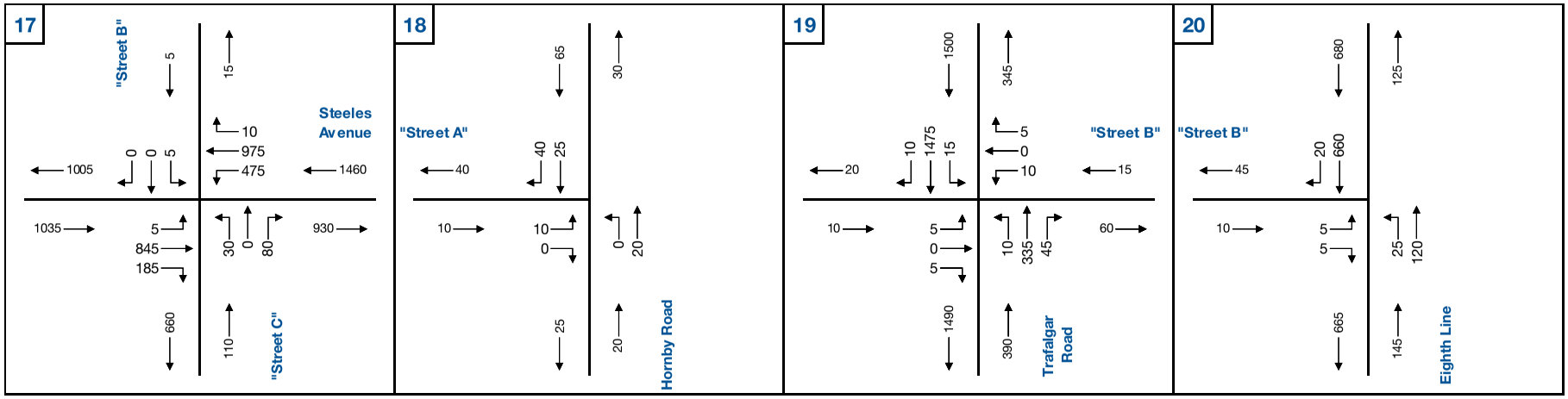


2021 AM Peak Hour

Total Traffic Volumes (1)

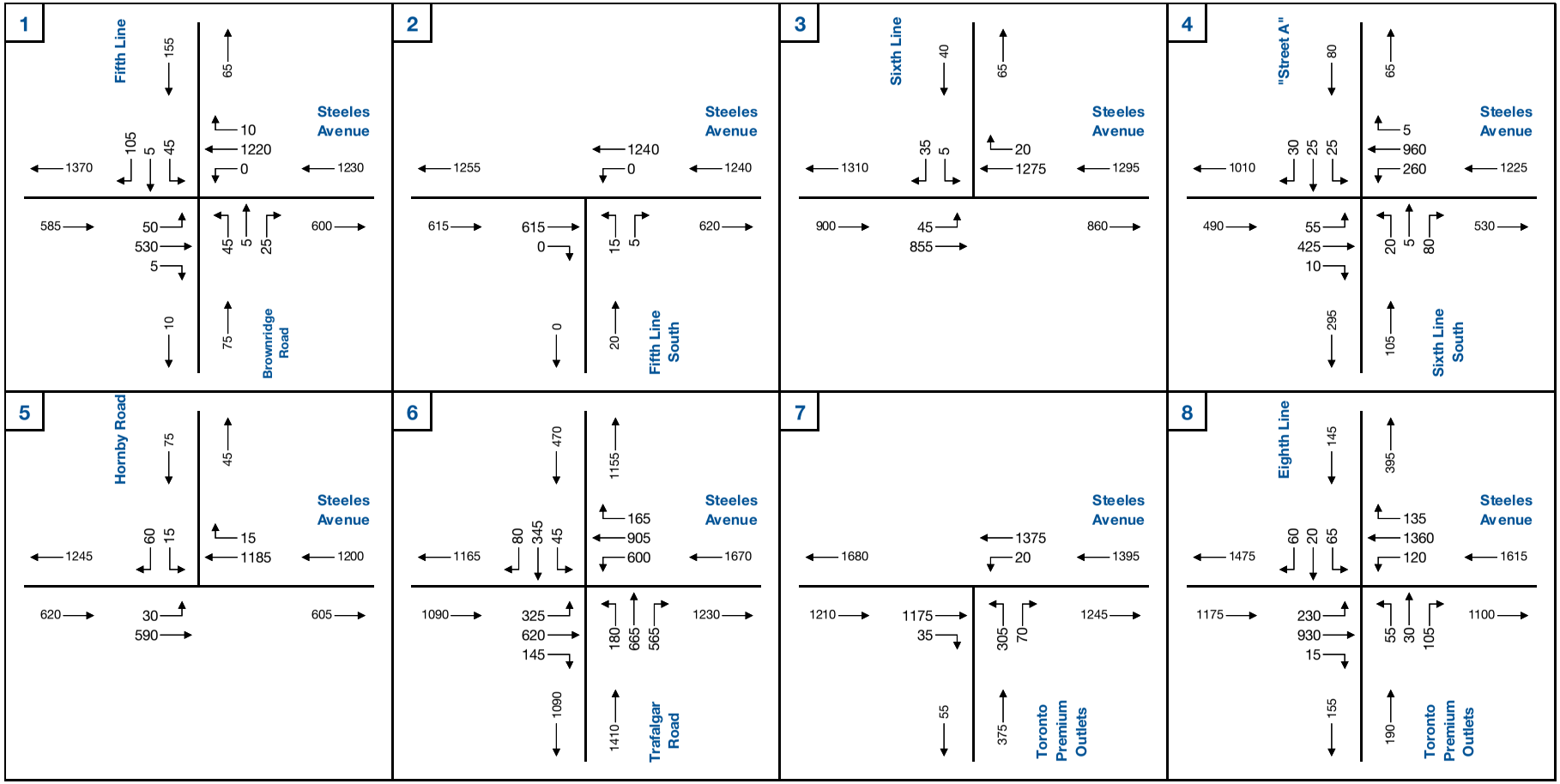


2021 AM Peak Hour
Total Traffic Volumes (2)



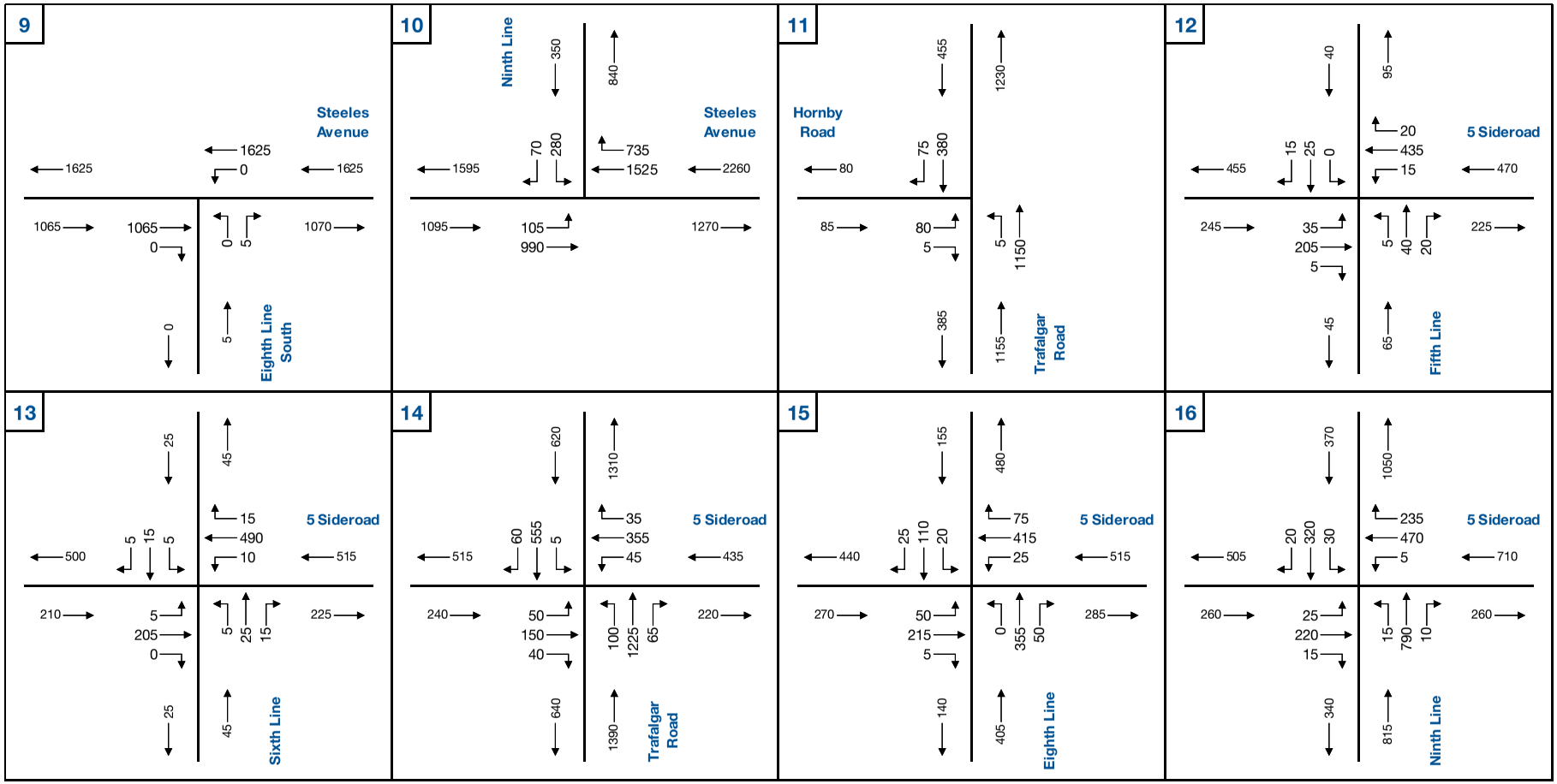
2021 AM Peak Hour
Total Traffic Volumes (3)

Figure 4.7c

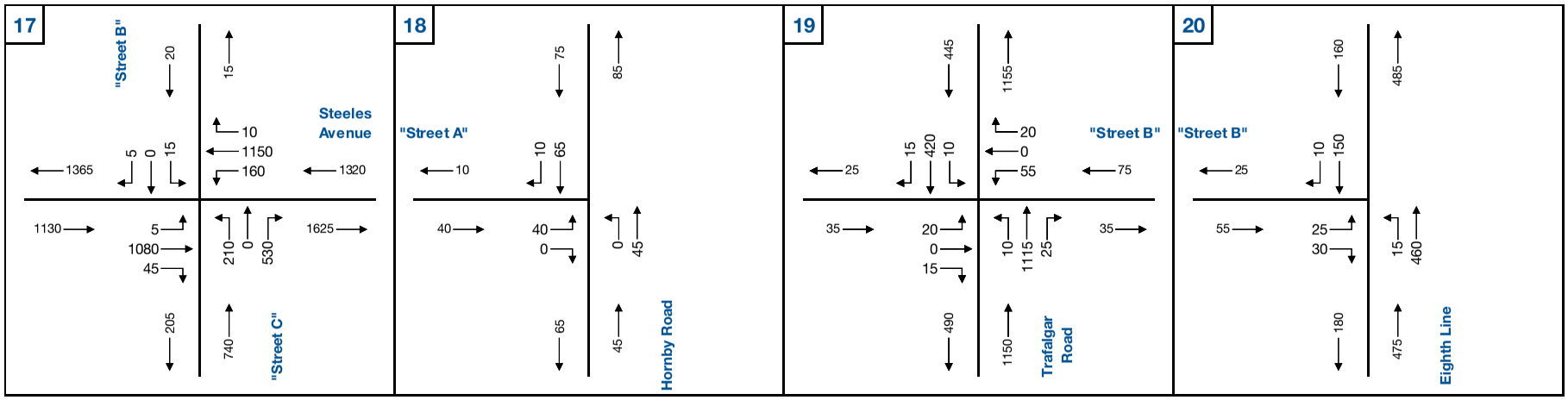


2021 PM Peak Hour

Total Traffic Volumes (1)



2021 PM Peak Hour
Total Traffic Volumes (2)



2021 PM Peak Hour
Total Traffic Volumes (3)

TABLE 4.4: 2021 AM PEAK HOUR TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																	
				Eastbound				Westbound				Northbound				Southbound					
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	OVERALL
AM Peak Hour	1 - Steeles Avenue and Fifth Line/Brownridge Road	TCS	LOS	A	A	A	**A**	A	A	A	**A**	C	C	C	**C**	C	C	C	**C**	**A**
			Delay	6	7	4	**7**	5	5	5	**5**	21	21	21	**21**	22	21	21	**21**	**7**
			V/C	0.29	0.54	0.04		0.07	0.32	0.32		0.08	0.00	0.00		0.22	0.05	0.05		
			Q	18	49	3		4	22	22		4	0	0		7	4	5		
			Ex	150	800	70		50	650	650		35	250	250		50	250	50		
			Avail	132	751	67		46	628	628		31	250	250		43	246	45		
	2 - Steeles Avenue and Fifth Line South	TCS	LOS		A	A	**A**	A	A		**A**	C		C	**C**					**A**
			Delay		4	2	**4**	2	3		**3**	29		27	**28**					**4**
			V/C		0.49	0.02		0.03	0.28			0.23		0.00						
			Q		48	2		2	22			5		3						
			Ex		600	600		60	450			20		400						
			Avail		552	598		58	428			15		397						
	3 - Steeles Avenue and Sixth Line	TWSC	LOS	A	A		**A**		A	A	**A**					E		A	**C**	
			Delay	9	0		**0**		0	0	**0**					42		10	**17**	**1**
			V/C	0.04	0.31				0.15	0.00						0.09		0.05		
			Q	1	0				0	0						2		1		
			Ex	60	400				900	30						30		500		
			Avail	59	400				900	30						28		499		
	4 - Steeles Avenue and Sixth Line South	TWSC	LOS	A	A	A	**A**	B	A	A	**A**	F	E	E	**F**	F	D	D	**E**	
			Delay	9	0	0	**0**	11	0	0	**2**	70	46	46	**50**	53	34	34	**41**	**3**
			V/C	0.03	0.30	0.02		0.12	0.14	0.02		0.15	0.41	0.41		0.06	0.07	0.07		
			Q	1	0	0		3	0	0		4	14	14		2	2	2		
			Ex	30	800	30		60	500	30		30	350	350		30	200	200		
			Avail	29	800	30		57	500	30		26	336	336		28	198	198		
	5 - Steeles Avenue and Hornby Road	TWSC	LOS	A	A		**A**		A	A	**A**					C		A	**B**	
			Delay	9	0		**0**		0	0	**0**					24		10	**13**	**1**
			V/C	0.02	0.28				0.15	0.02						0.05		0.05		
			Q	1	0				0	0						1		1		
			Ex	60	450				850	30						30		500		
			Avail	59	450				850	30						29		499		
	6 - Steeles Avenue and Trafalgar Road	TCS	LOS	E	E	D	**E**	E	D	D	**E**	E	C	C	**D**	C	E	D	**D**	**D**
			Delay	70	65	49	**62**	75	42	35	**57**	77	33	32	**41**	29	57	46	**52**	**53**
			V/C	0.45	0.84	0.33		0.86	0.55	0.03		0.71	0.27	0.23		0.32	0.90	0.54		
			Q	21	111	40		101	83	0		51	52	23		44	215	70		
			Ex	115	850	50		140	250	75		100	300	100		250	500	80		
			Avail	94	739	10		39	167	75		49	248	77		206	285	10		
	7 - Steeles Avenue and Toronto Premium Outlets	TCS	LOS		A	A	**A**	A	A		**A**	C		C	**C**					**A**
			Delay		10	6	**10**	4	6		**6**	21		20	**21**					**8**
			V/C		0.57	0.00		0.04	0.49			0.06		0.00						
			Q		70	2		2	43			4		2						
			Ex		250	250		50	150			40		40						
			Avail		180	248		48	107			36		38						
	8 -Steeles Avenue and Eighth Line/Toronto Premium Outlets	TCS	LOS	B	C	B	**B**	B	B	B	**B**	C	B	B	**C**	D	C	C	**D**	**C**
			Delay	11	20	12	**19**	12	18	13	**17**	33	16	16	**20**	51	26	26	**35**	**22**
			V/C	0.23	0.73	0.01		0.15	0.57	0.03		0.08	0.02	0.02		0.81	0.25	0.25		
			Q	13	114	0		6	63	0		2	4	4		69	25	25		
			Ex	110	150	65		125	850	30		135	200	200		70	500	500		
			Avail	97	36	65		119	787	30		133	196	196		1	475	475		
	9 - Steeles Avenue and Eighth Line South	TWSC	LOS		A	A	**A**	B	A		**A**	E		A	**E**					
			Delay		0	0	**0**	11	0		**0**	41		0	**41**					**0**
			V/C		0.46	0.23		0.01	0.21			0.05		0.00						
			Q		0	0		0	0			1		0						
			Ex		800	800		90	500			30		500						
			Avail		800	800		90	500			29		500						
	10 - Steeles Avenue and Ninth Line	TCS	LOS	A	B		**B**		B	B	**B**					C		B	**C**	**B**
			Delay	8	12		**12**		16	13	**15**					27		18	**26**	**16**
			V/C	0.24	0.64				0.56	0.15						0.72		0.06		
			Q	9	64				52	13						48		9		
			Ex	65	500				750	75						90		500		
			Avail	56	436				698	62						42		491		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

TABLE 4.4: 2021 AM PEAK HOUR TOTAL TRAFFIC OPERATIONS (CONTINUED)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																	
				Eastbound				Westbound				Northbound				Southbound				OVERALL
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	
AM Peak Hour	11 - Trafalgar Road and Hornby Road	TWSC	LOS	F		F	F					A	A		A		A	A	A	2
			Delay	83		83	83					1	1		1		0	0	0	
			V/C	0.45		0.45						0.01	0.01				0.91	0.91		
			Q	15		15						0	0				0	0		
			Ex	150		150						500	500				500	500		
			Avail	135		135						500	500				500	500		
	12 - 5 Sideroad and Fifth Line	TWSC	LOS	A	A	A	A	A	A	A	A	C	C	C	C	D	D	D	D	4
			Delay	0	0	0	0	1	1	1	1	19	19	19	19	25	25	25	25	
			V/C	0.01	0.01	0.01		0.03	0.03	0.03		0.16	0.16	0.16		0.40	0.40	0.40		
			Q	0	0	0		1	1	1		5	5	5		15	15	15		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	500	500	500		499	499	499		495	495	495		485	485	485		
	13 - 5 Sideroad and Sixth Line	TWSC	LOS	A	A	A	A	A	A	A	A	C	C	C	C	C	C	C	C	2
			Delay	0	0	0	0	1	1	1	1	16	16	16	16	19	19	19	19	
			V/C	0.01	0.01	0.01		0.01	0.01	0.01		0.13	0.13	0.13		0.21	0.21	0.21		
			Q	0	0	0		0	0	0		4	4	4		6	6	6		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	500	500	500		500	500	500		496	496	496		494	494	494		
	14 - 5 Sideroad and Trafalgar Road	TCS	LOS	C	C	C	C	C	C	C	C	B	B	B	B	B	C	B	C	C
			Delay	20	28	21	25	24	21	21	22	14	14	14	14	11	25	12	24	22
			V/C	0.11	0.66	0.27		0.36	0.20	0.20		0.16	0.30	0.30		0.07	0.85	0.03		
			Q	12	82	26		21	25	25		5	38	38		7	174	0		
			Ex	45	500	80		75	500	500		100	500	500		175	500	30		
			Avail	33	418	54		54	475	475		95	462	462		168	326	30		
	15 - 5 Sideroad and Eighth Line	TCS	LOS	C	C	C	C	B	B	B	B	A	A	A	A	B	B	B	B	B
			Delay	23	23	23	23	15	15	15	15	6	6	6	6	14	14	14	14	16
			V/C	0.76	0.76	0.76		0.39	0.39	0.39		0.12	0.12	0.12		0.70	0.70	0.70		
			Q	63	63	63		28	28	28		12	12	12		92	92	92		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	437	437	437		472	472	472		488	488	488		408	408	408		
	16 - 5 Sideroad and Ninth Line	TCS	LOS	B	C	C	C	B	B	B	B	B	B	B	B	B	B	B	B	B
			Delay	14	28	28	27	14	15	14	15	15	17	17	17	13	12	12	12	17
			V/C	0.06	0.82	0.82		0.03	0.21	0.01		0.06	0.32	0.32		0.58	0.44	0.44		
			Q	6	99	99		2	22	0		4	27	27		36	45	45		
			Ex	40	500	500		40	500	40		40	500	500		40	500	500		
			Avail	34	401	401		38	478	40		36	473	473		4	455	455		
	17 - Steeles Avenue and "Street B"/"Street C"	TCS	LOS	C	C	C	C	D	B	A	C	C	A	C	C	C	A	A	C	C
			Delay	21	34	22	32	45	15	9	24	28	0	27	27	27	0	0	27	28
			V/C	0.03	0.82	0.19		0.77	0.64	0.01		0.08	0.00	0.05		0.01	0.00	0.00		
			Q	3	96	21		64	66	0		13	0	0		4	0	0		
			Ex	30	500	30		60	250	30		30	150	150		30	150	150		
			Avail	27	404	9		-4	184	30		17	150	150		26	150	150		
	18 - Hornby Road and "Street A"	Round-about	LOS	A		A	A					A	A				A	A		A
			Delay	3		3	3					3	3				3	3		3
			V/C	0.01		0.01						0.02	0.02				0.06	0.06		
			Q	0		0						0	0				0	0		
			Ex	200		200						200	200				200	200		
			Avail	200		200						200	200				200	200		
	19 - Trafalgar Road and "Street B"	TWSC	LOS	F	F	F	F	E	E	E	E	B	A	A	A	A	A	A	A	A
			Delay	67	67	67	67	41	41	41	41	13	0	0	0	8	0	0	0	1
			V/C	0.15	0.15	0.15		0.13	0.13	0.13		0.10	0.21	0.21		0.01	0.88	0.88		
			Q	3	3	3		6	6	6		1	0	0		0	0	0		
			Ex	250	250	250		250	250	250		30	350	350		30	500	500		
			Avail	247	247	247		244	244	244		29	350	350		30	500	500		
	20 - Eighth Line and "Street B"	TWSC	LOS	C		C	C					A	A		A		A	A	A	A
			Delay	15		15	15					2	2		2		0	0	0	1
			V/C	0.03		0.03						0.03	0.03				0.40	0.40		
			Q	1		1						1	1				0	0		
			Ex	250		250						300	300				500	500		
			Avail	249		249						299	299				500	500		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

TABLE 4.5: 2021 PM PEAK HOUR TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																OVERALL
				Eastbound				Westbound				Northbound				Southbound				
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	
PM Peak Hour	1 - Steeles Avenue and Fifth Line/Brownridge Road	TCS	LOS	A	A	A	**A**	A	A	A	**A**	C	C	C	**C**	C	B	C	**C**	**A**
			Delay	8	6	5	**6**	5	9	9	**9**	21	20	20	**20**	21	19	20	**20**	**9**
			V/C	0.25	0.29	0.00		0.01	0.64	0.64		0.23	0.06	0.06		0.25	0.02	0.07		
			Q	9	22	0		1	62	62		10	7	7		11	3	10		
			Ex	150	800	70		50	650	650		35	250	250		50	250	50		
			Avail	141	778	70		49	588	588		25	243	243		39	247	40		
	2 - Steeles Avenue and Fifth Line South	TCS	LOS		A	A	**A**	A	A		**A**	C		C	**C**					**A**
			Delay		3	2	**3**	2	4		**4**	30		27	**29**					**4**
			V/C		0.28	0.00		0.01	0.52			0.30		0.01						
			Q		24	1		1	60			6		4						
			Ex		600	600		60	450			20		400						
			Avail		576	599		59	390			14		396						
	3 - Steeles Avenue and Sixth Line	TWSC	LOS	B	A		**A**		A	A	**A**					F		B	**C**	**1**
			Delay	13	0		**1**		0	0	**0**					65		14	**21**	
			V/C	0.09	0.25				0.38	0.01						0.08		0.08		
			Q	3	0				0	0						2		2		
			Ex	60	400				900	30						30		500		
			Avail	57	400				900	30						28		498		
	4 - Steeles Avenue and Sixth Line South	TWSC	LOS	B	A	A	**A**	A	A	A	**A**	F	C	C	**F**	F	F	F	**F**	
			Delay	11	0	0	**1**	9	0	0	**2**	403	18	18	**102**	384	123	123	**204**	**16**
			V/C	0.09	0.13	0.01		0.24	0.28	0.00		1.00	0.24	0.24		0.97	0.70	0.70		
			Q	2	0	0		7	0	0		25	7	7		24	27	27		
			Ex	30	800	30		60	500	30		30	350	350		30	200	200		
			Avail	28	800	30		53	500	30		5	343	343		6	173	173		
	5 - Steeles Avenue and Hornby Road	TWSC	LOS	B	A		**A**		A	A	**A**					F		B	**D**	
			Delay	12	0		**1**		0	0	**0**					68		14	**25**	**1**
			V/C	0.06	0.17				0.35	0.01						0.21		0.13		
			Q	2	0				0	0						6		4		
			Ex	60	450				850	30						30		500		
			Avail	58	450				850	30						24		496		
	6 - Steeles Avenue and Trafalgar Road	TCS	LOS	E	D	D	**E**	E	D	C	**D**	E	D	D	**D**	D	D	D	**D**	**D**
			Delay	77	53	40	**58**	61	50	33	**52**	65	43	42	**45**	36	44	40	**43**	**51**
			V/C	0.86	0.77	0.12		0.82	0.84	0.13		0.61	0.60	0.47		0.19	0.39	0.07		
			Q	73	106	7		106	143	19		40	120	66		18	64	0		
			Ex	115	850	50		140	250	75		100	300	100		250	500	80		
			Avail	42	744	43		34	107	56		60	180	34		232	436	80		
	7 - Steeles Avenue and Toronto Premium Outlets	TCS	LOS		C	B	**C**	B	B		**B**	C		C	**C**					**C**
			Delay		22	13	**22**	13	18		**18**	26		24	**26**					**21**
			V/C		0.72	0.03		0.14	0.72			0.28		0.04						
			Q		139	6		6	136			34		10						
			Ex		250	250		50	150			40		40						
			Avail		111	244		44	14			6		30						
	8 -Steeles Avenue and Eighth Line/Toronto Premium Outlets	TCS	LOS	D	B	B	**C**	B	C	B	**C**	D	C	C	**C**	D	D	D	**D**	**C**
			Delay	43	17	11	**22**	11	26	13	**24**	42	27	27	**32**	53	39	39	**45**	**25**
			V/C	0.85	0.57	0.01		0.34	0.85	0.08		0.32	0.14	0.14		0.52	0.16	0.16		
			Q	69	89	0		15	154	5		11	18	18		30	18	18		
			Ex	110	150	65		125	850	30		135	200	200		70	500	500		
			Avail	41	61	65		110	696	25		124	182	182		40	482	482		
	9 - Steeles Avenue and Eighth Line South	TWSC	LOS		A	A	**A**	A	A		**A**	F		B	**E**					
			Delay		0	0	**0**	0	0		**0**	66		13	**40**					**0**
			V/C		0.42	0.21		0.00	0.48			0.08		0.01						
			Q		0	0		0	0			2		0						
			Ex		800	800		90	500			30		500						
			Avail		800	800		90	500			28		500						
	10 - Steeles Avenue and Ninth Line	TCS	LOS	B	A		**A**		C	B	**B**					C		C	**C**	**B**
			Delay	11	7		**7**		20	12	**17**					34		27	**32**	**16**
			V/C	0.44	0.46				0.85	0.46						0.59		0.05		
			Q	11	42				145	16						30		10		
			Ex	65	500				750	75						90		500		
			Avail	54	458				605	59						60		490		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

TABLE 4.5: 2021 PM PEAK HOUR TOTAL TRAFFIC OPERATIONS (CONTINUED)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																	
				Eastbound				Westbound				Northbound				Southbound				OVERALL
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	
PM Peak Hour	11 - Trafalgar Road and Hornby Road	TWSC	LOS	F		F	F					A	A		A		A	A		
			Delay	79		79	79					0	0		0		0	0		4
			V/C	0.67		0.67						0.00	0.00				0.27	0.27		
			Q	29		29						0	0				0	0		
			Ex	150		150						500	500				500	500		
			Avail	121		121						500	500				500	500		
	12 - 5 Sideroad and Fifth Line	TWSC	LOS	A	A	A	A	A	A	A	A	C	C	C	C	C	C	C	C	
			Delay	2	2	2	2	0	0	0	0	17	17	17	17	17	17	17	17	3
			V/C	0.04	0.04	0.04		0.01	0.01	0.01		0.20	0.20	0.20		0.14	0.14	0.14		
			Q	1	1	1		0	0	0		6	6	6		4	4	4		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	499	499	499		500	500	500		494	494	494		496	496	496		
	13 - 5 Sideroad and Sixth Line	TWSC	LOS	A	A	A	A	A	A	A	A	C	C	C	C	C	C	C	C	
			Delay	0	0	0	0	0	0	0	0	16	16	16	16	16	16	16	16	2
			V/C	0.01	0.01	0.01		0.01	0.01	0.01		0.14	0.14	0.14		0.10	0.10	0.10		
			Q	0	0	0		0	0	0		4	4	4		3	3	3		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	500	500	500		500	500	500		496	496	496		497	497	497		
	14 - 5 Sideroad and Trafalgar Road	TCS	LOS	C	C	B	C	C	C	C	C	A	C	C	C	B	B	B	B	
			Delay	23	21	19	21	20	29	29	28	9	21	21	20	14	16	13	16	C 20
			V/C	0.30	0.28	0.03		0.14	0.71	0.71		0.23	0.78	0.78		0.09	0.38	0.04		
			Q	15	32	2		13	79	79		17	173	173		3	53	5		
			Ex	45	500	80		75	500	500		100	500	500		175	500	30		
			Avail	30	468	78		62	421	421		83	327	327		172	447	25		
	15 - 5 Sideroad and Eighth Line	TCS	LOS	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	
			Delay	11	11	11	11	18	18	18	18	12	12	12	12	8	8	8	8	B 13
			V/C	0.49	0.49	0.49		0.77	0.77	0.77		0.52	0.52	0.52		0.19	0.19	0.19		
			Q	31	31	31		66	66	66		45	45	45		16	16	16		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	469	469	469		434	434	434		455	455	455		484	484	484		
	16 - 5 Sideroad and Ninth Line	TCS	LOS	B	B	B	B	B	C	B	B	A	B	B	B	A	A	A	A	
			Delay	12	13	13	13	11	20	13	17	8	12	12	12	10	9	9	9	B 13
			V/C	0.15	0.38	0.38		0.03	0.76	0.34		0.03	0.53	0.53		0.12	0.23	0.23		
			Q	7	30	30		3	67	24		4	43	43		6	18	18		
			Ex	40	500	500		40	500	40		40	500	500		40	500	500		
			Avail	33	470	470		37	433	16		36	457	457		34	482	482		
	17 - Steeles Avenue and "Street B"/"Street C"	TCS	LOS	B	D	B	D	D	B	A	C	C	A	D	D	C	C	C	C	
			Delay	18	37	18	36	44	16	10	20	32	0	41	38	24	24	24	24	C 30
			V/C	0.03	0.89	0.03		0.47	0.64	0.01		0.48	0.00	0.75		0.03	0.00	0.00		
			Q	3	133	2		27	98	0		59	0	120		7	0	0		
			Ex	30	500	30		60	250	30		30	150	150		30	150	150		
			Avail	27	367	28		33	152	30		-29	150	30		23	150	150		
	18 - Hornby Road and "Street A"	Round-about	LOS	A		A	A					A	A		A		A	A	A	
			Delay	3		3	3					3	3		3		3	3	3	A 3
			V/C	0.04		0.04						0.04	0.04				0.07	0.07		
			Q	0		0						0	0				0	0		
			Ex	200		200						200	200				200	200		
			Avail	200		200						200	200				200	200		
	19 - Trafalgar Road and "Street B"	TWSC	LOS	E	E	E	E	F	F	F	F	A	A	A	A	B	A	A	A	
			Delay	49	49	49	49	50	50	50	50	8	0	0	0	11	0	0	0	A 6
			V/C	0.30	0.30	0.30		0.49	0.49	0.49		0.01	0.66	0.66		0.02	0.26	0.26		
			Q	9	9	9		19	19	19		0	0	0		0	0	0		
			Ex	250	250	250		250	250	250		30	350	350		30	500	500		
			Avail	241	241	241		231	231	231		30	350	350		30	500	500		
	20 - Eighth Line and "Street B"	TWSC	LOS	B		B	B					A	A		A		A	A	A	
			Delay	12		12	12					0	0		0		0	0	0	A 1
			V/C	0.09		0.09						0.01	0.01				0.09	0.09		
			Q	2		2						0	0				0	0		
			Ex	250		250						300	300				500	500		
			Avail	248		248						300	300				500	500		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

4.5 2026 Background Traffic Conditions

4.5.1 Background Traffic Volumes

Similar to 2021, horizon year 2026 peak hour background traffic volumes were estimated by applying growth factors derived from population forecasts contained in the Halton Region Best Planning Estimates Report[15] to existing traffic volumes. Per the report, the population of Halton Region is projected to grow by approximately 1.3% per annum between 2017 and 2021, and by approximately 4.5% per annum between 2021 and 2026. This represents total growth of about 31% over this nine-year period.

Figures 4.9 and **4.10** summarize the 2026 AM and PM peak hour overall background traffic volumes, respectively, which were calculated by adding the volumes for the generalized growth (noted above) and the other area developments (**Figures 4.3** and **4.4**).

4.5.2 Traffic Operations with Network Improvements

Intersection capacity analyses were undertaken to assess 2026 background peak hour traffic conditions for the Study Area intersections. The analyses applied the same methodology, parameters and lane configurations used for the existing conditions analysis in Section 2.3, and incorporated the following road network improvements noted in Sections 4.2 and 4.3.5:

- Improvements to address existing critical traffic movements.
- Widening of Ninth Line from 2 to 4 lanes between Steeles Avenue and 5 Sideroad (needed to address background traffic growth to 2021).
- Improvements to address critical traffic movements for 2021 background/total traffic conditions.

Signal timings were also optimized using Synchro.

Tables 4.6 and **4.7** summarize the analysis results for the AM and PM peak hours with 2026 background traffic volumes, respectively (**Figures 4.9** and **4.10**). The tables denote LOS, delay, v/c ratios and 95% queue length for the Study Area intersections**. Appendix H** provides the Synchro analysis output. The following critical movements were identified:

- **Steeles Avenue and Sixth Line:**
  - The southbound left movement is projected to operate at LOS E (v/c = 0.20) during the AM peak hour and LOS F (v/c = 0.26) during the PM peak hour.

[15] Best Planning Estimates of Population, Occupied Dwelling Units and Employment, 2011-2031, Regional Municipality of Halton, June 2011

- **Steeles Avenue and Sixth Line South:**
  - The northbound left movement is projected to operate at LOS F (v/c = 0.25) during the AM peak hour and LOS F (v/c = 0.43) during the PM peak hour.
- **Steeles Avenue and Hornby Road:**
  - The southbound left movement is projected to operate at LOS F (v/c = 0.11) during the PM peak hour.
- **Steeles Avenue and Trafalgar Road:**
  - The eastbound through movement is projected to operate at LOS F (v/c = 1.02) during the AM peak hour and LOS E (v/c = 0.87) during the PM peak hour.
  - The westbound left movement is projected to operate at LOS F (v/c = 1.05) during the AM peak hour.
  - The westbound through movement is projected to operate at LOS E (v/c = 0.94) during the PM peak hour.
  - The northbound left movement is projected to operate at LOS F (v/c = 1.05) during the AM peak hour.
  - The northbound right-turn lane 95th percentile queue length is projected to exceed available storage by 49 metres during the PM peak hour.
  - The southbound through movement is projected to operate at LOS F (v/c = 1.04) during the AM peak hour.
- **Steeles Avenue and Eighth Line/Toronto Premium Outlets:**
  - The eastbound through lane 95th percentile queue length is projected to exceed available storage by 7 metres during the AM peak hour and by 4 metres during the PM peak hour.
- **Steeles Avenue and Eighth Line South:**
  - The northbound left movement is projected to operate at LOS F (v/c = 0.08) during the AM peak hour and LOS F (v/c = 0.12) during the PM peak hour.
- **Steeles Avenue and Ninth Line:**
  - The southbound left movement is projected to operate at LOS E (v/c = 0.98) during the AM peak hour and LOS E (v/c = 0.95) during the PM peak hour.
- **Trafalgar Road and Hornby Road:**
  - The eastbound shared left-right movement is projected to operate at LOS F (v/c = 0.57) during the AM peak hour and LOS F (v/c = 0.53) during the PM peak hour.
- **5 Sideroad and Trafalgar Road:**
  - The eastbound through movement is projected to operate at LOS E (v/c = 0.97) during the AM peak hour.

- The westbound shared through-right movement is projected to operate at LOS D (v/c = 0.87) during the PM peak hour.
- The southbound through movement is projected to operate at LOS D (v/c = 0.93) during the AM peak hour.

- **5 Sideroad and Eighth Line:**
  - The eastbound shared left-through-right movement is projected to operate at LOS D (v/c = 0.91) during the AM peak hour.
  - The southbound shared left-through-right movement is projected to operate at LOS C (v/c = 0.88) during the AM peak hour.
- **5 Sideroad and Ninth Line:**
  - The southbound left-turn lane 95th percentile queue length is projected to exceed available storage by 52 metres during the AM peak hour and by 5 metres during the PM peak hour.

4.5.3 Traffic Operations with Remedial Measures

The operational analyses of 2026 background traffic conditions projected critical movements at 12 intersections within the Study Area. The following improvements were incorporated to address these concerns:

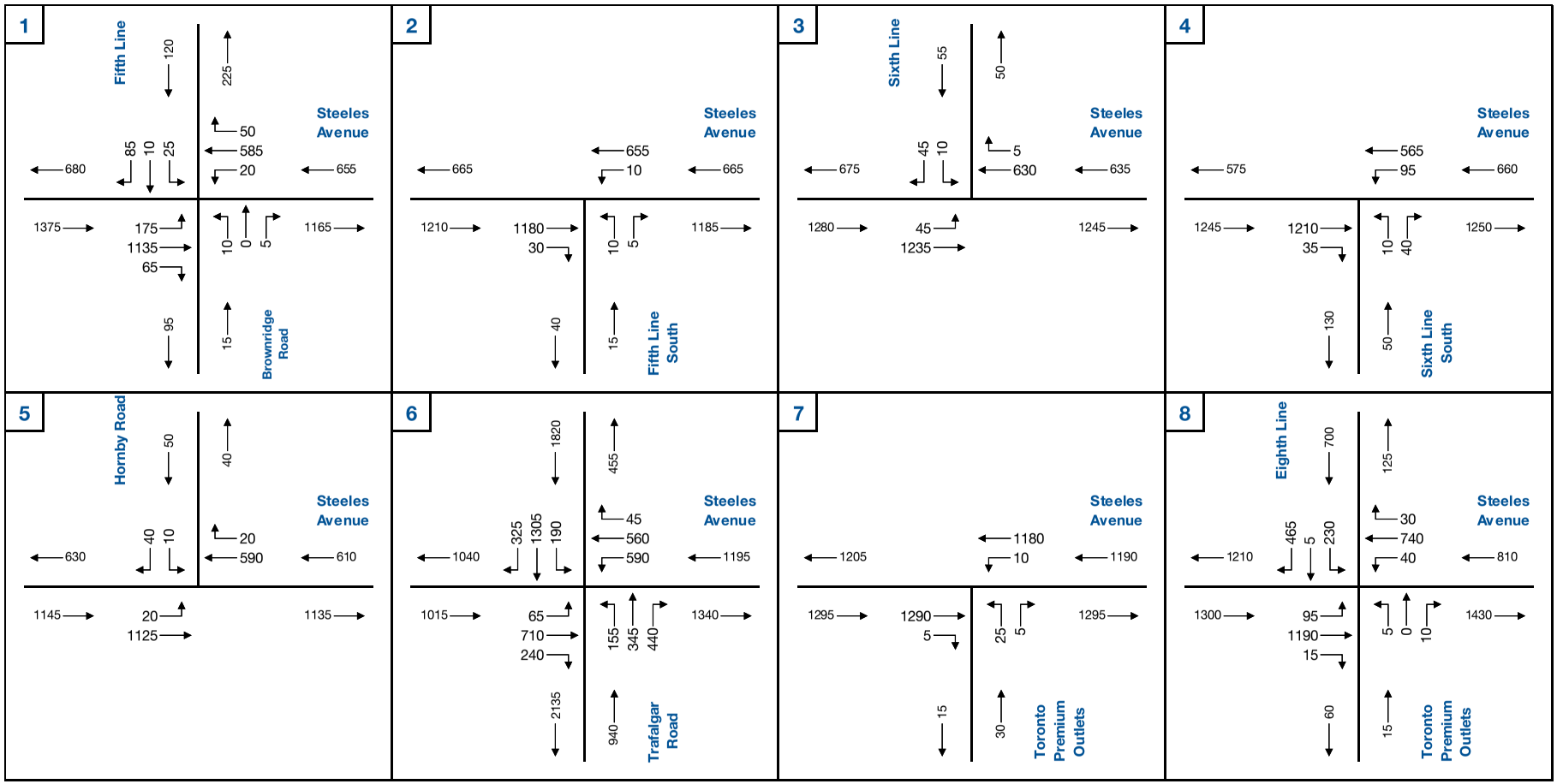
- **Steeles Avenue and Trafalgar Road:**
  - Addition of eastbound and westbound through lanes (widening of Steeles Avenue from 4 to 6 lanes between Trafalgar Road and Ninth Line)
- **Steeles Avenue and Eighth Line/Toronto Premium Outlets:**
  - Addition of eastbound and westbound through lanes (widening of Steeles Avenue from 4 to 6 lanes between Trafalgar Road and Ninth Line)
  - Extension of the southbound left-turn lane storage to 85 metres
- **Steeles Avenue and Eighth Line South:**
  - Addition of eastbound and westbound through lanes (widening of Steeles Avenue from 4 to 6 lanes between Trafalgar Road and Ninth Line)
- **Steeles Avenue and Ninth Line:**
  - Addition of eastbound and westbound through lanes (widening of Steeles Avenue from 4 to 6 lanes between Trafalgar Road and Ninth Line)
- **5 Sideroad and Trafalgar Road:**
  - Addition of eastbound and westbound through lanes (widening of 5 Sideroad from 2 to 4 lanes between Trafalgar Road and Ninth Line)

- **5 Sideroad and Eighth Line:**
  - Addition of eastbound and westbound through lanes (widening of 5 Sideroad from 2 to 4 lanes between Trafalgar Road and Ninth Line)
- **5 Sideroad and Ninth Line:**
  - Addition of eastbound and westbound through lanes (widening of 5 Sideroad from 2 to 4 lanes between Trafalgar Road and Ninth Line)

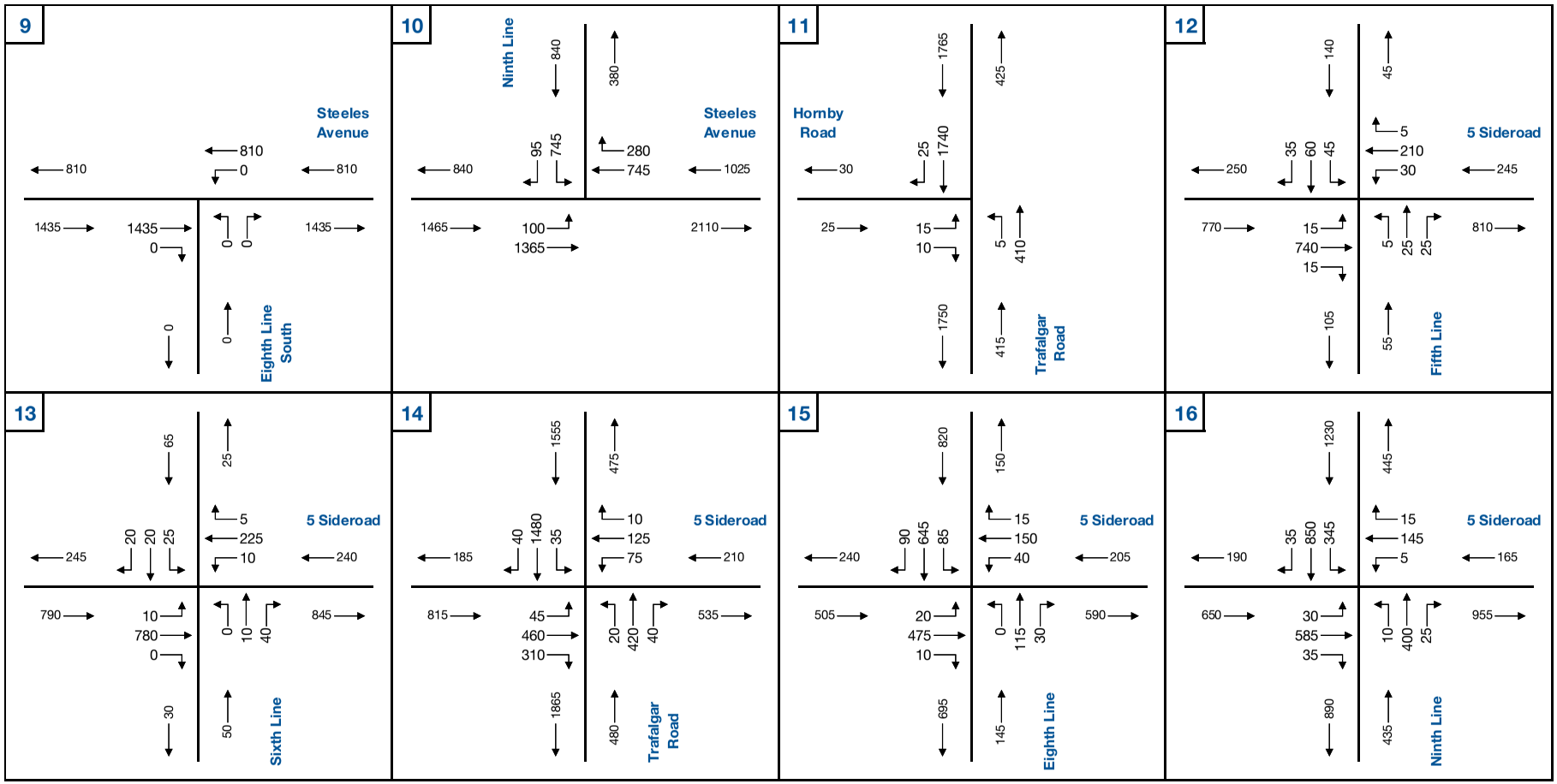
No remedial measures are recommended at the other five (5) intersections.

Table 4.8 summarizes the capacity analyses completed for the intersections with the above-noted improvements, based on the 2026 AM and PM peak hour background traffic forecasts. **Appendix I** provides the Synchro analysis output. The table illustrates that the intersections are projected to operate at or near satisfactory levels of service if these road improvements were implemented, except for Steeles Avenue and Trafalgar Road. Although this intersection overall is projected to operate at LOS E during the AM peak hour, the following critical movements would remain:

- The eastbound through movement is projected to operate at LOS E (v/c = 0.88).
- The westbound left movement is projected to operate at LOS F (v/c = 1.00).
- The northbound left movement is projected to operate at LOS F (v/c = 1.04).
- The southbound through movement is projected to operate at LOS F (v/c = 1.07).



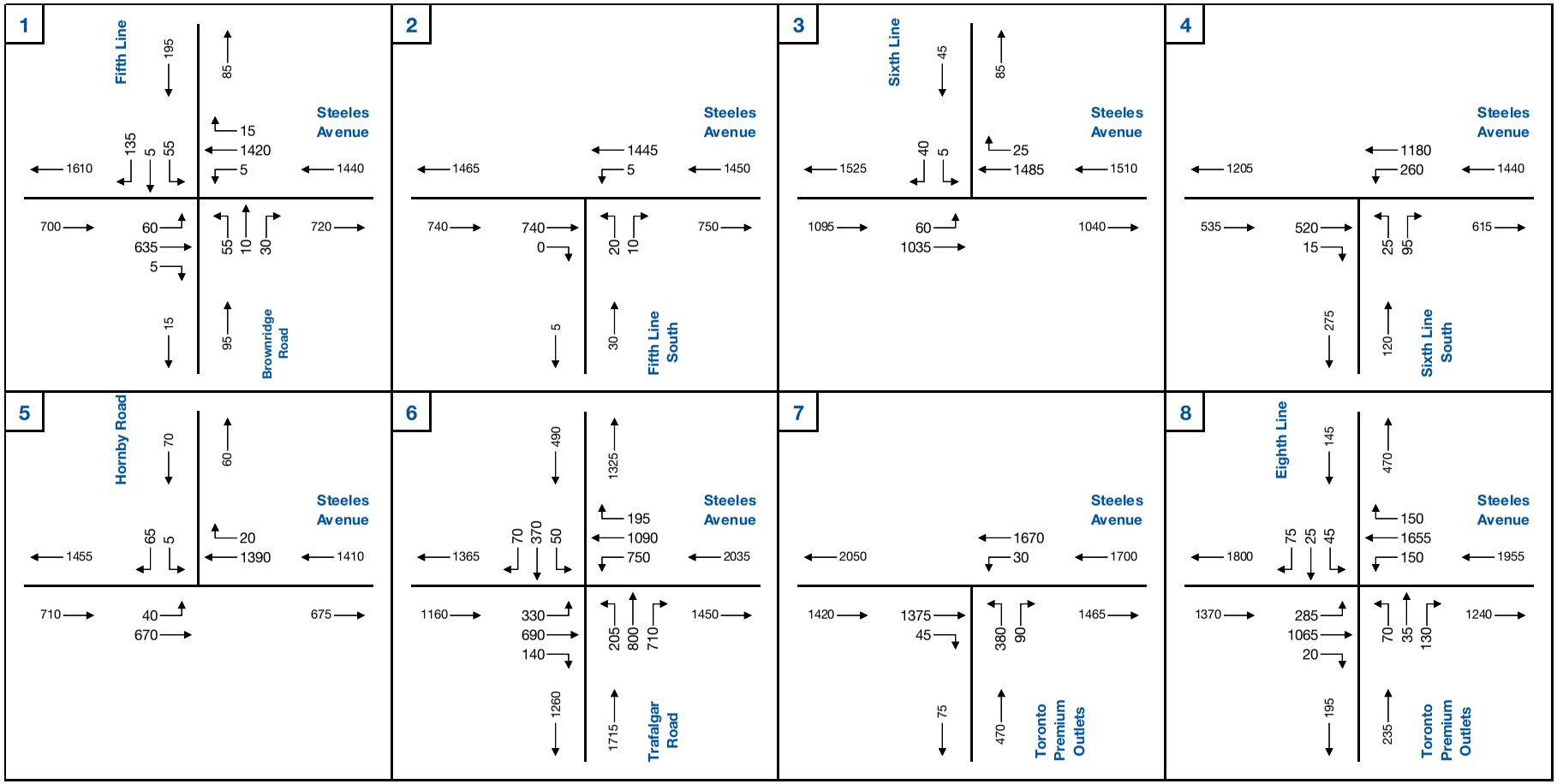
2026 AM Peak Hour Background Traffic Volumes (1)



2026 AM Peak Hour
Background Traffic Volumes (2)

Premier Gateway Phase 1B Employment Area Secondary Plan Transportation Study
150770

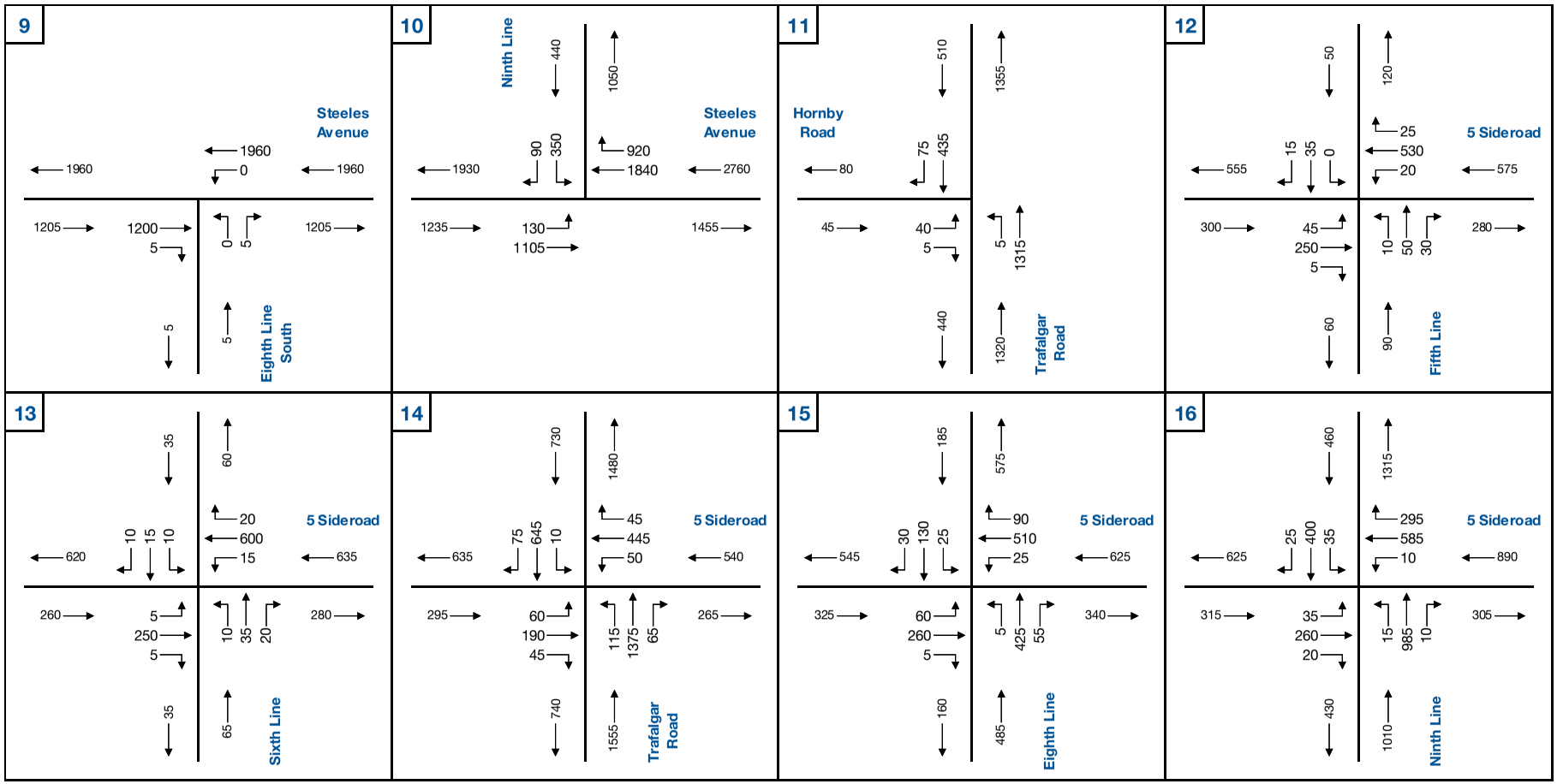
Figure 4.9b



2026 PM Peak Hour

Background Traffic Volumes (1)

Figure 4.10a



2026 PM Peak Hour
Background Traffic Volumes (2)

TABLE 4.6: 2026 AM PEAK HOUR BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																	
				Eastbound				Westbound				Northbound				Southbound				OVERALL
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	
AM Peak Hour	1 - Steeles Avenue and Fifth Line/Brownridge Road	TCS	LOS	A	A	A	A	A	A	A	A	C	C	C	C	C	C	C	C	A
			Delay	8	8	4	8	5	6	6	6	21	21	21	21	23	21	21	21	8
			V/C	0.40	0.62	0.05		0.11	0.39	0.39		0.12	0.01	0.01		0.26	0.05	0.06		
			Q	24	60	4		5	27	27		5	0	0		8	4	7		
			Ex	150	800	70		50	650	650		35	250	250		50	250	50		
			Avail	126	740	66		45	623	623		30	250	250		42	246	43		
	2 - Steeles Avenue and Fifth Line South	TCS	LOS		A	A	A	A	A		A	C		C	C					A
			Delay		5	2	5	2	3		3	30		27	29					4
			V/C		0.55	0.02		0.04	0.34			0.23		0.00						
			Q		60	2		2	27			5		3						
			Ex		600	600		60	450			20		400						
			Avail		540	598		58	423			15		397						
	3 - Steeles Avenue and Sixth Line	TWSC	LOS	A	A				A	A	A					F		B	D	
			Delay	9	0				0	0	0					66		11	25	1
			V/C	0.05	0.36				0.19	0.00						0.20		0.07		
			Q	1	0				0	0						6		2		
			Ex	60	400				900	30						30		500		
			Avail	59	400				900	30						24		498		
	4 - Steeles Avenue and Sixth Line South	TWSC	LOS		A	A	A	B	A		A	F		B	D					
			Delay		0	0	0	13	0		2	84		14	33					2
			V/C		0.36	0.02		0.18	0.17			0.25		0.09						
			Q		0	0		5	0			7		3						
			Ex		800	30		60	500			30		350						
			Avail		800	30		55	500			23		347						
	5 - Steeles Avenue and Hornby Road	TWSC	LOS	A	A		A		A	A	A					D		B	C	
			Delay	9	0		0		0	0	0					30		11	15	1
			V/C	0.02	0.33				0.17	0.01						0.06		0.06		
			Q	1	0				0	0						2		2		
			Ex	60	450				850	30						30		500		
			Avail	59	450				850	30						28		498		
	6 - Steeles Avenue and Trafalgar Road	TCS	LOS	E	F	D	F	F	D	C	E	F	C	C	D	C	F	D	E	E
			Delay	74	95	50	83	112	39	31	75	155	32	33	53	27	83	43	70	71
			V/C	0.56	1.02	0.48		1.05	0.57	0.03		1.05	0.29	0.32		0.40	1.04	0.56		
			Q	19	165	59		139	96	0		51	51	30		47	266	71		
			Ex	115	850	50		140	250	75		100	300	100		250	500	80		
			Avail	96	685	-9		1	154	75		49	249	70		203	234	9		
	7 - Steeles Avenue and Toronto Premium Outlets	TCS	LOS		A	A	A	A	A		A	C		C	C					A
			Delay		10	5	10	5	6		6	23		23	23					9
			V/C		0.66	0.01		0.06	0.55			0.08		0.00						
			Q		107	2		2	53			5		2						
			Ex		250	250		50	150			40		40						
			Avail		143	248		48	97			35		38						
	8 -Steeles Avenue and Eighth Line/Toronto Premium Outlets	TCS	LOS	B	C	B	C	B	B	B	B	D	C	C	C	E	D	D	D	C
			Delay	11	25	12	23	14	19	13	19	40	21	21	25	67	35	35	46	28
			V/C	0.29	0.81	0.01		0.22	0.58	0.02		0.10	0.02	0.02		0.90	0.49	0.49		
			Q	17	157	0		8	79	0		2	5	5		91	59	59		
			Ex	110	150	65		125	850	30		135	200	200		70	500	500		
			Avail	93	-7	65		117	771	30		133	195	195		-21	441	441		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

TABLE 4.6: 2026 AM PEAK HOUR BACKGROUND TRAFFIC OPERATIONS (CONTINUED)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																
				Eastbound				Westbound				Northbound				Southbound				OVERALL
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	
AM Peak Hour	9 - Steeles Avenue and Eighth Line South	TWSC	LOS		A	A	A	B	A		A	F		F	F					
			Delay		0	0	0	13	0		0	64		64	64					0
			V/C		0.56	0.28		0.01	0.24			0.08		0.00						
			Q		0	0		0	0			2		0						
			Ex		800	800		90	500			30		500						
			Avail		800	800		90	500			28		500						
	10 - Steeles Avenue and Ninth Line	TCS	LOS	A	B		B		C	B	B					D		B	C	C
			Delay	9	16		15		20	14	18					35		18	33	21
			V/C	0.31	0.79				0.67	0.19						0.89		0.08		
			Q	11	89				58	14						72		10		
			Ex	65	500				750	75						90		500		
			Avail	54	411				692	61						18		490		
	11 - Trafalgar Road and Hornby Road	TWSC	LOS	F		F	F					A	A				A	A	A	
			Delay	141		141	141					1	1				0	0	0	2
			V/C	0.57		0.57						0.02	0.02				1.04	1.04		
			Q	18		18						1	1				0	0		
			Ex	500		500						500	500				500	500		
			Avail	482		482						499	499				500	500		
	12 - 5 Sideroad and Fifth Line	TWSC	LOS	A	A	A	A	A	A	A	A	D	D	D	D	E	E	E	E	
			Delay	0	0	0	0	2	2	2	2	25	25	25	25	48	48	48	48	8
			V/C	0.01	0.01	0.01		0.04	0.04	0.04		0.25	0.25	0.25		0.66	0.66	0.66		
			Q	0	0	0		1	1	1		8	8	8		32	32	32		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	500	500	500		499	499	499		492	492	492		468	468	468		
	13 - 5 Sideroad and Sixth Line	TWSC	LOS	A	A	A	A	A	A	A	A	C	C	C	C	D	D	D	D	
			Delay	0	0	0	0	1	1	1	1	21	21	21	21	29	29	29	29	3
			V/C	0.01	0.01	0.01		0.02	0.02	0.02		0.21	0.21	0.21		0.35	0.35	0.35		
			Q	0	0	0		0	0	0		6	6	6		12	12	12		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	500	500	500		500	500	500		494	494	494		488	488	488		
	14 - 5 Sideroad and Trafalgar Road	TCS	LOS	C	E	C	D	C	C	C	C	C	B	B	B	B	D	B	C	D
			Delay	26	69	32	53	31	29	29	30	20	18	18	18	12	35	14	34	36
			V/C	0.13	0.97	0.45		0.54	0.29	0.29		0.25	0.35	0.35		0.09	0.93	0.03		
			Q	6	101	24		21	40	40		6	44	44		7	209	0		
			Ex	45	500	80		75	500	500		100	500	500		175	500	30		
			Avail	39	399	56		54	460	460		94	456	456		168	291	30		
	15 - 5 Sideroad and Eighth Line	TCS	LOS	D	D	D	D	C	C	C	C	A	A	A	A	C	C	C	C	C
			Delay	44	44	44	44	22	22	22	22	9	9	9	9	27	27	27	27	30
			V/C	0.91	0.91	0.91		0.49	0.49	0.49		0.15	0.15	0.15		0.88	0.88	0.88		
			Q	128	128	128		45	45	45		18	18	18		181	181	181		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	372	372	372		455	455	455		482	482	482		319	319	319		
	16 - 5 Sideroad and Ninth Line	TCS	LOS	B	C	C	C	B	B	B	B	C	C	C	C	C	B	B	C	C
			Delay	16	32	32	31	15	17	15	16	27	30	30	29	21	19	19	20	24
			V/C	0.06	0.85	0.85		0.04	0.20	0.01		0.14	0.52	0.52		0.72	0.58	0.58		
			Q	8	135	135		3	28	0		9	59	59		92	101	101		
			Ex	40	500	500		40	500	40		40	500	500		40	500	500		
			Avail	32	365	365		37	472	40		31	441	441		-52	399	399		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

TABLE 4.7: 2026 PM PEAK HOUR BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																	
				Eastbound				Westbound				Northbound				Southbound				OVERALL
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	
PM Peak Hour	1 - Steeles Avenue and Fifth Line/Brownridge Road	TCS	LOS	B	A	A	A	A	A	A	A	C	C	C	C	C	C	C	C	A
			Delay	12	5	4	6	4	9	9	9	25	23	23	24	25	23	24	25	10
			V/C	0.39	0.19	0.00		0.01	0.68	0.68		0.34	0.07	0.07		0.34	0.03	0.27		
			Q	15	15	0		1	80	80		15	8	8		14	3	18		
			Ex	150	800	70		50	650	650		35	250	250		50	250	50		
			Avail	135	785	70		49	570	570		20	242	242		36	247	32		
	2 - Steeles Avenue and Fifth Line South	TCS	LOS		A	A	A	A	A		A	C		C	C					A
			Delay		4	2	4	3	5		5	30		28	29					5
			V/C		0.33	0.00		0.01	0.60			0.22		0.01						
			Q		30	1		1	75			8		4						
			Ex		600	600		60	450			20		400						
			Avail		570	599		59	375			12		396						
	3 - Steeles Avenue and Sixth Line	TWSC	LOS	C	A		A		A	A	A					F		C	E	
			Delay	15	0		1		0	0	0					130		16	37	1
			V/C	0.14	0.30				0.44	0.01						0.26		0.12		
			Q	4	0				0	0						7		3		
			Ex	60	400				900	30						30		500		
			Avail	56	400				900	30						23		497		
	4 - Steeles Avenue and Sixth Line South	TWSC	LOS		A	A	A	A	A		A	F		A	F					
			Delay		0	0	0	10	0		2	90		10	70					3
			V/C		0.15	0.01		0.25	0.35			0.43		0.01						
			Q		0	0		8	0			13		0						
			Ex		800	30		60	500			30		350						
			Avail		800	30		52	500			17		350						
	5 - Steeles Avenue and Hornby Road	TWSC	LOS	B	A		A		A	A	A					F		C	C	
			Delay	13	0		1		0	0	0					94		16	22	1
			V/C	0.08	0.20				0.41	0.01						0.11		0.18		
			Q	2	0				0	0						3		5		
			Ex	60	450				850	30						30		500		
			Avail	58	450				850	30						27		495		
	6 - Steeles Avenue and Trafalgar Road	TCS	LOS	F	E	D	E	E	E	C	E	E	D	E	D	D	D	D	D	E
			Delay	82	61	41	64	67	58	32	59	67	50	55	54	40	48	42	47	57
			V/C	0.89	0.87	0.11		0.92	0.94	0.19		0.66	0.76	0.75		0.30	0.46	0.06		
			Q	76	129	8		144	203	29		44	141	149		18	67	0		
			Ex	115	850	50		140	250	75		100	300	100		250	500	80		
			Avail	39	721	42		-4	47	46		56	159	-49		232	433	80		
	7 - Steeles Avenue and Toronto Premium Outlets	TCS	LOS		B	A	B	A	A		A	D		C	C					B
			Delay		13	6	13	6	9		9	36		23	34					14
			V/C		0.76	0.03		0.15	0.75			0.78		0.06						
			Q		120	5		3	93			34		10						
			Ex		250	250		50	150			40		40						
			Avail		130	245		47	57			6		30						
	8 -Steeles Avenue and Eighth Line/Toronto Premium Outlets	TCS	LOS	F	B	A	C	B	D	B	C	E	D	D	D	E	E	E	E	C
			Delay	80	17	10	30	13	37	15	34	59	43	43	47	68	58	58	61	34
			V/C	0.94	0.55	0.01		0.43	0.93	0.09		0.34	0.18	0.18		0.44	0.22	0.22		
			Q	114	109	0		19	276	9		17	28	28		25	26	26		
			Ex	110	150	65		125	850	30		135	200	200		70	500	500		
			Avail	-4	41	65		106	574	21		118	172	172		45	474	474		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

TABLE 4.7: 2026 PM PEAK HOUR BACKGROUND TRAFFIC OPERATIONS (CONTINUED)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																	
				Eastbound				Westbound				Northbound				Southbound				OVERALL
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	
PM Peak Hour	9 - Steeles Avenue and Eighth Line South	TWSC	LOS		A	A	A	A	A		A	F		B	E					
			Delay		0	0	0	0	0		0	107		14	45					0
			V/C		0.47	0.24		0.00	0.58			0.12		0.02						
			Q		0	0		0	0			3		1						
			Ex		800	800		90	500			30		500						
			Avail		800	800		90	500			27		499						
	10 - Steeles Avenue and Ninth Line	TCS	LOS	C	A		A		B	B	B					E		D	E	C
			Delay	34	5		8		18	14	17					79		41	71	20
			V/C	0.70	0.46				0.84	0.63						0.95		0.06		
			Q	38	48				178	40						65		15		
			Ex	65	500				750	75						90		500		
			Avail	27	452				572	35						25		485		
	11 - Trafalgar Road and Hornby Road	TWSC	LOS	F		F	F					A	A		A		A	A	A	
			Delay	73		73	73					0	0		0		0	0	0	2
			V/C	0.53		0.53						0.00	0.00				0.30	0.30		
			Q	19		19						0	0				0	0		
			Ex	500		500						500	500				500	500		
			Avail	481		481						500	500				500	500		
	12 - 5 Sideroad and Fifth Line	TWSC	LOS	A	A	A	A	A	A	A	A	C	C	C	C	C	C	C	C	
			Delay	2	2	2	2	0	0	0	0	22	22	22	22	21	21	21	21	4
			V/C	0.04	0.04	0.04		0.02	0.02	0.02		0.30	0.30	0.30		0.21	0.21	0.21		
			Q	1	1	1		0	0	0		10	10	10		6	6	6		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	499	499	499		500	500	500		490	490	490		494	494	494		
	13 - 5 Sideroad and Sixth Line	TWSC	LOS	A	A	A	A	A	A	A	A	C	C	C	C	C	C	C	C	
			Delay	0	0	0	0	0	0	0	0	19	19	19	19	20	20	20	20	2
			V/C	0.01	0.01	0.01		0.01	0.01	0.01		0.20	0.20	0.20		0.14	0.14	0.14		
			Q	0	0	0		0	0	0		6	6	6		4	4	4		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	500	500	500		500	500	500		494	494	494		496	496	496		
	14 - 5 Sideroad and Trafalgar Road	TCS	LOS	E	C	C	D	C	D	D	D	B	C	C	C	B	B	B	B	C
			Delay	73	28	24	37	26	47	47	45	11	23	23	22	17	18	15	18	27
			V/C	0.78	0.34	0.03		0.16	0.87	0.87		0.27	0.80	0.80		0.11	0.41	0.06		
			Q	36	46	4		17	131	131		19	201	201		3	63	9		
			Ex	45	500	80		75	500	500		100	500	500		175	500	30		
			Avail	9	454	76		58	369	369		81	299	299		172	437	21		
	15 - 5 Sideroad and Eighth Line	TCS	LOS	B	B	B	B	C	C	C	C	B	B	B	B	B	B	B	B	B
			Delay	11	11	11	11	20	20	20	20	16	16	16	16	11	11	11	11	16
			V/C	0.52	0.52	0.52		0.84	0.84	0.84		0.66	0.66	0.66		0.26	0.26	0.26		
			Q	38	38	38		97	97	97		71	71	71		22	22	22		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	462	462	462		403	403	403		429	429	429		478	478	478		
	16 - 5 Sideroad and Ninth Line	TCS	LOS	B	B	B	B	B	C	B	C	B	B	B	B	B	B	B	B	B
			Delay	16	16	16	16	14	26	17	23	11	17	17	17	15	13	13	13	18
			V/C	0.25	0.38	0.38		0.03	0.80	0.44		0.05	0.62	0.62		0.21	0.27	0.27		
			Q	10	45	45		4	109	45		6	90	90		11	34	34		
			Ex	40	500	500		40	500	40		40	500	500		40	500	500		
			Avail	30	455	455		36	391	-5		34	410	410		29	466	466		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

TABLE 4.8: 2026 AM AND PM PEAK HOUR BACKGROUND TRAFFIC OPERATIONS WITH REMEDIAL MEASURES

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																
				Eastbound				Westbound				Northbound				Southbound				
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	OVERALL
AM Peak Hour	6 - Steeles Avenue and Trafalgar Road	TCS	LOS	E	E	D	D	F	C	C	E	F	C	C	D	C	F	D	E	E
			Delay	57	57	43	54	84	32	28	57	138	28	28	46	21	83	36	69	59
			V/C	0.51	0.88	0.39		1.00	0.45	0.03		1.04	0.31	0.29		0.39	1.07	0.55		
			Q	15	87	40		111	53	0		43	43	22		38	221	58		
			Ex	115	850	50		140	250	75		100	300	100		250	500	80		
			Avail	100	763	10		29	197	75		57	257	78		212	279	22		
	8 -Steeles Avenue and Eighth Line/Toronto Premium Outlets	TCS	LOS	B	B	B	B	B	B	B	B	D	B	B	C	D	C	C	D	C
			Delay	11	19	13	18	14	18	15	18	35	17	17	20	52	27	27	35	22
			V/C	0.29	0.63	0.01		0.22	0.48	0.02		0.08	0.02	0.02		0.84	0.32	0.32		
			Q	17	81	0		8	48	0		2	5	5		80	29	29		
			Ex	110	150	65		125	850	30		135	200	200		85	500	500		
			Avail	93	69	65		117	802	30		133	195	195		5	471	471		
	10 - Steeles Avenue and Ninth Line	TCS	LOS	B	B		B		C	B	C					C		B	C	B
			Delay	11	14		13		23	17	21					28		19	27	19
			V/C	0.32	0.56				0.66	0.19						0.72		0.08		
			Q	14	61				74	16						70		10		
			Ex	65	500				750	75						90		500		
			Avail	51	439				676	59						20		490		
	14 - 5 Sideroad and Trafalgar Road	TCS	LOS	C	D	D	D	C	C	C	C	B	B	B	B	A	C	A	C	C
			Delay	32	43	43	42	33	34	34	33	15	13	13	13	9	21	10	21	26
			V/C	0.18	0.73	0.61		0.45	0.21	0.21		0.23	0.30	0.30		0.08	0.80	0.03		
			Q	16	66	69		23	21	21		5	38	38		6	167	0		
			Ex	45	500	80		75	500	500		100	500	500		175	500	30		
			Avail	29	434	11		52	479	479		95	462	462		169	333	30		
	15 - 5 Sideroad and Eighth Line	TCS	LOS	C	C	C	C	C	C	C	C	A	A	A	A	B	B	B	B	C
			Delay	33	33	33	33	27	27	27	27	6	6	6	6	14	14	14	14	21
			V/C	0.74	0.74	0.74		0.40	0.40	0.40		0.12	0.12	0.12		0.73	0.73	0.73		
			Q	56	56	56		25	25	25		14	14	14		128	128	128		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	444	444	444		475	475	475		486	486	486		372	372	372		
	16 - 5 Sideroad and Ninth Line	TCS	LOS	B	C	C	C	B	B	B	B	B	C	C	C	B	A	A	B	B
			Delay	16	20	20	20	15	16	15	16	18	20	20	20	11	10	10	11	15
			V/C	0.09	0.64	0.64		0.03	0.15	0.01		0.13	0.48	0.48		0.61	0.51	0.51		
			Q	8	47	47		3	13	0		6	35	35		36	48	48		
			Ex	40	500	500		40	500	40		40	500	500		40	500	500		
			Avail	32	453	453		37	487	40		34	465	465		4	452	452		
PM Peak Hour	6 - Steeles Avenue and Trafalgar Road	TCS	LOS	E	D	D	D	D	D	E	D	D	D	D	D	C	D	C	D	D
			Delay	60	51	38	52	45	45	61	47	51	40	39	41	30	38	33	36	45
			V/C	0.84	0.84	0.12		0.88	0.82	0.15		0.63	0.76	0.62		0.25	0.45	0.06		
			Q	60	75	0		115	105	30		36	113	79		14	53	0		
			Ex	115	850	50		140	250	75		100	300	100		250	500	80		
			Avail	55	775	50		25	145	45		64	187	21		236	447	80		
	8 -Steeles Avenue and Eighth Line/Toronto Premium Outlets	TCS	LOS	D	B	B	C	B	C	B	C	D	C	C	C	D	D	D	D	C
			Delay	45	18	14	24	14	29	17	27	43	28	28	32	46	41	41	43	27
			V/C	0.86	0.48	0.01		0.44	0.81	0.09		0.26	0.16	0.16		0.33	0.18	0.18		
			Q	79	67	0		21	134	5		14	21	21		20	21	21		
			Ex	110	150	65		125	850	30		135	200	200		70	500	500		
			Avail	31	83	65		104	716	25		121	179	179		50	479	479		
	10 - Steeles Avenue and Ninth Line	TCS	LOS	B	A		A		B	B	B					D		C	D	B
			Delay	16	7		8		17	18	17					38		31	37	17
			V/C	0.60	0.36				0.70	0.62						0.59		0.06		
			Q	25	36				104	38						45		13		
			Ex	65	500				750	75						90		500		
			Avail	40	464				646	37						45		487		
	14 - 5 Sideroad and Trafalgar Road	TCS	LOS	D	C	C	C	C	C	C	C	A	B	B	B	B	B	A	B	B
			Delay	35	28	26	29	28	32	32	31	7	16	16	15	11	13	10	12	19
			V/C	0.48	0.24	0.03		0.20	0.60	0.60		0.24	0.73	0.73		0.08	0.36	0.06		
			Q	23	23	5		18	55	55		15	165	165		3	54	8		
			Ex	45	500	80		75	500	500		100	500	500		175	500	30		
			Avail	22	477	75		57	445	445		85	335	335		172	446	22		
	15 - 5 Sideroad and Eighth Line	TCS	LOS	C	C	C	C	C	C	C	C	A	A	A	A	A	A	A	A	B
			Delay	22	22	22	22	26	26	26	26	9	9	9	9	6	6	6	6	18
			V/C	0.52	0.52	0.52		0.72	0.72	0.72		0.44	0.44	0.44		0.17	0.17	0.17		
			Q	31	31	31		56	56	56		63	63	63		21	21	21		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	469	469	469		444	444	444		437	437	437		479	479	479		
	16 - 5 Sideroad and Ninth Line	TCS	LOS	B	C	C	C	B	B	B	B	B	C	C	C	B	A	A	B	B
			Delay	16	20	20	20	15	16	15	16	18	20	20	20	11	10	10	11	15
			V/C	0.09	0.64	0.64		0.03	0.15	0.01		0.13	0.48	0.48		0.61	0.51	0.51		
			Q	8	47	47		3	13	0		6	35	35		36	48	48		
			Ex	40	500	500		40	500	40		40	500	500		40	500	500		
			Avail	32	453	453		37	487	40		34	465	465		4	452	452		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

4.6 2026 Total Traffic Conditions

4.6.1 Total Traffic Volumes

Figures 4.11 and **4.12** summarize the 2026 AM and PM peak hour total traffic volumes, respectively, which were calculated by adding 2026 background traffic volumes (**Figures 4.9** and **4.10**) and the Premier Gateway Phase 1B lands traffic assignments (**Figures 3.7** and **3.8**).

4.6.2 Traffic Operations with Network Improvements

Intersection capacity analyses were undertaken to assess 2026 total peak hour traffic conditions for the Study Area intersections. The analyses applied the same methodology, parameters and lane configurations used for the existing conditions analysis in Section 2.3, and incorporated the following road network improvements noted in Sections 4.2, 4.3.5 and 4.5.3:

- Improvements to address existing critical traffic movements.
- Widening of Ninth Line from 2 to 4 lanes between Steeles Avenue and 5 Sideroad (needed to address background traffic growth to 2021).
- Improvements to address critical traffic movements for 2021 background/total traffic conditions.
- Widening of Steeles Avenue from 4 to 6 lanes between Trafalgar Road and Ninth Line (needed to address 2026 background traffic growth).
- Widening of 5 Sideroad from 2 to 4 lanes between Trafalgar Road and Ninth Line (needed to address 2026 background traffic growth).
- Improvements to address critical traffic movements for 2026 background traffic conditions.

Signal timings were also optimized using Synchro.

Tables 4.9 and **4.10** summarize the analysis results for the AM and PM peak hours with 2026 total traffic volumes, respectively (**Figures 4.11** and **4.12**). The tables denote LOS, delay, v/c ratios and 95% queue length for the Study Area intersections**. Appendix J** provides the Synchro analysis output. The following critical movements were identified:

- **Steeles Avenue and Sixth Line:**
  - The southbound left movement is projected to operate at LOS F (v/c = 0.30) during the AM peak hour and LOS F (v/c = 0.68) during the PM peak hour.
- **Steeles Avenue and Sixth Line South/Street A:**
  - The northbound and southbound approaches are projected to operate with very high delays and over capacity conditions during the AM and PM peak hours.

- **Steeles Avenue and Hornby Road:**
  - The southbound left movement is projected to operate at LOS F (v/c = 0.22) during the AM peak hour and LOS F (v/c = 2.28) during the PM peak hour.
- **Steeles Avenue and Trafalgar Road:**
  - The eastbound through movement is projected to operate at LOS F (v/c = 1.10) during the AM peak hour and LOS E (v/c = 0.89) during the PM peak hour.
  - The eastbound right-turn lane 95th percentile queue length is projected to exceed available storage by 32 metres during the AM peak hour and 35 metres during the PM peak hour.
  - The westbound left movement is projected to operate at LOS F (v/c = 1.09) during the AM peak hour, with the 95th percentile queue length projected to exceed available storage by 2 metres.
  - The westbound through movement is projected to operate at LOS D (v/c = 0.85) during the PM peak hour.
  - The northbound left movement is projected to operate at LOS F (v/c = 1.08) during the AM peak hour.
  - The northbound right-turn lane 95th percentile queue length is projected to exceed available storage by 20 metres during the PM peak hour.
  - The southbound through movement is projected to operate at LOS F (v/c = 1.05) during the AM peak hour.
- **Steeles Avenue and Eighth Line/Toronto Premium Outlets:**
  - The eastbound left movement is projected to operate at LOS E (v/c = 0.98) during the PM peak hour.
  - The westbound through movement is projected to operate at LOS D (v/c = 1.00) during the PM peak hour.
  - The southbound left-turn lane 95th percentile queue length is projected to exceed available storage by 22 metres during the AM peak hour and 29 metres during the PM peak hour.
- **Steeles Avenue and Eighth Line South:**
  - The northbound left movement is projected to operate at LOS F (v/c = 0.08) during the AM peak hour.
- **Steeles Avenue and Ninth Line:**
  - The westbound through movement is projected to operate at LOS C (v/c = 0.85) during the AM peak hour and LOS C (v/c = 0.93) during the PM peak hour.

- **Trafalgar Road and Hornby Road:**
  - The eastbound approach is projected to operate with very high delays and over capacity conditions during the AM and PM peak hours.
  - The southbound shared through-right movement is projected to operate at LOS A (v/c = 1.30) during the AM peak hour.
- **5 Sideroad and Fifth Line:**
  - The southbound through movement is projected to operate at LOS F (v/c = 0.75) during the AM peak hour.
- **5 Sideroad and Trafalgar Road:**
  - The eastbound right-turn lane 95th percentile queue length is projected to exceed available storage by 35 metres during the AM peak hour.
  - The northbound through-right movement is projected to operate at LOS B (v/c = 0.85) during the PM peak hour.
  - The southbound through movement is projected to operate at LOS D (v/c = 1.02) during the AM peak hour.
- **5 Sideroad and Eighth Line:**
  - The southbound shared left-through-right movement is projected to operate at LOS C (v/c = 0.88) during the AM peak hour.
- **Steeles Avenue and Street B/Street C:**
  - The westbound left-turn lane 95th percentile queue length is projected to exceed available storage by 10 metres during the AM peak hour.
- **Trafalgar Road and Street B:**
  - The eastbound shared left-through-right movement is projected to operate at LOS F (v/c = 2.00) during the AM peak hour and LOS F (v/c = 13.08) during the PM peak hour.
  - The westbound shared left-through-right movement is projected to operate at LOS E (v/c = 7.18) during the AM peak hour and LOS F (v/c = 16.94) during the PM peak hour.
  - The southbound shared through-right movement is projected to operate at LOS A (v/c = 1.07) during the AM peak hour.
- **Eighth Line and Street B:**
  - The westbound shared left-right turn movement is projected to operate at LOS E (v/c = 0.78) during the PM peak hour.

4.6.3 Traffic Operations with Remedial Measures

The operational analyses of 2026 total traffic conditions projected critical movements at 14 intersections within the Study Area. The following improvements were incorporated to address these concerns:

- **Steeles Avenue and Sixth Line South/Street A:**
  - Installation of traffic control signals
  - Addition of an eastbound left-turn lane with 50 metres storage
  - Addition of an eastbound right-turn lane with 30 metres storage
  - Addition of a westbound left-turn lane with 50 metres storage
  - Addition of a westbound right-turn lane with 30 metres storage
  - Addition of a northbound left-turn lane with 30 metres storage
  - Addition of a southbound left-turn lane with 55 metres storage
- **Trafalgar Road and Hornby Road:**
  - Installation of traffic control signals
  - Addition of an eastbound right-turn lane with 50 metres storage
  - Addition of northbound and southbound through lanes (widening of Trafalgar Road from 2 to 4 lanes between Steeles Avenue and 5 Sideroad)
  - Addition of a northbound left-turn lane with 30 metres storage
  - Removal of the southbound right-turn slip lane from Trafalgar Road onto Hornby Road
- **5 Sideroad and Trafalgar Road**:
  - Extension of the eastbound right-turn lane storage to 115 metres
  - Addition of a northbound right-turn lane with 20 metres storage
- **5 Sideroad and Eighth Line:**
  - Addition of a southbound left-turn lane with 25 metres storage
- **Trafalgar Road and Street B:**
  - Installation of traffic control signals
  - Addition of an eastbound left-turn lane with 50 metres storage
  - Addition of an eastbound right-turn lane with 50 metres storage
  - Addition of a westbound left-turn lane with 85 metres storage
  - Addition of a westbound right-turn lane with 50 metres storage
  - Addition of northbound and southbound through lanes (widening of Trafalgar Road from 2 to 4 lanes between Steeles Avenue and 5 Sideroad)
  - Extension of the northbound left-turn lane storage to 50 metres
  - Addition of a northbound right-turn lane with 50 metres storage
  - Extension of the southbound left-turn lane storage to 50 metres
  - Addition of a southbound right-turn lane with 50 metres storage

- **Eighth Line and Street B:**
  - Addition of an eastbound left-turn lane with 25 metres storage
  - Addition of a northbound left-turn lane with 25 metres storage

No remedial measures are recommended at the other eight (8) intersections.

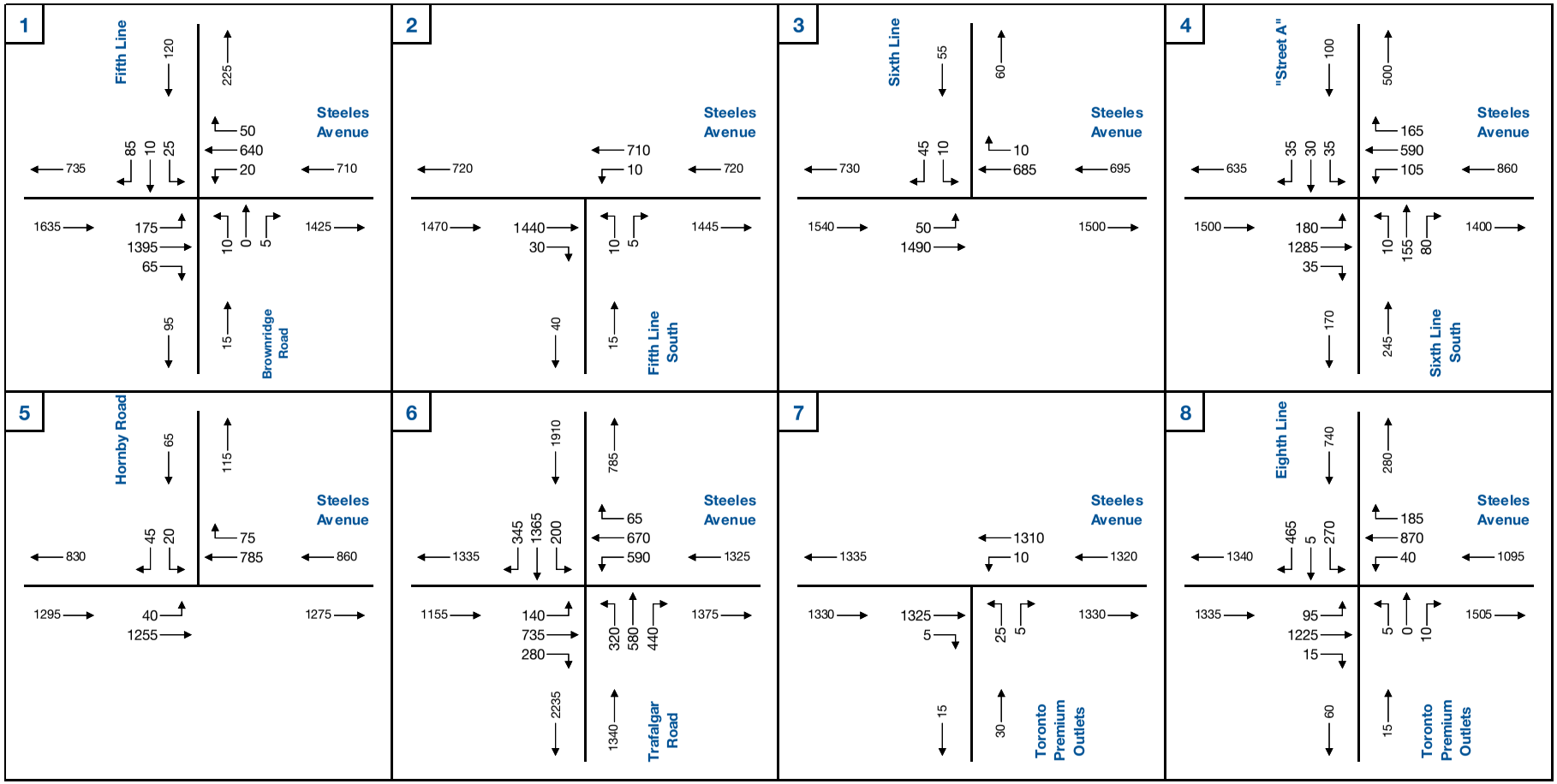
Tables 4.11 and **4.12** summarize the capacity analyses completed for the intersections with the above-noted improvements, based on the 2026 AM and PM peak hour total traffic forecasts, respectively. **Appendix L** provides the Synchro analysis output. The tables illustrate that the intersections are projected to operate at or near satisfactory levels of service if these road improvements were implemented.

As part of the analysis, the need for traffic control signals was assessed at the Study Area intersections based on Ontario Traffic Manual Book 12 (Traffic Signals)[16] and found to be justified at the locations noted above. The calculations also illustrated that signals would not to be justified at:

- Steeles Avenue and Sixth Line
- Steeles Avenue and Hornby Road

Appendix K provides the signal warrant calculations for all intersections.

[16] Queen's Printer for Ontario, Ontario Traffic Manual Book 12 (Traffic Signals), March 2012

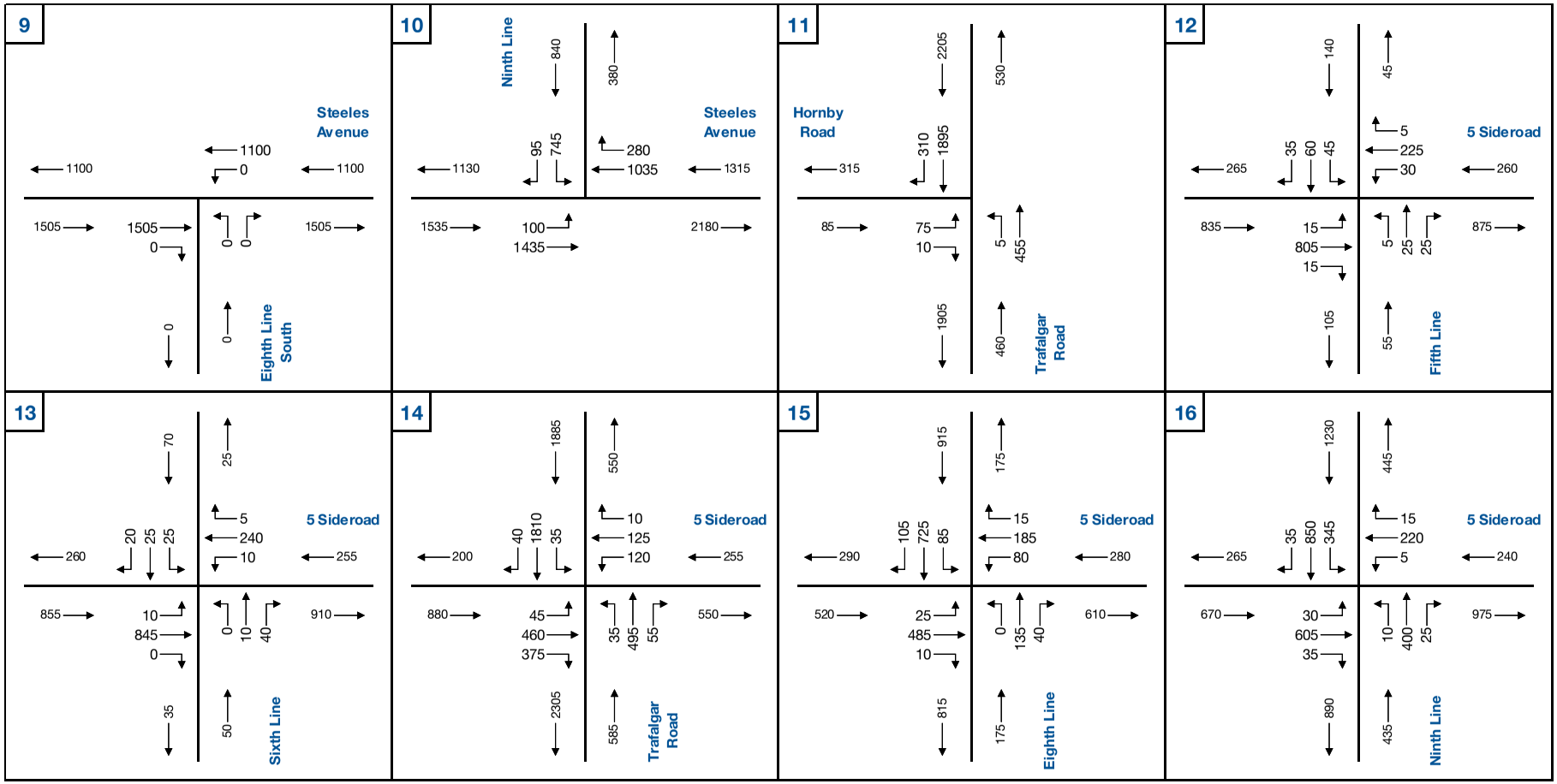


2026 AM Peak Hour

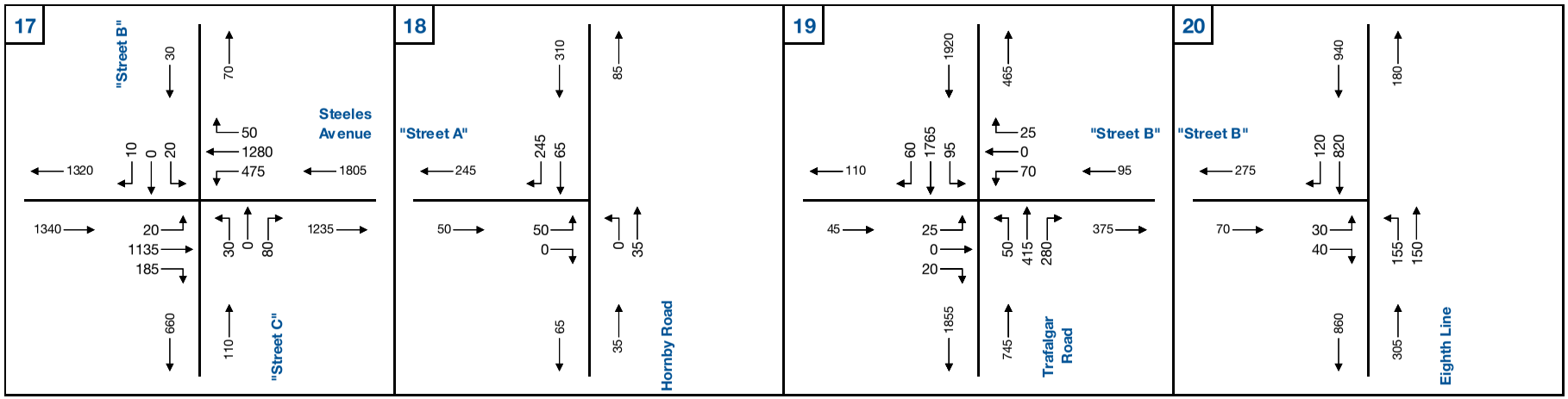
Total Traffic Volumes (1)

Premier Gateway Phase 1B Employment Area Secondary Plan Transportation Study
150770

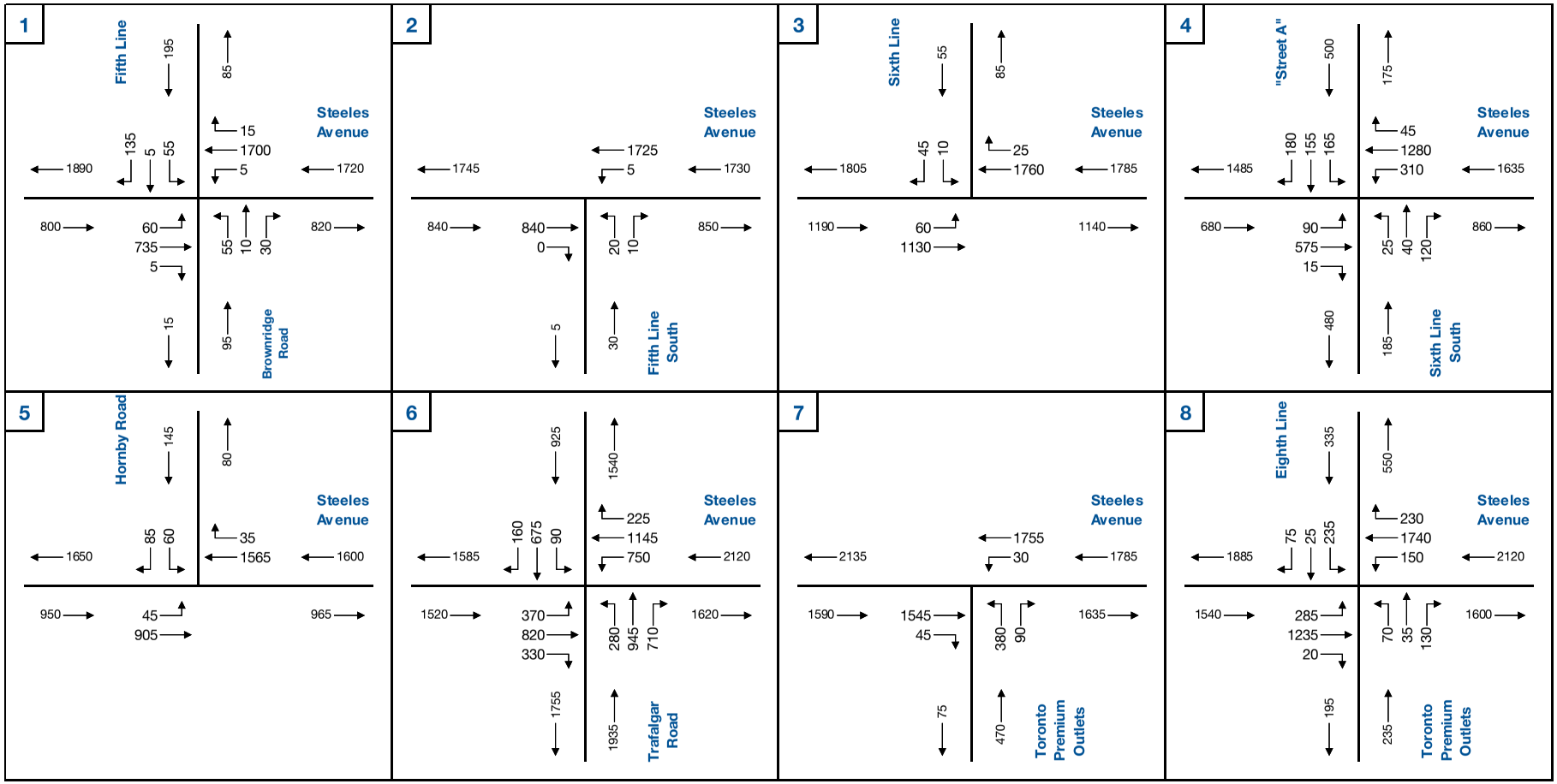
Figure 4.11a



2026 AM Peak Hour
Total Traffic Volumes (2)

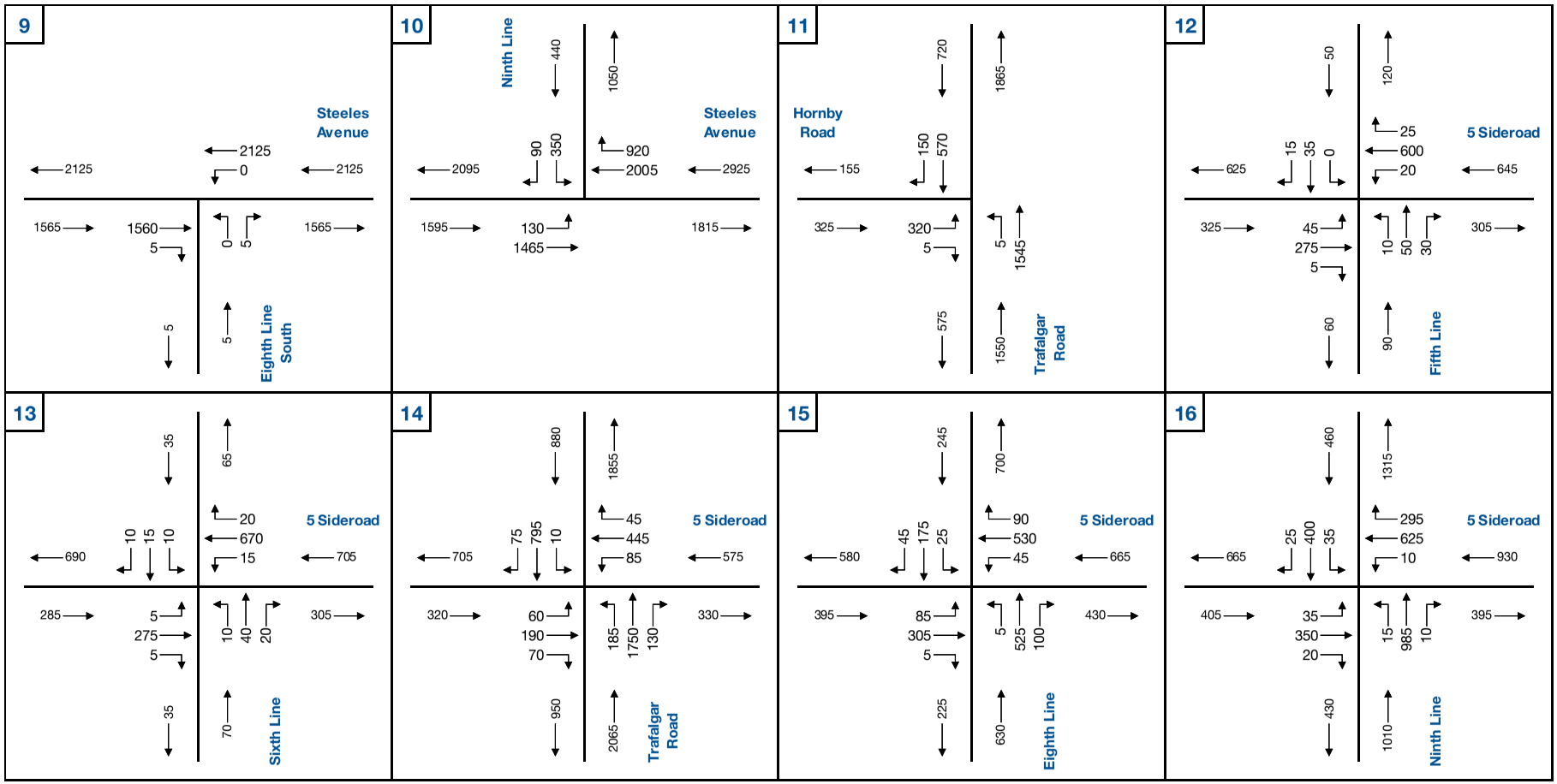


2026 AM Peak Hour
Total Traffic Volumes (3)



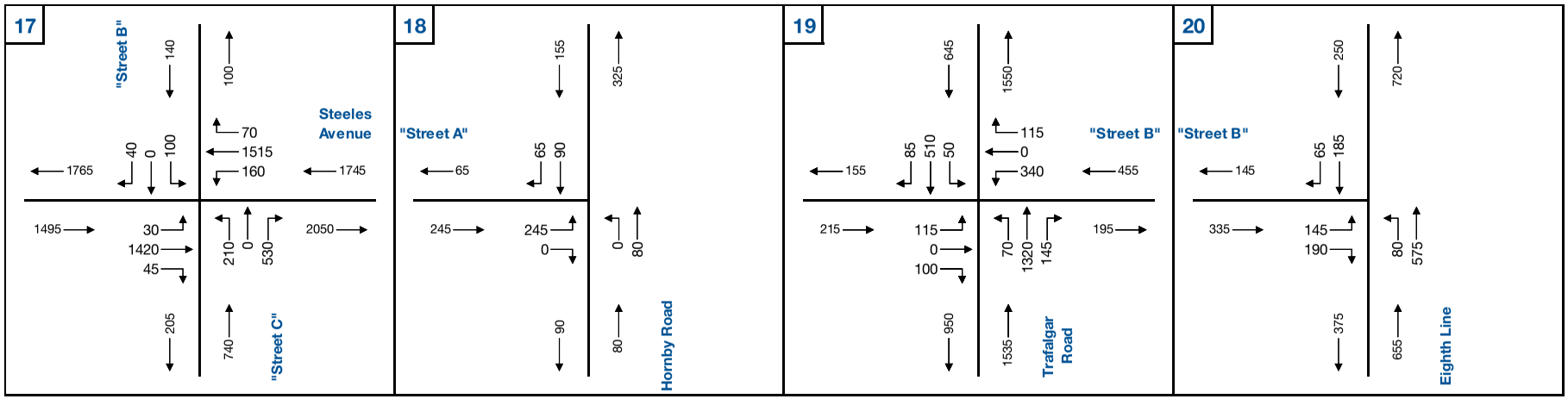
2026 PM Peak Hour

Total Traffic Volumes (1)



2026 PM Peak Hour

Total Traffic Volumes (2)



2026 PM Peak Hour

Total Traffic Volumes (3)

TABLE 4.9: 2026 AM PEAK HOUR TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																	
				Eastbound				Westbound				Northbound				Southbound					
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	OVERALL
AM Peak Hour	1 - Steeles Avenue and Fifth Line/Brownridge Road	TCS	LOS	A	A	A	**A**	A	A	A	**A**	C	C	C	**C**	C	C	C	**C**	**A**
			Delay	8	9	4	**9**	6	6	6	**6**	26	25	25	**25**	27	25	25	**26**	**9**
			V/C	0.39	0.72	0.05		0.16	0.40	0.40		0.10	0.01	0.01		0.24	0.04	0.06		
			Q	23	83	4		5	29	29		6	0	0		10	5	10		
			Ex	150	800	70		50	650	650		35	250	250		50	250	50		
			Avail	127	717	66		45	621	621		29	250	250		40	245	40		
	2 - Steeles Avenue and Fifth Line South	TCS	LOS		A	A	**A**	A	A		**A**	D		C	**C**					**A**
			Delay		5	2	**5**	2	3		**3**	36		32	**34**					**5**
			V/C		0.64	0.02		0.05	0.35			0.26		0.00						
			Q		83	2		2	30			6		3						
			Ex		600	600		60	450			20		400						
			Avail		517	598		58	420			14		397						
	3 - Steeles Avenue and Sixth Line	TWSC	LOS	A	A		**A**		A	A	**A**					F		B	**D**	**A**
			Delay	9	0		**0**		0	0	**0**					103		11	**34**	**1**
			V/C	0.06	0.44				0.20	0.01						0.30		0.07		
			Q	1	0				0	0						8		2		
			Ex	60	400				900	30						30		500		
			Avail	59	400				900	30						22		498		
	4 - Steeles Avenue and Sixth Line South	TWSC	LOS	A	A	A	**A**	B	A	A	**A**	F	F	F	**F**	F	F	F	**F**	
			Delay	10	0	0	**1**	14	0	0	**2**	ERR	ERR	ERR	**ERR**	ERR	371	371	**ERR**	**ERR**
			V/C	0.18	0.38	0.02		0.22	0.12	0.10		ERR	7.89	7.89		ERR	1.32	1.32		
			Q	5	0	0		7	0	0		ERR	ERR	ERR		ERR	48	48		
			Ex	30	800	30		60	500	30		30	350	350		30	200	200		
			Avail	25	800	30		53	500	30		ERR	ERR	ERR		ERR	152	152		
	5 - Steeles Avenue and Hornby Road	TWSC	LOS	A	A		**A**		A	A	**A**					F		B	**D**	**A**
			Delay	10	0		**0**		0	0	**0**					54		12	**25**	**1**
			V/C	0.05	0.37				0.23	0.04						0.22		0.08		
			Q	1	0				0	0						6		2		
			Ex	60	450				850	30						30		500		
			Avail	59	450				850	30						24		498		
	6 - Steeles Avenue and Trafalgar Road	TCS	LOS	E	F	E	**F**	F	D	D	**F**	F	C	C	**D**	C	F	D	**E**	**E**
			Delay	72	127	71	**107**	128	54	44	**86**	138	27	26	**53**	26	84	43	**71**	**78**
			V/C	0.65	1.10	0.71		1.09	0.72	0.05		1.08	0.41	0.29		0.48	1.05	0.59		
			Q	33	122	82		142	87	0		88	77	19		42	282	78		
			Ex	115	850	50		140	250	75		100	300	100		250	500	80		
			Avail	82	728	-32		-2	163	75		12	223	81		208	218	2		
	7 - Steeles Avenue and Toronto Premium Outlets	TCS	LOS		A	A	**A**	A	A		**A**	C		B	**C**					**A**
			Delay		9	6	**9**	5	6		**6**	20		19	**20**					**8**
			V/C		0.52	0.01		0.06	0.46			0.06		0.00						
			Q		56	2		2	37			4		2						
			Ex		250	250		50	150			40		40						
			Avail		194	248		48	113			36		38						
	8 -Steeles Avenue and Eighth Line/Toronto Premium Outlets	TCS	LOS	B	C	B	**C**	B	C	B	**C**	D	B	B	**C**	D	C	C	**D**	**C**
			Delay	13	21	14	**20**	15	21	17	**20**	37	16	16	**20**	50	26	26	**35**	**24**
			V/C	0.35	0.67	0.01		0.24	0.58	0.13		0.09	0.02	0.02		0.85	0.32	0.32		
			Q	18	97	0		9	61	12		2	5	5		92	29	29		
			Ex	110	150	65		125	850	30		135	200	200		70	500	500		
			Avail	92	53	65		116	789	18		133	195	195		-22	471	471		
	9 - Steeles Avenue and Eighth Line South	TWSC	LOS		A	A	**A**	B	A		**A**	F		A	**A**					
			Delay		0	0	**0**	13	0		**0**	67		0	**0**					**0**
			V/C		0.35	0.18		0.01	0.22			0.08		0.00						
			Q		0	0		0	0			2		0						
			Ex		800	800		90	500			30		500						
			Avail		800	800		90	500			28		500						
	10 - Steeles Avenue and Ninth Line	TCS	LOS	B	B		**B**		C	B	**C**					D		C	**D**	**C**
			Delay	11	11		**11**		26	14	**23**					39		20	**37**	**21**
			V/C	0.41	0.55				0.85	0.19						0.90		0.08		
			Q	11	52				104	14						78		10		
			Ex	65	500				750	75						90		500		
			Avail	54	448				646	61						12		490		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

TABLE 4.9: 2026 AM PEAK HOUR TOTAL TRAFFIC OPERATIONS (CONTINUED)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																OVERALL
				Eastbound				Westbound				Northbound				Southbound				
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	
AM Peak Hour	11 - Trafalgar Road and Hornby Road	TWSC	LOS	F		F	F					A	A		A		A	A	A	326
			Delay	ERR		ERR	ERR					1	1		1		0	0	0	
			V/C	3.32		3.32						0.02	0.02				1.30	1.30		
			Q	ERR		ERR						1	1				0	0		
			Ex	500		500						500	500				500	500		
			Avail	ERR		ERR						499	499				500	500		
	12 - 5 Sideroad and Fifth Line	TWSC	LOS	A	A	A	A	A	A	A	A	D	D	D	D	F	F	F	F	9
			Delay	0	0	0	0	2	2	2	2	29	29	29	29	64	64	64	64	
			V/C	0.01	0.01	0.01		0.04	0.04	0.04		0.28	0.28	0.28		0.75	0.75	0.75		
			Q	0	0	0		1	1	1		9	9	9		39	39	39		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	500	500	500		499	499	499		491	491	491		461	461	461		
	13 - 5 Sideroad and Sixth Line	TWSC	LOS	A	A	A	A	A	A	A	A	C	C	C	C	D	D	D	D	4
			Delay	0	0	0	0	1	1	1	1	23	23	23	23	35	35	35	35	
			V/C	0.01	0.01	0.01		0.02	0.02	0.02		0.23	0.23	0.23		0.42	0.42	0.42		
			Q	0	0	0		1	1	1		7	7	7		15	15	15		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	500	500	500		499	499	499		493	493	493		485	485	485		
	14 - 5 Sideroad and Trafalgar Road	TCS	LOS	C	D	E	E	D	C	C	D	C	B	B	B	A	D	B	D	D
			Delay	32	43	76	57	40	33	33	36	23	14	14	15	10	49	11	48	44
			V/C	0.18	0.72	0.93		0.66	0.20	0.20		0.34	0.36	0.36		0.09	1.02	0.03		
			Q	16	72	115		42	22	22		6	45	45		6	254	0		
			Ex	45	500	80		75	500	500		100	500	500		175	500	30		
			Avail	29	428	-35		33	478	478		94	455	455		169	246	30		
	15 - 5 Sideroad and Eighth Line	TCS	LOS	C	C	C	C	C	C	C	C	A	A	A	A	C	C	C	C	C
			Delay	26	26	26	26	24	24	24	24	7	7	7	7	23	23	23	23	22
			V/C	0.68	0.68	0.68		0.53	0.53	0.53		0.16	0.16	0.16		0.88	0.88	0.88		
			Q	49	49	49		29	29	29		17	17	17		188	188	188		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	451	451	451		471	471	471		483	483	483		312	312	312		
	16 - 5 Sideroad and Ninth Line	TCS	LOS	B	C	C	C	B	B	B	B	B	C	C	C	B	B	B	B	B
			Delay	16	20	20	20	15	16	15	16	18	20	20	20	11	11	11	11	15
			V/C	0.10	0.65	0.65		0.03	0.22	0.01		0.13	0.48	0.48		0.61	0.51	0.51		
			Q	8	49	49		3	18	0		6	35	35		36	48	48		
			Ex	40	500	500		40	500	40		40	500	500		40	500	500		
			Avail	32	451	451		37	482	40		34	465	465		4	452	452		
	17 - Steeles Avenue and "Street B"/"Street C"	TCS	LOS	A	A	A	A	C	A	A	B	C	A	C	C	C	C	C	C	B
			Delay	6	7	6	7	31	8	5	14	28	0	27	27	27	26	26	27	12
			V/C	0.09	0.41	0.12		0.90	0.52	0.03		0.09	0.00	0.05		0.06	0.01	0.01		
			Q	4	35	6		70	44	3		12	0	5		9	0	0		
			Ex	30	500	30		60	250	30		30	150	150		30	150	150		
			Avail	26	465	24		-10	206	27		18	150	145		21	150	150		
	18 - Hornby Road and "Street A"	Round-about	LOS	A		A	A					A	A		A		A	A	A	A
			Delay	3		3	3					3	3		3		4	4	4	4
			V/C	0.05		0.05						0.03	0.03				0.26	0.26		
			Q	0		0						0	0				1	1		
			Ex	200		200						200	200				200	200		
			Avail	200		200						200	200				199	199		
	19 - Trafalgar Road and "Street B"	TWSC	LOS	F	F	F	F	F	F	F		C	A	A	A	A	A	A	A	F
			Delay	824	824	824	824	ERR	ERR	ERR		18	0	0	1	10	0	0	1	352
			V/C	2.00	2.00	2.00		7.18	7.18	7.18		0.15	0.41	0.41		0.11	1.07	1.07		
			Q	46	46	46		ERR	ERR	ERR		4	0	0		3	0	0		
			Ex	250	250	250		250	250	250		30	350	350		30	500	500		
			Avail	204	204	204		ERR	ERR	ERR		26	350	350		27	500	500		
	20 - Eighth Line and "Street B"	TWSC	LOS	D		D	D					A	A		A		A	A	A	A
			Delay	33		33	33					7	7		7		0	0	0	3
			V/C	0.35		0.35						0.22	0.22				0.56	0.56		
			Q	12		12						7	7				0	0		
			Ex	250		250						300	300				500	500		
			Avail	238		238						293	293				500	500		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

TABLE 4.10: 2026 PM PEAK HOUR TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																OVERALL
				Eastbound				Westbound				Northbound				Southbound				
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	
PM Peak Hour	1 - Steeles Avenue and Fifth Line/Brownridge Road	TCS	LOS	C	A	A	A	A	B	B	B	C	C	C	C	C	C	C	C	B
			Delay	23	6	4	7	4	12	12	12	25	23	23	24	25	23	24	25	12
			V/C	0.55	0.37	0.00		0.02	0.82	0.82		0.34	0.07	0.07		0.34	0.03	0.27		
			Q	24	31	0		1	139	139		15	8	8		14	3	18		
			Ex	150	800	70		50	650	650		35	250	250		50	250	50		
			Avail	126	769	70		49	511	511		20	242	242		36	247	32		
	2 - Steeles Avenue and Fifth Line South	TCS	LOS		A	A	A	A	A		A	C		C	C					A
			Delay		4	2	4	2	6		6	33		31	32					6
			V/C		0.37	0.00		0.02	0.70			0.23		0.01						
			Q		34	1		1	106			8		4						
			Ex		600	600		60	450			20		400						
			Avail		566	599		59	344			12		396						
	3 - Steeles Avenue and Sixth Line	TWSC	LOS	C	A		A		A	A	A					F		C	F	2
			Delay	18	0		1		0	0	0					333		19	98	
			V/C	0.17	0.33				0.52	0.01						0.68		0.15		
			Q	5	0				0	0						16		4		
			Ex	60	400				900	30						30		500		
			Avail	55	400				900	30						14		496		
	4 - Steeles Avenue and Sixth Line South	TWSC	LOS	B	A	A	A	B	A	A	A	F	F	F	F	F	F	F	F	ERR
			Delay	13	0	0	1	11	0	0	2	ERR	1003	1003	ERR	ERR	ERR	ERR	ERR	
			V/C	0.09	0.17	0.01		0.32	0.38	0.03		ERR	2.88	2.88		ERR	10.44	10.44		
			Q	2	0	0		11	0	0		ERR	137	137		ERR	ERR	ERR		
			Ex	30	800	30		60	500	30		30	350	350		30	200	200		
			Avail	28	800	30		49	500	30		ERR	213	213		ERR	ERR	ERR		
	5 - Steeles Avenue and Hornby Road	TWSC	LOS	C	A		A		A	A	A					F		C	F	21
			Delay	15	0		1		0	0	0					903		19	373	
			V/C	0.11	0.27				0.46	0.02						2.28		0.26		
			Q	3	0				0	0						58		8		
			Ex	60	450				850	30						30		500		
			Avail	57	450				850	30						-28		492		
	6 - Steeles Avenue and Trafalgar Road	TCS	LOS	E	E	E	E	E	D	D	D	E	D	D	D	D	D	D	D	D
			Delay	70	61	55	62	63	49	36	53	69	50	48	52	38	52	39	49	54
			V/C	0.86	0.89	0.68		0.91	0.85	0.26		0.80	0.85	0.71		0.55	0.78	0.14		
			Q	75	101	85		134	126	38		59	158	120		26	115	11		
			Ex	115	850	50		140	250	75		100	300	100		250	500	80		
			Avail	40	749	-35		6	124	37		41	142	-20		224	385	69		
	7 - Steeles Avenue and Toronto Premium Outlets	TCS	LOS		B	A	B	A	A		A	C		C	C					B
			Delay		11	7	11	5	7		7	30		20	28					11
			V/C		0.64	0.03		0.14	0.57			0.71		0.06						
			Q		67	5		3	50			30		9						
			Ex		250	250		50	150			40		40						
			Avail		183	245		47	100			10		31						
	8 -Steeles Avenue and Eighth Line/Toronto Premium Outlets	TCS	LOS	E	C	B	D	C	D	C	D	D	C	C	C	F	C	C	E	D
			Delay	74	27	19	36	20	53	23	48	43	22	22	29	99	33	33	79	45
			V/C	0.98	0.69	0.01		0.56	1.00	0.22		0.27	0.14	0.14		1.00	0.13	0.13		
			Q	98	97	0		27	170	27		14	19	19		99	19	19		
			Ex	110	150	65		125	850	30		135	200	200		70	500	500		
			Avail	12	53	65		98	680	3		121	181	181		-29	481	481		
	9 - Steeles Avenue and Eighth Line South	TWSC	LOS		A	A	A	A	A		A	F		B	F					0
			Delay		0	0	0	0	0		0	125		13	50					
			V/C		0.37	0.19		0.00	0.42			0.14		0.02						
			Q		0	0		0	0			4		1						
			Ex		800	800		90	500			30		500						
			Avail		800	800		90	500			26		499						
	10 - Steeles Avenue and Ninth Line	TCS	LOS	D	A		A		C	B	C					E		D	D	C
			Delay	49	6		10		26	15	22					57		42	54	21
			V/C	0.77	0.43				0.93	0.61						0.76		0.06		
			Q	45	48				247	32						59		15		
			Ex	65	500				750	75						90		500		
			Avail	20	452				503	43						31		485		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

TABLE 4.10: 2026 PM PEAK HOUR TOTAL TRAFFIC OPERATIONS (CONTINUED)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																OVERALL
				Eastbound				Westbound				Northbound				Southbound				
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	
PM Peak Hour	11 - Trafalgar Road and Hornby Road	TWSC	LOS	F		F	F					A	A		A		A	A	A	1284
			Delay	ERR		ERR	ERR					1	1		1		0	0	0	
			V/C	6.59		6.59						0.00	0.00				0.43	0.43		
			Q	ERR		ERR						0	0				0	0		
			Ex	500		500						500	500				500	500		
			Avail	ERR		ERR						500	500				500	500		
	12 - 5 Sideroad and Fifth Line	TWSC	LOS	A	A	A	A	A	A	A	A	D	D	D	D	C	C	C	C	4
			Delay	2	2	2	2	0	0	0	0	25	25	25	25	24	24	24	24	
			V/C	0.05	0.05	0.05		0.02	0.02	0.02		0.34	0.34	0.34		0.24	0.24	0.24		
			Q	1	1	1		0	0	0		12	12	12		7	7	7		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	499	499	499		500	500	500		488	488	488		493	493	493		
	13 - 5 Sideroad and Sixth Line	TWSC	LOS	A	A	A	A	A	A	A	A	C	C	C	C	C	C	C	C	3
			Delay	0	0	0	0	0	0	0	0	22	22	22	22	23	23	23	23	
			V/C	0.01	0.01	0.01		0.01	0.01	0.01		0.25	0.25	0.25		0.16	0.16	0.16		
			Q	0	0	0		0	0	0		8	8	8		5	5	5		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	500	500	500		500	500	500		492	492	492		495	495	495		
	14 - 5 Sideroad and Trafalgar Road	TCS	LOS	F	C	C	D	D	D	D	D	A	B	B	B	B	B	A	B	C
			Delay	92	34	32	45	38	45	45	44	6	18	18	17	13	12	9	12	22
			V/C	0.83	0.31	0.05		0.44	0.80	0.80		0.38	0.85	0.85		0.10	0.41	0.05		
			Q	36	26	10		30	64	64		16	226	226		2	57	6		
			Ex	45	500	80		75	500	500		100	500	500		175	500	30		
			Avail	9	474	70		45	436	436		84	274	274		173	443	24		
	15 - 5 Sideroad and Eighth Line	TCS	LOS	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	B
			Delay	14	14	14	14	16	16	16	16	13	13	13	13	8	8	8	8	14
			V/C	0.54	0.54	0.54		0.67	0.67	0.67		0.68	0.68	0.68		0.27	0.27	0.27		
			Q	25	25	25		38	38	38		94	94	94		24	24	24		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	475	475	475		462	462	462		406	406	406		476	476	476		
	16 - 5 Sideroad and Ninth Line	TCS	LOS	B	B	B	B	B	B	B	B	A	B	B	B	B	A	A	A	B
			Delay	12	13	13	13	11	14	14	14	8	13	13	12	11	9	9	9	12
			V/C	0.16	0.32	0.32		0.03	0.56	0.50		0.05	0.64	0.64		0.20	0.28	0.28		
			Q	7	20	20		3	35	33		4	57	57		8	22	22		
			Ex	40	500	500		40	500	40		40	500	500		40	500	500		
			Avail	33	480	480		37	465	7		36	443	443		32	478	478		
	17 - Steeles Avenue and "Street B"/"Street C"	TCS	LOS	A	B	A	B	B	B	A	B	B	A	C	B	A	A	A	A	B
			Delay	9	13	8	13	11	14	8	13	11	0	21	19	9	8	8	9	14
			V/C	0.18	0.72	0.03		0.49	0.76	0.04		0.38	0.00	0.79		0.18	0.03	0.03		
			Q	6	47	4		12	51	5		25	0	82		12	4	4		
			Ex	30	500	30		60	250	30		30	150	150		30	150	150		
			Avail	24	453	26		48	199	25		5	150	68		18	146	146		
	18 - Hornby Road and "Street A"	Round-about	LOS	A		A	A					A	A		A		A	A	A	A
			Delay	4		4	4					4	4		4		3	3	3	4
			V/C	0.22		0.22						0.09	0.09				0.14	0.14		
			Q	1		1						1	1				1	1		
			Ex	200		200						200	200				200	200		
			Avail	199		199						199	199				199	199		
	19 - Trafalgar Road and "Street B"	TWSC	LOS	F	F	F	F	F	F	F	F	A	A	A	A	B	A	A	A	F
			Delay	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR	9	0	0	0	14	0	0	1	2347
			V/C	####	####	####		####	####	####		0.07	0.86	0.86		0.11	0.35	0.35		
			Q	ERR	ERR	ERR		ERR	ERR	ERR		2	0	0		3	0	0		
			Ex	250	250	250		250	250	250		30	350	350		30	500	500		
			Avail	ERR	ERR	ERR		ERR	ERR	ERR		28	350	350		27	500	500		
	20 - Eighth Line and "Street B"	TWSC	LOS	E		E	E					A	A		A		A	A	A	B
			Delay	37		37	37					2	2		2		0	0	0	11
			V/C	0.78		0.78						0.06	0.06				0.15	0.15		
			Q	53		53						2	2				0	0		
			Ex	250		250						300	300				500	500		
			Avail	197		197						298	298				500	500		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

TABLE 4.11: 2026 AM PEAK HOUR TOTAL TRAFFIC OPERATIONS WITH REMEDIAL MEASURES

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																
				Eastbound				Westbound				Northbound				Southbound				
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	OVERALL
AM Peak Hour	4 - Steeles Avenue and Sixth Line South	TCS	LOS	A	C	B	C	B	B	B	B	D	D	D	D	D	D	D	D	
			Delay	10	23	12	21	14	14	12	13	35	44	44	44	38	36	36	37	22
			V/C	0.29	0.75	0.02		0.44	0.25	0.11		0.05	0.52	0.52		0.18	0.10	0.10		
			Q	24	156	2		15	34	10		9	74	74		17	18	18		
			Ex	50	800	30		50	500	30		30	350	350		55	200	200		
			Avail	26	644	28		35	466	20		21	276	276		38	182	182		
	11 - Trafalgar Road and Hornby Road	TCS	LOS	C		C	C					A	A		A		A	A	A	
			Delay	31		27	31					5	4		4		9	4	8	8
			V/C	0.48		0.01						0.07	0.21				0.77	0.19		
			Q	21		4						2	18				131	7		
			Ex	500		50						30	500				500	500		
			Avail	479		46						28	482				369	493		
	14 - 5 Sideroad and Trafalgar Road	TCS	LOS	C	D	F	E	D	C	C	D	C	B	B	B	A	D	B	B	
			Delay	33	45	82	60	42	34	34	38	22	14	11	14	9	47	11	15	43
			V/C	0.18	0.74	0.95		0.68	0.20	0.20		0.33	0.32	0.04		0.08	1.01	0.03		
			Q	16	72	115		43	22	22		6	41	0		6	254	0		
			Ex	45	500	115		75	500	500		100	500	20		175	500	30		
			Avail	29	428	0		32	478	478		94	459	20		169	246	30		
	15 - 5 Sideroad and Eighth Line	TCS	LOS	C	C	C	C	C	C	C	C	A	A	A	A	A	B	B	B	
			Delay	33	33	33	33	30	30	30	30	6	6	6	6	6	14	14	13	20
			V/C	0.74	0.74	0.74		0.60	0.60	0.60		0.15	0.15	0.15		0.11	0.71	0.71		
			Q	57	57	57		34	34	34		17	17	17		11	128	128		
			Ex	500	500	500		500	500	500		500	500	500		25	500	500		
			Avail	443	443	443		466	466	466		483	483	483		14	372	372		
	19 - Trafalgar Road and "Street B"	TWSC	LOS	E	E	E	E	E	E	E	E	B	A	A	A	A	B	A	B	
			Delay	43	43	43	43	38	38	40	39	11	7	7	8	4	14	6	13	13
			V/C	0.29	0.00	0.01		0.39	0.00	0.02		0.32	0.21	0.18		0.14	0.79	0.04		
			Q	11	0	0		23	0	0		5	27	10		8	176	0		
			Ex	50	250	250		85	250	250		50	350	50		50	500	50		
			Avail	39	250	250		62	250	250		45	323	40		42	324	50		
	20 - Eighth Line and "Street B"	TWSC	LOS	E		C	D					B	A		A		A	A	A	
			Delay	42		17	28					11	0		6		0	0	0	3
			V/C	0.24		0.12						0.22	0.09				0.56	0.56		
			Q	7		3						7	0				0	0		
			Ex	25		250						25	300				500	500		
			Avail	18		247						18	300				500	500		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

TABLE 4.12: 2026 PM PEAK HOUR TOTAL TRAFFIC OPERATIONS WITH REMEDIAL MEASURES

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																
				Eastbound				Westbound				Northbound				Southbound				
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	OVERALL
PM Peak Hour	4 - Steeles Avenue and Sixth Line South	TCS	LOS	B	C	B	C	B	C	B	C	D	D	D	D	D	D	D	D	C
			Delay	16	21	16	20	12	25	12	22	48	49	49	48	39	46	46	44	27
			V/C	0.22	0.39	0.01		0.57	0.81	0.03		0.22	0.30	0.30		0.58	0.66	0.66		
			Q	8	66	0		45	164	0		16	35	35		53	99	99		
			Ex	50	800	30		50	500	30		30	350	350		55	200	200		
			Avail	42	734	30		5	336	30		14	315	315		2	101	101		
	11 - Trafalgar Road and Hornby Road	TCS	LOS	C		B	C					A	B		B		A	A	A	B
			Delay	26		17	26					6	14		14		8	7	8	14
			V/C	0.72		0.01						0.01	0.80				0.29	0.10		
			Q	55		3						2	125				28	7		
			Ex	500		50						30	500				500	500		
			Avail	445		47						28	375				472	493		
	14 - 5 Sideroad and Trafalgar Road	TCS	LOS	D	C	C	C	C	D	D	D	A	B	A	B	B	B	A	B	C
			Delay	47	28	27	32	31	35	35	35	7	18	7	16	12	13	10	13	20
			V/C	0.64	0.29	0.05		0.40	0.73	0.73		0.40	0.85	0.10		0.09	0.46	0.05		
			Q	30	23	8		27	55	55		15	192	11		2	56	5		
			Ex	45	500	115		75	500	500		100	500	20		175	500	30		
			Avail	15	477	107		48	445	445		85	308	9		173	444	25		
	15 - 5 Sideroad and Eighth Line	TCS	LOS	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	B
			Delay	14	14	14	14	16	16	16	16	13	13	13	13	6	7	7	7	14
			V/C	0.54	0.54	0.54		0.67	0.67	0.67		0.68	0.68	0.68		0.07	0.22	0.22		
			Q	25	25	25		38	38	38		94	94	94		5	20	20		
			Ex	500	500	500		500	500	500		500	500	500		25	500	500		
			Avail	475	475	475		462	462	462		406	406	406		20	480	480		
	19 - Trafalgar Road and "Street B"	TWSC	LOS	D	D	D	D	E	E	D	E	B	D	C	D	C	C	C	C	D
			Delay	31	31	34	33	36	36	31	35	13	27	15	25	18	17	15	17	25
			V/C	0.31	0.00	0.01		0.17	0.00	0.02		0.16	0.80	0.09		0.33	0.31	0.05		
			Q	29	0	0		84	2	2		12	150	8		10	47	0		
			Ex	50	250	250		85	250	250		50	350	50		50	500	50		
			Avail	21	250	250		1	248	248		38	200	42		40	453	50		
	20 - Eighth Line and "Street B"	TWSC	LOS	D		B	C					A	A		A		A	A	A	A
			Delay	34		11	21					8	0		1		0	0	0	6
			V/C	0.54		0.23						0.06	0.34				0.15	0.15		
			Q	24		7						2	0				0	0		
			Ex	25		250						25	300				500	500		
			Avail	1		243						23	300				500	500		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

4.7 2031 Background Traffic Conditions

4.7.1 Background Traffic Volumes

Similar to 2021 and 2026, horizon year 2031 peak hour background traffic volumes were estimated by applying growth factors derived from population forecasts contained in the Halton Region Best Planning Estimates Report[17] to existing traffic volumes. Per the report, the population of Halton Region is projected to grow by approximately 1.3% per annum between 2017 and 2021, by approximately 4.5% per annum between 2021 and 2026, and by approximately 3.6% per annum between 2026 and 2031. This represents total growth of about 57% over this 14-year period.

Figures 4.13 and **4.14** summarize the 2031 AM and PM peak hour overall background traffic volumes, respectively, which were calculated by adding the volumes for the generalized growth (noted above) and the other area developments (**Figures 4.3** and **4.4**).

4.7.2 Traffic Operations with Network Improvements

Intersection capacity analyses were undertaken to assess 2031 background peak hour traffic conditions for the Study Area intersections. The analyses applied the same methodology, parameters and lane configurations used for the existing conditions analysis in Section 2.3, and incorporated the following road network improvements noted in Sections 4.2, 4.3.5, 4.5.3 and 4.6.3:

- Improvements to address existing critical traffic movements.
- Widening of Ninth Line from 2 to 4 lanes between Steeles Avenue and 5 Sideroad (needed to address background traffic growth to 2021).
- Improvements to address critical traffic movements for 2021 background/total traffic conditions.
- Widening of Steeles Avenue from 4 to 6 lanes between Trafalgar Road and Ninth Line (needed to address 2026 background traffic growth).
- Widening of 5 Sideroad from 2 to 4 lanes between Trafalgar Road and Ninth Line (needed to address 2026 background traffic growth).
- Improvements to address critical traffic movements for 2026 background traffic conditions.
- Widening of Trafalgar Road from 2 to 4 lanes between Steeles Avenue and 5 Sideroad (needed to address 2026 total traffic volumes).

[17] Best Planning Estimates of Population, Occupied Dwelling Units and Employment, 2011-2031, Regional Municipality of Halton, June 2011

- Improvements to address critical traffic movements for 2026 total traffic conditions.

Signal timings were also optimized using Synchro.

Tables 4.13 and **4.14** summarize the analysis results for the AM and PM peak hours with 2031 background traffic volumes, respectively (**Figures 4.13** and **4.14**). The tables denote LOS, delay, v/c ratios and 95% queue length for the Study Area intersections**. Appendix M** provides the Synchro analysis output. The following critical movements were identified:

- **Steeles Avenue and Sixth Line:**
  - The southbound left-turn movement is projected to operate at LOS F (v/c = 3.31) during the AM peak hour and LOS F (v/c = 1.68) during the PM peak hour.
- **Steeles Avenue and Sixth Line South:**
  - The northbound left-turn movement is projected to operate at LOS E (v/c = 0.05) during the AM peak hour.
- **Steeles Avenue and Hornby Road:**
  - The southbound left-turn movement is projected to operate at LOS F (v/c = 0.11) during the PM peak hour.
- **Steeles Avenue and Trafalgar Road:**
  - The westbound left movement is projected to operate at LOS F (v/c = 1.16) during the AM peak hour and at LOS E (v/c = 0.95) during the PM peak hour, with the 95th percentile queue length projected to exceed available storage by 32 metres.
  - The westbound through movement is projected to operate at LOS D (v/c = 0.85) during the PM peak hour.
  - The northbound right-turn lane 95th percentile queue length is projected to exceed available storage by 83 metres during the PM peak hour.
  - The southbound through movement is projected to operate at LOS E (v/c = 1.04) during the AM peak hour.
- **Steeles Avenue and Eighth Line/Toronto Premium Outlets:**
  - The eastbound left-turn lane 95th percentile queue length is projected to exceed available storage by 6 metres during the PM peak hour.
  - The westbound through movement is projected to operate at LOS C (v/c = 0.87) during the PM peak hour.
  - The southbound left-turn lane 95th percentile queue length is projected to exceed available storage by 12 metres during the AM peak hour.

- **Steeles Avenue and Eighth Line South:**
  - The northbound left movement is projected to operate at LOS F (v/c = 0.10) during the AM peak hour and LOS F (v/c = 0.12) during the PM peak hour.
- **Steeles Avenue and Ninth Line:**
  - The eastbound left movement is projected to operate at LOS F (v/c = 1.00) during the PM peak hour, with the 95th percentile queue length projected to exceed available storage by 4 metres.
  - The westbound right-turn lane 95th percentile queue length is projected to exceed available storage by 37 metres during the PM peak hour.
  - The southbound left-turn lane 95th percentile queue length is projected to exceed available storage by 13 metres during the AM peak hour, and is projected to operate at LOS E (v/c = 0.88) during the PM peak hour.
- **Trafalgar Road and Hornby Road:**
  - The eastbound shared left-right movement is projected to operate at LOS F (v/c = 0.67) during the AM peak hour.
- **5 Sideroad and Fifth Line:**
  - The northbound shared left-through-right movement is projected to operate at LOS E (v/c = 0.48) during the AM peak hour.
  - The southbound shared left-through-right movement is projected to operate at LOS F (v/c = 1.18) during the AM peak hour.
- **5 Sideroad and Sixth Line:**
  - The northbound shared left-through-right movement is projected to operate at LOS F (v/c = 0.72) during the PM peak hour.
  - The southbound shared left-through-right movement is projected to operate at LOS E (v/c = 0.50) during the AM peak hour.
- **5 Sideroad and Trafalgar Road:**
  - The westbound shared through-right movement is projected to operate at LOS D (v/c = 0.90) during the PM peak hour.
  - The northbound shared through-right movement is projected to operate at LOS C (v/c = 0.89) during the PM peak hour.
  - The southbound through movement is projected to operate at LOS C (v/c = 0.96) during the AM peak hour.
- **5 Sideroad and Eighth Line:**
  - The southbound shared left-through-right movement is projected to operate at LOS C (v/c = 0.92) during the AM peak hour.

- **5 Sideroad and Ninth Line:**
  - The southbound left-turn lane 95th percentile queue length is projected to exceed available storage by 13 metres.

4.7.3 Traffic Operations with Remedial Measures

The operational analyses of 2031 background traffic conditions projected critical movements at 13 intersections within the Study Area. The following improvements were incorporated to address these concerns:

- **Steeles Avenue and Sixth Line:**
  - Addition of eastbound and westbound through lanes (widening of Steeles Avenue from 4 to 6 lanes between Fifth Line and Trafalgar Road)
- **Steeles Avenue and Sixth Line South:**
  - Addition of eastbound and westbound through lanes (widening of Steeles Avenue from 4 to 6 lanes between Fifth Line and Trafalgar Road)
- **Steeles Avenue and Hornby Road:**
  - Addition of eastbound and westbound through lanes (widening of Steeles Avenue from 4 to 6 lanes between Fifth Line and Trafalgar Road)
- **Steeles Avenue and Trafalgar Road:**
  - Extension of the westbound left-turn lane storage to 175 metres
- **Steeles Avenue and Eighth Line/Toronto Premium Outlets:**
  - Extension of the eastbound left-turn lane storage to 120 metres
  - Extension of the southbound left-turn lane storage to 100 metres
- **Steeles Avenue and Ninth Line:**
  - Addition of a westbound channelized right-turn lane with 75 metres storage and dedicated receiving lane
- **5 Sideroad and Eighth Line:**
  - Addition of a southbound left-turn lane with 25 metres storage
- **5 Sideroad and Ninth Line:**
  - Extension of the southbound left-turn lane storage to 55 metres

No remedial measures are recommended at the other five (5) intersections.

The analysis also assumed the new Steeles Avenue and Street D (5½ Line) intersection would be configured as follows:

- Three (3) eastbound and westbound through lanes on Steeles Avenue (within widening between Fifth Line and Trafalgar Road)

- Eastbound channelized right-turn lane with 50 metres storage
- Westbound dual left-turn lanes with 50 metres storage
- Northbound dual left-turn lanes with 50 metres storage
- Northbound right-turn lane with 30 metres storage

Table 4.15 summarizes the capacity analyses completed for the intersections with the above-noted improvements, based on the 2031 AM and PM peak hour background traffic forecasts. **Appendix O** provides the Synchro analysis output. The table illustrates that the intersections are projected to operate at or near satisfactory levels of service if these road improvements were implemented, except for Steeles Avenue and Trafalgar Road. Although this intersection overall is projected to operate at LOS E during the AM peak hour, the following critical movements would remain:

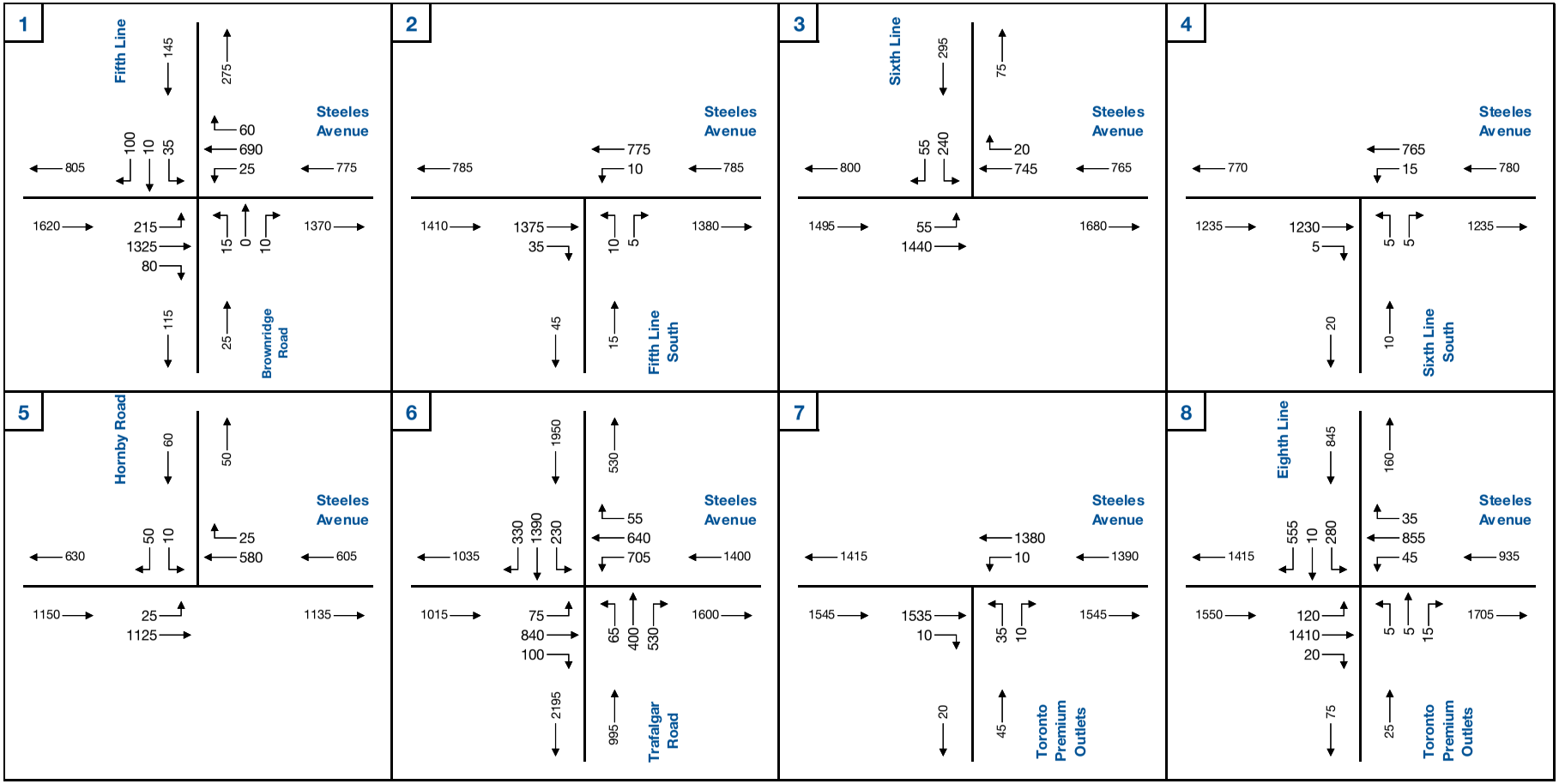
- The eastbound through movement is projected to operate at LOS D (v/c = 0.86) during the AM peak hour and LOS E (v/c = 0.94) during the PM peak hour.
- The westbound left-turn movement is projected to operate at LOS F (v/c = 1.16) during the AM peak hour.
- The southbound through movement is projected to operate at LOS E (v/c = 1.04) during the AM peak hour.

As part of the analysis, the need for traffic control signals was assessed at the following intersections based on Ontario Traffic Manual Book 12 (Traffic Signals)[18] and found not to be justified:

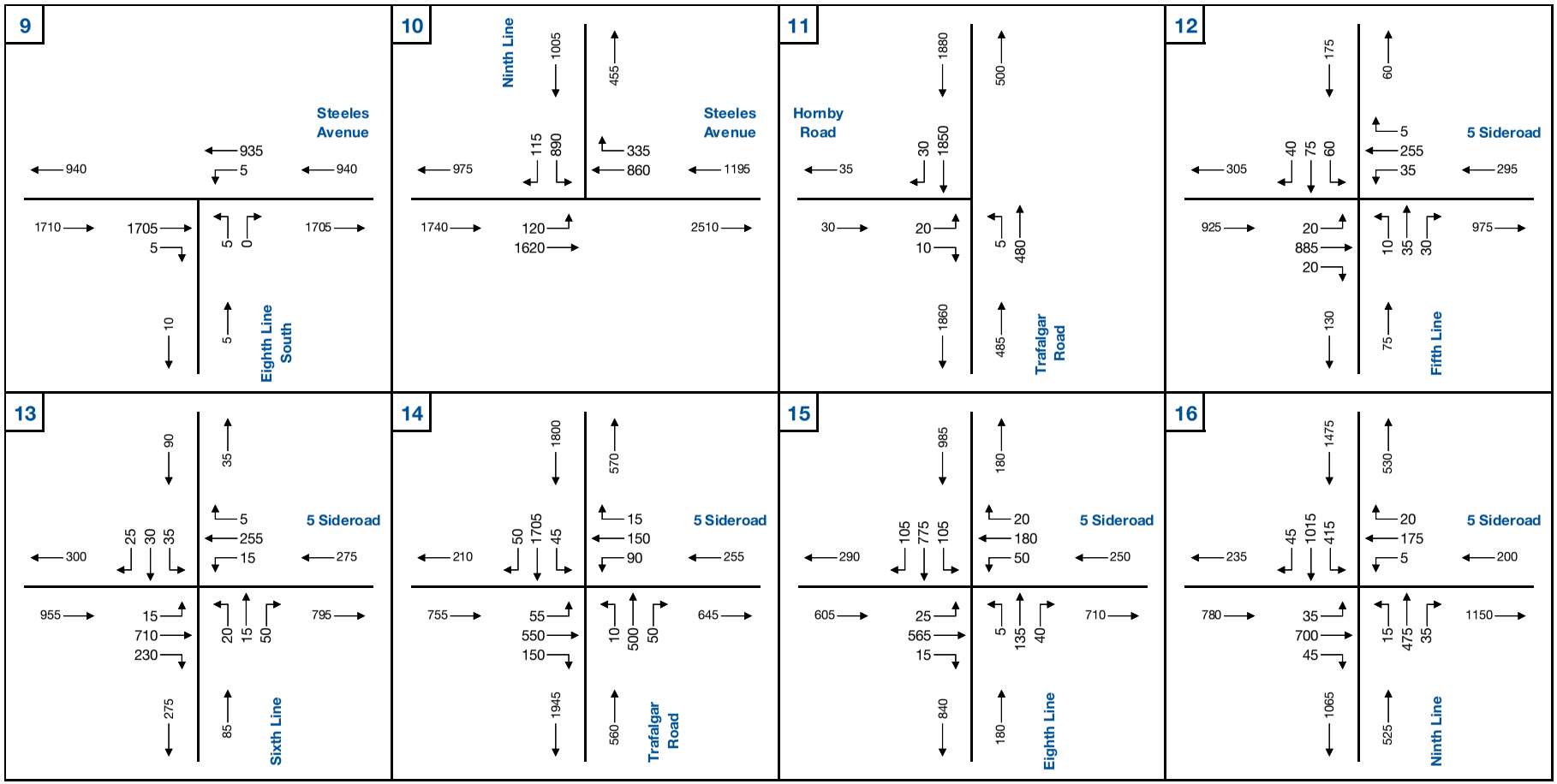
- Steeles Avenue and Sixth Line
- Steeles Avenue and Sixth Line South
- Steeles Avenue and Hornby Road
- Steeles Avenue and Eighth Line South
- Trafalgar Road and Hornby Road
- 5 Sideroad and Fifth Line
- 5 Sideroad and Sixth Line

Appendix N provides the signal warrant calculations.

[18] Queen's Printer for Ontario, Ontario Traffic Manual Book 12 (Traffic Signals), March 2012

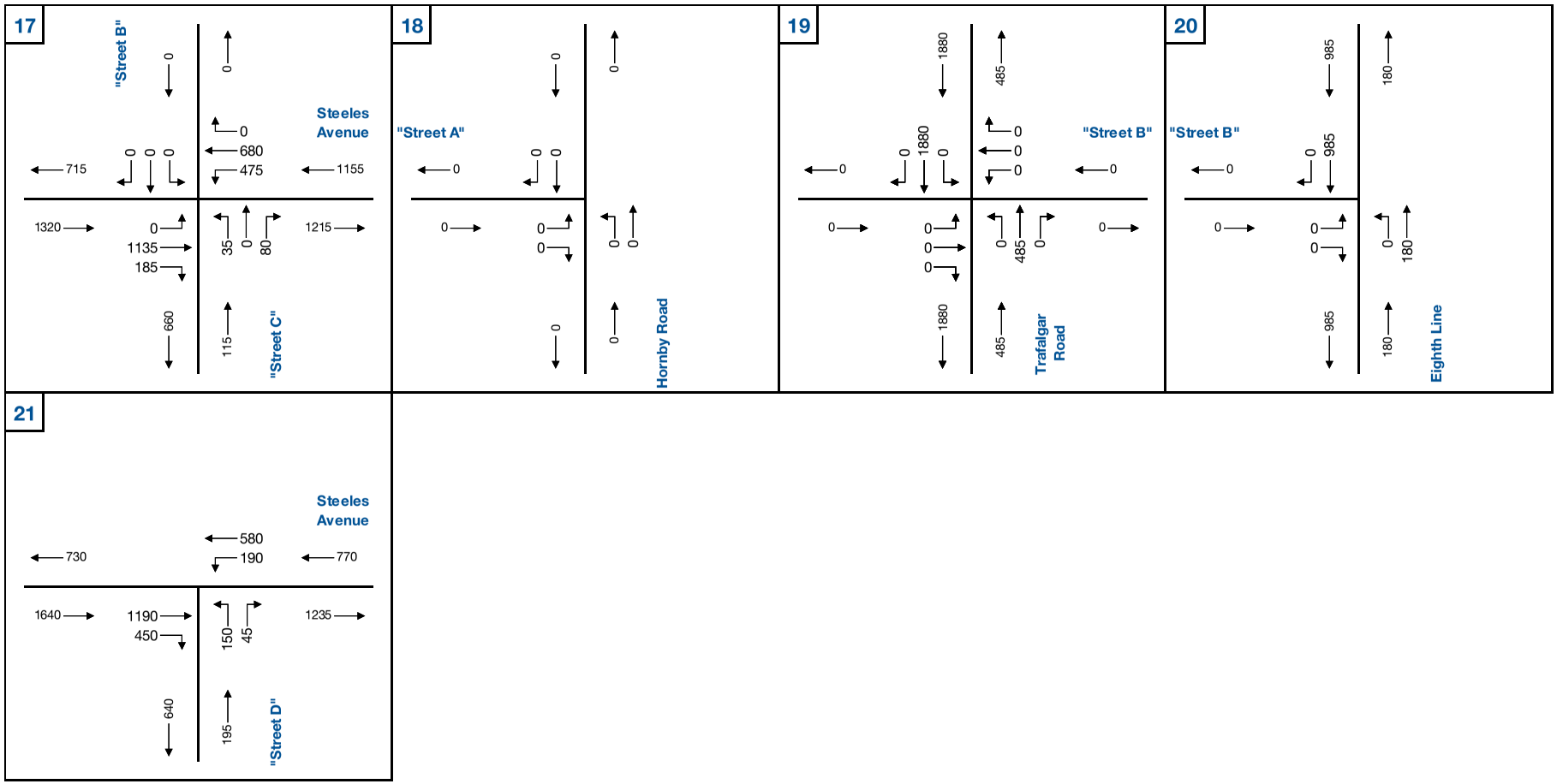


2031 AM Peak Hour Background Traffic Volumes (1)

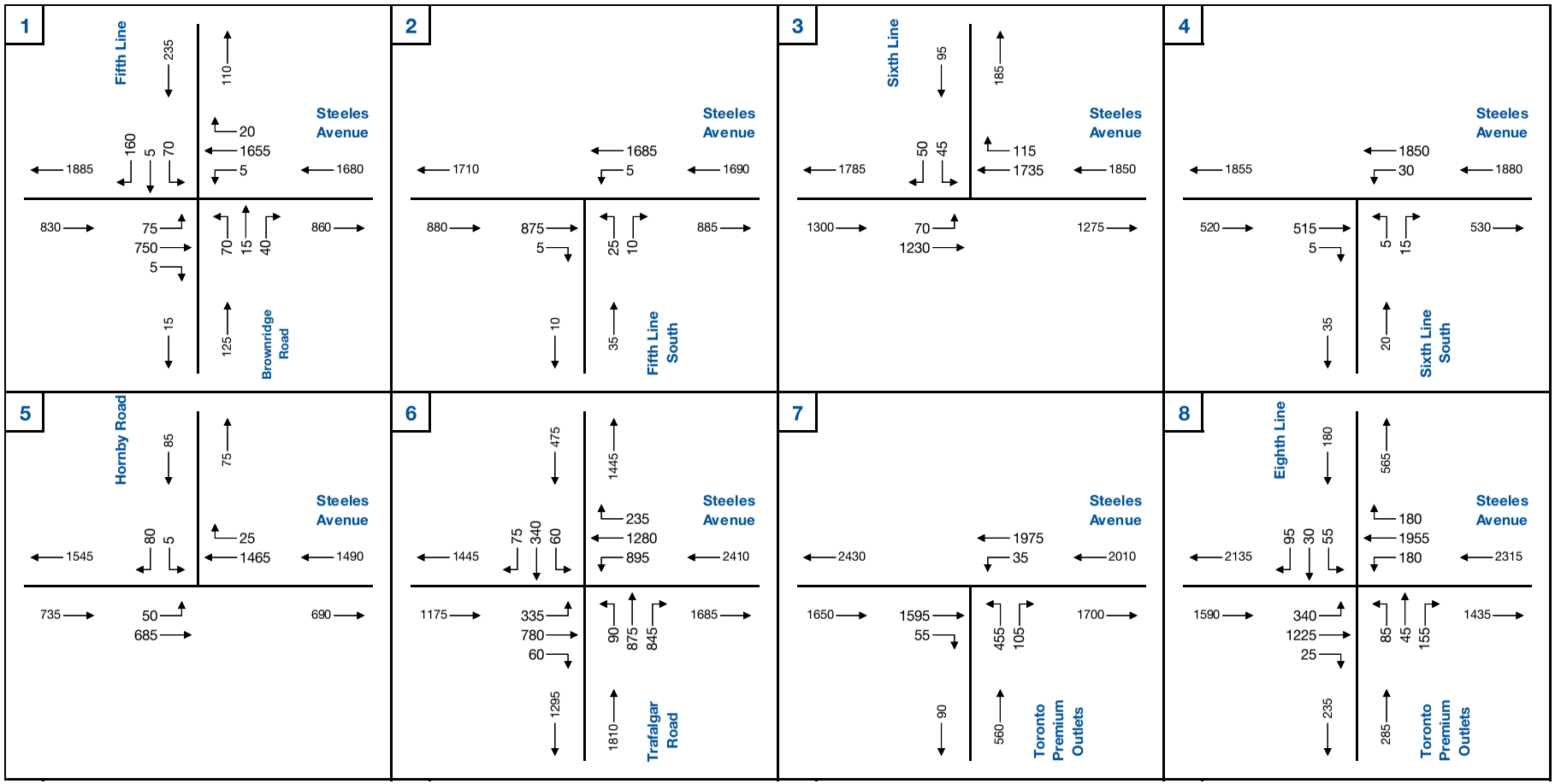


2031 AM Peak Hour

Background Traffic Volumes (2)

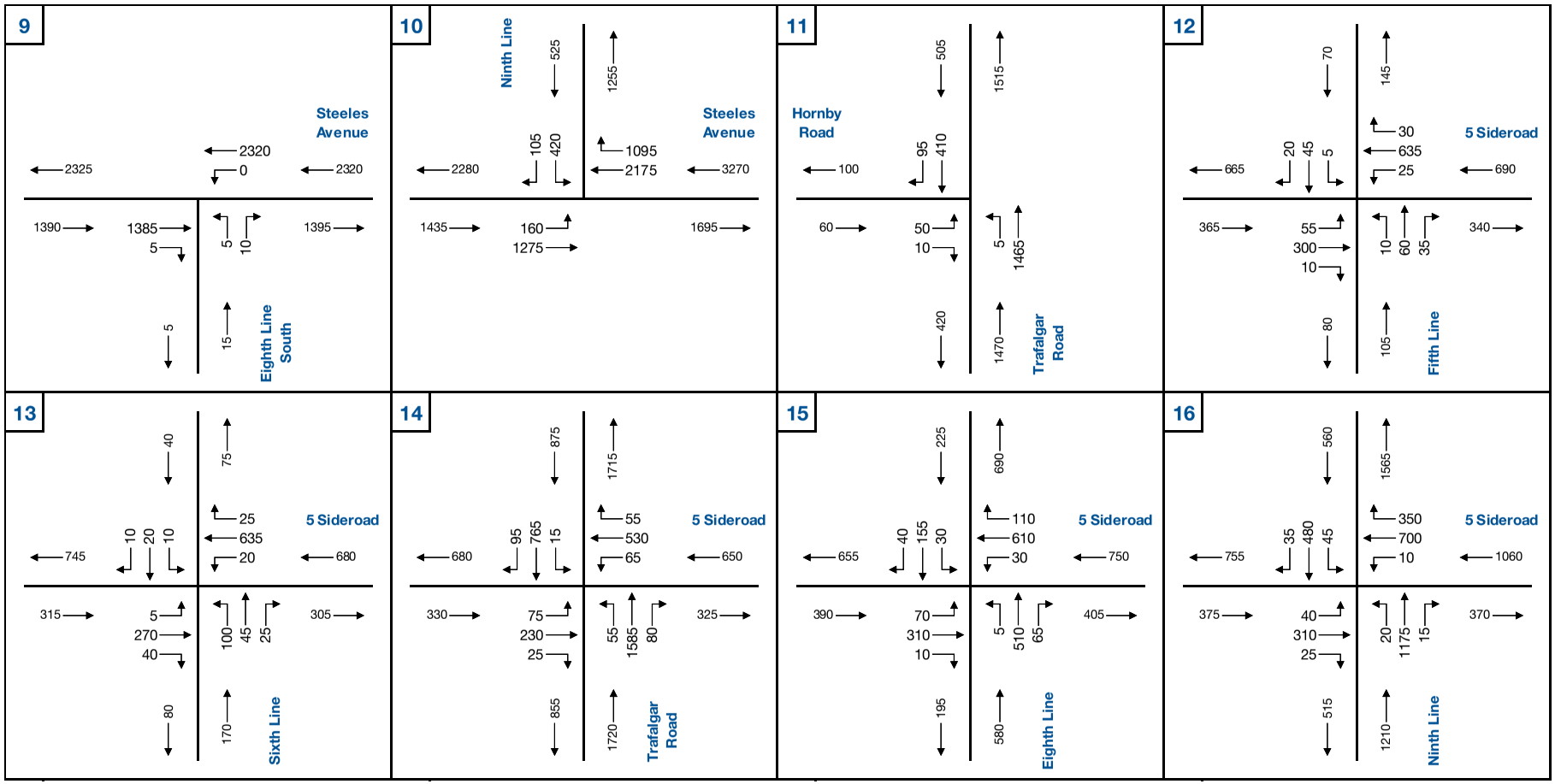


2031 AM Peak Hour
Background Traffic Volumes (3)



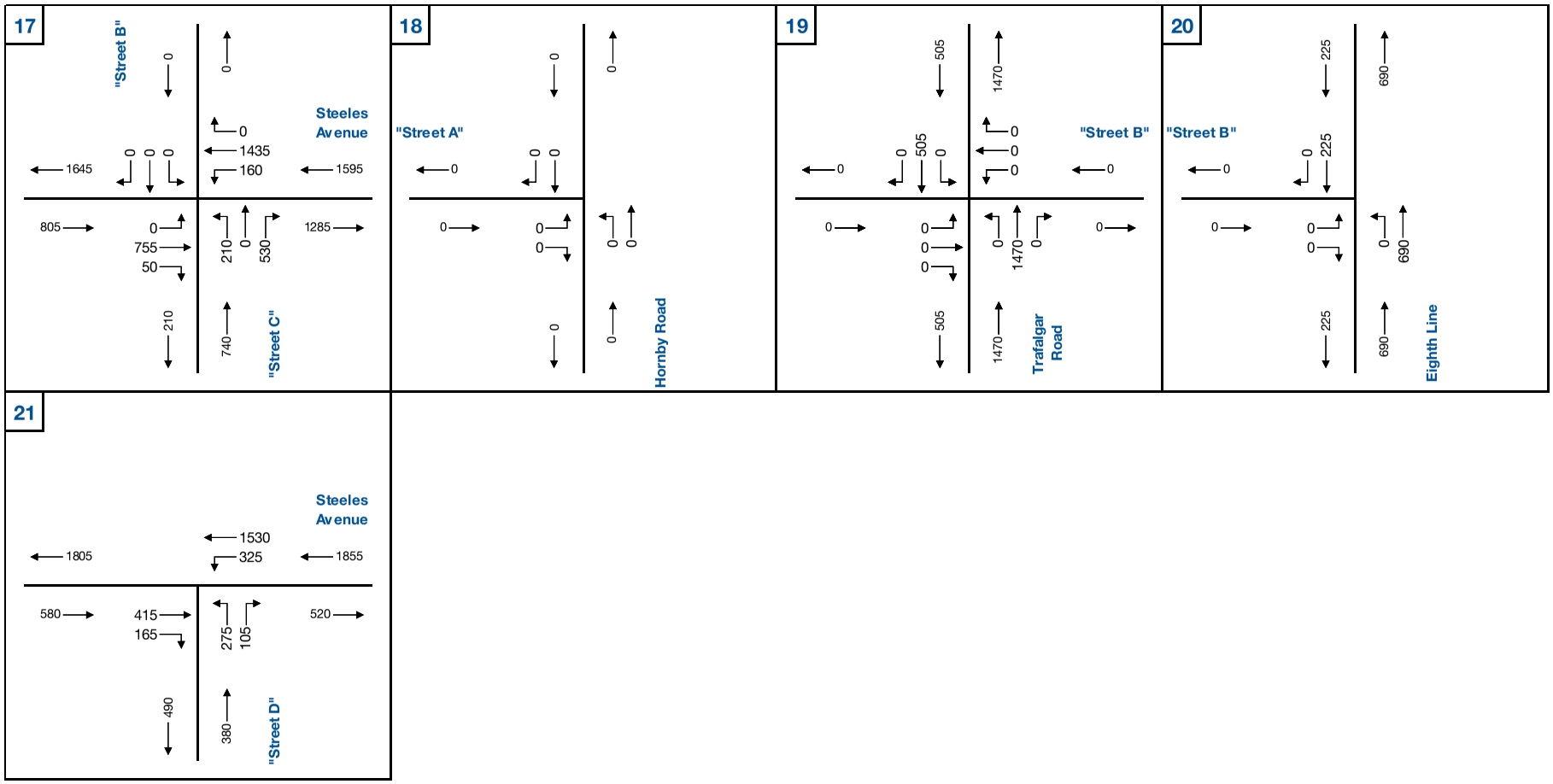
2031 PM Peak Hour

Background Traffic Volumes (1)



2031 PM Peak Hour

Background Traffic Volumes (2)



2031 PM Peak Hour
Background Traffic Volumes (3)

TABLE 4.13: 2031 AM PEAK HOUR BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																	
				Eastbound				Westbound				Northbound				Southbound				OVERALL
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	
AM Peak Hour	1 - Steeles Avenue and Fifth Line/Brownridge Road	TCS	LOS	A	A	A	A	A	A	A	A	C	C	C	C	C	C	C	C	A
			Delay	10	6	4	7	5	5	5	5	25	25	25	25	27	25	25	26	7
			V/C	0.52	0.47	0.05		0.13	0.30	0.30		0.10	0.01	0.01		0.28	0.04	0.07		
			Q	34	38	4		4	19	19		6	0	0		11	5	11		
			Ex	150	800	70		50	650	650		35	250	250		50	250	50		
			Avail	116	762	66		46	631	631		29	250	250		39	245	39		
	2 - Steeles Avenue and Fifth Line South	TCS	LOS		A	A	A	A	A		A	C		C	C					A
			Delay		4	2	4	3	3		3	29		27	28					4
			V/C		0.45	0.02		0.05	0.28			0.23		0.00						
			Q		40	3		2	20			5		3						
			Ex		600	600		60	450			20		400						
			Avail		560	597		58	430			15		397						
	3 - Steeles Avenue and Sixth Line	TWSC	LOS	A	A		A		A	A	A					F		A	F	
			Delay	9	0		0		0	0	0					ERR		10	8137	940
			V/C	0.07	0.28				0.15	0.01						3.31		0.07		
			Q	2	0				0	0						ERR		2		
			Ex	60	400				400	30						30		500		
			Avail	58	400				400	30						ERR		498		
	4 - Steeles Avenue and Sixth Line South	TWSC	LOS		A	A	A	B	A		A	E		B	D					
			Delay		0	0	0	12	0		0	44		11	28					0
			V/C		0.24	0.00		0.03	0.15			0.05		0.01						
			Q		0	0		1	0			1		0						
			Ex		400	30		60	500			30		350						
			Avail		400	30		59	500			29		350						
	5 - Steeles Avenue and Hornby Road	TWSC	LOS	A	A		A		A	A	A					C		A	B	
			Delay	9	0		0		0	0	0					23		10	12	1
			V/C	0.03	0.22				0.11	0.01						0.05		0.06		
			Q	1	0				0	0						1		2		
			Ex	60	450				850	30						30		500		
			Avail	59	450				850	30						29		498		
	6 - Steeles Avenue and Trafalgar Road	TCS	LOS	D	D	C	D	F	C	C	E	D	C	D	D	C	E	D	E	E
			Delay	46	43	30	42	128	25	21	77	46	30	38	36	24	72	35	60	56
			V/C	0.48	0.86	0.09		1.16	0.46	0.04		0.45	0.35	0.61		0.57	1.04	0.46		
			Q	15	82	0		119	48	0		13	32	66		45	139	40		
			Ex	115	850	50		140	250	75		100	300	100		250	500	80		
			Avail	100	768	50		21	202	75		87	268	34		205	361	40		
	7 - Steeles Avenue and Toronto Premium Outlets	TCS	LOS		A	A	A	A	A		A	C		C	C					A
			Delay		8	5	8	5	6		6	30		29	30					7
			V/C		0.50	0.01		0.06	0.43			0.08		0.01						
			Q		70	2		2	43			6		4						
			Ex		250	250		50	150			40		40						
			Avail		180	248		48	107			34		36						
	8 -Steeles Avenue and Eighth Line/Toronto Premium Outlets	TCS	LOS	B	C	B	C	B	C	B	C	D	B	B	C	D	D	D	D	C
			Delay	14	26	16	25	19	25	19	24	46	19	19	25	43	38	38	40	28
			V/C	0.37	0.74	0.01		0.29	0.55	0.02		0.10	0.02	0.02		0.74	0.66	0.66		
			Q	24	121	0		11	68	0		2	5	5		97	97	97		
			Ex	110	150	65		125	850	30		135	200	200		85	500	500		
			Avail	86	29	65		114	782	30		133	195	195		-12	403	403		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

TABLE 4.13: 2031 AM PEAK HOUR BACKGROUND TRAFFIC OPERATIONS (CONTINUED)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																	
				Eastbound				Westbound				Northbound				Southbound				OVERALL
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	
AM Peak Hour	9 - Steeles Avenue and Eighth Line South	TWSC	LOS		A	A	A	C	A		A	F		A	F					
			Delay		0	0	0	15	0		0	84		0	84					0
			V/C		0.40	0.20		0.01	0.18			0.10		0.00						
			Q		0	0		0	0			3		0						
			Ex		800	800		90	500			30		500						
			Avail		800	800		90	500			27		500						
	10 - Steeles Avenue and Ninth Line	TCS	LOS	B	C		C		C	C	C					C		C	C	C
			Delay	15	21		20		25	22	25					31		22	30	24
			V/C	0.41	0.68				0.52	0.22						0.72		0.09		
			Q	22	105				63	18						103		12		
			Ex	65	500				750	75						90		500		
			Avail	43	395				687	57						-13		488		
	11 - Trafalgar Road and Hornby Road	TWSC	LOS	F		F	F					A	A		A		A	A	A	
			Delay	185		185	185					2	0		1		0	0	0	2
			V/C	0.67		0.67						0.03	0.19				0.73	0.38		
			Q	21		21						1	0				0	0		
			Ex	500		500						500	500				500	500		
			Avail	479		479						499	500				500	500		
	12 - 5 Sideroad and Fifth Line	TWSC	LOS	A	A	A	A	A	A	A	A	E	E	E	E	F	F	F	F	
			Delay	0	0	0	0	2	2	2	2	48	48	48	48	190	190	190	190	26
			V/C	0.02	0.02	0.02		0.05	0.05	0.05		0.48	0.48	0.48		1.18	1.18	1.18		
			Q	0	0	0		1	1	1		18	18	18		80	80	80		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	500	500	500		499	499	499		482	482	482		420	420	420		
	13 - 5 Sideroad and Sixth Line	TWSC	LOS	A	A	A	A	A	A	A	A	D	D	D	D	E	E	E	E	
			Delay	0	0	0	0	1	1	1	1	29	29	29	29	43	43	43	43	5
			V/C	0.01	0.01	0.01		0.02	0.02	0.02		0.37	0.37	0.37		0.50	0.50	0.50		
			Q	0	0	0		1	1	1		13	13	13		20	20	20		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	500	500	500		499	499	499		487	487	487		480	480	480		
	14 - 5 Sideroad and Trafalgar Road	TCS	LOS	C	D	C	D	C	C	C	C	B	B	B	B	A	C	A	C	
			Delay	28	43	30	39	33	30	30	31	18	15	15	15	9	34	10	33	C
			V/C	0.21	0.82	0.10		0.59	0.23	0.23		0.11	0.38	0.38		0.12	0.96	0.04		31
			Q	16	81	16		24	22	22		3	46	46		7	228	0		
			Ex	45	500	80		75	500	500		100	500	500		175	500	30		
			Avail	29	419	64		51	478	478		97	454	454		168	272	30		
	15 - 5 Sideroad and Eighth Line	TCS	LOS	C	C	C	C	C	C	C	C	A	A	A	A	C	C	C	C	
			Delay	33	33	33	33	25	25	25	25	7	7	7	7	27	27	27	27	C
			V/C	0.80	0.80	0.80		0.47	0.47	0.47		0.15	0.15	0.15		0.92	0.92	0.92		27
			Q	64	64	64		27	27	27		17	17	17		214	214	214		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	436	436	436		473	473	473		483	483	483		286	286	286		
	16 - 5 Sideroad and Ninth Line	TCS	LOS	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	B	
			Delay	21	30	30	30	21	22	20	21	21	23	23	23	13	12	12	12	B
			V/C	0.11	0.78	0.78		0.05	0.18	0.01		0.13	0.49	0.49		0.69	0.55	0.55		19
			Q	11	75	75		3	18	0		7	55	55		53	71	71		
			Ex	40	500	500		40	500	40		40	500	500		40	500	500		
			Avail	29	425	425		37	482	40		33	445	445		-13	429	429		
	21 - Steeles Avenue and "Street D"	TCS	LOS		B	B	B	C	A		B	B		B	B					
			Delay		19	14	17	27	8		13	13		12	13					B
			V/C		0.74	0.28		0.60	0.23			0.13		0.03						16
			Q		53	17		21	17			11		5						
			Ex		400	400		90	400			400		500						
			Avail		347	383		69	383			389		495						

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

TABLE 4.14: 2031 PM PEAK HOUR BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																	
				Eastbound				Westbound				Northbound				Southbound				OVERALL
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	
PM Peak Hour	1 - Steeles Avenue and Fifth Line/Brownridge Road	TCS	LOS	C	A	A	A	A	A	A	A	C	C	C	C	C	C	C	C	A
			Delay	20	5	4	6	4	7	7	7	26	24	24	25	27	23	26	26	9
			V/C	0.54	0.26	0.00		0.02	0.55	0.55		0.40	0.10	0.10		0.45	0.03	0.39		
			Q	25	19	0		1	50	50		18	10	10		18	3	22		
			Ex	150	800	70		50	650	650		35	250	250		50	250	50		
			Avail	125	781	70		49	600	600		17	240	240		32	247	28		
	2 - Steeles Avenue and Fifth Line South	TCS	LOS		A	A	A	A	A		A	C		C	C					A
			Delay		4	3	4	3	5		5	26		25	26					5
			V/C		0.29	0.00		0.02	0.51			0.24		0.01						
			Q		22	1		1	51			8		3						
			Ex		600	600		60	450			20		400						
			Avail		578	599		59	399			12		397						
	3 - Steeles Avenue and Sixth Line	TWSC	LOS	C	A		A		A	A	A					F		B	F	10
			Delay	19	0		1		0	0	0					645		14	313	
			V/C	0.22	0.24				0.34	0.07						1.68		0.11		
			Q	7	0				0	0						43		3		
			Ex	60	400				400	30						30		500		
			Avail	53	400				400	30						-13		497		
	4 - Steeles Avenue and Sixth Line South	TWSC	LOS		A	A	A	A	A		A	D		A	B					0
			Delay		0	0	0	9	0		0	26		9	14					
			V/C		0.10	0.00		0.03	0.36			0.03		0.02						
			Q		0	0		1	0			1		0						
			Ex		400	30		60	500			30		350						
			Avail		400	30		59	500			29		350						
	5 - Steeles Avenue and Hornby Road	TWSC	LOS	A	A		A		A	A	A					F		B	C	1
			Delay	3	0		1		0	0	0					93		13	18	
			V/C	0.11	0.13				0.29	0.01						0.11		0.15		
			Q	3	0				0	0						3		4		
			Ex	60	450				850	30						30		500		
			Avail	57	450				850	30						27		496		
	6 - Steeles Avenue and Trafalgar Road	TCS	LOS	E	E	D	E	E	D	D	E	E	D	E	D	C	D	D	D	E
			Delay	78	74	47	73	67	50	36	55	67	41	61	52	31	37	35	36	56
			V/C	0.87	0.94	0.05		0.95	0.85	0.26		0.51	0.55	0.85		0.27	0.22	0.07		
			Q	75	109	0		172	148	42		23	95	183		20	37	0		
			Ex	115	850	50		140	250	75		100	300	100		250	500	80		
			Avail	40	741	50		-32	102	33		77	205	-83		230	463	80		
	7 - Steeles Avenue and Toronto Premium Outlets	TCS	LOS		B	A	B	A	A		A	C		C	C					B
			Delay		12	7	12	6	8		8	31		21	29					12
			V/C		0.65	0.04		0.18	0.65			0.74		0.07						
			Q		74	5		4	67			38		11						
			Ex		250	250		50	150			40		40						
			Avail		176	245		46	83			2		29						
	8 -Steeles Avenue and Eighth Line/Toronto Premium Outlets	TCS	LOS	E	B	B	C	B	C	B	C	D	D	D	D	E	D	D	E	C
			Delay	63	17	12	27	15	33	18	31	54	38	38	53	66	53	53	57	31
			V/C	0.91	0.48	0.02		0.55	0.87	0.12		0.38	0.26	0.26		0.50	0.25	0.25		
			Q	116	82	0		24	187	14		19	35	35		29	27	27		
			Ex	110	150	65		125	850	30		135	200	200		85	500	500		
			Avail	-6	68	65		101	663	16		116	165	165		56	473	473		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

TABLE 4.14: 2031 PM PEAK HOUR BACKGROUND TRAFFIC OPERATIONS (CONTINUED)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																	
				Eastbound				Westbound				Northbound				Southbound				OVERALL
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	
PM Peak Hour	9 - Steeles Avenue and Eighth Line South	TWSC	LOS		A	A	A	A	A		A	F		B	E					
			Delay		0	0	0	0	0		0	103		12	43					0
			V/C		0.33	0.17		0.00	0.45			0.12		0.02						
			Q		0	0		0	0			3		1						
			Ex		800	800		90	500			30		500						
			Avail		800	800		90	500			27		499						
	10 - Steeles Avenue and Ninth Line	TCS	LOS	F	A		B		D	C	C					E		D	E	C
			Delay	112	6		18		36	20	31					71		46	66	31
			V/C	1.00	0.37				0.98	0.77						0.88		0.09		
			Q	69	42				334	112						81		18		
			Ex	65	500				750	75						90		500		
			Avail	-4	458				416	-37						9		482		
	11 - Trafalgar Road and Hornby Road	TWSC	LOS	D		D	D					A	A		A		A	A	A	
			Delay	30		30	30					0	0		0		0	0	0	1
			V/C	0.29		0.29						0.00	0.57				0.16	0.14		
			Q	9		9						0	0				0	0		
			Ex	500		500						500	500				500	500		
			Avail	491		491						500	500				500	500		
	12 - 5 Sideroad and Fifth Line	TWSC	LOS	A	A	A	A	A	A	A	A	D	D	D	D	D	D	D	D	
			Delay	2	2	2	2	1	1	1	1	32	32	32	32	29	29	29	29	5
			V/C	0.06	0.06	0.06		0.02	0.02	0.02		0.45	0.45	0.45		0.32	0.32	0.32		
			Q	2	2	2		1	1	1		17	17	17		11	11	11		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	498	498	498		499	499	499		483	483	483		489	489	489		
	13 - 5 Sideroad and Sixth Line	TWSC	LOS	A	A	A	A	A	A	A	A	F	F	F	F	C	C	C	C	
			Delay	0	0	0	0	0	0	0	0	52	52	52	52	23	23	23	23	8
			V/C	0.01	0.01	0.01		0.02	0.02	0.02		0.72	0.72	0.72		0.17	0.17	0.17		
			Q	0	0	0		0	0	0		39	39	39		5	5	5		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	500	500	500		500	500	500		461	461	461		495	495	495		
	14 - 5 Sideroad and Trafalgar Road	TCS	LOS	C	C	C	C	C	D	D	D	A	C	C	C	B	B	B	B	C
			Delay	32	33	30	33	29	53	53	51	8	25	25	24	17	16	12	15	28
			V/C	0.51	0.36	0.02		0.23	0.90	0.90		0.14	0.89	0.89		0.16	0.45	0.06		
			Q	21	31	0		18	87	87		8	217	217		3	64	4		
			Ex	45	500	80		75	500	500		100	500	500		175	500	30		
			Avail	24	469	80		57	413	413		92	283	283		172	436	26		
	15 - 5 Sideroad and Eighth Line	TCS	LOS	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
			Delay	13	13	13	13	15	15	15	15	19	19	19	19	11	11	11	11	15
			V/C	0.47	0.47	0.47		0.66	0.66	0.66		0.75	0.75	0.75		0.31	0.31	0.31		
			Q	24	24	24		43	43	43		92	92	92		25	25	25		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	476	476	476		457	457	457		408	408	408		475	475	475		
	16 - 5 Sideroad and Ninth Line	TCS	LOS	B	B	B	B	B	C	B	C	B	C	C	C	A	A	A	A	B
			Delay	19	18	18	18	16	22	18	21	11	20	20	20	10	8	8	9	18
			V/C	0.30	0.33	0.33		0.03	0.70	0.30		0.05	0.79	0.79		0.22	0.27	0.27		
			Q	11	24	24		4	53	22		6	119	119		6	25	25		
			Ex	40	500	500		40	500	40		40	500	500		40	500	500		
			Avail	29	476	476		36	447	18		34	381	381		34	475	475		
	21 - Steeles Avenue and "Street D"	TCS	LOS		C	C	C	C	B		B	B		B	B					
			Delay		21	20	21	25	15		17	11		11	11					B
			V/C		0.41	0.10		0.59	0.69			0.19		0.07						17
			Q		21	12		29	51			20		9						
			Ex		400	400		90	400			400		500						
			Avail		379	388		61	349			380		491						

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

TABLE 4.15: 2031 AM AND PM PEAK HOUR BACKGROUND TRAFFIC OPERATIONS WITH REMEDIAL MEASURES

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																
				Eastbound				Westbound				Northbound				Southbound				
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	OVERALL
AM Peak Hout	6 - Steeles Avenue and Trafalgar Road	TCS	LOS	D	D	C	**D**	F	C	C	**E**	D	C	D	**D**	C	E	D	**E**	**E**
			Delay	46	43	30	**42**	128	25	21	**77**	46	30	38	**36**	24	72	35	**60**	**56**
			V/C	0.48	0.86	0.09		1.16	0.46	0.04		0.45	0.35	0.61		0.57	1.04	0.46		
			Q	15	82	0		119	48	0		13	32	66		45	139	40		
			Ex	115	850	50		175	250	75		100	300	100		250	500	80		
			Avail	100	768	50		56	202	75		87	268	34		205	361	40		
	8 -Steeles Avenue and Eighth Line/Toronto Premium Outlets	TCS	LOS	B	C	B	**C**	B	C	B	**C**	D	B	B	**C**	D	D	D	**D**	**C**
			Delay	14	26	16	**25**	19	25	19	**24**	46	19	19	**25**	43	38	38	**40**	**28**
			V/C	0.37	0.74	0.01		0.29	0.55	0.02		0.10	0.02	0.02		0.74	0.66	0.66		
			Q	24	121	0		11	68	0		2	5	5		97	97	97		
			Ex	120	150	65		125	850	30		135	200	200		100	500	500		
			Avail	96	29	65		114	782	30		133	195	195		3	403	403		
	10 - Steeles Avenue and Ninth Line	TCS	LOS	C	C		**C**		C	A	**B**					C		B	**C**	**C**
			Delay	20	23		**23**		27	0	**19**					25		18	**25**	**22**
			V/C	0.40	0.75				0.59	0.22						0.67		0.09		
			Q	22	105				61	0						89		10		
			Ex	65	500				750	75						90		500		
			Avail	43	395				689	75						1		490		
	15 - 5 Sideroad and Eighth Line	TCS	LOS	C	C	C	**C**	C	C	C	**C**	B	B	B	**B**	A	B	B	**B**	**C**
			Delay	29	29	29	**29**	23	23	23	**23**	12	12	12	**12**	7	17	17	**16**	**21**
			V/C	0.77	0.77	0.77		0.44	0.44	0.44		0.20	0.20	0.20		0.15	0.80	0.80		
			Q	57	57	57	**57**	25	25	25		25	25	25		12	167	167		
			Ex	500	500	500		500	500	500		500	500	500		25	500	500		
			Avail	443	443	443		475	475	475		475	475	475		13	333	333		
	16 - 5 Sideroad and Ninth Line	TCS	LOS	C	C	C	**C**	C	C	C	**C**	C	C	C	**C**	B	B	B	**B**	**B**
			Delay	21	30	30	**30**	21	22	20	**21**	21	23	23	**23**	13	12	12	**12**	**19**
			V/C	0.11	0.78	0.78		0.05	0.18	0.01		0.13	0.49	0.49		0.69	0.55	0.55		
			Q	11	75	75		3	18	0		7	55	55		53	71	71		
			Ex	40	500	500		40	500	40		40	500	500		55	500	500		
			Avail	29	425	425		37	482	40		33	445	445		2	429	429		
PM Peak Hout	6 - Steeles Avenue and Trafalgar Road	TCS	LOS	E	E	D	**E**	E	D	D	**E**	E	D	E	**D**	C	D	D	**D**	**E**
			Delay	78	74	47	**73**	67	50	36	**55**	67	41	61	**52**	32	37	35	**36**	**56**
			V/C	0.87	0.94	0.05		0.95	0.85	0.26		0.51	0.55	0.85		0.27	0.22	0.07		
			Q	75	109	0		172	148	42		23	95	183		20	37	0		
			Ex	115	850	50		175	250	75		100	300	100		250	500	80		
			Avail	40	741	50		3	102	33		77	205	-83		230	463	80		
	8 -Steeles Avenue and Eighth Line/Toronto Premium Outlets	TCS	LOS	E	B	B	**C**	B	C	B	**C**	D	D	D	**D**	E	D	D	**E**	**C**
			Delay	63	17	12	**27**	15	33	18	**31**	54	38	38	**43**	66	53	53	**57**	**31**
			V/C	0.91	0.48	0.02		0.55	0.87	0.12		0.38	0.26	0.26		0.50	0.25	0.25		
			Q	116	82	0		24	187	14		19	35	35		29	27	27		
			Ex	120	150	65		125	850	30		135	200	200		100	500	500		
			Avail	4	68	65		101	663	16		116	165	165		71	473	473		
	10 - Steeles Avenue and Ninth Line	TCS	LOS	D	A		**B**		C	A	**B**					D		D	**D**	**B**
			Delay	42	8		**12**		23	2	**16**					50		40	**48**	**18**
			V/C	0.72	0.39				0.79	0.68						0.65		0.07		
			Q	45	52				182	0						68		15		
			Ex	65	500				750	75						90		500		
			Avail	20	448				568	75						22		485		
	15 - 5 Sideroad and Eighth Line	TCS	LOS	B	B	B	**B**	B	B	B	**B**	B	B	B	**B**	A	A	A	**A**	**B**
			Delay	13	13	13	**13**	15	15	15	**15**	19	19	19	**19**	9	10	10	**10**	**15**
			V/C	0.47	0.47	0.47		0.66	0.66	0.66		0.75	0.75	0.75		0.10	0.23	0.23		
			Q	24	24	24		43	43	43		92	92	92		6	21	21		
			Ex	500	500	500		500	500	500		500	500	500		25	500	500		
			Avail	476	476	476		457	457	457		408	408	408		19	479	479		
	16 - 5 Sideroad and Ninth Line	TCS	LOS	B	B	B	**B**	B	C	B	**C**	B	C	C	**C**	A	A	A	**A**	**B**
			Delay	19	18	18	**18**	16	22	18	**21**	11	20	20	**20**	10	8	8	**9**	**18**
			V/C	0.30	0.33	0.33		0.03	0.70	0.30		0.05	0.79	0.79		0.22	0.27	0.27		
			Q	11	24	24		4	53	22		6	119	119		6	25	25		
			Ex	40	500	500		40	500	40		40	500	500		55	500	500		
			Avail	29	476	476		36	447	18		34	381	381		49	475	475		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

4.8 2031 Total Traffic Conditions

4.8.1 Total Traffic Volumes

Figures 4.15 and **4.16** summarize the 2031 AM and PM peak hour total traffic volumes, respectively, which were calculated by adding 2026 background traffic volumes (**Figures 4.13** and **4.14**) and the Premier Gateway Phase 1B lands traffic assignments (**Figures 3.9** and **3.10**).

4.8.2 Traffic Operations with Network Improvements

Intersection capacity analyses were undertaken to assess 2031 total peak hour traffic conditions for the Study Area intersections. The analyses applied the same methodology, parameters and lane configurations used for the existing conditions analysis in Section 2.3, and incorporated the following road network improvements noted in Sections 4.2, 4.3.5, 4.5.3, 4.6.3 and 4.7.3:

- Improvements to address existing critical traffic movements.
- Widening of Ninth Line from 2 to 4 lanes between Steeles Avenue and 5 Sideroad (needed to address background traffic growth to 2021).
- Improvements to address critical traffic movements for 2021 background/total traffic conditions.
- Widening of Steeles Avenue from 4 to 6 lanes between Trafalgar Road and Ninth Line (needed to address 2026 background traffic growth).
- Widening of 5 Sideroad from 2 to 4 lanes between Trafalgar Road and Ninth Line (needed to address 2026 background traffic growth).
- Improvements to address critical traffic movements for 2026 background traffic conditions.
- Widening of Trafalgar Road from 2 to 4 lanes between Steeles Avenue and 5 Sideroad (needed to address 2026 total traffic volumes).
- Improvements to address critical traffic movements for 2026 total traffic conditions.
- Widening of Steeles Avenue from 4 to 6 lanes between Fifth Line and Trafalgar Road (needed to address 2031 background traffic growth).
- New 6-lane 5½ Line corridor from Britannia Road to Steeles Avenue (needed to address 2031 background traffic growth).
- Improvements to address critical traffic movements for 2031 background traffic conditions.

Signal timings were also optimized using Synchro.

Tables 4.16 and **4.17** summarize the analysis results for the AM and PM peak hours with 2031 total traffic volumes, respectively (**Figures 4.15** and **4.16**). The tables denote LOS, delay, v/c ratios and 95% queue length for the Study Area intersections**. Appendix P** provides the Synchro analysis output. The following critical movements were identified:

- **Steeles Avenue and Sixth Line:**
  - The southbound left movement is projected to operate at LOS F (v/c = 5.59) during the AM peak hour and LOS F (v/c = 5.77) during the PM peak hour.
- **Steeles Avenue and Sixth Line South/Street A:**
  - The eastbound left movement 95th percentile queue length is projected to exceed available storage by 51 metres during the AM peak hour and by 47 metres during the PM peak hour.
  - The westbound through movement is projected to operate at LOS D (v/c = 0.93) during the PM peak hour.
  - The southbound left-turn lane 95th percentile queue length is projected to exceed available storage by 39 metres during the PM peak hour.
  - The southbound shared through-right movement is projected to operate at LOS E (v/c = 0.92) during the PM peak hour.
- **Steeles Avenue and Hornby Road:**
  - The southbound left movement is projected to operate at LOS F (v/c = 0.33) during the AM peak hour and at LOS F (v/c = 6.49) during the PM peak hour.
- **Steeles Avenue and Trafalgar Road:**
  - The eastbound left movement is projected to operate at LOS F (v/c = 0.98) during the PM peak hour.
  - The eastbound through movement is projected to operate at LOS F (v/c = 1.00) during the AM peak hour and LOS F (v/c = 1.03) during the PM peak hour.
  - The westbound left movement is projected to operate at LOS F (v/c = 1.00) during the AM peak hour and LOS F (v/c = 1.03) during the PM peak hour.
  - The westbound through movement is projected to operate at LOS D (v/c = 0.91) during the AM peak hour.
  - The northbound left movement is projected to operate at LOS F (v/c = 0.99) during the AM peak hour.
  - The southbound through movement is projected to operate at LOS E (v/c = 0.96) during the AM peak hour.

- **Steeles Avenue and Toronto Premium Outlets:**
  - The northbound left-turn lane 95th percentile queue length is projected to exceed available storage by 1 metre during the PM peak hour.
- **Steeles Avenue and Eighth Line/Toronto Premium Outlets:**
  - The eastbound left-turn lane 95th percentile queue length is projected to exceed available storage by 25 metres during the PM peak hour.
  - The eastbound through movement is projected to operate at LOS E (v/c = 1.00) during the AM peak hour.
  - The westbound through movement is projected to operate at LOS D (v/c = 0.89) during the AM peak hour and LOS D (v/c = 0.97) during the PM peak hour.
  - The westbound right-turn lane 95th percentile queue length is projected to exceed available storage by 21 metres during the PM peak hour.
  - The southbound left movement is projected to operate at LOS F (v/c = 1.05) during the PM peak hour, with the 95th percentile queue length projected to exceed available storage by 48 metres.
- **Steeles Avenue and Eighth Line South:**
  - The northbound left movement is projected to operate at LOS F (v/c = 0.15) during the AM peak hour and LOS F (v/c = 0.36) during the PM peak hour.
- **Steeles Avenue and Ninth Line:**
  - The westbound through movement is projected to operate at LOS C (v/c = 0.85) during the PM peak hour.
- **Trafalgar Road and Hornby Road:**
  - The southbound shared through-right movement is projected to operate at LOS D (v/c = 1.03) during the AM peak hour.
  - The northbound through movement is projected to operate at LOS C (v/c = 0.93) during the PM peak hour.
- **5 Sideroad and Fifth Line:**
  - The northbound shared left-through-right movement is projected to operate at LOS F (v/c = 0.62) during the AM peak hour and LOS E (v/c = 0.57) during the PM peak hour.
  - The southbound shared left-through-right movement is projected to operate at LOS F (v/c = 1.50) during the AM peak hour and LOS E (v/c = 0.41) during the PM peak hour.

- **5 Sideroad and Sixth Line:**
  - The northbound shared left-through-right movement is projected to operate at LOS E (v/c = 0.50) during the AM peak hour and LOS F (v/c = 1.05) during the PM peak hour.
  - The southbound shared left-through-right movement is projected to operate at LOS F (v/c = 0.72) during the AM peak hour.
- **5 Sideroad and Trafalgar Road:**
  - The eastbound through movement is projected to operate at LOS F (v/c = 1.02) during the AM peak hour.
  - The westbound left movement is projected to operate at LOS F (v/c = 1.24) during the AM peak hour, with the 95th percentile queue length projected to exceed available storage by 25 metres.
  - The westbound shared through-right movement is projected to operate at LOS F (v/c = 1.08) during the PM peak hour.
  - The northbound through movement is projected to operate at LOS D (v/c = 0.96) during the PM peak hour.
  - The southbound through movement is projected to operate at LOS E (v/c = 1.07) during the AM peak hour.
- **5 Sideroad and Eighth Line:**
  - The eastbound shared left-through-right movement is projected to operate at LOS D (v/c = 0.89) during the AM peak hour.
  - The westbound shared left-through-right movement is projected to operate at LOS D (v/c = 1.22) during the AM peak hour.
  - The southbound shared through-right movement is projected to operate at LOS C (v/c = 0.89) during the AM peak hour.
- **5 Sideroad and Ninth Line:**
  - The southbound left-turn lane 95th percentile queue length is projected to exceed available storage by 2 metres during the AM peak hour.
- **Steeles Avenue and Street B/Street C:**
  - The eastbound left-turn lane 95th percentile queue length is projected to exceed available storage by 2 metres during the AM peak hour and by 19 metres during the PM peak hour.
  - The westbound left-turn lane 95th percentile queue length is projected to exceed available storage by 3 metres during the PM peak hour.
  - The northbound left-turn lane 95th percentile queue length is projected to exceed available storage by 25 metres during the PM peak hour.

- **Trafalgar Road and Street B:**
  - The westbound left-turn lane 95th percentile queue length is projected to exceed available storage by 42 metres during the PM peak hour.
  - The northbound through movement is projected to operate at LOS D (v/c = 0.96) during the PM peak hour.
  - The northbound right-turn lane 95th percentile queue length is projected to exceed available storage by 63 metres during the AM peak hour.
  - The southbound through movement is projected to operate at LOS C (v/c = 0.91) during the AM peak hour.
  - The southbound left-turn lane 95th percentile queue length is projected to exceed available storage by 5 metres during the PM peak hour.
- **Eighth Line and Street B:**
  - The eastbound left movement is projected to operate at LOS F (v/c = 1.04) during the AM peak hour and LOS F (v/c = 1.44) during the PM peak hour.

4.8.3 Traffic Operations with Remedial Measures

The operational analyses of 2031 total traffic conditions projected critical movements at 17 intersections within the Study Area. The following improvements were incorporated to address these concerns:

- **Steeles Avenue and Sixth Line South/Street A:**
  - Extension of the eastbound left-turn lane storage to 85 metres
  - Extension of the southbound left-turn lane storage to 70 metres
  - Addition of a southbound right-turn lane with 135 metres storage
- **Steeles Avenue and Toronto Premium Outlets:**
  - Extension of the northbound left-turn lane storage to 45 metres
- **Steeles Avenue and Eighth Line/Toronto Premium Outlets:**
  - Extension of the eastbound left-turn lane storage to 130 metres
  - Extension of the westbound right-turn lane storage to 55 metres
  - Addition of a second southbound left-turn lane with 100 metres storage.
  - Addition of a southbound right-turn lane with 100 metres storage
- **Trafalgar Road and Hornby Road:**
  - Addition of northbound and southbound through lands (widening of Trafalgar Road from 4 to 6 lanes between Steeles Avenue and 5 Sideroad)

- **5 Sideroad and Sixth Line:**
  - Addition of a northbound left-turn lane with 35 metres storage
- **5 Sideroad and Trafalgar Road:**
  - Addition of northbound and southbound through lanes (widening of Trafalgar Road from 4 to 6 lanes between Steeles Avenue and 5 Sideroad)
- **5 Sideroad and Eighth Line:**
  - Addition of an eastbound left-turn lane with 40 metres storage
  - Addition of a southbound right-turn lane with 25 metres storage
- **5 Sideroad and Ninth Line:**
  - Extension of the southbound left-turn lane storage to 60 metres
- **Steeles Avenue and Street B/Street C:**
  - Extension of the eastbound left-turn lane storage to 50 metres
  - Extension of the westbound right-turn lane storage to 65 metres
  - Extension of the northbound left-turn lane storage to 60 metres
- **Trafalgar Road and Street B:**
  - Extension of the westbound left-turn lane storage to 105 metres.
  - Addition of northbound and southbound through lanes (widening of Trafalgar Road from 4 to 6 lanes between Steeles Avenue and 5 Sideroad)

No remedial measures are recommended at the other seven (7) intersections.

Tables 4.18 and **4.19** summarize the capacity analyses completed for the intersections with the above-noted improvements, based on the 2031 AM and PM peak hour total traffic forecasts, respectively. **Appendix R** provides the Synchro analysis output. The tables illustrate that the intersections are projected to operate at or near satisfactory levels of service if these road improvements were implemented, except for the following critical movements:

- **Steeles Avenue and Sixth Line South/Street A:**
  - The westbound through movement is projected to operate at LOS C (v/c = 0.89) during the PM peak hour.
- **Steeles Avenue and Eighth Line/Toronto Premium Outlets:**
  - The eastbound through movement is projected to operate at LOS E (v/c = 1.04) during the AM peak hour.
  - The eastbound left movement is projected to operate at LOS F (v/c = 1.02) during the PM peak hour.

- The westbound through movement is projected to operate at LOS D (v/c = 0.88) during the AM peak hour and LOS D (v/c = 0.95) during the PM peak hour.

- **Trafalgar Road and Street B:**
  - The northbound through movement is projected to operate at LOS D (v/c = 0.94) during the PM peak hour.

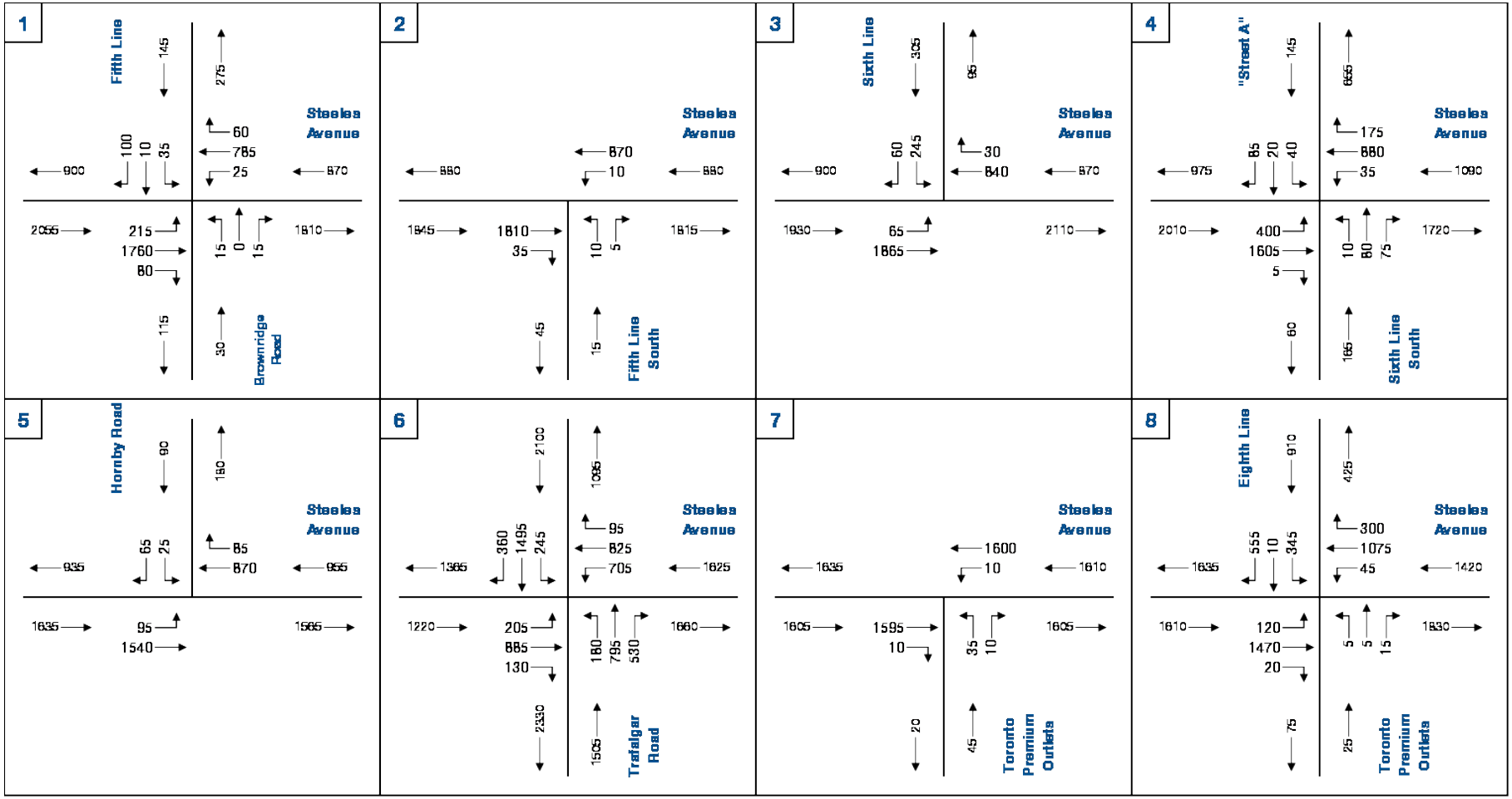
It is noted that all three (3) intersections are expected to operate at overall LOS D or better during both peak hours.

As part of the analysis, the need for traffic control signals was assessed at the following intersections based on Ontario Traffic Manual Book 12 (Traffic Signals)[19] and found not to be justified:

- Steeles Avenue and Sixth Line
- Steeles Avenue and Hornby Road
- Steeles Avenue and Eighth Line South
- 5 Sideroad and Fifth Line
- 5 Sideroad and Sixth Line
- Eighth Line and Street B

Appendix Q provides the signal warrant calculations.

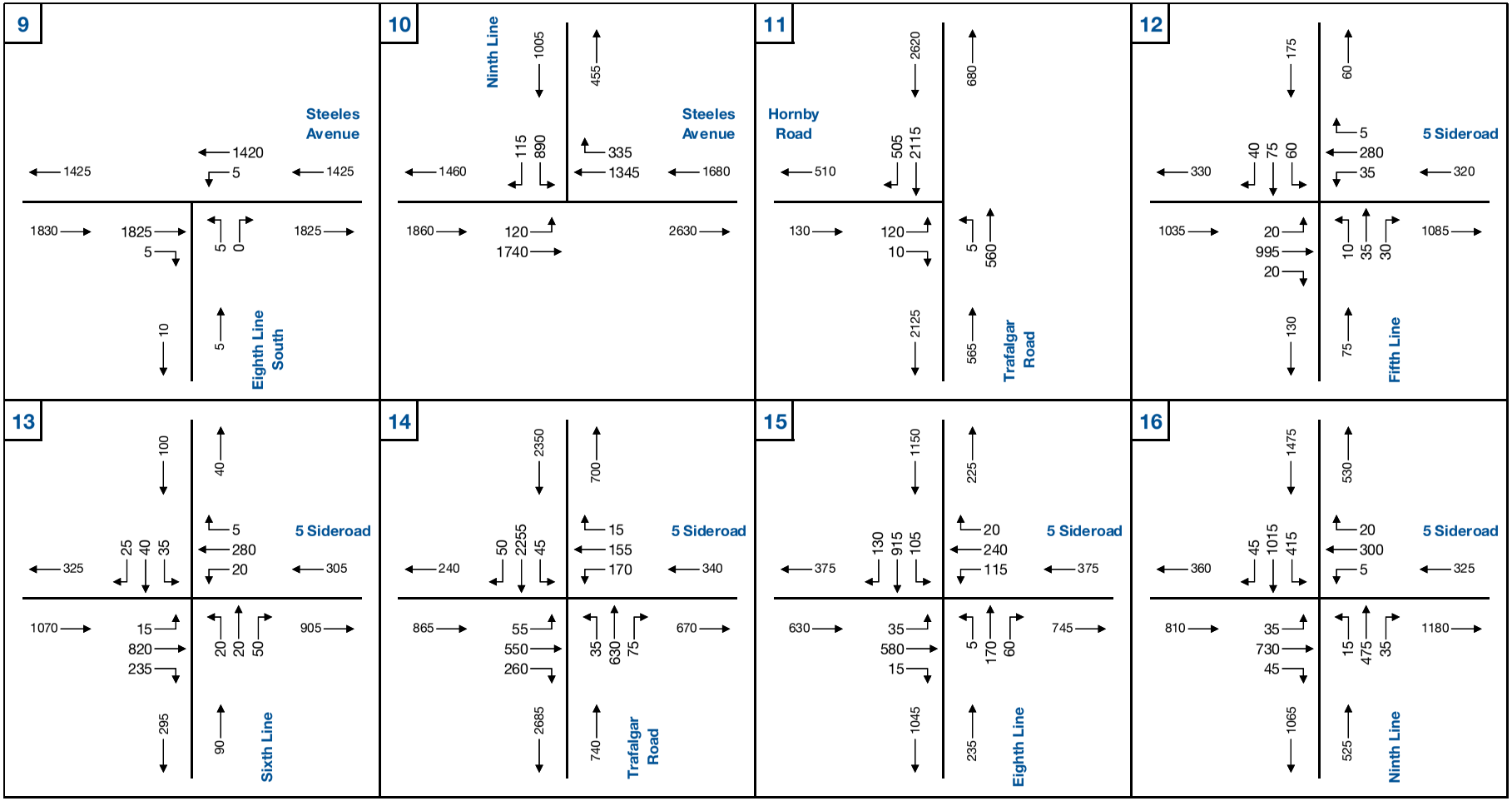
[19] Queen's Printer for Ontario, Ontario Traffic Manual Book 12 (Traffic Signals), March 2012



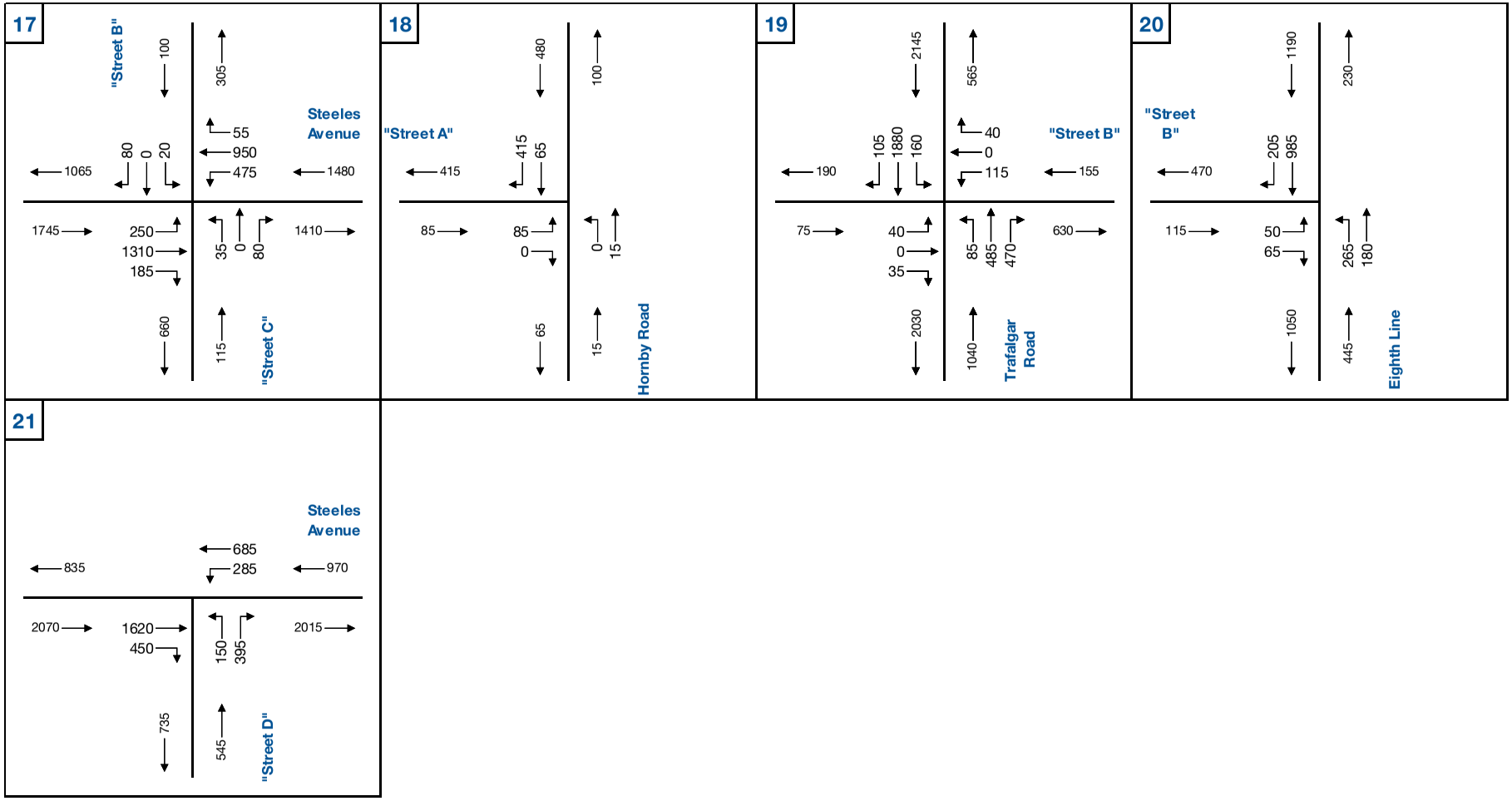
2031 AM Peak Hour

Total Traffic Volumes (1)

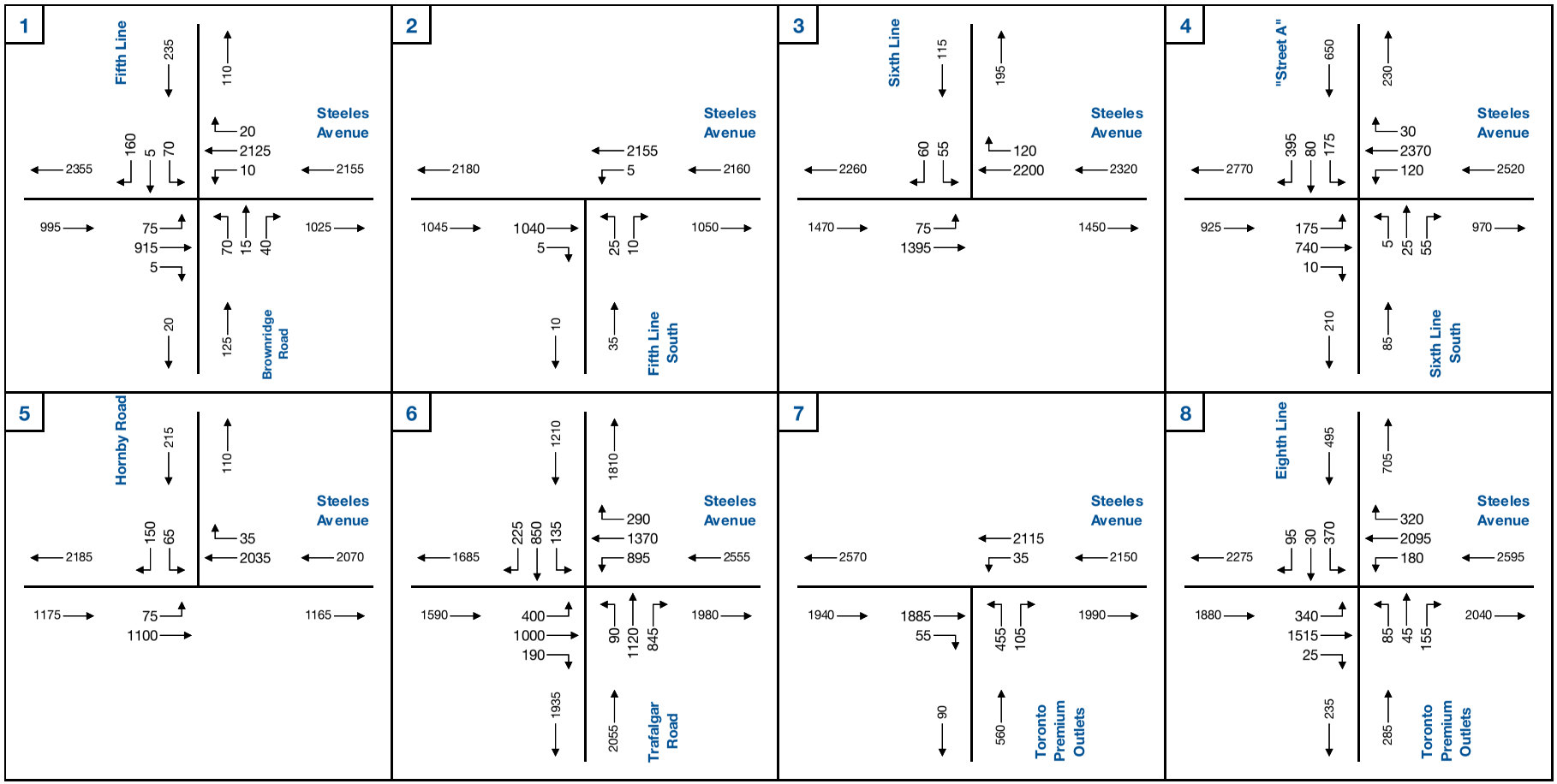
Figure 4.15a



2031 AM Peak Hour
Total Traffic Volumes (2)



2031 AM Peak Hour
Total Traffic Volumes (3)

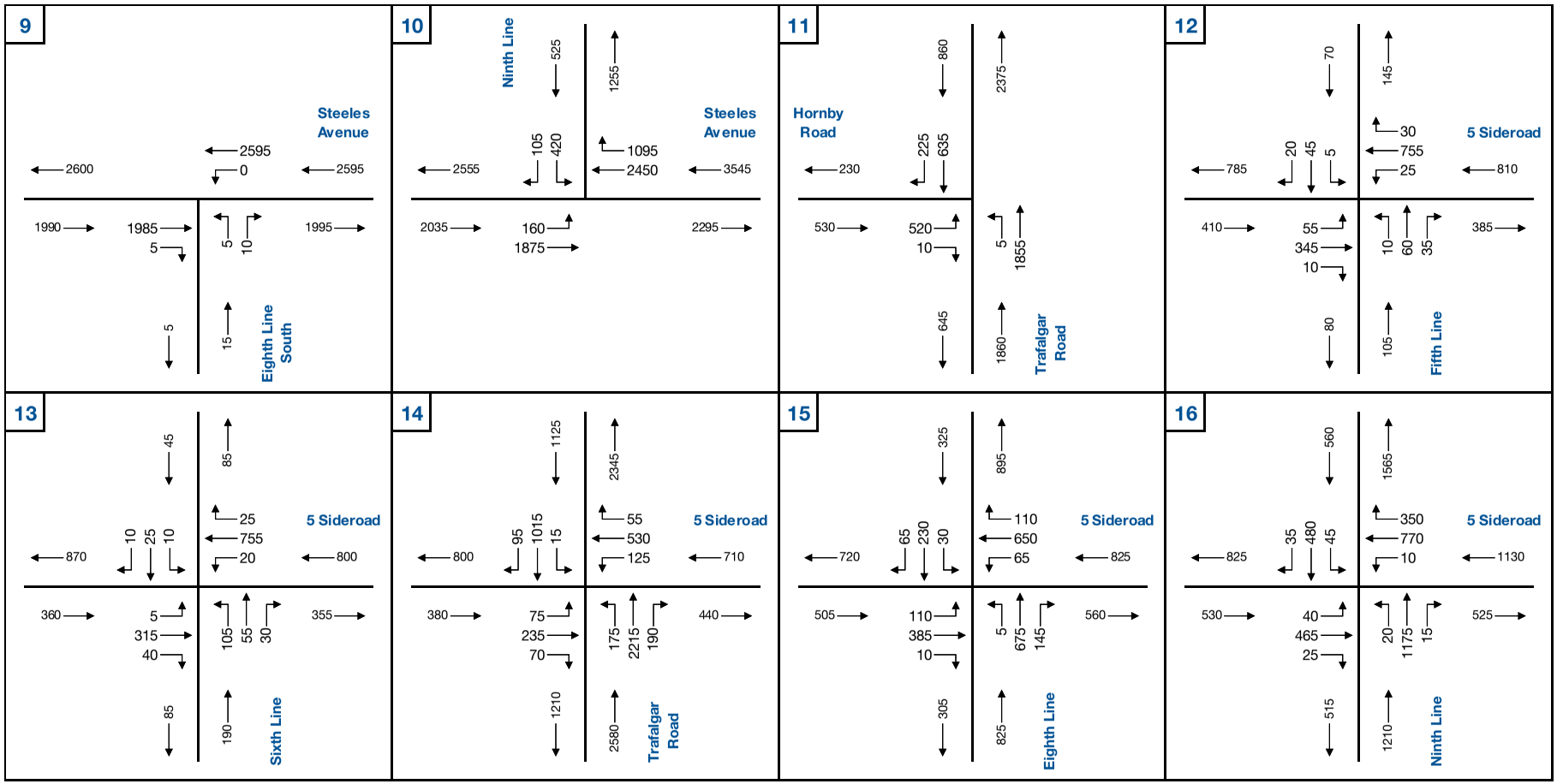


2031 PM Peak Hour

Total Traffic Volumes (1)

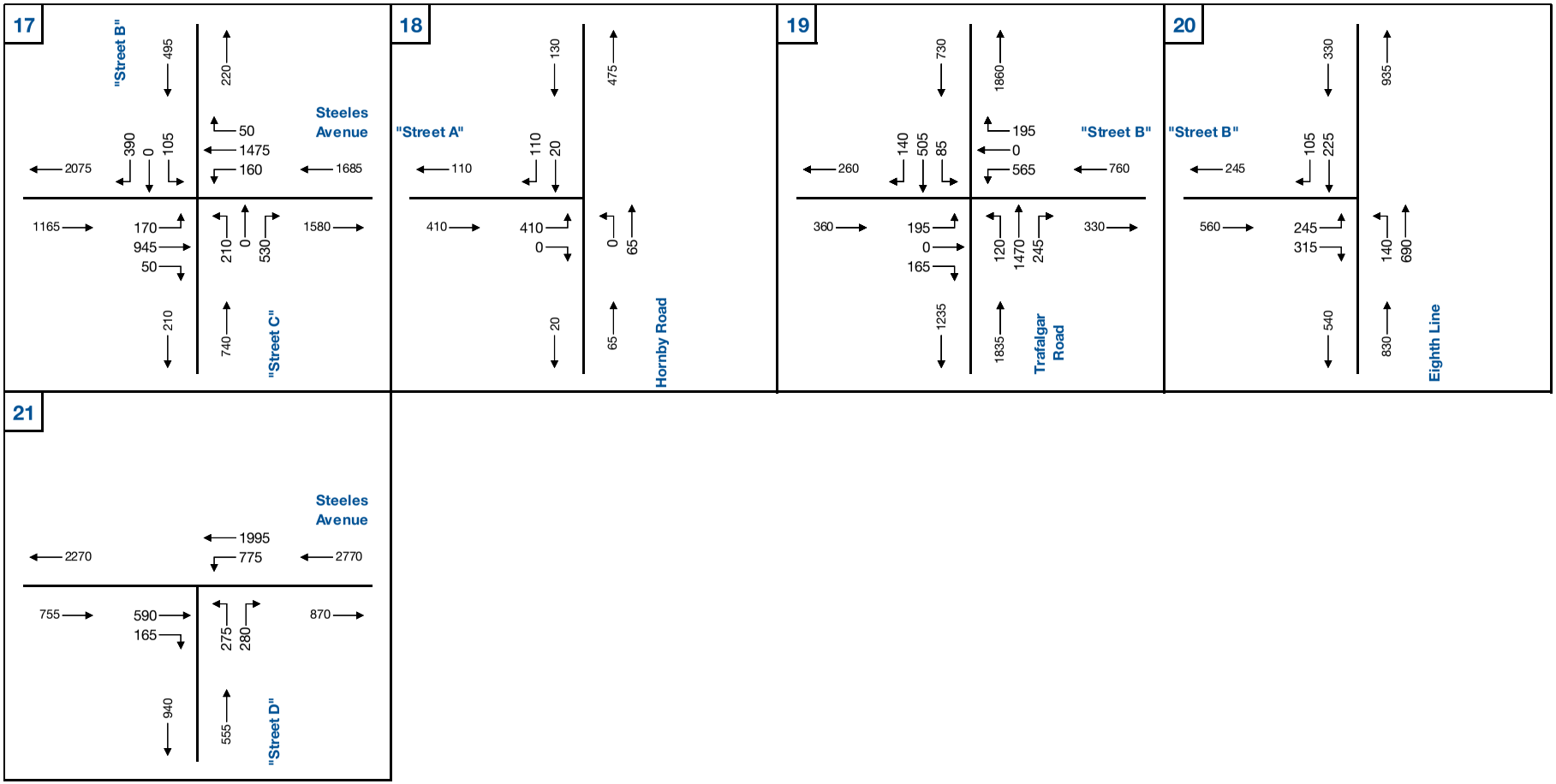
Premier Gateway Phase 1B Employment Area Secondary Plan Transportation Study
150770

Figure 4.16a



2031 PM Peak Hour

Total Traffic Volumes (2)



2031 PM Peak Hour
Total Traffic Volumes (3)

TABLE 4.16: 2031 AM PEAK HOUR TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																	
				Eastbound				Westbound				Northbound				Southbound				
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	OVERALL
AM Peak Hour	1 - Steeles Avenue and Fifth Line/Brownridge Road	TCS	LOS	B	A	A	**A**	A	A	A	**A**	C	C	C	**C**	C	C	C	**C**	**A**
			Delay	12	8	4	**8**	9	5	5	**5**	25	25	25	**25**	27	25	25	**25**	**8**
			V/C	0.57	0.63	0.05		0.23	0.34	0.34		0.10	0.01	0.01		0.28	0.04	0.07		
			Q	47	59	4		6	22	22		6	0	0		11	5	11		
			Ex	150	800	70		50	650	650		35	250	250		50	250	50		
			Avail	103	741	66		44	628	628		29	250	250		39	245	39		
	2 - Steeles Avenue and Fifth Line South	TCS	LOS		A	A	**A**	A	A		**A**	C		C	**C**					**A**
			Delay		5	2	**5**	3	3		**3**	30		27	**29**					**4**
			V/C																	
			Q		61	3		2	23			5		3						
			Ex		600	600		60	450			20		400						
			Avail		539	597		58	427			15		397						
	3 - Steeles Avenue and Sixth Line	TWSC	LOS	A	A		**A**		A	A	**A**					F		B	**F**	**789**
			Delay	10	0		**0**		0	0	**0**					ERR		11	**8034**	
			V/C	0.09	0.37				0.16	0.02						5.59		0.08		
			Q	2	0				0	0						ERR		2		
			Ex	60	400				400	30						30		500		
			Avail	58	400				400	30						ERR		498		
	4 - Steeles Avenue and Sixth Line South	TCS	LOS	C	C	A	**C**	B	C	B	**B**	C	C	C	**C**	C	C	C	**C**	**C**
			Delay	26	31	9	**30**	14	20	16	**19**	24	28	28	**27**	26	25	25	**25**	**26**
			V/C	0.76	0.72	0.00		0.19	0.49	0.12		0.03	0.29	0.29		0.14	0.11	0.11		
			Q	81	109	0		5	58	15		5	30	30		13	15	15		
			Ex	30	800	30		60	500	30		30	350	350		55	200	200		
			Avail	-51	691	30		55	442	15		25	320	320		42	185	185		
	5 - Steeles Avenue and Hornby Road	TWSC	LOS	B	A		**A**		A	A	**A**					F		B	**D**	**1**
			Delay	11	0		**1**		0	0	**0**					76		11	**29**	
			V/C	0.14	0.30				0.17	0.05						0.33		0.09		
			Q	4	0				0	0						10		3		
			Ex	60	450				850	30						30		500		
			Avail	56	450				850	30						20		497		
	6 - Steeles Avenue and Trafalgar Road	TCS	LOS	E	F	D	**E**	F	D	C	**E**	F	D	D	**D**	D	E	F	**E**	**E**
			Delay	64	82	43	**75**	85	42	33	**60**	125	39	40	**50**	37	57	94	**61**	**61**
			V/C	0.71	1.00	0.11		1.00	0.68	0.07		0.99	0.56	0.47		0.77	0.96	0.56		
			Q	41	120	9		141	90	7		51	80	58		58	184	72		
			Ex	115	850	50		175	250	75		100	300	100		250	500	80		
			Avail	74	730	41		34	160	68		49	220	42		192	316	8		
	7 - Steeles Avenue and Toronto Premium Outlets	TCS	LOS		A	A	**A**	A	A		**A**	C		C	**C**					**A**
			Delay		10	6	**10**	5	6		**6**	21		20	**21**					**8**
			V/C		0.60	0.01		0.07	0.54			0.08		0.01						
			Q		70	2		2	46			5		3						
			Ex		250	250		50	150			40		40						
			Avail		180	248		48	104			35		37						
	8 -Steeles Avenue and Eighth Line/Toronto Premium Outlets	TCS	LOS	C	E	C	**D**	C	D	C	**D**	D	D	D	**D**	B	C	C	**C**	**D**
			Delay	23	55	21	**53**	24	41	28	**38**	44	39	39	**40**	18	28	28	**24**	**41**
			V/C	0.56	1.00	0.01		0.28	0.89	0.32		0.09	0.05	0.05		0.49	0.56	0.56		
			Q	21	123	0		10	78	29		2	7	7		68	99	99		
			Ex	120	150	65		125	850	30		135	200	200		100	500	500		
			Avail	99	27	65		115	772	1		133	193	193		32	401	401		
	9 - Steeles Avenue and Eighth Line South	TWSC	LOS		A	A	**A**	C	A		**A**	F		A	**F**					**0**
			Delay		0	0	**0**	16	0		**0**	136		0	**136**					
			V/C		0.43	0.22		0.01	0.28			0.15		0.03						
			Q		0	0		0	0			4		0						
			Ex		800	800		90	500			30		500						
			Avail		800	800		90	500			26		500						
	10 - Steeles Avenue and Ninth Line	TCS	LOS	C	B		**B**		C	A	**C**					C		B	**C**	**C**
			Delay	21	19		**19**		28	0	**22**					29		19	**28**	**22**
			V/C	0.63	0.74				0.82	0.22						0.78		0.09		
			Q	20	97				95	0						87		11		
			Ex	65	500				750	75						90		500		
			Avail	45	403				655	75						3		489		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

TABLE 4.16: 2031 AM PEAK HOUR TOTAL TRAFFIC OPERATIONS (CONTINUED)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																	OVERALL
				Eastbound				Westbound				Northbound				Southbound					
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH		
AM Peak Hour	11 - Trafalgar Road and Hornby Road	TCS	LOS	E		D	E					A	A		A		D	D	D		D
			Delay	57		44	56					5	5		5		41	41	41		36
			V/C	0.56		0.01						0.12	0.24				1.03	1.03			
			Q	49		5						2	25				406	406			
			Ex	500		50						30	500				500	500			
			Avail	451		45						28	475				94	94			
	12 - 5 Sideroad and Fifth Line	TWSC	LOS	A	A	A	A	A	A	A	A	F	F	F	F	F	F	F	F		
			Delay	0	0	0	0	2	2	2	2	75	75	75	75	332	332	332	332		40
			V/C	0.02	0.02	0.02		0.05	0.05	0.05		0.62	0.62	0.62		1.50	1.50	1.50			
			Q	0	0	0		0	0	0		25	25	25		100	100	100			
			Ex	500	500	500		500	500	500		500	500	500		500	500	500			
			Avail	500	500	500		500	500	500		475	475	475		400	400	400			
	13 - 5 Sideroad and Sixth Line	TWSC	LOS	A	A	A	A	A	A	A	A	E	E	E	E	F	F	F	F		
			Delay	0	0	0	0	1	1	1	1	44	44	44	44	80	80	80	80		8
			V/C	0.01	0.01	0.01		0.03	0.03	0.03		0.50	0.50	0.50		0.72	0.72	0.72			
			Q	0	0	0		1	1	1		20	20	20		33	33	33			
			Ex	500	500	500		500	500	500		500	500	500		500	500	500			
			Avail	500	500	500		499	499	499		480	480	480		467	467	467			
	14 - 5 Sideroad and Trafalgar Road	TCS	LOS	D	F	F	F	F	D	D	F	D	B	B	B	A	E	B	E		E
			Delay	53	107	80	95	209	53	53	131	39	14	11	15	9	71	11	68		70
			V/C	0.26	1.02	0.80		1.24	0.27	0.27		0.38	0.35	0.06		0.11	1.07	0.04			
			Q	27	139	108		100	36	36		10	60	6		8	454	2			
			Ex	45	500	115		75	500	500		100	500	500		175	500	30			
			Avail	18	361	7		-25	464	464		90	440	494		167	46	28			
	15 - 5 Sideroad and Eighth Line	TCS	LOS	D	D	D	D	D	D	D	D	A	A	A	A	A	C	C	C		C
			Delay	44	44	44	44	45	45	45	45	7	7	7	7	6	23	23	21		30
			V/C	0.89	0.89	0.89		1.22	1.22	1.22		0.20	0.20	0.20		0.14	0.89	0.89			
			Q	82	82	82		55	55	55		22	22	22		12	229	229			
			Ex	500	500	500		500	500	500		500	500	500		25	500	500			
			Avail	418	418	418		445	445	445		478	478	478		13	271	271			
	16 - 5 Sideroad and Ninth Line	TCS	LOS	B	C	C	C	B	B	B	B	C	C	C	C	B	B	B	B		B
			Delay	16	23	23	23	15	16	15	16	20	21	21	21	19	12	12	14		18
			V/C	0.12	0.77	0.77		0.04	0.29	0.01		0.15	0.57	0.57		0.80	0.62	0.62			
			Q	9	60	60		3	23	0		6	40	40		57	61	61			
			Ex	40	500	500		40	500	40		40	500	500		55	500	500			
			Avail	31	440	440		37	477	40		34	460	460		-2	439	439			
	17 - Steeles Avenue and "Street B"/"Street C"	TCS	LOS	B	C	C	C	D	C	B	C	C	C	C	C	C	C	C	C		C
			Delay	19	30	22	28	44	21	17	28	27	27	30	29	29	31	31	30		28
			V/C	0.63	0.72	0.14		0.75	0.44	0.03		0.10	0.00	0.05		0.06	0.05	0.05			
			Q	32	101	17		63	63	0		13	0	0		9	0	0			
			Ex	30	500	30		60	250	30		30	150	150		30	150	150			
			Avail	-2	399	13		-3	187	30		17	150	150		21	150	150			
	18 - Hornby Road and "Street A"	Round-about	LOS	A		A	A					A	A		A		A	A	A		A
			Delay	3		3	3					3	3		3		5	5	5		5
			V/C	0.08		0.08						0.04	0.04				0.43	0.43			
			Q	1		1						0	0				3	3			
			Ex	200		200						200	200				200	200			
			Avail	199		199						200	200				197	197			
	19 - Trafalgar Road and "Street B"	TCS	LOS	D	D	D	D	D	D	D	D	D	A	F	D	A	C	B	C		D
			Delay	43	46	46	45	43	45	45	44	52	6	92	48	10	30	12	28		35
			V/C	0.14	0.02	0.02		0.38	0.03	0.03		0.56	0.23	0.30		0.27	0.91	0.07			
			Q	19	0	0		43	0	0		19	37	113		21	262	9			
			Ex	50	250	250		85	250	250		50	350	50		50	500	50			
			Avail	31	250	250		42	250	250		31	313	-63		29	238	41			
	20 - Eighth Line and "Street B"	TWSC	LOS	F		C	F					C	A		A		A	A	A		B
			Delay	274		23	132					16	0		10		0	0	0		11
			V/C	1.04		0.25						0.45	0.11				0.70	0.70			
			Q	36		8						19	0				0	0			
			Ex	250		250						300	300				500	500			
			Avail	214		242						281	300				500	500			
	21 - Steeles Avenue and "Street D"	TCS	LOS		C	B	C	D	A		B	C		C	C						C
			Delay		22	16	21	49	6		19	24		32	30						21
			V/C		0.75	0.30		0.74	0.22			0.17		0.56							
			Q		95	19		42	20			17		54							
			Ex		400	400		90	400			400		500							
			Avail		305	381		48	380			383		446							

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

TABLE 4.17: 2031 PM PEAK HOUR TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																	
				Eastbound				Westbound				Northbound				Southbound				
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	OVERALL
PM Peak Hour	1 - Steeles Avenue and Fifth Line/Brownridge Road	TCS	LOS	C	A	A	A	A	A	A	A	C	C	C	C	C	C	C	C	A
			Delay	31	5	4	7	4	9	9	9	26	24	24	25	27	23	26	26	10
			V/C	0.64	0.32	0.00		0.04	0.71	0.71		0.40	0.10	0.10		0.45	0.03	0.39		
			Q	28	23	0		2	75	75		18	10	10		18	3	22		
			Ex	150	800	70		50	650	650		35	250	250		50	250	50		
			Avail	122	777	70		48	575	575		17	240	240		32	247	28		
	2 - Steeles Avenue and Fifth Line South	TCS	LOS		A	A	A	A	A		A	C		C	C					A
			Delay		4	3	4	3	6		6	27		25	27					5
			V/C		0.34	0.00		0.02	0.65			0.25		0.01						
			Q		27	1		1	76			8		3						
			Ex		600	600		60	450			20		400						
			Avail		573	599		59	374			12		397						
	3 - Steeles Avenue and Sixth Line	TWSC	LOS	D	A		A		A	A	A					F		C	F	142
			Delay	31	0		2		0	0	0					ERR		17	4791	
			V/C	0.35	0.27				0.43	0.07						5.77		0.16		
			Q	12	0				0	0						ERR		5		
			Ex	60	400				400	30						30		500		
			Avail	48	400				400	30						ERR		495		
	4 - Steeles Avenue and Sixth Line South	TCS	LOS	E	B	B	C	B	D	B	D	D	D	D	D	D	E	E	E	D
			Delay	78	16	13	28	13	38	15	36	42	39	39	39	49	78	78	70	40
			V/C	0.88	0.30	0.01		0.26	0.93	0.02		0.09	0.09	0.09		0.50	0.92	0.92		
			Q	77	48	0		19	255	0		5	19	19		69	180	180		
			Ex	30	800	30		60	500	30		30	350	350		55	200	200		
			Avail	-47	752	30		41	245	30		25	331	331		-14	20	20		
	5 - Steeles Avenue and Hornby Road	TWSC	LOS	C	A		A		A	A	A					F		C	F	189
			Delay	23	0		2		0	0	0					ERR		19	3036	
			V/C	0.27	0.22				0.40	0.02						6.49		0.38		
			Q	9	0				0	0						ERR		14		
			Ex	60	450				850	30						30		500		
			Avail	51	450				850	30						ERR		486		
	6 - Steeles Avenue and Trafalgar Road	TCS	LOS	F	F	D	F	F	D	D	E	E	D	F	F	D	A	D	D	E
			Delay	94	88	42	84	86	52	35	62	62	49	123	80	47	4	37	42	68
			V/C	0.98	1.03	0.21		1.03	0.91	0.38		0.47	0.80	1.11		0.74	0.62	0.20		
			Q	90	136	27		174	154	57		22	122	226		47	89	22		
			Ex	115	850	50		175	250	75		100	300	100		250	500	80		
			Avail	25	714	23		1	96	18		78	178	-126		203	411	58		
	7 - Steeles Avenue and Toronto Premium Outlets	TCS	LOS		B	A	B	A	A		A	D		C	D					B
			Delay		12	6	12	6	7		7	50		23	45					14
			V/C		0.72	0.04		0.18	0.66			0.92		0.07						
			Q		94	5		4	67			41		11						
			Ex		250	250		50	150			40		40						
			Avail		156	245		46	83			-1		29						
	8 -Steeles Avenue and Eighth Line/Toronto Premium Outlets	TCS	LOS	F	C	B	D	C	D	C	D	E	F	F	F	F	D	D	F	D
			Delay	110	26	17	41	26	48	25	44	58	94	94	83	105	50	50	91	49
			V/C	1.06	0.66	0.02		0.69	0.97	0.33		0.33	0.83	0.83		1.05	0.18	0.18		
			Q	145	134	0		42	238	51		20	73	73		148	26	26		
			Ex	120	150	65		125	850	30		135	200	200		100	500	500		
			Avail	-25	16	65		83	612	-21		115	127	127		-48	474	474		
	9 - Steeles Avenue and Eighth Line South	TWSC	LOS		A	A	A	A	A			F		C	F					0
			Delay		0	0	0	0	0			370		15	134					
			V/C		0.47	0.24		0.00	0.51			0.36		0.03						
			Q		0	0		0	0			7		1						
			Ex		800	800		90	500			30		500						
			Avail		800	800		90	500			23		499						
	10 - Steeles Avenue and Ninth Line	TCS	LOS	E	A		B		C	A	B					E		D	D	C
			Delay	55	10		14		25	2	18					55		44	53	20
			V/C	0.78	0.57				0.85	0.68						0.68		0.07		
			Q	55	93				220	0						73		16		
			Ex	65	500				750	75						90		500		
			Avail	10	407				530	75						17		484		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

TABLE 4.17: 2031 PM PEAK HOUR TOTAL TRAFFIC OPERATIONS (CONTINUED)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																	
				Eastbound				Westbound				Northbound				Southbound				OVERALL
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	
PM Peak Hour	11 - Trafalgar Road and Hornby Road	TCS	LOS	D		C	D					B	C		C		B	B	B	C
			Delay	51		26	51					14	24		24		15	15	15	26
			V/C	0.85		0.01						0.02	0.93				0.43	0.43		
			Q	182		5						1	123				71	71		
			Ex	500		50						30	500				500	500		
			Avail	318		45						29	377				429	429		
	12 - 5 Sideroad and Fifth Line	TWSC	LOS	A	A	A	A	A	A	A	A	E	E	E	E	E	E	E	E	7
			Delay	2	2	2	2	1	1	1	1	48	48	48	48	40	40	40	40	
			V/C	0.07	0.07	0.07		0.02	0.02	0.02		0.57	0.57	0.57		0.41	0.41	0.41		
			Q	2	2	2		1	1	1		24	24	24		15	15	15		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	498	498	498		499	499	499		476	476	476		485	485	485		
	13 - 5 Sideroad and Sixth Line	TWSC	LOS	A	A	A	A	A	A	A	A	F	F	F	F	D	D	D	D	19
			Delay	0	0	0	0	0	0	0	0	133	133	133	133	31	31	31	31	
			V/C	0.01	0.01	0.01		0.02	0.02	0.02		1.05	1.05	1.05		0.25	0.25	0.25		
			Q	0	0	0		0	0	0		72	72	72		7	7	7		
			Ex	500	500	500		500	500	500		500	500	500		500	500	500		
			Avail	500	500	500		500	500	500		428	428	428		493	493	493		
	14 - 5 Sideroad and Trafalgar Road	TCS	LOS	F	E	E	E	D	F	F	F	A	D	A	C	C	B	B	B	D
			Delay	86	65	59	68	54	126	126	113	10	35	10	31	33	16	12	16	43
			V/C	0.75	0.53	0.05		0.57	1.08	1.08		0.47	0.96	0.15		0.21	0.48	0.07		
			Q	43	52	12		53	146	146		24	422	24		3	104	9		
			Ex	45	500	115		75	500	500		100	500	500		175	500	30		
			Avail	2	448	103		22	354	354		76	78	476		172	396	21		
	15 - 5 Sideroad and Eighth Line	TCS	LOS	C	C	C	C	C	C	C	C	C	C	C	C	A	A	A	A	C
			Delay	33	33	33	33	34	34	34	34	25	25	25	25	9	10	10	10	28
			V/C	0.96	0.96	0.96		0.91	0.91	0.91		0.87	0.87	0.87		0.11	0.30	0.30		
			Q	58	58	58		85	85	85		160	160	160		6	32	32		
			Ex	500	500	500		500	500	500		500	500	500		25	500	500		
			Avail	442	442	442		415	415	415		340	340	340		19	468	468		
	16 - 5 Sideroad and Ninth Line	TCS	LOS	C	B	B	B	B	C	B	C	B	C	C	C	A	A	A	A	B
			Delay	20	19	19	19	16	24	18	22	11	20	20	20	10	9	9	9	19
			V/C	0.34	0.48	0.48		0.04	0.76	0.30		0.05	0.80	0.80		0.22	0.27	0.27		
			Q	12	36	36		4	59	22		6	119	119		6	25	25		
			Ex	40	500	500		40	500	40		40	500	500		55	500	500		
			Avail	28	464	464		36	441	18		34	381	381		49	475	475		
	17 - Steeles Avenue and "Street B"/"Street C"	TCS	LOS	D	C	C	C	E	D	C	D	D	D	D	D	C	D	D	D	D
			Delay	37	28	22	29	56	35	23	37	37	37	44	42	33	47	47	44	37
			V/C	0.74	0.47	0.03		0.58	0.76	0.03		0.73	0.00	0.69		0.25	0.60	0.60		
			Q	49	77	0		32	138	0		55	0	107		28	80	80		
			Ex	30	500	30		60	250	30		30	150	150		30	150	150		
			Avail	-19	423	30		28	112	30		-25	150	43		2	70	70		
	18 - Hornby Road and "Street A"	Round-about	LOS	A		A	A					A	A		A		A	A	A	A
			Delay	5		5	5					4	4		4		3	3	3	4
			V/C	0.37		0.37						0.13	0.13				0.19	0.19		
			Q	2		2						1	1				1	1		
			Ex	200		200						200	200				200	200		
			Avail	198		198						199	199				199	199		
	19 - Trafalgar Road and "Street B"	TCS	LOS	D	D	D	D	D	D	D	D	B	D	C	D	E	D	F	E	D
			Delay	37	42	42	39	52	35	35	47	18	48	22	43	75	47	137	68	48
			V/C	0.51	0.10	0.10		0.92	0.18	0.18		0.29	0.96	0.25		0.67	0.34	0.09		
			Q	50	0	0		127	27	27		25	235	35		35	84	34		
			Ex	50	250	250		85	250	250		50	350	50		50	500	50		
			Avail	0	250	250		-42	223	223		25	115	15		15	416	16		
	20 - Eighth Line and "Street B"	TWSC	LOS	F		B	F					A	A		A		A	A	A	E
			Delay	281		13	130					8	0		1		0	0	0	43
			V/C	1.44		0.41						0.11	0.41				0.19	0.19		
			Q	123		16						3	0				0	0		
			Ex	250		250						300	300				500	500		
			Avail	127		234						297	300				500	500		
	21 - Steeles Avenue and "Street D"	TCS	LOS		C	C	C	C	A		B	C		C	C					B
			Delay		24	22	24	32	10		16	30		29	29					19
			V/C		0.38	0.10		0.79	0.61			0.38		0.18						
			Q		43	15		77	77			32		20						
			Ex		400	400		90	400			400		500						
			Avail		357	385		13	323			368		480						

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

TABLE 4.18: 2031 AM PEAK HOUR TOTAL TRAFFIC OPERATIONS WITH REMEDIAL MEASURES

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																
				Eastbound				Westbound				Northbound				Southbound				
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	OVERALL
AM Peak Hour	4 - Steeles Avenue and Sixth Line South	TCS	LOS	C	C	A	C	B	C	B	B	C	C	C	C	C	C	C	C	C
			Delay	26	31	9	30	14	20	16	19	24	28	28	27	26	25	25	25	26
			V/C	0.76	0.72	0.00		0.19	0.49	0.12		0.03	0.29	0.29		0.14	0.05	0.05		
			Q	81	110	0		5	58	15		5	30	30		13	8	2		
			Ex	85	800	30		60	500	30		30	350	350		70	200	135		
			Avail	4	690	30		55	442	15		25	320	320		57	192	133		
	8 -Steeles Avenue and Eighth Line/Toronto Premium Outlets	TCS	LOS	C	E	C	E	C	D	C	C	D	D	D	D	C	B	C	C	D
			Delay	22	63	20	59	21	37	23	33	39	35	35	36	22	19	26	24	42
			V/C	0.57	1.04	0.01		0.24	0.88	0.20		0.08	0.05	0.05		0.32	0.02	0.53		
			Q	19	113	0		9	71	16		2	7	7		40	6	86		
			Ex	130	150	65		125	850	55		135	200	200		100	500	500		
			Avail	111	37	65		116	779	39		133	193	193		60	494	414		
	11 - Trafalgar Road and Hornby Road	TCS	LOS	D		D	D					A	A		A		A	A	A	B
			Delay	53		42	52					6	5		5		10	10	10	11
			V/C	0.51		0.01						0.12	0.17				0.73	0.73		
			Q	49		5						2	16				192	192		
			Ex	50		500						500	500				500	500		
			Avail	1		495						498	484				308	308		
	13 - 5 Sideroad and Sixth Line	TWSC	LOS	A	A	A	A	A	A	A	A	F	D	D	D	F	F	F	A	
			Delay	0	0	0	0	1	1	1	1	53	26	26	32	80	80	80	7	7
			V/C	0.01	0.01	0.01		0.03	0.03	0.03		0.21	0.29	0.29		0.72	0.72	0.72		
			Q	0	0	0		1	1	1		6	9	9		33	33	33		
			Ex	500	500	500		500	500	500		35	500	500		500	500	500		
			Avail	500	500	500		499	499	499		29	491	491		467	467	467		
	14 - 5 Sideroad and Trafalgar Road	TCS	LOS	D	E	D	E	E	D	D	D	C	B	B	B	B	C	B	C	C
			Delay	42	60	51	56	61	39	39	50	24	17	15	17	12	29	14	29	34
			V/C	0.21	0.83	0.54		0.83	0.20	0.20		0.38	0.29	0.06		0.12	0.86	0.04		
			Q	21	104	65		66	29	29		8	43	1		10	217	0		
			Ex	45	500	115		75	500	500		100	500	500		175	500	30		
			Avail	24	396	50		9	471	471		92	457	499		165	283	30		
	19 - Trafalgar Road and "Street B"	TCS	LOS	C	C	C	C	C	C	C	C	B	B	B	B	A	C	B	B	B
			Delay	22	21	21	22	25	21	21	24	14	14	14	14	10	21	12	19	18
			V/C	0.11	0.02	0.02		0.31	0.03	0.03		0.41	0.22	0.30		0.30	0.80	0.07		
			Q	13	0	0		30	0	0		10	22	15		16	105	9		
			Ex	50	250	250		105	250	250		50	350	50		50	500	50		
			Avail	37	250	250		75	250	250		40	328	35		34	395	41		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

TABLE 4.19: 2031 PM PEAK HOUR TOTAL TRAFFIC OPERATIONS WITH REMEDIAL MEASURES

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																
				Eastbound				Westbound				Northbound				Southbound				OVERALL
				LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	LEFT	THROUGH	RIGHT	APPROACH	
PM Peak Hour	4 - Steeles Avenue and Sixth Line South	TCS	LOS	E	B	A	C	B	C	B	C	D	D	D	D	D	D	E	E	C
			Delay	59	13	10	22	11	30	13	29	40	41	41	41	54	42	70	62	33
			V/C	0.81	0.29	0.01		0.25	0.89	0.02		0.02	0.10	0.10		0.60	0.19	0.85		
			Q	64	42	0		16	228	0		5	19	19		69	32	133		
			Ex	85	800	30		60	500	30		30	350	350		70	200	135		
			Avail	21	758	30		44	272	30		25	331	331		1	168	2		
	8 -Steeles Avenue and Eighth Line/Toronto Premium Outlets	TCS	LOS	F	B	B	C	C	D	C	D	E	E	E	E	E	D	D	E	D
			Delay	81	19	14	30	23	42	22	38	55	61	61	59	75	47	47	68	39
			V/C	1.02	0.64	0.02		0.68	0.95	0.30		0.38	0.62	0.62		0.90	0.12	0.06		
			Q	126	114	0		37	199	41		19	62	62		75	17	9		
			Ex	130	150	65		125	850	55		135	200	200		100	500	500		
			Avail	4	36	65		88	651	14		116	138	138		25	483	491		
	11 - Trafalgar Road and Hornby Road	TCS	LOS	C		C	C					B	C				C	C	C	C
			Delay	33		20	33					17	27				20	20	20	26
			V/C	0.68		0.01						0.02	0.77				0.34	0.34		
			Q	162		5						3	135				44	44		
			Ex	500		500						500	500				500	500		
			Avail	338		495						497	365				456	456		
	13 - 5 Sideroad and Sixth Line	TWSC	LOS	A	A	A	A	A	A	A	A	F	D	D	F	D	D	D	D	
			Delay	0	0	0	0	0	0	0	0	75	26	26	53	31	31	31	31	9
			V/C	0.01	0.01	0.01		0.02	0.02	0.02		0.72	0.33	0.33		0.25	0.25	0.25		
			Q	0	0	0		0	0	0		34	11	11		7	7	7		
			Ex	500	500	500		500	500	500		35	500	500		500	500	500		
			Avail	500	500	500		500	500	500		1	489	489		493	493	493		
	14 - 5 Sideroad and Trafalgar Road	TCS	LOS	C	C	C	C	C	D	D	D	B	C	B	C	B	B	B	B	C
			Delay	33	34	32	34	30	48	48	44	11	21	11	20	17	18	15	18	24
			V/C	0.51	0.37	0.05		0.41	0.85	0.85		0.48	0.83	0.15		0.16	0.45	0.06		
			Q	21	31	1		31	87	87		22	178	17		3	59	4		
			Ex	45	500	115		75	500	500		100	500	500		175	500	30		
			Avail	24	469	114		44	413	413		78	322	483		172	441	26		
	19 - Trafalgar Road and "Street B"	TCS	LOS	B	C	C	C	D	C	C	C	B	D	B	C	C	C	B	C	C
			Delay	18	23	23	20	36	22	22	32	17	37	19	33	20	21	19	20	29
			V/C	0.40	0.10	0.10		0.88	0.12	0.12		0.33	0.94	0.18		0.44	0.34	0.09		
			Q	30	3	3		102	5	5		20	112	18		15	31	10		
			Ex	50	250	250		105	250	250		50	350	50		50	500	50		
			Avail	20	247	247		3	245	245		30	238	32		35	469	40		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

5 Recommended Transportation Plan

5.1 Roads

The analyses presented in Section 4 illustrated that background traffic growth and development of the Premier Gateway Phase 1B lands will significantly increase traffic volumes on roads within the Study Area, necessitating improvements to the roadway network.

Table 5.1 summarizes the road improvements by horizon year identified through the operational analyses, and whether the need for the remedial measure arises due to background (red font) or development (total) traffic growth. Most intersections within the Study Area will require expansion by full build out in the year 2031, assuming development progresses as planned. Many of these improvements have been identified for the 2026 and 2031 horizon years, given projected traffic volumes attributed to both generalized growth and build out of the Premier Gateway Phase 1B lands in the latter years of the plan.

Several of the identified improvements will likely be constructed as part of broader corridor widening projects, which also increase midblock capacity and can help with managing access. Many of these projects are already programmed in the 2017-2026 Halton Region Transportation Capital Forecast, as noted in Section 4.2. Recommended expansion projects by horizon year include (projects identified in the 2017 Halton Region Budget and Business Plan and their status are denoted):

- By 2021:
  - Ninth Line widening from 2 to 4 lanes between Steeles Avenue and 5 Sideroad – Identified for construction in 2020
- By 2026:
  - Steeles Avenue widening from 4 to 6 lanes between Trafalgar Road and Ninth Line – Identified for construction beyond 2026
  - 5 Sideroad widening from 2 to 4 lanes between Trafalgar Road and Ninth Line – Not currently identified in the 2017-2026 Town of Halton Hills Capital Forecast Summary, although the Town has earmarked funding for “5 Sideroad (all phases)”
  - Trafalgar Road widening from 2 to 4 lanes between Steeles Avenue and 5 Sideroad – Identified for construction in 2018
- By 2031:
  - Steeles Avenue widening from 4 to 6 lanes between Fifth Line and Trafalgar Road – Identified for construction in 2024
  - Trafalgar Road widening from 4 to 6 lanes between Steeles Avenue and 5 Sideroad – Not currently identified
  - New 6-lane 5½ Line between Britannia Road and Steeles Avenue – Identified for construction beyond 2026

TABLE 5.1: IDENTIFIED INTERSECTION IMPROVEMENTS

Intersection	Identified Improvements			
	Existing	2021	2026	2031
1. Steeles Avenue & Fifth Line/Brownridge Road				EB THL WB THL
2. Steeles Avenue & Fifth Line South				EB THL WB THL
3. Steeles Avenue & Sixth Line				EB THL WB THL
4. Steeles Avenue & Sixth Line South/Street A			Signalized control EB LTL (50 m) EB RTL (30 m) WB LTL (50 m) WB RTL (30 m) NB LTL (30 m) SB LTL (55 m)	EB LTL (+85 m) EB THL WB THL SB LTL (+70 m) SB RTL (135 m)
5. Steeles Avenue & Hornby Road				EB THL WB THL
6. Steeles Avenue & Trafalgar Road		EB DLTL (115 m) SB RTL (80 m)	EB THL WB THL	WB LTL (+175 m)
7. Steeles Avenue & Toronto Premium Outlets				NB LTL (+45 m)
8. Steeles Avenue & Eighth Line/Toronto Premium Outlets	SB LTL (+60 m)	WB RTL (30 m) SB LTL (+70 m)	EB THL WB THL SB LTL (+85 m)	EB LTL (+120 m) > EB LTL (+130 m) WB RTL (+55 m) SB LTL (+100 m) > SB DLTL (100 m) SB RTL (100 m)
9. Steeles Avenue & Eighth Line South			EB THL WB THL	
10. Steeles Avenue & Ninth Line	SB DLTL (90 m)		EB THL WB THL	WB CRTL (75 m)

TABLE 5.1: IDENTIFIED INTERSECTION IMPROVEMENTS

Intersection	Identified Improvements			
	Existing	2021	2026	2031
11. Trafalgar Road & Hornby Road			Signalized control EB RTL (50 m) NB LTL (30 m) NB THL SB THL	 NB THL SB THL
12. 5 Sideroad & Fifth Line				
13. 5 Sideroad & Sixth Line				NB LTL (35 m)
14. 5 Sideroad & Trafalgar Road		 SB RTL (30 m)	EB THL EB RTL (+115 m) WB THL NB RTL (20 m)	 NB THL SB THL
15. 5 Sideroad & Eighth Line	Signalized control	 WB RTL (40 m)	 EB THL WB THL SB LTL (25 m)	EB LTL (40 m) WB LTL (40 m) SB RTL (25 m)
16. 5 Sideroad & Ninth Line	WB RTL (30 m) SB LTL (40 m)	 NB THL SB THL	EB THL WB THL	 SB LTL (+55 m) > SB LTL (+60 m)
17. Steeles Avenue & Street B/Street C		Signalized control EB LTL (30 m) EB RTL (30 m) WB DLTL (60 m) WB RTL (30 m) NB LTL (30 m) NB RTL (100 m) SB LTL (30 m)		EB LTL (+50 m) WB RTL (+65 m) NB LTL (+60 m)
18. Hornby Road & Street A		Single-lane roundabout		

TABLE 5.1: IDENTIFIED INTERSECTION IMPROVEMENTS

Intersection	Identified Improvements			
	Existing	2021	2026	2031
19. Trafalgar Road & Street B		EB SML WB SML NB LTL (30 m) SB LTL (30 m)	Signalized control EB LTL (50 m) EB RTL (50 m) WB LTL (85 m) WB RTL (50 m) NB LTL (+50 m) NB THL NB RTL (50 m) SB LTL (+50 m) SB THL SB RTL (50 m)	 WB LTL (+105 m) NB THL SB THL
20. Eighth Line & Street B		EB SML NB SML SB SML	EB LTL (25 m) NB LTL (25 m)	
21. Steeles Avenue & Street D				EB CRTL (50 m) WB DLTL (50 m) NB DLTL (30 m) NB RTL (30 m)

LEGEND:

Red font denotes improvement required to serve background traffic growth

EB = Eastbound
WB = Westbound
NB = Northbound
SB = Southbound
(50 m) = Metres of vehicle storage provided
(+50 m) = Existing lane extended to metres of vehicle storage
> Increase in storage length from background to total traffic conditions

LTL = Left-turn lane
DLTL = Dual left-turn lane
RTL = Right-turn lane
CRTL = Channelized right-turn lane
SML = Shared movement lane
THL = Additional through lane

In a few instances, the identified improvement in **Table 5.1** is to extend an existing or newly added turn lane to provide additional storage. Since it is neither pragmatic nor cost-effective to carry out incremental road works, the ultimate turn lane storage length should be constructed when implementing the improvement. On this basis, the following details the recommended traffic control and auxiliary turn lane improvements for the Study Area intersections:

- **Steeles Avenue and Sixth Line South/Street A**:
  - Traffic control signals
  - Eastbound left-turn lane with 85 metres storage
  - Eastbound right-turn lane with 30 metres storage
  - Westbound left-turn lane with 50 metres storage
  - Westbound right-turn lane with 30 metres storage
  - Northbound left-turn lane with 30 metres storage.
  - Southbound left-turn lane with 70 metres storage
  - Southbound right-turn lane with 135 metres storage
- **Steeles Avenue and Trafalgar Road**:
  - Eastbound dual left-turn lane with 115 metres storage
  - Southbound right-turn lane with 80 metres storage
  - Westbound left-turn lane with 175 metres storage
- **Steeles Avenue and Toronto Premium Outlets:**
  - Northbound left-turn lane with 45 metres storage
- **Steeles Avenue and Eighth Line/Toronto Premium Outlets:**
  - Eastbound left-turn lane with 130 metres storage
  - Westbound right-turn lane with 55 metres storage
  - Southbound dual left-turn lane with 100 metres storage
  - Southbound right-turn lane with 100 metres storage
- **Steeles Avenue and Ninth Line:**
  - Westbound channelized right-turn lane with 75 metres storage into dedicated receiving lane
  - Southbound dual left-turn lane with 90 metres storage
- **Trafalgar Road and Hornby Road:**
  - Traffic control signals
  - Eastbound right-turn lane with 50 metres storage
  - Northbound left-turn lane with 30 metres storage

- **5 Sideroad and Sixth Line:**
  - Northbound left-turn lane with 35 metres storage
- **5 Sideroad and Trafalgar Road:**
  - Eastbound right-turn lane with 115 metres storage
  - Northbound right-turn lane with 20 metres storage
  - Southbound right-turn lane with 30 metres storage
- **5 Sideroad and Eighth Line:**
  - Traffic control signals
  - Eastbound left-turn lane with 40 metres storage
  - Westbound left-turn lane with 40 metres storage
  - Westbound right-turn lane with 40 metres storage
  - Southbound left-turn lane with 25 metres storage
  - Southbound right-turn lane with 25 metres storage
- **5 Sideroad and Ninth Line:**
  - Westbound right-turn lane with 30 metres storage
  - Southbound left-turn lane with 60 metres storage
- **Steeles Avenue and Street B/Street C:**
  - Traffic control signals
  - Eastbound left-turn lane with 50 metres storage
  - Eastbound right-turn lane with 30 metres storage
  - Westbound dual left-turn lane with 60 metres storage
  - Westbound right-turn lane with 65 metres storage
  - Northbound left-turn lane with 60 metres storage
  - Northbound right-turn lane with 100 metres storage
  - Southbound left-turn lane with 30 metres storage
- **Hornby Road and Street A:**
  - Single-lane roundabout.
- **Trafalgar Road and Street B:**
  - Traffic control signals
  - Eastbound left-turn lane with 50 metres storage
  - Eastbound right-turn lane with 50 metres storage
  - Westbound left-turn lane with 105 metres storage
  - Westbound right-turn lane with 50 metres storage
  - Northbound left-turn lane with 50 metres storage

- Northbound right-turn lane with 50 metres storage
- Southbound left-turn lane with 50 metres storage
- Southbound right-turn lane with 50 metres storage

- **Eighth Line and Street B:**
  - Eastbound left-turn lane with 25 metres storage
  - Northbound left-turn lane with 25 metres storage
- **Steeles Avenue and Street D (5½ Line):**
  - Eastbound channelized right-turn lane with 50 metres storage
  - Westbound dual left-turn lane with 50 metres storage
  - Northbound dual left-turn lane
  - Northbound right-turn lane

Table 5.2 presents a potential road improvement program that integrates the corridor widening projects with the intersection upgrades identified through the operational analyses. A timetable for implementation is proposed based on projected traffic need and current budget programming. Situations where the intersection improvement could be undertaken as part of another corridor widening project are identified. For these locations, the intersection works will be carried out with the corridor widening that proceeds first.

The program can be refined as further information about overall development phasing and timing becomes available.

TABLE 5.2: POTENTIAL ROAD IMPROVEMENT PROGRAM

Project Location	Description	Timing	Status
Ninth Line from Steeles Avenue to 5 Sideroad	Widen from 2 to 4 lanes Add southbound dual left-turn lane (90 metres storage) at Steeles Avenue Add westbound right-turn lane (30 metres storage) and southbound left-turn lane (60 metres storage) at 5 Sideroad	Now	Identified for construction in 2020 in 2017-2026 Halton Region Transportation Capital Forecast
Steeles Avenue and Eighth Line/Toronto Premium Outlets	Add southbound left-turn lane (100 metres storage)	Now	Not identified in Town or Region capital forecasts
5 Sideroad and Ninth Line	Install traffic control signals	Now	Not identified in Town or Region capital forecasts
Trafalgar Road from Steeles Avenue to 5 Sideroad	Widen from 2 to 4 lanes Add eastbound dual left-turn lane (115 metres storage) and southbound right-turn lane (80 metres storage), and extend westbound left-turn lane (to 175 metres storage) at Steeles Avenue *(could also undertake with Steeles Avenue, Trafalgar Road to 5 Sideroad widening if it proceeds first)* Install traffic control signals, and add eastbound right-turn lane (50 metres storage) and northbound left-turn lane (30 metres storage) at Hornby Road Extend eastbound right-turn lane (to 115 metres storage), and add northbound right-turn lane (20 metres storage) and southbound right-turn lane (30 metres storage) at 5 Sideroad *(could also undertake with 5 Sideroad, Trafalgar Road to Ninth Line widening if it proceeds first)*	By 2026 or before development lands are 60% built out	Identified for construction in 2018 in 2017-2026 Halton Region Transportation Capital Forecast
Steeles Avenue from Trafalgar Road to Ninth Line	Widen from 4 to 6 lanes Extend northbound left-turn lane (to 45 metres storage) at Toronto Premium Outlets Add westbound right-turn lane (55 metres storage), southbound dual left-turn lane (100 metres storage), and southbound right-turn lane (100 metres storage), and extend	By 2026 or before development lands are 60% built out	Identified for construction beyond 2026 in 2017-2026 Halton Region Transportation Capital Forecast

TABLE 5.2: POTENTIAL ROAD IMPROVEMENT PROGRAM

Project Location	Description	Timing	Status
	eastbound left-turn lane (to 130 metres storage) at Eighth Line/Toronto Premium Outlets Add westbound channelized right-turn lane (75 metres storage) at Ninth Line		
5 Sideroad from Trafalgar Road to Ninth Line	Widen from 2 to 4 lanes Add eastbound left-turn lane (40 metres storage), westbound left turn lane (40 metres), westbound right-turn lane (40 metres storage), southbound left-turn lane (25 metres storage) and southbound right-turn lane (25 metres storage) at Eighth Line	By 2026 or before development lands are 60% built out	Not currently identified in the 2017-2026 Town of Halton Hills Capital Forecast Summary, although the Town has earmarked funding for "5 Sideroad (all phases)"
Steeles Avenue from Fifth Line to Trafalgar Road	Widen from 4 to 6 lanes	By 2031 or before development lands are 100% built out	Identified for construction in 2024 in 2017-2026 Halton Region Transportation Capital Forecast
Trafalgar Road from Steeles Avenue to 5 Sideroad	Widen from 4 to 6 lanes	By 2031 or before development lands are 100% built out	Not currently identified in the 2017-2026 Halton Region Transportation Capital Forecast
5 Sideroad and Sixth Line	Add northbound left-turn lane (35 metres storage)	By 2031 or before development lands are 100% built out	Not currently identified in the 2017-2026 Town of Halton Hills Capital Forecast Summary
5½ Line from Britannia Road to Steeles Avenue	Construct new 6-lane corridor Add eastbound channelized right-turn lane (50 metres storage), westbound dual left-turn lanes (50 metres storage), northbound dual left-turn lanes (30 metres storage) and northbound right-turn lane (30 metres storage) at Steeles Avenue	By 2031 or before development lands are 100% built out	Identified for construction beyond 2026 in 2017-2026 Halton Region Transportation Capital Forecast

TABLE 5.2: POTENTIAL ROAD IMPROVEMENT PROGRAM

Project Location	Description	Timing	Status
Steeles Avenue and Sixth Line South/Street A	Install traffic control signals Add eastbound left-turn lane (85 metres storage), eastbound right-turn lane (30 metres storage), westbound left-turn lane (50 metres storage), westbound right-turn lane (30 metres storage), northbound left-turn lane (30 metres storage), southbound left-turn lane (70 metres storage) and southbound right-turn lane (135 metres storage) *(could undertake as part of Steeles Avenue, Fifth Line to Trafalgar Road widening if development timing coincides)*	At time of development	Steeles Avenue widening identified for construction in 2024 in 2017-2026 Halton Region Transportation Capital Forecast
Steeles Avenue and Street B/Street C	Install traffic control signals Add eastbound left-turn lane (50 metres storage), eastbound right-turn lane (30 metres storage), westbound dual left-turn lane (60 metres storage), westbound right-turn lane (65 metres storage), northbound left-turn lane (60 metres storage), northbound right-turn lane (100 metres storage) and southbound left-turn lane (30 metres storage) *(could undertake as part of Steeles Avenue, Fifth Line to Trafalgar Road widening if development timing coincides)*	At time of development	Steeles Avenue widening identified for construction in 2024 in 2017-2026 Halton Region Transportation Capital Forecast
Hornby Road and Street A	Construct single-lane roundabout	At time of development	Not currently identified in the 2017-2026 Town of Halton Hills Capital Forecast Summary
Trafalgar Road and Street B	Install traffic control signals Add eastbound left-turn lane (50 metres storage), eastbound right-turn lane (50 metres storage), westbound left-turn lane (105 metres storage), westbound right-turn lane (50 metres storage), northbound left-turn lane (50 metres storage), northbound right-turn lane (50 metres storage), southbound left-turn lane (50 metres storage) and southbound right-turn lane (50 metres storage)	At time of development	Trafalgar Road widening (2 to 4 lanes) identified for construction in 2018 in 2017-2026 Halton Region Transportation Capital Forecast. Widening from 4 to 6 lanes note

TABLE 5.2: POTENTIAL ROAD IMPROVEMENT PROGRAM

Project Location	Description	Timing	Status
	(could undertake as part of Trafalgar Road, Steeles Avenue to 5 Sideroad widening if development timing coincides)		currently identified.
Eighth Line and Street B	Add eastbound left-turn lane (25 metres storage) and northbound left-turn lane (25 metres storage)	At time of development	Not currently identified in the 2017-2026 Town of Halton Hills Capital Forecast Summary

5.2 Transit

There is currently no transit service to the Study Area. With the area being developed as a large employment centre, the Premier Gateway Phase 1B lands have the potential to a significant generator of transit ridership. The secondary plan should include policies supporting the future provision of transit service to this important node.

The development should be designed to allow for well-connected, efficient transit to the area once service is available, offering individuals more choice in transportation modes and helping to reduce dependence on personal vehicle travel. This includes incorporating a greater range of uses and designing the development to minimize walking distances and enhance conditions for pedestrians and cyclists to access the service. Further guidance on transit-supportive land use design for office parks and industrial/employment areas is provided in several references, including the Ministry of Transportation Transit-Supportive Guidelines[20], and outlined further in Section 5.4 below.

Future transit routes servicing the Premier Gateway Phase 1B lands should connect with major stops at nearby population centres (Milton, Georgetown, and Mississauga), as well as adjacent GO transit hubs (Milton and Lisgar). Routes within the area should be coordinated with development and designed to serve key origin-destination pairings to ensure the service will be effective and well-utilized.

5.3 Active Transportation

Per Section 1.3, the Town of Halton Hills and Halton Region active transportation plans identify future cycling lanes along Steeles Avenue and a multi-use trail along Trafalgar Road. These facilities will form the backbone for the active transportation network serving the Premier Gateway Phase 1B lands.

Like transit, the development should be designed to facilitate (and not preclude) the use of active transportation modes. New roads within the secondary plan area should be designed to include cycling and pedestrian facilities. Individual developments should provide bicycle parking, building entrances along street-frontages and additional amenities further described in Section 5.4.

5.4 Transportation Demand Management

Transportation Demand Management (TDM) uses policies, programs, services and products to influence whether, why, when, where and how people travel. TDM measures help shape the economic and social factors behind personal travel decisions. These actions are intended to encourage the use of more sustainable modes of transportation and minimize single-

[20] Queen's Printer for Ontario, Transit-Supportive Guidelines, 2012

occupant vehicle trips as part of an overall transportation management strategy.

Table 5.3 outlines a range of TDM measures intended to:

- **Influence Site Design** – Effective site design can enhance the attractiveness, convenience and safety of walking, cycling, transit use and car sharing/carpooling. Conversely, if the development is not designed to facilitate more sustainable travel behaviour, use will be diminished or precluded.
- **Offer Travel Choices** – Other modes need to be available to be used.
- **Promote Sustainable Travel Options** – Priority treatment and/or incentives can be offered to encourage the use of other, non-auto transportation modes and help "level the playing field".

The measures listed in **Table 5.3** should be pursued through future development within the Premier Gateway Phase 1B lands, and are applicable for both commercial and employment land uses. With the area comprising mostly new development, the opportunity exists to incorporate design features and encourage behaviour that can reduce demand for single-occupant vehicle travel.

TABLE 5.3: POTENTIAL TDM MEASURES

TDM Measure	Land Use	
	Commercial	Employment
Exterior Design		
Provide a clearly visible "way-finding system" which provides direction to everyone including persons with impairment of one or more senses. Features may include textured surfaces, coloured lines and patters, lights, raised letters, large lettering and other clearly understandable directional cues.	●	●
Locate signs indicating entrances, amenities such as showers, lockers, transit stations/stops and transportation information kiosk strategically throughout the site.	●	●
Provide signs indicating clear direction from transit to public facilities and service centres.	●	●
Unbundle parking costs from multifamily residential units at the time of purchase or rental.		
Interior Design		
Provide adequate signage and wayfinding at main entrances to all facilities or amenities such as showers, lockers, information/transit ticket purchase service.		●
Provide a permanent TDM booth at main entrances of all buildings and facilities to display transportation information including a monitor with transit schedules for the nearest transit station/ stop.		●
Provide for direct access to transit facilities from the lobby of major buildings located along a transit route.	●	●
Carpool		
Promote carpooling initiatives and investigate partnerships with private ride-matching services.		●
Locate carpool parking stalls near the main entrance of the building.		●
Provide ample carpool stalls to meet or exceed requirements.		●
Clearly mark carpool parking stalls as reserved for carpool vehicles.		●
Direct carpoolers to reserved areas with clear and intuitive signage.		●
Active Transportation		
Provide the most direct, convenient and shortest connections from buildings to public sidewalks, to off-site pedestrian paths, and to transit stops as well as direct connections between buildings on-site. Ensure sidewalks are paved and maintained in winter.	●	●
Ensure main entrances of new buildings front directly onto, and are clearly visible from, the public street.	●	●

TABLE 5.3: POTENTIAL TDM MEASURES

TDM Measure	Land Use	
	Commercial	Employment
Ensure pedestrian circulation is well-defined with safe and convenient connections to parking areas (both auto and bike parking) and off-site pedestrian facilities, and that pedestrian specific lighting is provided onto sidewalks and pathways.	●	●
Ensure sidewalks are continuous and barrier-free with at least 2.0 metres wide to accommodate simultaneous passage of a pedestrian and a wheelchair.	●	●
Construct multi-use pathways 3.0 to 4.5 metres in width with 1.0 metre "clear zones" on either side.	●	●
Design sidewalks and pathways to ensure personal security and safety through adequate lighting, unobstructed sign lines and provision of at-grade facilities.	●	●
Provide bicycle parking facilities in public and/or private locations close to building entrances.	●	●
Provide bicycle repair stations, including air pump, basic tools, and links to instructional online videos	●	●
Transit		
Ensure that transit services are provided to new development at an early stage, with support from developer funding.	●	●
Promote awareness of available transit services.	●	●
Develop and encourage the use of employer transit pass programs.		●
Develop and encourage the use of a flexible transit pass program for students.	●	
Provide covered shelters at transit stations and key bus stop locations which include adequate seating and lighting.	●	●

6 Conclusions and Recommendations

6.1 Conclusions

The following conclusions are drawn from the analyses completed for the Premier Gateway Phase 1B Secondary Plan Transportation Study:

- The existing road network serving the Premier Gateway Phase 1B lands is currently operating at satisfactory levels of service and within capacity, expect for a few locations where localized improvements would resolve critical movements.
- Several improvements to the road network will be required in the later horizon years (2026 and 2031) to serve the considerable volume of background traffic growth anticipated due to the increase in the population of Halton Region.
- The Premier Gateway Phase 1B lands are forecasted to generate approximately 3,540 trips during the AM peak hour and 4,720 trips during the PM peak hour at build-out. When combined with background traffic growth, the existing road network will need expansion to serve projected demands.
- Most significant road improvements will not be required until the 2026 horizon year, which is assumed to be 60% build out of the Premier Gateway Phase 1B lands. Further expansion will then be required by 2031, given background and development traffic forecasts and assuming full build out is achieved as planned.
- The more significant road improvement projects required to serve projected background and development traffic volumes, and the recommended timing for implementation, include:
  - Widening of Ninth Line widening from 2 to 4 lanes between Steeles Avenue and 5 Sideroad (by 2021)
  - Widening of Steeles Avenue from 4 to 6 lanes between Trafalgar Road and Ninth Line (by 2026)
  - Widening of 5 Sideroad from 2 to 4 lanes between Trafalgar Road and Ninth Line (by 2026)
  - Widening of Trafalgar Road from 2 to 4 lanes between Steeles Avenue and 5 Sideroad (by 2026)
  - Widening of Steeles Avenue from 4 to 6 lanes between Fifth Line and Trafalgar Road (by 2031)
  - Widening of Trafalgar Road from 4 to 6 lanes between Steeles Avenue and 5 Sideroad (by 2031)
  - Construction of new 6-lane 5½ Line between Britannia Road and Steeles Avenue (by 2031)

  Many of these projects are already programmed in the 2017-2026 Halton Region Transportation Capital Forecast.

- Several of the identified intersection improvements can likely be constructed as part of broader corridor widening projects.
- Several intersections already or are projected to warrant traffic control signals, including:
  - Steeles Avenue and Sixth Line South/Street A
  - Trafalgar Road and Hornby Road
  - 5 Sideroad and Eighth Line
  - Steeles Avenue and Street B/Street C
  - Trafalgar Road and Street B
- The Study Area is not well served by non-auto modes currently. Targeted measures will be needed to facilitate and preserve the opportunity for use of more sustainable transportation options in the future.

6.2 Recommendations

Based on the foregoing, it is recommended that:

- The Premier Gateway Phase 1B development proceed in phases, subject to the provision of required infrastructure improvements to support the planned phase of development.
- A more detailed implementation plan be prepared once the development phasing strategy is better defined to articulate the timing of required infrastructure improvements.
- Opportunities to leverage planned road infrastructure improvements by Halton Region be pursued and the phasing plan for the Premier Gateway Phase 1B lands take these into consideration.
- A TDM program be implemented for the Premier Gateway Phase 1B lands to minimize vehicular traffic generation.

Appendix A

Traffic Count Data

Appendix B

Existing Traffic Operations Reports

Appendix C

Existing Traffic with Remedial Measures Operations Reports

Appendix D

2021 Background Traffic Operations Reports

Appendix E

2021 Background Traffic with Remedial Measures Operations Reports

Appendix F

2021 Total Traffic Operations Reports

Appendix G

2021 Total Traffic Signal Warrants

Appendix H

2026 Background Traffic Operations Reports

Appendix I

2026 Background Traffic with Remedial Measures Operations Reports

Appendix J

2026 Total Traffic Operations Reports

Appendix K

2026 Total Traffic Signal Warrants

Appendix L

2026 Total Traffic with Remedial Measures Operations Reports

Appendix M

2031 Background Traffic Operations Reports

Appendix N

2031 Background Traffic Signal Warrants

Appendix O

2031 Background Traffic with Remedial Measures Operations Reports

Appendix P

2031 Total Traffic Operations Reports

Appendix Q

2031 Total Traffic Signal Warrants

Appendix R

2031 Total Traffic with Remedial Measures Operations Reports