TRAFFIC IMPACT STUDY

PROPOSED SERVICE STATION
10819 HIGHWAY 9
TOWN OF CALEDON,
REGIONAL MUNICIPALITY OF PEEL

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1.0 Executive Summary

C.F. Crozier & Associates Inc. (Crozier) was retained by Lions Group Inc. (the client) to prepare a Traffic Impact Study in support of the development application for the proposed service station at 10819 Highway 9 in the Town of Caledon, Regional Municipality of Peel (the site). The purpose of the study is to evaluate the transportation-related impacts of the proposed service station on the boundary road network and to recommend any required mitigation measures, if warranted.

Per the Development Concept Plan prepared by Glen Schnarr and Associates Inc. (updated March 2020), the elements envisioned for the development include:

- The removal of the existing automotive services shop;
- The construction of a gas station with six fueling positions; and
- The construction of a retail store and accessory restaurant with a gross floor area (GFA) of 2,800 square feet.

The development proposes the removal of the portion of the existing westerly access to Highway 9 on the subject property which would result in the westerly access being solely for the adjacent 10795 Highway 9 property. Access to the site is proposed via the existing south approach of the signalized intersection of Highway 9 and Tottenham Road. The existing south approach will be reconfigured to provide auxiliary turn lanes.

The study has been completed in accordance with the Ministry of Transportation of Ontario (MTO)'s "Guidelines for the Preparation of Traffic Impact Studies" (September 2014). The analysis contained within this report includes the intersections of Highway 9 and Tottenham Road.

The 2022, 2027 and 2032 horizon years were analyzed to reflect assumed full build-out and the five- and ten-year horizons, respectively. Based on calculated growth rates from historical traffic data in the study area, a growth rate of two percent compounded annually was applied to all movements on the boundary road network to forecast 2022, 2027 and 2032 future background traffic volumes.

The proposed service station development is expected to generate approximately 76 and 84 trips in the weekday a.m. and p.m. peak hours, respectively.

The study intersections operate well with a LOS "B" or better under 2019 existing conditions and are forecasted to continue operating with a LOS "C" or better under 2022 through 2032 future background and future total traffic volume conditions.

Under 2032 future background and future total conditions, the eastbound left-turn movement is expected to operate near capacity and the forecasted 95th percentile queue lengths for the southbound left-turn and eastbound left-turn movements are expected to exceed their respective designated storage lengths. These metrics are attributed to background traffic growth over a 13-year horizon at an arterial-to-arterial intersection with heavy traffic volumes.

However, it is noted that the overall intersection delay, eastbound left-turn volume-to-capacity ratio and eastbound left-turn 95th percentile queue length are all expected to slightly decrease under future total conditions. This is attributed to the pass-by diversions applied to traffic for the critical eastbound left-turn movement with the build-out of the proposed gas station.

The intersection of Highway 9 and Tottenham Road is still expected to operate at overall satisfactory levels of service. These operations indicate that the addition of site traffic to the intersection is expected to minimally impact traffic operations.

Therefore, the proposed development is supportable from a traffic operations perspective.

Sensitivity analysis of 2032 future background and total conditions with a seasonal adjustment factor of 20% applied to the existing traffic volumes indicates that the addition of site traffic to the road network is still expected to minimally impact traffic operations and that no external roadway improvements are required to accommodate the proposed development.

Analysis of safety components for the proposed development indicate that:

- The development proposal satisfies the MTO's access spacing and density guidelines;
- The proposed site layout provides adequate store length for the outbound (northbound) turn lanes which can accommodate the forecasted outbound 95th percentile queue lengths under future total conditions and can accommodate a typical fuel truck exiting the site;
- The proposed site layout is not likely to result in queueing for inbound passenger cars at the site access; and
- There are no expected maneuverability constraints within the site for typica fuel trucks nor delivery trucks.

The analysis undertaken herein was prepared using the most recent Development Concept Plan. Any minor changes to the development proposal will not materially affect the conclusions contained within this report.

In conclusion, the proposed development can be supported from a transportation operations and safety perspective.

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2.0 Introduction

2.1 Background

C.F. Crozier & Associates Inc. (Crozier) was retained by Lions Group Inc. (the client) to prepare a Traffic Impact Study in support of the development application for the proposed service station at 10819 Highway 9 in the Town of Caledon, Regional Municipality of Peel (the site).

2.2 Development Proposal

Per the Development Concept Plan prepared by Glen Schnarr and Associates Inc. (updated March 2020), the elements envisioned for the development include:

- The removal of the existing automotive services shop;
- The construction of a gas station with six fueling positions; and
- The construction of a retail store and accessory restaurant with a gross floor area (GFA) of 2,800 square feet.

The development proposes the removal of the portion of the existing westerly access to Highway 9 on the subject property which would result in the westerly access being solely for the adjacent 10795 Highway 9 property. Access to the site is proposed via the existing south approach of the signalized intersection of Highway 9 and Tottenham Road. The existing south approach will be reconfigured to provide auxiliary turn lanes (discussed further in Sections 6.2 and 7.1).

The latest Development Concept Plan has been included in **Appendix A. Figure 1** illustrates the current location of the proposed development lands.

2.3 Purpose and Scope

The purpose of the study is to evaluate the transportation-related impacts of the proposed service station on the boundary road network and to recommend any required mitigation measures, if warranted.

The study reviews the following main aspects of the proposed development from a transportation engineering perspective:

- Existing, future background, and future total traffic operations on the boundary road network during the weekday a.m. and p.m. peak hours;
- Forecasted trip generation and distribution of the proposed development;
- Mitigation measures to support the proposed development, if required; and
- Safety components including access management, access offset and internal truck circulation within the site.

The study has been completed in accordance with the Ministry of Transportation of Ontario (MTO)'s "Guidelines for the Preparation of Traffic Impact Studies" (September 2014).

3.0 Existing Conditions

3.1 Development Lands

The subject property covers an area of approximately 1.58 acres and is located in a rural environment with existing commercial uses on the south side of Highway 9. The subject property is bound by

Highway 9 to the north, an existing "Environmental Policy Area" zone to the south, and existing commercial uses to the east and west. The subject property currently consists of a vacant automotive services shop with two accesses to Highway 9: one at the south leg of the signalized intersection of Highway 9 and Tottenham Road (Simcoe County Road 10), and the other consolidated with the easterly access to the adjacent 10795 Highway 9 property.

3.2 Study Intersections

The Traffic Impact Study analyzes the signalized intersection of Highway 9 and Tottenham Road during the weekday a.m. and p.m. peak hours. Details of the boundary roadway network are summarized in the subsequent section.

3.3 Boundary Road Network

The boundary road network at the site frontage is described in **Table 1**. Details relating to the road classification and jurisdiction were obtained from the County of Simcoe's Official Plan, with relevant excerpts included in **Appendix B**.

Table 1: Boundary Road Network – Roadways

Feature	Roadway	
	Highway 9	**Tottenham Road**
Direction	Two-way (East-West)	Two-way (North-South)
Classification	2B – Arterial [1]	Primary Arterial – Controlled Access [2]
Jurisdiction	Ministry of Transportation of Ontario (MTO)	County of Simcoe (County Road 10)
Speed Limit	80 km/h (posted)	80 km/h (posted)
Span	Highway 10 (Orangeville) to Highway 400	Highway 9 to County Road 90 (Angus)
Number of lanes total	Four travel lanes (site frontage) Two travel lanes (east and west of site frontage)	Two travel lanes
Median type	Centre lane (site frontage)	None
Shoulder Type	Gravel	Gravel
Pedestrian Facilities	None	None
Cycling Facilities	None	None
Transit Services	None	None

Note 1: Classification per the MTO's Highway Corridor Management Manual (September 2018)
Note 2: Classification per the County of Simcoe Official Plan Schedule 5.5.1. "County Transportation Systems"

Table 2 outlines the existing traffic control, configurations, and pedestrian crossing provisions at the study intersections on the boundary road network. **Figure 2** illustrates the existing boundary road network, including lane configurations and intersection control.

Table 2: Boundary Road Network – Study Intersections

Intersection	Control	Approaches	Major Street	Auxiliary Turn Lanes	Pedestrian Crossing
Highway 9 and Tottenham Road	Signal	4	Highway 9	WBR (85 m) WBL (85 m) EBL (85 m) SBL (40 m)	All Approaches

3.4 Traffic Data

Turning movement counts were conducted by Spectrum Traffic Data Inc. (Spectrum) staff on Tuesday December 3, 2019 at the intersections of Highway 9 and Tottenham Road between 6:00 a.m. – 10:00 a.m., and 3:00 p.m. – 7:00 p.m. to determine existing traffic volumes.

Intersection analysis was conducted utilizing peak hour factors (PHFs) as calculated for the intersection during each time period. **Table 3** outlines the calculated peak hour factors at each intersection during each peak hour.

Table 3: Peak Hour Factors

Intersection	Peak Hour	Peak Hour Factor
Highway 9 and Tottenham Road	Weekday A.M. 7:15 a.m. – 8:15 a.m.	0.96
	Weekday P.M. 4:30 p.m. – 5:30 p.m.	0.97

The traffic count data is contained in **Appendix C**. **Figure 3** illustrates the 2019 existing traffic volume that was recorded.

A sensitivity analysis was conducted with a seasonal adjustment factor applied to the existing traffic volumes to reflect summer conditions. Section 7.0 contains the sensitivity analysis.

3.5 Traffic Modelling

The boundary road network was modelled in Synchro 11.0 using existing roadway geometrics, collected traffic data, and default modelling parameters such as ideal saturation flow rates and lost time values. Signal timing plans were obtained from MTO staff and have been utilized for the existing, future background and future total analyses. 95th percentile queue lengths were derived from Synchro.

The assessment of intersections is based on the "Highway Capacity Manual (HCM)" methodology. Intersections are assessed using a Level of Service (LOS) metric with ranges of delay assigned a letter from "A" to "F"; "A" representing low delays and "F" representing heavy delays. The LOS definitions for signalized intersections are included in **Appendix D.**

3.6 Intersection Operations

The existing intersection operations at the study intersections were analyzed using the existing 2019 traffic volumes illustrated in **Figure 3.** Detailed capacity analysis worksheets are included in **Appendix E**. **Table 4** outlines the 2019 existing traffic operations.

Table 4: 2019 Existing Levels of Service

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Maximum v/c ratio [2]	95th Percentile Queues > Storage
Highway 9 and Tottenham Road	Signal	A.M.	B	14.1 s	0.72 (SBL)	59.7 m > 40 m (SBL)
		P.M.	B	12.6 s	0.68 (EBL)	None

Note[1]: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU). The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM2000).

Note[2]: The maximum v/c ratio represents the maximum v/c ratio for the minor road approach movements at the intersection. Any movements that experience a v/c ratio in excess of 0.85 are considered critical per the MTO TIS Guidelines.

The intersection of Highway 9 and Tottenham Road is currently operating at level of service (LOS) "B" during the weekday a.m. and p.m. peak hours with minor control delays and no critical volume-to-capacity ratios.

The 95th percentile queue length for the southbound left-turn movement exceeds the designated storage length during the weekday a.m, peak hour by 19.7 metres (approximately three passenger car lengths). These queues are attributed to heavy southbound volumes at the intersection during the a.m. peak period and are not uncommon at arterial-to-arterial intersections during peak hours. However, this extended queue length can be accommodated by the effective storage length provided by the southbound left-turn taper.

Overall, the intersection of Highway 9 and Tottenham Road is currently operating at satisfactory levels of service.

4.0 Future Background Conditions

4.1 Horizon Years

It is assumed that the proposed development will be fully built-out by 2022. The MTO's guidelines require analysis of the full build-out horizon and the five-year and ten-year horizons from the estimated year of full build-out. Therefore, the 2022, 2027 and 2032 horizon years were analyzed.

4.2 Growth Rate

The MTO's "Provincial Highways Traffic Volumes 1988-2016" document was reviewed to analyze historical traffic volumes on Highway 9 at Tottenham Road. A growth rate of 1.00% percent compounded annually was calculated for the Annual Average Daily Traffic (AADT) between 2013 and 2016. A growth rate of 1.88% percent compounded annually was calculated for the Summer Average Daily Traffic (SADT) between 2013 and 2016. **Appendix F** contains the growth rate analysis.

Therefore, a growth rate of 2% compounded annually was applied to all movements on the boundary road network to forecast 2022, 2027 and 2032 future background traffic volumes.

4.3 Future Road Improvements

No future road improvements have been identified in the study area.

4.4 Intersection Operations

The future background operations at the study intersections were analyzed using the 2022, 2027 and 2032 future background traffic volumes illustrated in **Figures 4, 5 and 6,** respectively. Detailed capacity analysis worksheets are included in **Appendix E**. Signal timing splits have been optimized for the assessment of future background conditions.

Table 5, Table 6 and Table 7 outline the 2022, 2027 and 2032 future background traffic operations, respectively.

Table 5: 2022 Future Background Levels of Service

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Maximum v/c ratio [2]	95th Percentile Queues > Storage
Highway 9 and Tottenham Road	Signal	A.M.	B	14.9 s	0.74 (SBL)	63.5 m > 50 m (SBL)
		P.M.	B	15.9 s	0.74 (EBL)	None

Note[1]: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU). The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM2000).

Note[2]: The maximum v/c ratio represents the maximum v/c ratio for the minor road approach movements at the intersection. Any movements that experience a v/c ratio in excess of 0.85 are considered critical per the MTO TIS Guidelines.

Table 6: 2027 Future Background Levels of Service

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Maximum v/c ratio [2]	95th Percentile Queues > Storage
Highway 9 and Tottenham Road	Signal	A.M.	B	16.6 s	0.77 (SBL)	70.5 m > 40 m (SBL)
		P.M.	C	20.4 s	0.80 (EBL)	109.1 m > 85 m (EBL)

Note[1]: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU). The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM2000).

Note[2]: The maximum v/c ratio represents the maximum v/c ratio for the minor road approach movements at the intersection. Any movements that experience a v/c ratio in excess of 0.85 are considered critical per the MTO TIS Guidelines.

Table 7: 2032 Future Background Levels of Service

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Maximum v/c ratio [2]	95th Percentile Queues > Storage
Highway 9 and Tottenham Road	Signal	A.M.	B	18.8 s	0.80 (SBL)	78.6 m > 40 m (SBL)
		P.M.	C	25.8 s	0.90 (EBL)	149.4 m > 85 m (EBL) 42.5 m > 40 m (SBL)

Note[1]: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU). The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM2000).

Note[2]: The maximum v/c ratio represents the maximum v/c ratio for the minor road approach movements at the intersection. Any movements that experience a v/c ratio in excess of 0.85 are considered critical per the MTO TIS Guidelines.

The intersection of Highway 9 and Tottenham Road is expected to change from LOS "B" to "C" during the weekday p.m. peak hour under 2032 future background conditions compared to existing conditions, with an increase in control delay of 13.2 seconds. While LOS "C" is considered satisfactory,

the eastbound left-turn movement is expected to operate with a volume-to-capacity ratio of 0.90 during the weekday p.m. peak hour, and the forecasted 95th percentile queue lengths for the southbound left-turn and eastbound left-turn movements are expected to exceed their respective designated storage lengths.

These metrics are attributed to background traffic growth over a 13-year horizon at an arterial-to-arterial intersection with heavy traffic volumes. However, these metrics are not uncommon, and the intersection is still expected to operate at overall satisfactory levels of service.

5.0 Site Generated Traffic

The proposed service station will result in additional vehicles on the boundary road network that would otherwise not exist. The proposed development will also result in additional turning movements at the study intersection.

5.1 Trip Generation

The trip generation of the proposed service station was forecasted using published data from the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition. The ITE Trip Generation Manual is a compendium of industry collected trip generation data across North America for a variety of land uses and is used industry wide as a source for trip generation forecasts.

Land Use Category (LUC) 945 "Gasoline/Service Station with Convenience Market" was considered to be the most appropriate to apply to the proposed gas station.

As defined by the ITE Trip Generation Handbook, 3rd Edition,, primary trips are made for the specific purpose of visiting the generator. Pass-by trips are made as intermediate stops on the way from an origin to a primary destination without a route diversion. Accordingly, these vehicles do not increase the volume of vehicles on the roadway.

The pass-by trips generated by the service station trips were forecasted using the rates provided by the ITE Trip Generation Handbook, 3rd Edition for LUC 945. The pass-by trip percentage for the weekday a.m. peak period is 62% and the pass-by trip percentage for the weekday p.m. peak period is 56%.

Relevant excerpts from the ITE Trip Generation Manual, 10th Edition and ITE Trip Generation Handbook, 3rd Edition have been included in **Appendix G**. The forecasted trip generation of the development is summarized in **Table 8**.

Table 8: Proposed Service Station Trip Generation

Land Use	Peak Hour	Trip Type	Trips Generated		
			Inbound	Outbound	Total
LUC 945 "Gasoline/Service Station with Convenience Market" (6 fuelling stations)	A.M.	Primary	14	14	29
		Pass-by	24	23	47
	P.M.	Primary	19	18	37
		Pass-by	24	23	47

5.2 Trip Distribution and Assignment

5.3 Primary Trips

The primary trips generated by the proposed development were distributed to the boundary road network based on expected catchment areas in the surrounding area. The community of Tottenham is located to the north via Tottenham Road, the community of Schomberg is located to the east via Highway 9 and the Town of Orangeville and Town of Mono are located to the west via Highway 9. Therefore, an even traffic disbursement to and from the north, east and west was assumed for primary trips.

Figure 7 outlines the primary trip distribution and **Figure 9** outlines the corresponding primary trip assignment.

5.4 Pass-By Trips

The pass-by trips generated by the proposed development were distributed to the boundary road network based on the existing travel patterns observed at the intersection of Highway 9 and Tottenham Road.

Figure 8 outlines the pass-by trip distribution and **Figure 10** outlines the corresponding pass-by trip assignment.

6.0 Future Total Conditions

6.1 Basis of Assessment

The site generated traffic volumes illustrated in **Figures 9 and 10** were added to the 2022, 2027 and 2032 future background traffic volumes in **Figures 4, 5 and 6**, respectively, to determine the future total traffic volumes. **Figures 11, 12 and 13** outline the 2022, 2027 and 2032 future total traffic volumes, respectively.

6.2 Site Access Configuration

The development proposes the following lane configurations at the south approach of Highway 9 and Tottenham Road:

- Outbound left-turn lane
- Outbound through/right-turn lane
- Inbound lane

The proposed lane configurations at the south approach mirror the existing lane configurations at the north approach to maintain geometric alignment and design consistency. Analysis of future total traffic operations at the south approach indicate that the proposed lane configurations are expected to result in satisfactory traffic operations (see Section 6.3).

The designated storage length for the outbound turn lanes is proposed to be approximately 35 metres. Analysis of forecasted 95th percentile queue lengths for the outbound movements under future total conditions indicate that the maximum forecasted outbound queue is less than 15 metres during the peak hours which can be accommodated within the outbound lanes. It is also noted that the proposed storage length of 35 metres can accommodate a typical A-Train Double (ATD) truck which has a length of 24.5 metres per the Transportation Association of Canada (TAC) Geometric Design

Guide for Canadian Roads (GDGCR). This vehicle profile represents a typical fuel truck which is the design vehicle for the site.

The proposed width of the inbound lane is 8.65 metres to allow an ATD truck to conduct an eastbound right-turn movement from Highway 9 and enter the site without rutting the curb. This proposed width is similar to the width of the existing northbound lane at the north approach of Highway 9 and Tottenham Road.

Therefore, the proposed geometrics at the south approach of Highway 9 and Tottenham Road are supportable from a traffic operations perspective.

Analysis of forecasted 95th percentile queue lengths for the westbound left-turn movement of the intersection of Highway 9 and Tottenham Road under future total conditions indicate that the existing westbound left-turn lane at the intersection can accommodate the forecasted queue lengths and thus does not need to be modified.

6.3 Intersection Operations

The future total intersection operations at the study intersections were analyzed using the 2022, 2027 and 2032 future total traffic volumes illustrated in **Figures 11, 12 and 13,** respectively. Detailed capacity analysis worksheets are included in **Appendix E**. Signal timing splits have been optimized for the assessment of future total conditions.

Table 9, Table 10 and Table 11 outline the 2022, 2027 and 2032 future total traffic operations, respectively.

Table 9: 2022 Future Total Levels of Service

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Maximum v/c ratio [2]	95th Percentile Queues > Storage
Highway 9 and Tottenham Road/Site Access	Signal	A.M.	B	15.7 s	0.74 (SBL)	62.9 m > 40 m (SBL)
		P.M.	B	15.9 s	0.74 (EBL)	None

Note[1]: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU). The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM2000).

Note[2]: The maximum v/c ratio represents the maximum v/c ratio for the minor road approach movements at the intersection. Any movements that experience a v/c ratio in excess of 0.85 are considered critical per the MTO TIS Guidelines.

Table 10: 2027 Future Total Levels of Service

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Maximum v/c ratio [2]	95th Percentile Queues > Storage
Highway 9 and Tottenham Road/Site Access	Signal	A.M.	B	16.8 s	0.77 (SBL)	69.8 m > 40 m (SBL)
		P.M.	B	19.8 s	0.79 (EBL)	102.0 m > 85.0m (EBL)

Note[1]: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU). The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM2000).

Note[2]: The maximum v/c ratio represents the maximum v/c ratio for the minor road approach movements at the intersection. Any movements that experience a v/c ratio in excess of 0.85 are considered critical per the MTO TIS Guidelines.

Table 11: 2032 Future Total Levels of Service

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Maximum v/c ratio [2]	95th Percentile Queues > Storage
Highway 9 and Tottenham Road/Site Access	Signal	A.M.	B	19.1 s	0.80 (SBL)	78.3 m > 40 m (SBL)
		P.M.	C	25.3 s	0.89 (EBL)	146.9 m > 85 m (EBL) 42.3 m > 40 m (SBL)

Note[1]: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU). The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM2000).

Note[2]: The maximum v/c ratio represents the maximum v/c ratio for the minor road approach movements at the intersection. Any movements that experience a v/c ratio in excess of 0.85 are considered critical per the MTO TIS Guidelines.

The intersection of Highway 9 and Tottenham Road is expected to operate at unchanged levels of service during the weekday a.m. and p.m. peak hours under 2032 future total conditions compared to 2032 future background conditions. The eastbound left-turn movement is expected to operate with a volume-to-capacity ratio of 0.89 during the weekday p.m. peak hour, and the forecasted 95th percentile queue lengths for the southbound left-turn and eastbound left-turn movements are expected to exceed their respective designated storage lengths.

These metrics are attributed to background traffic growth over a 13-year horizon at an arterial-to-arterial intersection with heavy traffic volumes.

However, it is noted that the overall intersection delay, eastbound left-turn volume-to-capacity ratio and eastbound left-turn 95th percentile queue length are all expected to slightly decrease under future total conditions. This is attributed to the pass-by diversions applied to traffic for the critical eastbound left-turn movement with the build-out of the proposed gas station.

The intersection of Highway 9 and Tottenham Road is still expected to operate at overall satisfactory levels of service. These operations indicate that the addition of site traffic to the intersection is expected to minimally impact traffic operations.

Therefore, the proposed development is supportable from a traffic operations perspective.

7.0 Sensitivity Analysis

A sensitivity analysis was conducted to assess the impacts of the proposed development with a seasonal adjustment factor applied to the recorded existing traffic volumes at the intersection of Highway 9 and Tottenham Road to reflect summer conditions. The ultimate 2032 horizon year was analyzed under both future background and future total conditions in this sensitivity analysis.

7.1 Seasonal Adjustment Factor

The MTO's "Provincial Highways Traffic Volumes 1988-2016" were analyzed to compare Annual Average Daily Traffic (AADT) volumes on Highway 9 at Tottenham Road to Summer Average Daily Traffic (SADT) volumes. A comparison of the AADT and SADT volumes from 2013-2016 indicates an average increase in traffic volumes under summer conditions of approximately 20%. Therefore, a seasonal adjustment factor of 20% was applied to the existing traffic volumes on Highway 9 and Tottenham Road, and carried forward in forecasting 2032 future background and 2032 future total traffic volumes.

Figures 14 and 15 illustrate the 2032 future background sensitivity traffic volumes and 2032 future total sensitivity traffic volumes, respectively.

7.2 Intersection Operations

The future background and future total sensitivity traffic operations at the study intersections were analyzed using the 2032 future background and future total sensitivity total traffic volumes illustrated in **Figures 14 and 15**, respectively. Detailed capacity analysis worksheets are included in **Appendix E**. Signal timing splits have been optimized for the assessment of future background conditions.

Table 12 outlines the 2032 future background sensitivity traffic operations.

Table 12: 2032 Future Background and Total Sensitivity Levels of Service

2032 Future Background Sensitivity						
Intersection	**Control**	**Peak Hour**	**Level of Service [1]**	**Control Delay**	**Maximum v/c ratio [2]**	**95th Percentile Queues > Storage**
Highway 9 and Tottenham Road/Site Access	Signal	A.M.	C	24.5 s	0.87 (SBL) 0.88 (SBTR)	106.4 m > 40 m (SBL)
		P.M.	D	52.3 s	1.19 (EBL) 1.00 (WBT)	227.0 m > 85 m (EBL) 50.8 m > 40 m (SBL)
2032 Future Total Sensitivity						
Intersection	**Control**	**Peak Hour**	**Level of Service [1]**	**Control Delay**	**Maximum v/c ratio [2]**	**95th Percentile Queues > Storage**
Highway 9 and Tottenham Road/Site Access	Signal	A.M.	C	24.9 s	0.87 (SBL) 0.89 (SBTR)	106.3m > 40 m (SBL)
		P.M.	D	48.9 s	1.17 (EBL) 0.99 (WBT)	222.9 m > 85 m (EBL) 49.9 m > 40 m (SBL)

Note[1]: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU). The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM2000).

Note[2]: The maximum v/c ratio represents the maximum v/c ratio for the minor road approach movements at the intersection. Any movements that experience a v/c ratio in excess of 0.85 are considered critical per the MTO TIS Guidelines.

The intersection of Highway 9 and Tottenham Road is expected to operate at unchanged levels of service during the weekday a.m. and p.m. peak hours from 2032 future background sensitivity conditions to 2032 future total sensitivity conditions. While several movements are still expected to operate with volume-to-capacity ratios approaching or exceeding capacity and with 95th percentile queue lengths that exceed storage lengths; the overall intersection delay, volume-to-capacity ratios and 95th percentile queue lengths are still expected to slightly decrease under future total sensitivity conditions. This is attributed to the pass-by diversions applied to traffic for the critical eastbound left-turn movement with the build-out of the proposed gas station.

These results are consistent with the results outlined in Section 6.3. These operations indicate that the addition of site traffic to the intersection is still expected to minimally impact traffic operations and that no external roadway improvements are required to accommodate the proposed development.

8.0 Safety Analysis

8.1 Access Management

As discussed earlier, the development proposes the removal of the portion of the existing westerly access to Highway 9 on the subject property which would result in the westerly access being solely for the adjacent 10795 Highway 9 property. The sole access to the site is proposed via the existing south approach of the signalized intersection of Highway 9 and Tottenham Road.

The removal of the secondary access to Highway 9 would be expected to improve traffic safety for all road users by restricting ingress and egress to and from the site to the existing signalized intersection, thus resulting in more defined and predictable ingress and egress travel patterns.

The access density and spacing guidelines set out in the MTO's Highway Corridor Management Manual (September 2018) are satisfied by the development proposal as the proposed site access connects to the existing signalized intersection of Highway 9 and Tottenham Road, and the removal of the secondary access to Highway 9 negates any issues pertaining to access spacing.

8.2 Access Offset

Per the MTO's Highway Corridor Management Manual, the minimum access offset for a commercial or private road access from a Class 2B Arterial Road (i.e. Highway 9) is 45 metres. However, this offset would not be possible to achieve given property constraints.

The proposed site layout provides an access connection depth of approximately 10 metres for inbound traffic not including the effective connection depth provided by the inbound curb radius. This effective access connection depth of approximately 20 metres could accommodate between two to three inbound passenger cars without obstructing Highway 9. However, there are no obstructions for inbound passenger cars to the fuelling stations. Additionally, the proposed loading space and underground gas tank storage are located at the southerly limit of the site and thus will not obstruct inbound traffic from Highway 9. Therefore, the site layout is not likely to result in queueing for inbound passenger cars at the site access.

The proposed site layout provides a storage length of approximately 35 metres for the outbound (northbound) turn lanes which can accommodate the forecasted outbound 95th percentile queue lengths under future total conditions and can accommodate an ATD truck exiting the site.

Therefore, the proposed site layout is supportable from a transportation safety perspective.

8.3 Internal Vehicle Circulation

The Development Concept Plan illustrates an ATD truck entering the site from Highway 9 in both directions, maneuvering the site to the underground fuel storage tanks, and exiting the site. The vehicle turning analysis shown on the plan does not identify any maneuverability constraints within the site for ATD trucks.

Additional vehicle turning analysis was conducted for a Medium Single Unit (MSU) delivery truck entering the site, maneuvering the site to the loading space, and exiting the site. Vehicle turning analysis indicates that there are no expected maneuverability constraints within the site for MSU delivery trucks.

Appendix H contains the MSU vehicle turning analysis.

9.0 Conclusions

The analysis contained within this report has resulted in the following key findings:

- The proposed service station development is expected to generate approximately 76 and 84 trips in the weekday a.m. and p.m. peak hours, respectively.

- The study intersections operate well with a LOS "B" or better under 2019 existing conditions and are forecasted to continue operating with a LOS "C" or better under 2022 through 2032 future background and future total traffic volume conditions.

- Under 2032 future background and future total conditions, the eastbound left-turn movement is expected to operate near capacity and the forecasted 95th percentile queue lengths for the southbound left-turn and eastbound left-turn movements are expected to exceed their respective designated storage lengths. These metrics are attributed to background traffic growth over a 13-year horizon at an arterial-to-arterial intersection with heavy traffic volumes.

- However, it is noted that the overall intersection delay, eastbound left-turn volume-to-capacity ratio and eastbound left-turn 95th percentile queue length are all expected to slightly decrease under future total conditions. This is attributed to the pass-by diversions applied to traffic for the critical eastbound left-turn movement with the build-out of the proposed gas station.

- The intersection of Highway 9 and Tottenham Road is still expected to operate at overall satisfactory levels of service.

- These operations indicate that the addition of site traffic to the intersection is expected to minimally impact traffic operations. Therefore, the proposed development is supportable from a traffic operations perspective.

- Sensitivity analysis of 2032 future background and total conditions with a seasonal adjustment factor of 20% applied to the existing traffic volumes indicates that the addition of site traffic to the road network is still expected to minimally impact traffic operations and that no external roadway improvements are required to accommodate the proposed development.

- Analysis of safety components for the proposed development indicate that:

    - The development proposal satisfies the MTO's access spacing and density guidelines;
    - The proposed site layout provides adequate store length for the outbound (northbound) turn lanes which can accommodate the forecasted outbound 95th percentile queue lengths under future total conditions and can accommodate a typical fuel truck exiting the site;
    - The proposed site layout is not likely to result in queueing for inbound passenger cars at the site access; and
    - There are no expected maneuverability constraints within the site for typica fuel trucks nor delivery trucks.

The analysis undertaken herein was prepared using the most recent Development Concept Plan. Any minor changes to the development proposal will not materially affect the conclusions contained within this report.

In conclusion, the proposed development can be supported from a transportation operations and safety perspective.

Respectfully submitted by,

C.F. CROZIER & ASSOCIATES INC.

Michael A. Linton, MASc., P.Eng.
Associate

C.F. CROZIER & ASSOCIATES INC.

Darren Loro, C.E.T.
Transportation Technologist

/SK

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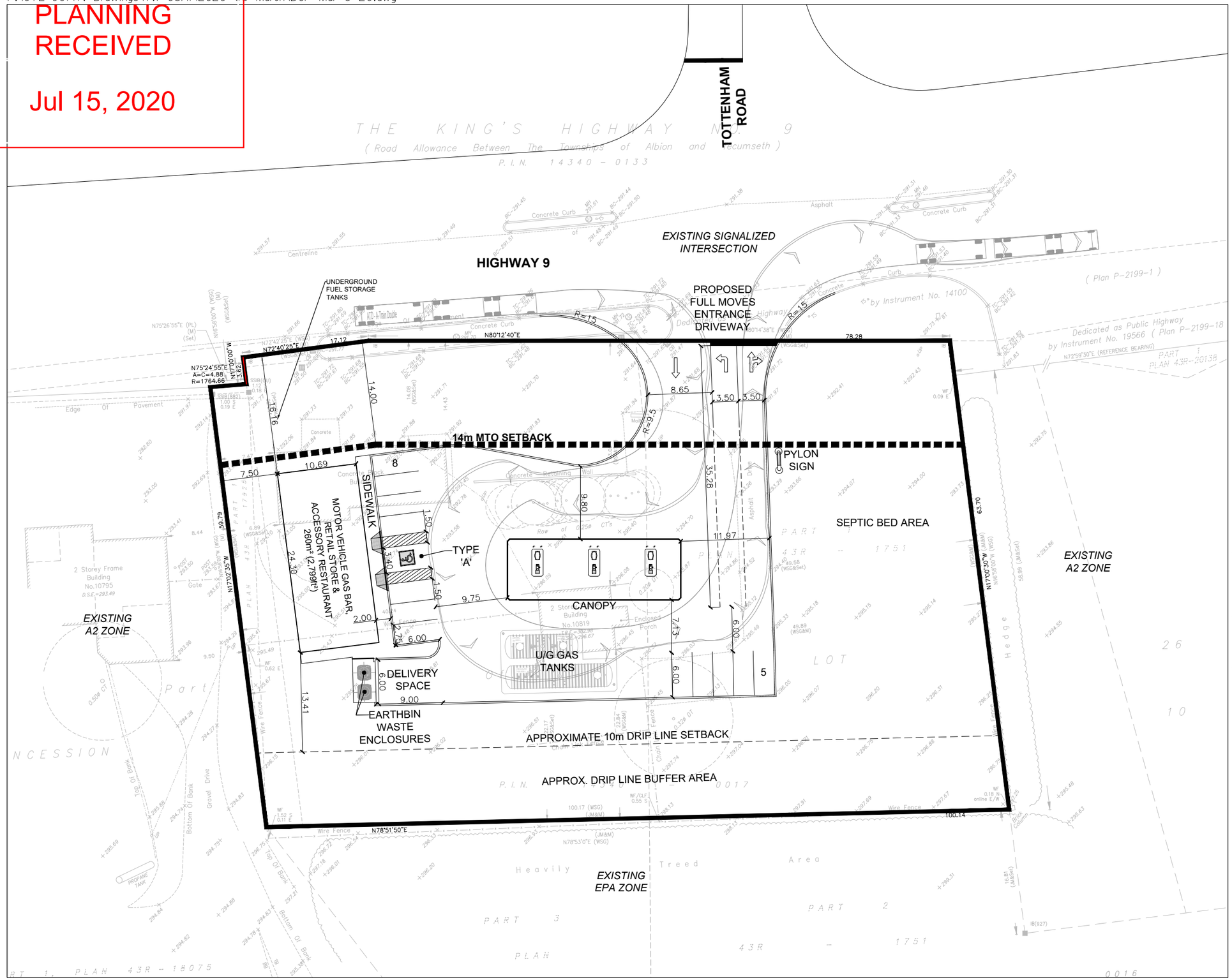
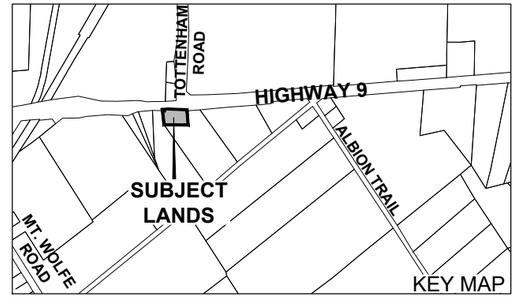
APPENDIX A

Site Plan

P:\972-001\7. Drawings\7.1 GSAI\2020 03 March\DCP Mar 5 20.dwg





DEVELOPMENT CONCEPT PLAN
PROPOSED GAS BAR

10819 HIGHWAY 9
PART OF LOT 26,
CONCESSION 10 (ALBION)
TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL

DEVELOPMENT STATISTICS

TOTAL SITE AREA:	0.64ha (1.58ac)
TOTAL DRIP LINE BUFFER AREA*:	0.09ha (0.22ac)
TOTAL 14m MTO SETBACK AREA:	0.14ha (0.35ac)
NET DEVELOPABLE AREA:	0.41ha (1.01ac)
TOTAL SITE LANDSCAPED AREA %:	0.31ha (48%)
LANDSCAPED AREA % EXCL. MTO SETBACK:	0.20ha (40%)

BUILDING STATISTICS

TOTAL GROSS FLOOR AREA:	260m² (2,799ft²)
BUILDING COVERAGE:	4%
BUILDING COVERAGE EXCL. MTO SETBACK:	5%

PARKING STATISTICS *(1 SPACE PER 20m²)*:

GAS BAR PARKING REQUIRED:	13 SPACES
GAS BAR PARKING PROVIDED:	13 SPACES

NOTES:

* NHS AREA & BUFFER LIMITS TO BE CONFIRMED BY TRCA
\- SEPTIC AREA TO BE CONFIRMED BY ENGINEER
\- POTABLE WATER WELL TO BE CONFIRMED

SCALE 1:500
MARCH 5, 2020

GSAI
Glen Schnarr & Associates Inc.

APPENDIX B

Official Plan Excerpts

Table 5.4

SIMCOE COUNTY ROAD SYSTEM

As approved by County Council

COUNTY ROAD NO.	DESCRIPTION	CLASSIFICATION	REQUIRED BASIC RIGHT OF WAY WIDTHS
1	County Road 27 to County Road 50	Primary Arterial	30.5 m
	County Road 50 to Simcoe/Dufferin Boundary Road	Secondary Arterial	30.5 m
3	County Road 4 to County Road 39	Secondary Arterial	36.0 m
4	Town of Bradford Limits to City Limits of Barrie	Controlled Access	45.0 m
5	County Road 15 to Simcoe/Dufferin Boundary	Secondary Arterial	30.5 m
6	County Road 27 to County Road 26	Primary Arterial	30.5 m
7	Highway 26 to 27/28 Sideroad Nottawasaga	Primary Arterial	45.0 m
	27/28 Sideroad Nottawasaga to Wasaga Beach	Secondary Arterial	36.0 m
8*	Highway 9 to Bradford	Secondary Arterial	20.0 m
9	County Road 10 to Creemore	Primary Arterial	30.5 m
	Creemore to Grey Boundary	Secondary Arterial	30.5 m
10	Highway 9 to Industrial Parkway (Including Tottenham By-Pass)	Controlled Access	40.0 m (36.0 metre minimum where constraints exist)
	Industrial Parkway to Highway 89	Controlled Access	45.0 m

	Highway 89 to Town of Wasaga Beach	Primary Arterial	40.0 m (36.0 metre minimum where constraints exist)
11	Concession 1 former Orillia Township to Highway 400	Primary Arterial	30.5 m
12	Lisle to Dufferin Boundary	Secondary Arterial	30.5 m
13	Highway 89 to Lisle	Secondary Arterial	30.5 m
14	County Road 10 to County Road 50	Secondary Arterial	30.5 m
15	Alliston to C.F.B. Borden	Primary Arterial	30.5 m
16	Highway 12 to Highway 400	Primary Arterial	30.5 m
17	Coldwater to Concession 3/4	Secondary Arterial	30.5 m
	Concession 3/4 to Muskoka	Secondary Arterial	30.5 m
19	Highway 12 to Elmvale	Primary Arterial	30.5 m
20	Highway 11 to Hawkstone	Secondary Arterial	30.5 m
	Hawkstone to Barrie	Secondary Arterial	30.5 m
21	County Road 27 West	Primary Arterial	30.5 m
	County Road 27 East	Primary Arterial	40.0 m (36.0 metre minimum where constraints exist)
22	Highway 12 to Highway 26	Primary Arterial	36.0 m
23	Highway 93 to Highway 400	Secondary Arterial	30.5 m
25	County Road 93 to County Road 6	Primary Arterial	30.5 m
26	Penetanguishene to County Road 6	Secondary Arterial	30.5 m
	County Road 6 to Lafontaine	Secondary Arterial	30.5 m

APPENDIX C

Traffic Data

Spectrum

Turning Movement Count
Location Name: HWY 9 & TOTTENHAM RD / #10819 EAST ACCESS
Date: Tue, Dec 03, 2019 Deployment Lead: Theo Daglis

Crozier & Associates

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Turning Movement Count (1 . HWY 9 & TOTTENHAM RD / #10819 EAST ACCESS) CustID: 99900015 MioID: 730562

Start Time	N Approach TOTTENHAM RD						E Approach HWY 9						S Approach #10819 EAST ACCESS						W Approach HWY 9						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total		
06:00:00	85	0	47	0	0	132	6	51	0	0	0	57	0	0	0	0	0	0	0	99	13	0	0	112	301	
06:15:00	77	0	41	0	0	118	8	65	0	0	0	73	0	0	0	0	0	0	0	133	18	0	0	151	342	
06:30:00	89	0	55	0	0	144	10	62	0	0	0	72	0	0	0	0	0	0	0	107	15	0	0	122	338	
06:45:00	152	0	68	0	0	220	14	74	0	0	0	88	0	0	0	0	0	0	0	138	17	0	0	155	463	1444
07:00:00	93	0	61	0	0	154	19	80	0	0	0	99	1	0	0	0	0	1	0	119	14	0	0	133	387	1530
07:15:00	101	0	46	0	0	147	21	107	0	0	0	128	0	0	0	0	0	0	0	131	25	0	0	156	431	1619
07:30:00	101	0	41	0	0	142	15	107	0	0	0	122	0	0	0	0	0	0	0	117	17	0	0	134	398	1679
07:45:00	91	0	59	0	0	150	22	114	0	0	0	136	0	0	0	0	0	0	0	133	21	0	0	154	440	1656
08:00:00	85	0	49	0	0	134	12	126	0	0	0	138	0	0	0	0	0	0	0	137	20	0	0	157	429	1698
08:15:00	67	0	34	0	0	101	22	110	0	0	0	132	0	0	0	0	0	0	0	133	26	0	0	159	392	1659
08:30:00	60	0	29	0	0	89	17	96	0	0	0	113	0	0	0	0	0	0	0	141	29	0	0	170	372	1633
08:45:00	40	0	33	0	0	73	22	89	3	0	0	114	0	0	0	0	0	0	0	127	28	0	0	155	342	1535
09:00:00	64	0	40	0	0	104	20	82	1	0	0	103	0	0	0	0	0	0	0	130	24	0	0	154	361	1467
09:15:00	45	1	30	0	0	76	11	72	0	0	0	83	0	0	0	0	0	0	0	133	19	0	0	152	311	1386
09:30:00	39	0	32	0	0	71	15	83	0	0	0	98	0	0	0	0	0	0	0	126	18	0	0	144	313	1327
09:45:00	40	0	39	0	0	79	13	72	0	0	0	85	0	0	0	0	0	0	0	108	19	0	0	127	291	1276
BREAK																										
15:00:00	23	1	18	0	0	42	27	129	1	0	0	157	0	0	1	0	0	1	0	108	61	0	0	169	369	
15:15:00	47	0	23	0	0	70	44	137	0	0	0	181	1	0	0	0	0	1	0	106	68	0	0	174	426	
15:30:00	38	0	22	0	0	60	26	149	1	0	0	176	1	0	0	0	0	1	0	121	100	0	0	221	458	
15:45:00	28	0	23	0	0	51	39	147	0	0	0	186	0	0	0	0	0	0	0	142	75	0	0	217	454	1707
16:00:00	35	0	27	0	0	62	48	140	1	0	0	189	1	0	1	0	0	2	0	121	85	0	0	206	459	1797
16:15:00	29	0	29	0	0	58	36	160	0	0	0	196	0	0	1	0	0	1	0	129	84	0	0	213	468	1839
16:30:00	29	0	28	0	0	57	48	165	2	0	0	215	0	0	0	0	0	0	0	123	97	0	0	220	492	1873
16:45:00	34	1	20	0	0	55	46	165	2	0	0	213	0	0	0	0	0	0	2	141	103	0	0	246	514	1933
17:00:00	28	0	33	0	0	61	44	144	0	0	0	188	3	3	3	0	0	9	0	159	111	0	0	270	528	2002
17:15:00	29	0	22	0	0	51	47	182	0	0	0	229	0	0	0	0	0	0	0	132	102	0	0	234	514	2048
17:30:00	38	0	23	0	0	61	31	130	0	0	0	161	0	0	0	0	0	0	0	113	101	0	0	214	436	1992
17:45:00	26	0	24	0	0	50	44	174	1	0	0	219	0	0	0	0	0	0	0	100	89	0	0	189	458	1936
18:00:00	22	0	21	0	0	43	41	121	1	0	0	163	1	1	1	0	0	3	1	88	79	0	0	168	377	1785
18:15:00	25	0	16	0	0	41	37	98	0	0	0	135	0	1	0	0	0	1	0	71	81	0	0	152	329	1600

18:00:00	20	0	7	0	0	27	27	85	1	0	0	113	0	0	1	0	0	1	0	68	55	0	0	123	264	1428
18:45:00	12	0	11	0	0	23	34	71	0	0	0	105	0	0	0	0	0	0	0	42	62	0	0	104	232	1202
Grand Total	1692	3	1051	0	0	2746	866	3587	14	0	0	4467	8	5	8	0	0	21	3	3776	1676	0	0	5455	**12689**	-
Approach%	61.6%	0.1%	38.3%	0%		-	19.4%	80.3%	0.3%	0%		-	38.1%	23.8%	38.1%	0%		-	0.1%	69.2%	30.7%	0%		-	**-**	-
Totals %	13.3%	0%	8.3%	0%		21.6%	6.8%	28.3%	0.1%	0%		35.2%	0.1%	0%	0.1%	0%		0.2%	0%	29.8%	13.2%	0%		43%	**-**	-
Heavy	49	0	50	0		-	52	377	0	0		-	1	0	0	0		-	0	456	50	0		-	**-**	-
Heavy %	2.9%	0%	4.8%	0%		-	6%	10.5%	0%	0%		-	12.5%	0%	0%	0%		-	0%	12.1%	3%	0%		-	**-**	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-

Spectrum

Turning Movement Count
Location Name: HWY 9 & TOTTENHAM RD / #10819 EAST ACCESS
Date: Tue, Dec 03, 2019 Deployment Lead: Theo Daglis

Crozier & Associates

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Peak Hour: 07:15 AM - 08:15 AM Weather: Broken Clouds (-6.81 °C)

Start Time	N Approach TOTTENHAM RD						E Approach HWY 9						S Approach #10819 EAST ACCESS						W Approach HWY 9						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
07:15:00	101	0	46	0	0	147	21	107	0	0	0	128	0	0	0	0	0	0	0	131	25	0	0	156	431
07:30:00	101	0	41	0	0	142	15	107	0	0	0	122	0	0	0	0	0	0	0	117	17	0	0	134	398
07:45:00	91	0	59	0	0	150	22	114	0	0	0	136	0	0	0	0	0	0	0	133	21	0	0	154	440
08:00:00	85	0	49	0	0	134	12	126	0	0	0	138	0	0	0	0	0	0	0	137	20	0	0	157	429
Grand Total	378	0	195	0	0	573	70	454	0	0	0	524	0	0	0	0	0	0	0	518	83	0	0	601	**1698**
Approach%	66%	0%	34%	0%		-	13.4%	86.6%	0%	0%		-	0%	0%	0%	0%		-	0%	86.2%	13.8%	0%		-	-
Totals %	22.3%	0%	11.5%	0%		33.7%	4.1%	26.7%	0%	0%		30.9%	0%	0%	0%	0%		0%	0%	30.5%	4.9%	0%		35.4%	-
PHF	0.94	0	0.83	0		0.96	0.8	0.9	0	0		0.95	0	0	0	0		0	0	0.95	0.83	0		0.96	-
Heavy	6	0	8	0		14	12	51	0	0		63	0	0	0	0		0	0	72	7	0		79	-
Heavy %	1.6%	0%	4.1%	0%		2.4%	17.1%	11.2%	0%	0%		12%	0%	0%	0%	0%		0%	0%	13.9%	8.4%	0%		13.1%	-
Lights	372	0	187	0		559	58	403	0	0		461	0	0	0	0		0	0	446	76	0		522	-
Lights %	98.4%	0%	95.9%	0%		97.6%	82.9%	88.8%	0%	0%		88%	0%	0%	0%	0%		0%	0%	86.1%	91.6%	0%		86.9%	-
Single-Unit Trucks	0	0	6	0		6	8	32	0	0		40	0	0	0	0		0	0	39	5	0		44	-
Single-Unit Trucks %	0%	0%	3.1%	0%		1%	11.4%	7%	0%	0%		7.6%	0%	0%	0%	0%		0%	0%	7.5%	6%	0%		7.3%	-
Buses	1	0	0	0		1	0	1	0	0		1	0	0	0	0		0	0	1	0	0		1	-
Buses %	0.3%	0%	0%	0%		0.2%	0%	0.2%	0%	0%		0.2%	0%	0%	0%	0%		0%	0%	0.2%	0%	0%		0.2%	-
Articulated Trucks	5	0	2	0		7	4	18	0	0		22	0	0	0	0		0	0	32	2	0		34	-
Articulated Trucks %	1.3%	0%	1%	0%		1.2%	5.7%	4%	0%	0%		4.2%	0%	0%	0%	0%		0%	0%	6.2%	2.4%	0%		5.7%	-

Spectrum

Turning Movement Count
Location Name: HWY 9 & TOTTENHAM RD / #10819 EAST ACCESS
Date: Tue, Dec 03, 2019 Deployment Lead: Theo Daglis

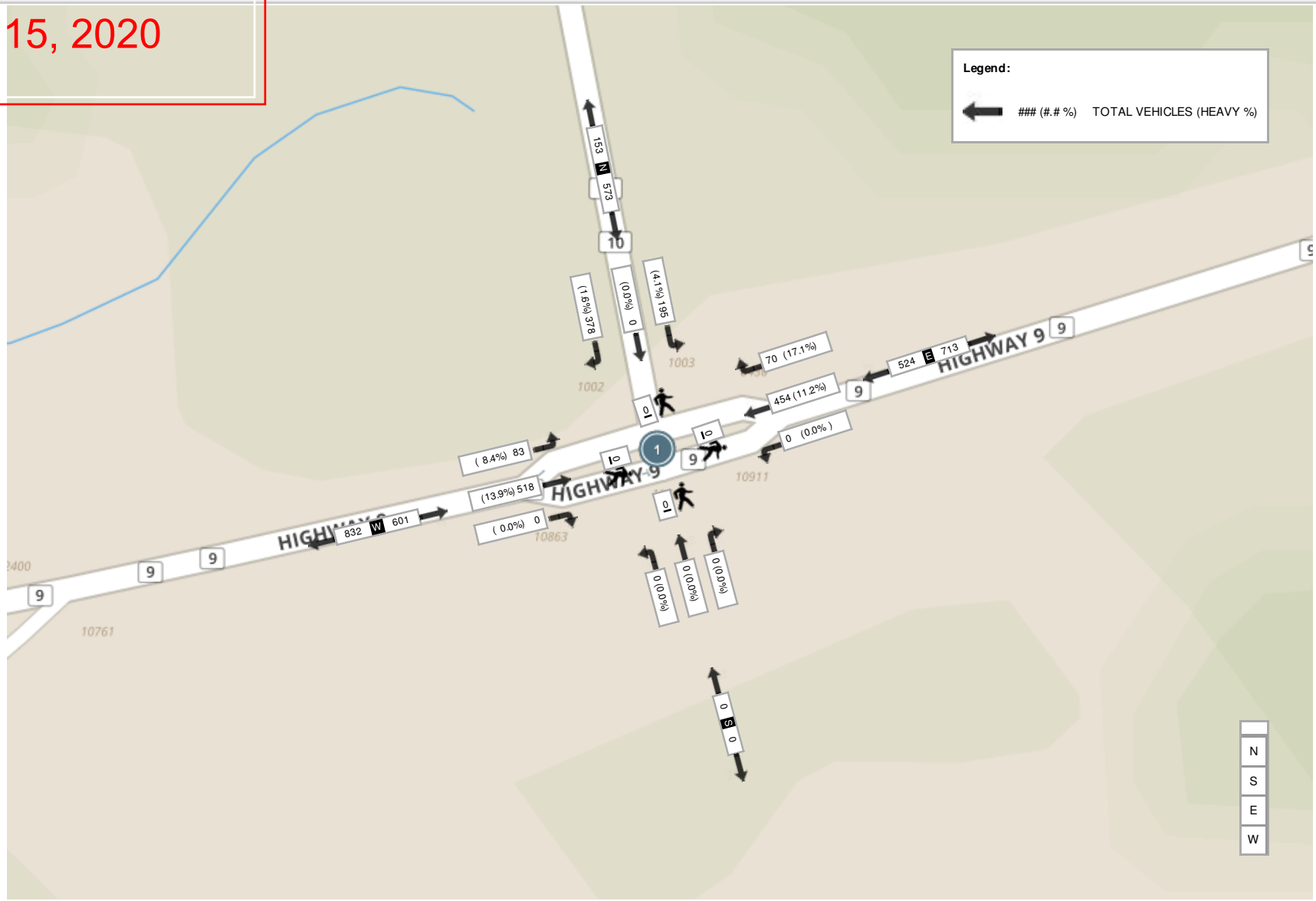
Crozier & Associates

, ,

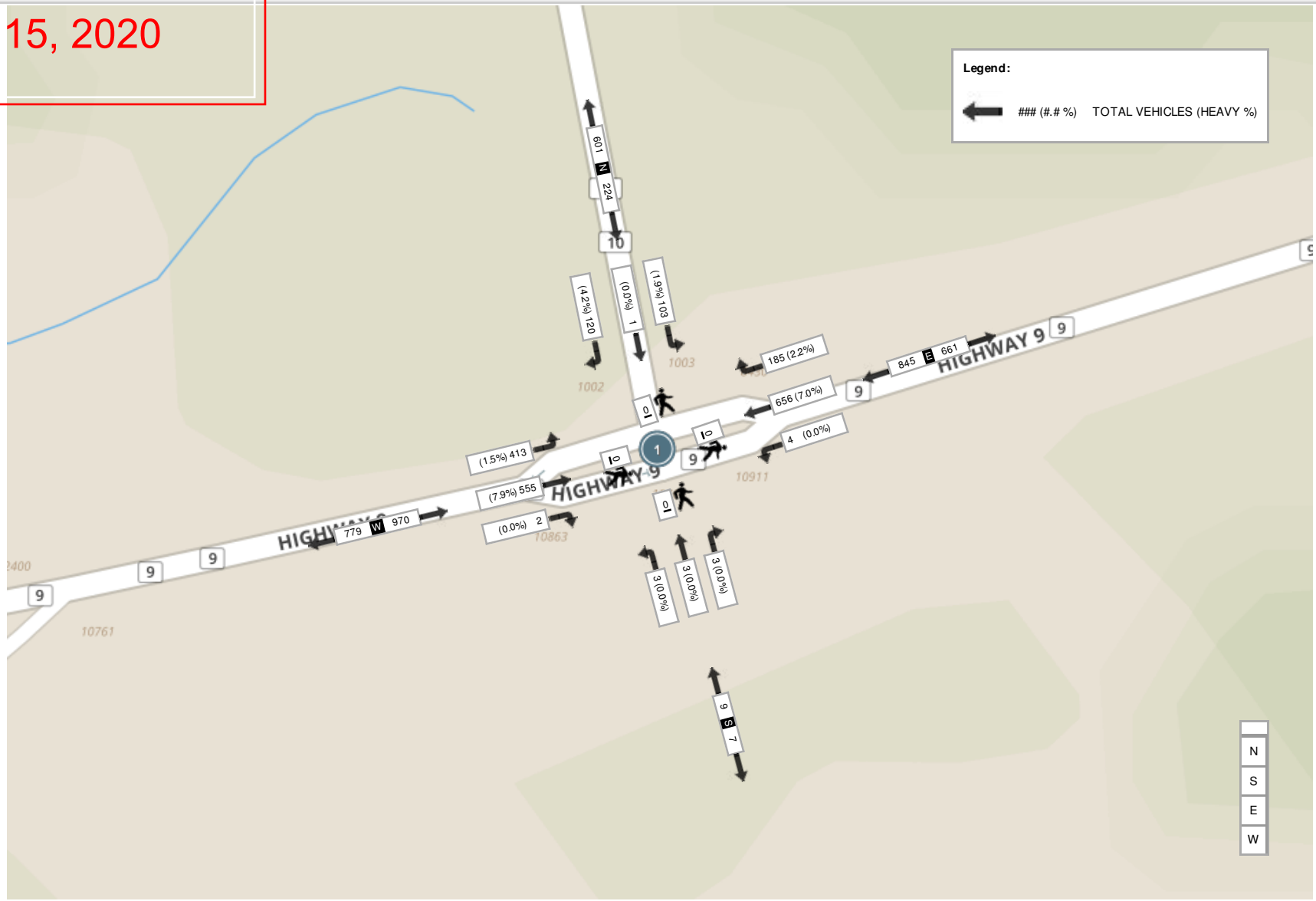
Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (0.28 °C)

Start Time	N Approach TOTTENHAM RD						E Approach HWY 9						S Approach #10819 EAST ACCESS						W Approach HWY 9						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
16:30:00	29	0	28	0	0	57	48	165	2	0	0	215	0	0	0	0	0	0	0	123	97	0	0	220	492
16:45:00	34	1	20	0	0	55	46	165	2	0	0	213	0	0	0	0	0	0	2	141	103	0	0	246	514
17:00:00	28	0	33	0	0	61	44	144	0	0	0	188	3	3	3	0	0	9	0	159	111	0	0	270	528
17:15:00	29	0	22	0	0	51	47	182	0	0	0	229	0	0	0	0	0	0	0	132	102	0	0	234	514
Grand Total	120	1	103	0	0	224	185	656	4	0	0	845	3	3	3	0	0	9	2	555	413	0	0	970	**2048**
Approach%	53.6%	0.4%	46%	0%		-	21.9%	77.6%	0.5%	0%		-	33.3%	33.3%	33.3%	0%		-	0.2%	57.2%	42.6%	0%		-	-
Totals %	5.9%	0%	5%	0%		10.9%	9%	32%	0.2%	0%		41.3%	0.1%	0.1%	0.1%	0%		0.4%	0.1%	27.1%	20.2%	0%		47.4%	-
PHF	0.88	0.25	0.78	0		0.92	0.96	0.9	0.5	0		0.92	0.25	0.25	0.25	0		0.25	0.25	0.87	0.93	0		0.9	-
Heavy	5	0	2	0		7	4	46	0	0		50	0	0	0	0		0	0	44	6	0		50	-
Heavy %	4.2%	0%	1.9%	0%		3.1%	2.2%	7%	0%	0%		5.9%	0%	0%	0%	0%		0%	0%	7.9%	1.5%	0%		5.2%	-
Lights	115	1	101	0		217	181	610	4	0		795	3	3	3	0		9	2	511	407	0		920	-
Lights %	95.8%	100%	98.1%	0%		96.9%	97.8%	93%	100%	0%		94.1%	100%	100%	100%	0%		100%	100%	92.1%	98.5%	0%		94.8%	-
Single-Unit Trucks	2	0	1	0		3	1	20	0	0		21	0	0	0	0		0	0	16	1	0		17	-
Single-Unit Trucks %	1.7%	0%	1%	0%		1.3%	0.5%	3%	0%	0%		2.5%	0%	0%	0%	0%		0%	0%	2.9%	0.2%	0%		1.8%	-
Buses	0	0	0	0		0	1	2	0	0		3	0	0	0	0		0	0	0	0	0		0	-
Buses %	0%	0%	0%	0%		0%	0.5%	0.3%	0%	0%		0.4%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Articulated Trucks	3	0	1	0		4	2	24	0	0		26	0	0	0	0		0	0	28	5	0		33	-
Articulated Trucks %	2.5%	0%	1%	0%		1.8%	1.1%	3.7%	0%	0%		3.1%	0%	0%	0%	0%		0%	0%	5%	1.2%	0%		3.4%	-

Peak Hour: 07:15 AM - 08:15 AM **Weather: Broken Clouds (-6.81 °C)**



Peak Hour: 04:30 PM - 05:30 PM **Weather: Overcast Clouds (0.28 °C)**



ase Timing 1-8 - Set 1, Peel - Hwy 9 @ Tottenham Rd

Next
Prev.
Save
Upload
Dnload
Toggle
Copy
Close

Phase:	1			4			8	
Walk	0	7	0	7	0	7	0	7
Pedestrian Clear	0	23	0	23	0	23	0	23
Minimum Green	0	20	0	10	7	20	0	10
Passage	0.0	4.0	0.0	3.0	3.0	4.0	0.0	3.0
Maximum 1	0	50	0	35	15	50	0	35
Maximum 2	0	50	0	40	20	50	0	40
Yellow Change	0.0	5.9	0.0	5.9	3.0	5.9	0.0	5.9
Red Clear	0.0	1.7	0.0	2.7	0.0	1.7	0.0	2.7
Red Revert	0.0	2.0	0.0	2.0	0.0	2.0	0.0	2.0
Added Initial	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0
Maximum Initial	0	34	0	0	0	34	0	0
Time Before Reduction	0	0	0	0	0	0	0	0
Cars Before Reduction	0	0	0	0	0	0	0	0
Time To Reduce	0	0	0	0	0	0	0	0
Reduce By	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Minimum Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dynamic Max Limit	0	0	0	0	0	0	0	0
Dynamic Max Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alternate Walk	0	0	0	0	0	0	0	0
Advance Walk	0	0	0	0	0	0	0	0
Delay Walk	0	0	0	0	0	0	0	0
Alternate Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Start Delay	0	0	0	0	0	0	0	0
Conditional Svc. Min.	0	0	0	0	0	0	0	0
Green Clear	0	0	0	0	0	0	0	0
Alternate Ped Clear	0	0	0	0	0	0	0	0
Alternate Min Green	0	0	0	0	0	0	0	0

APPENDIX D

Level of Service Definitions

Level of Service Definitions

Two-Way Stop Controlled Intersections

Level of Service	Control Delay per Vehicle (seconds)	Interpretation
A	≤ 10	EXCELLENT. Large and frequent gaps in traffic on the main roadway. Queuing on the minor street is rare.
B	> 10 and ≤ 15	VERY GOOD. Many gaps exist in traffic on the main roadway. Queuing on the minor street is minimal.
C	> 15 and ≤ 25	GOOD. Fewer gaps exist in traffic on the main roadway. Delay on minor approach becomes more noticeable.
D	> 25 and ≤ 35	FAIR. Infrequent and shorter gaps in traffic on the main roadway. Queue lengths develop on the minor street.
E	> 35 and ≤ 50	POOR. Very infrequent gaps in traffic on the main roadway. Queue lengths become noticeable.
F	> 50	UNSATISFACTORY. Very few gaps in traffic on the main roadway. Excessive delay with significant queue lengths on the minor street.

Adapted from Highway Capacity Manual 2000, Transportation Research Board

Level of Service Definitions

Signalized Intersections

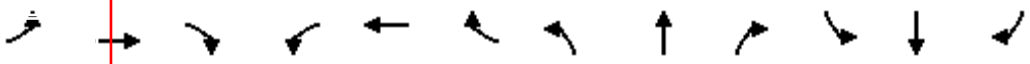
Level of Service	Control Delay per Vehicle (seconds)	Interpretation
A	≤ 10	EXCELLENT. Extremely favourable progression with most vehicles arriving during the green phase. Most vehicles do not stop and short cycle lengths may contribute to low delay.
B	> 10 and ≤ 20	VERY GOOD. Very good progression and/or short cycle lengths with slightly more vehicles stopping than LOS "A" causing slightly higher levels of average delay.
C	> 20 and ≤ 35	GOOD. Fair progression and longer cycle lengths lead to a greater number of vehicles stopping than LOS "B".
D	> 35 and ≤ 55	FAIR. Congestion becomes noticeable with higher average delays resulting from a combination of long cycle lengths, high volume-to-capacity ratios and unfavourable progression.
E	> 55 and ≤ 80	POOR. Lengthy delays values are indicative of poor progression, long cycle lengths and high volume-to-capacity ratios. Individual cycle failures are common with individual movement failures also common.
F	> 80	UNSATISFACTORY. Indicative of oversaturated conditions with vehicular demand greater than the capacity of the intersection.

Adapted from Highway Capacity Manual 2000, Transportation Research Board

APPENDIX E

Detailed Capacity Analysis Worksheets

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	518	0	0	454	70	0	0	0	195	0	378
Future Volume (vph)	83	518	0	0	454	70	0	0	0	195	0	378
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.5	2.9	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6
Storage Length (m)	85.0		0.0	85.0		85.0	0.0		0.0	40.0		0.0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (m)	75.0			80.0			7.6			40.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850					0.850	
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1616	3131	0	1752	3216	1365	0	1879	0	1736	1583	0
Flt Permitted	0.456									0.757		
Satd. Flow (perm)	775	3131	0	1752	3216	1365	0	1879	0	1383	1583	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						85					469	
Link Speed (k/h)		80			80			50			80	
Link Distance (m)		93.8			227.5			62.5			163.3	
Travel Time (s)		4.2			10.2			4.5			7.3	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	14%	0%	0%	11%	17%	0%	0%	0%	4%	0%	2%
Adj. Flow (vph)	86	540	0	0	473	73	0	0	0	203	0	394
Shared Lane Traffic (%)												
Lane Group Flow (vph)	86	540	0	0	473	73	0	0	0	203	394	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.04	1.01	1.01	1.11	1.01	1.01	1.01	1.01	1.01	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm				Perm	NA	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6		6	4			8		
Detector Phase	5	2		6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	20.0		20.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	10.0	37.6		37.6	37.6	37.6	38.6	38.6		38.6	38.6	
Total Split (s)	20.0	70.0		50.0	50.0	50.0	40.0	40.0		40.0	40.0	
Total Split (%)	18.2%	63.6%		45.5%	45.5%	45.5%	36.4%	36.4%		36.4%	36.4%	
Maximum Green (s)	17.0	62.4		42.4	42.4	42.4	31.4	31.4		31.4	31.4	
Yellow Time (s)	3.0	5.9		5.9	5.9	5.9	5.9	5.9		5.9	5.9	
All-Red Time (s)	0.0	1.7		1.7	1.7	1.7	2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.6		7.6	7.6	7.6		8.6		8.6	8.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max	Max	None	None		None	None	
Walk Time (s)		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		23.0		23.0	23.0	23.0	23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	
Act Effct Green (s)	67.3	62.7			54.0	54.0				20.2	20.2	
Actuated g/C Ratio	0.68	0.63			0.54	0.54				0.20	0.20	
v/c Ratio	0.15	0.27			0.27	0.09				0.72	0.57	
Control Delay	7.3	9.4			14.5	3.2				51.3	4.4	
Queue Delay	0.0	0.0			0.0	0.0				0.0	0.0	
Total Delay	7.3	9.4			14.5	3.2				51.3	4.4	
LOS	A	A			B	A				D	A	
Approach Delay		9.1			13.0						20.4	
Approach LOS		A			B						C	
Queue Length 50th (m)	5.0	22.2			25.1	0.0				36.5	0.0	
Queue Length 95th (m)	13.3	39.5			44.8	6.4				59.7	8.6	
Internal Link Dist (m)		69.8			203.5			38.5			139.3	
Turn Bay Length (m)	85.0					85.0				40.0		
Base Capacity (vph)	670	1978			1751	782				439	823	
Starvation Cap Reductn	0	0			0	0				0	0	
Spillback Cap Reductn	0	0			0	0				0	0	
Storage Cap Reductn	0	0			0	0				0	0	
Reduced v/c Ratio	0.13	0.27			0.27	0.09				0.46	0.48	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 99.2			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 14.1		Intersection LOS: B	
Intersection Capacity Utilization 76.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: #10819/Tottenham Road & Highway 9

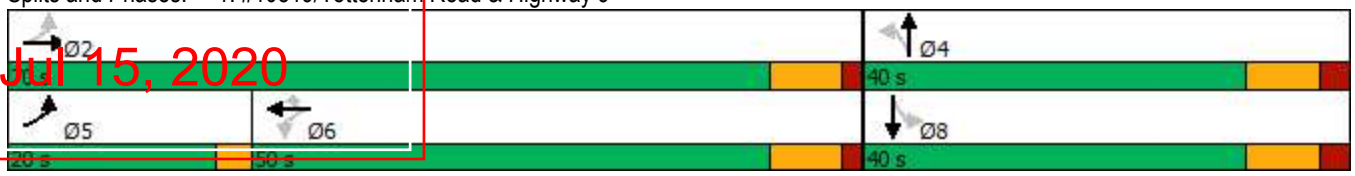
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	413	555	2	4	656	186	3	3	3	103	1	120
Future Volume (vph)	413	555	2	4	656	186	3	3	3	103	1	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.5	2.9	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6
Storage Length (m)	85.0		0.0	85.0		85.0	0.0		0.0	40.0		0.0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (m)	75.0			80.0			7.6			40.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999				0.850		0.955			0.851	
Flt Protected	0.950			0.950				0.984		0.950		
Satd. Flow (prot)	1711	3303	0	1665	3336	1566	0	1766	0	1770	1555	0
Flt Permitted	0.338			0.436				0.867		0.752		
Satd. Flow (perm)	609	3303	0	764	3336	1566	0	1556	0	1401	1555	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				192		3			124	
Link Speed (k/h)		80			80			50			80	
Link Distance (m)		93.8			227.5			62.5			163.3	
Travel Time (s)		4.2			10.2			4.5			7.3	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	8%	0%	0%	7%	2%	0%	0%	0%	2%	0%	4%
Adj. Flow (vph)	426	572	2	4	676	192	3	3	3	106	1	124
Shared Lane Traffic (%)												
Lane Group Flow (vph)	426	574	0	4	676	192	0	9	0	106	125	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.04	1.01	1.01	1.11	1.01	1.01	1.01	1.01	1.01	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6		6	4			8		
Detector Phase	5	2		6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	20.0		20.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	10.0	37.6		37.6	37.6	37.6	38.6	38.6		38.6	38.6	
Total Split (s)	20.0	70.0		50.0	50.0	50.0	40.0	40.0		40.0	40.0	
Total Split (%)	18.2%	63.6%		45.5%	45.5%	45.5%	36.4%	36.4%		36.4%	36.4%	
Maximum Green (s)	17.0	62.4		42.4	42.4	42.4	31.4	31.4		31.4	31.4	
Yellow Time (s)	3.0	5.9		5.9	5.9	5.9	5.9	5.9		5.9	5.9	
All-Red Time (s)	0.0	1.7		1.7	1.7	1.7	2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.6		7.6	7.6	7.6		8.6		8.6	8.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max	Max	None	None		None	None	
Walk Time (s)		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		23.0		23.0	23.0	23.0	23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	
Act Effct Green (s)	67.1	62.5		44.9	44.9	44.9		12.7		12.7	12.7	
Actuated g/C Ratio	0.73	0.68		0.49	0.49	0.49		0.14		0.14	0.14	
v/c Ratio	0.68	0.25		0.01	0.41	0.22		0.04		0.55	0.39	
Control Delay	10.8	6.2		14.5	16.7	3.1		28.7		47.4	10.5	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	10.8	6.2		14.5	16.7	3.1		28.7		47.4	10.5	
LOS	B	A		B	B	A		C		D	B	
Approach Delay		8.1			13.7			28.7			27.5	
Approach LOS		A			B			C			C	
Queue Length 50th (m)	21.3	17.2		0.3	38.0	0.0		0.9		17.6	0.2	
Queue Length 95th (m)	42.0	29.1		2.3	60.0	11.5		5.0		33.5	14.6	
Internal Link Dist (m)		69.8			203.5			38.5			139.3	
Turn Bay Length (m)	85.0			85.0		85.0				40.0		
Base Capacity (vph)	651	2257		375	1637	866		537		482	616	
Starvation Cap Reductn	0	0		0	0	0		0		0	0	
Spillback Cap Reductn	0	0		0	0	0		0		0	0	
Storage Cap Reductn	0	0		0	0	0		0		0	0	
Reduced v/c Ratio	0.65	0.25		0.01	0.41	0.22		0.02		0.22	0.20	

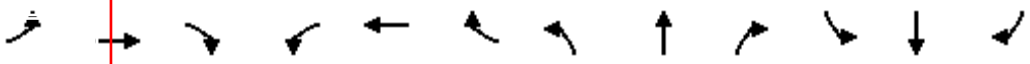
Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 91.4
Natural Cycle: 90
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 12.6 Intersection LOS: B
Intersection Capacity Utilization 70.2% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: #10819/Tottenham Road & Highway 9



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	550	0	0	482	74	0	0	0	207	0	401
Future Volume (vph)	88	550	0	0	482	74	0	0	0	207	0	401
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.5	2.9	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6
Storage Length (m)	85.0		0.0	85.0		85.0	0.0		0.0	40.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	75.0			80.0			7.6			40.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850					0.850	
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1616	3131	0	1752	3216	1365	1879	1879	0	1736	1583	0
Flt Permitted	0.440									0.757		
Satd. Flow (perm)	748	3131	0	1752	3216	1365	1879	1879	0	1383	1583	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						85					454	
Link Speed (k/h)		80			80			50			80	
Link Distance (m)		247.2			227.5			62.5			163.3	
Travel Time (s)		11.1			10.2			4.5			7.3	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	14%	0%	0%	11%	17%	0%	0%	0%	4%	0%	2%
Adj. Flow (vph)	92	573	0	0	502	77	0	0	0	216	0	418
Shared Lane Traffic (%)												
Lane Group Flow (vph)	92	573	0	0	502	77	0	0	0	216	418	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.04	1.01	1.01	1.11	1.01	1.01	1.01	1.01	1.01	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm			Perm	NA	

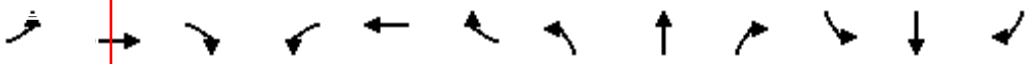


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6		6	4			8		
Detector Phase	5	2		6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	20.0		20.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	10.0	37.6		37.6	37.6	37.6	38.6	38.6		38.6	38.6	
Total Split (s)	20.0	70.0		50.0	50.0	50.0	40.0	40.0		40.0	40.0	
Total Split (%)	18.2%	63.6%		45.5%	45.5%	45.5%	36.4%	36.4%		36.4%	36.4%	
Maximum Green (s)	17.0	62.4		42.4	42.4	42.4	31.4	31.4		31.4	31.4	
Yellow Time (s)	3.0	5.9		5.9	5.9	5.9	5.9	5.9		5.9	5.9	
All-Red Time (s)	0.0	1.7		1.7	1.7	1.7	2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.6		7.6	7.6	7.6	8.6	8.6		8.6	8.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max	Max	None	None		None	None	
Walk Time (s)		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		23.0		23.0	23.0	23.0	23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	
Act Effct Green (s)	67.3	62.7			53.9	53.9				21.1	21.1	
Actuated g/C Ratio	0.67	0.63			0.54	0.54				0.21	0.21	
v/c Ratio	0.16	0.29			0.29	0.10				0.74	0.60	
Control Delay	7.7	9.9			15.2	3.6				52.2	6.0	
Queue Delay	0.0	0.0			0.0	0.0				0.0	0.0	
Total Delay	7.7	9.9			15.2	3.6				52.2	6.0	
LOS	A	A			B	A				D	A	
Approach Delay		9.6			13.6						21.7	
Approach LOS		A			B						C	
Queue Length 50th (m)	5.6	24.7			27.7	0.0				39.2	0.0	
Queue Length 95th (m)	14.2	43.0			48.8	7.1				63.5	15.5	
Internal Link Dist (m)		223.2			203.5			38.5			139.3	
Turn Bay Length (m)	85.0					85.0				40.0		
Base Capacity (vph)	650	1960			1731	774				435	809	
Starvation Cap Reductn	0	0			0	0				0	0	
Spillback Cap Reductn	0	0			0	0				0	0	
Storage Cap Reductn	0	0			0	0				0	0	
Reduced v/c Ratio	0.14	0.29			0.29	0.10				0.50	0.52	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 100.1			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 14.9		Intersection LOS: B	
Intersection Capacity Utilization 78.0%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: #10819/Tottenham Road & Highway 9

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	438	589	2	4	696	196	3	3	3	109	1	127
Future Volume (vph)	438	589	2	4	696	196	3	3	3	109	1	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.5	2.9	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6
Storage Length (m)	85.0		0.0	85.0		85.0	0.0		0.0	40.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	75.0			80.0			7.6			40.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850		0.925			0.851	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1616	3133	0	1665	3216	1365	1785	1738	0	1736	1585	0
Flt Permitted	0.296			0.421			0.673			0.754		
Satd. Flow (perm)	503	3133	0	738	3216	1365	1264	1738	0	1377	1585	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						202		3			131	
Link Speed (k/h)		80			80			50			80	
Link Distance (m)		247.2			227.5			62.5			163.3	
Travel Time (s)		11.1			10.2			4.5			7.3	
Peak Hour Factor	0.96	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	8%	14%	0%	0%	11%	17%	0%	0%	0%	4%	0%	2%
Adj. Flow (vph)	456	607	2	4	718	202	3	3	3	112	1	131
Shared Lane Traffic (%)												
Lane Group Flow (vph)	456	609	0	4	718	202	3	6	0	112	132	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.04	1.01	1.01	1.11	1.01	1.01	1.01	1.01	1.01	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	

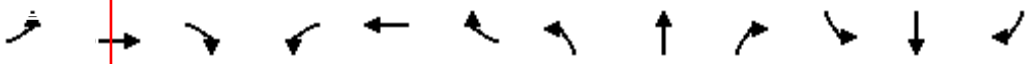


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6		6	4			8		
Detector Phase	5	2		6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	20.0		20.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	10.0	37.6		37.6	37.6	37.6	38.6	38.6		38.6	38.6	
Total Split (s)	32.0	71.4		39.4	39.4	39.4	38.6	38.6		38.6	38.6	
Total Split (%)	29.1%	64.9%		35.8%	35.8%	35.8%	35.1%	35.1%		35.1%	35.1%	
Maximum Green (s)	29.0	63.8		31.8	31.8	31.8	30.0	30.0		30.0	30.0	
Yellow Time (s)	3.0	5.9		5.9	5.9	5.9	5.9	5.9		5.9	5.9	
All-Red Time (s)	0.0	1.7		1.7	1.7	1.7	2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.6		7.6	7.6	7.6	8.6	8.6		8.6	8.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max	Max	None	None		None	None	
Walk Time (s)		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		23.0		23.0	23.0	23.0	23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	
Act Effct Green (s)	68.5	63.9		40.3	40.3	40.3	13.3	13.3		13.3	13.3	
Actuated g/C Ratio	0.73	0.68		0.43	0.43	0.43	0.14	0.14		0.14	0.14	
v/c Ratio	0.74	0.28		0.01	0.52	0.29	0.02	0.02		0.57	0.39	
Control Delay	14.9	6.5		21.2	23.3	4.7	33.7	26.8		49.1	10.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	14.9	6.5		21.2	23.3	4.7	33.7	26.8		49.1	10.2	
LOS	B	A		C	C	A	C	C		D	B	
Approach Delay		10.1			19.2			29.1			28.1	
Approach LOS		B			B			C			C	
Queue Length 50th (m)	24.7	19.3		0.4	48.0	0.0	0.5	0.5		19.1	0.2	
Queue Length 95th (m)	62.2	32.7		2.9	82.7	14.9	2.9	3.8		35.5	14.9	
Internal Link Dist (m)		223.2			203.5			38.5			139.3	
Turn Bay Length (m)	85.0			85.0		85.0				40.0		
Base Capacity (vph)	714	2141		318	1387	703	406	560		442	598	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.64	0.28		0.01	0.52	0.29	0.01	0.01		0.25	0.22	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 93.4			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 15.9		Intersection LOS: B	
Intersection Capacity Utilization 73.0%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: #10819/Tottenham Road & Highway 9

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	97	607	0	0	532	82	0	0	0	228	0	443
Future Volume (vph)	97	607	0	0	532	82	0	0	0	228	0	443
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.5	2.9	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6
Storage Length (m)	85.0		0.0	85.0		85.0	0.0		0.0	40.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	75.0			80.0			7.6			40.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850					0.850	
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1616	3131	0	1752	3216	1365	1879	1879	0	1736	1583	0
Flt Permitted	0.407									0.757		
Satd. Flow (perm)	692	3131	0	1752	3216	1365	1879	1879	0	1383	1583	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						85					430	
Link Speed (k/h)		80			80			50			80	
Link Distance (m)		247.2			227.5			62.5			163.3	
Travel Time (s)		11.1			10.2			4.5			7.3	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	14%	0%	0%	11%	17%	0%	0%	0%	4%	0%	2%
Adj. Flow (vph)	101	632	0	0	554	85	0	0	0	238	0	461
Shared Lane Traffic (%)												
Lane Group Flow (vph)	101	632	0	0	554	85	0	0	0	238	461	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.04	1.01	1.01	1.11	1.01	1.01	1.01	1.01	1.01	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm			Perm	NA	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6		6	4			8		
Detector Phase	5	2		6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	20.0		20.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	10.0	37.6		37.6	37.6	37.6	38.6	38.6		38.6	38.6	
Total Split (s)	20.0	70.0		50.0	50.0	50.0	40.0	40.0		40.0	40.0	
Total Split (%)	18.2%	63.6%		45.5%	45.5%	45.5%	36.4%	36.4%		36.4%	36.4%	
Maximum Green (s)	17.0	62.4		42.4	42.4	42.4	31.4	31.4		31.4	31.4	
Yellow Time (s)	3.0	5.9		5.9	5.9	5.9	5.9	5.9		5.9	5.9	
All-Red Time (s)	0.0	1.7		1.7	1.7	1.7	2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.6		7.6	7.6	7.6	8.6	8.6		8.6	8.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max	Max	None	None		None	None	
Walk Time (s)		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		23.0		23.0	23.0	23.0	23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	
Act Effct Green (s)	67.3	62.6			53.6	53.6				22.9	22.9	
Actuated g/C Ratio	0.66	0.61			0.53	0.53				0.22	0.22	
v/c Ratio	0.19	0.33			0.33	0.11				0.77	0.67	
Control Delay	8.4	10.9			16.5	4.3				53.2	9.6	
Queue Delay	0.0	0.0			0.0	0.0				0.0	0.0	
Total Delay	8.4	10.9			16.5	4.3				53.2	9.6	
LOS	A	B			B	A				D	A	
Approach Delay		10.5			14.9						24.5	
Approach LOS		B			B						C	
Queue Length 50th (m)	6.6	29.4			32.9	0.0				44.1	4.9	
Queue Length 95th (m)	15.4	48.2			54.7	8.6				70.5	32.4	
Internal Link Dist (m)		223.2			203.5			38.5			139.3	
Turn Bay Length (m)	85.0					85.0				40.0		
Base Capacity (vph)	612	1926			1692	758				428	787	
Starvation Cap Reductn	0	0			0	0				0	0	
Spillback Cap Reductn	0	0			0	0				0	0	
Storage Cap Reductn	0	0			0	0				0	0	
Reduced v/c Ratio	0.17	0.33			0.33	0.11				0.56	0.59	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 101.8			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 16.6		Intersection LOS: B	
Intersection Capacity Utilization 80.7%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: #10819/Tottenham Road & Highway 9

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	484	650	2	5	769	217	4	4	4	121	1	141
Future Volume (vph)	484	650	2	5	769	217	4	4	4	121	1	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.5	2.9	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6
Storage Length (m)	85.0		0.0	85.0		85.0	0.0		0.0	40.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	75.0			80.0			7.6			40.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850		0.925			0.851	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1616	3133	0	1665	3216	1365	1785	1738	0	1736	1585	0
Flt Permitted	0.221			0.396			0.664			0.752		
Satd. Flow (perm)	376	3133	0	694	3216	1365	1248	1738	0	1374	1585	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						224		4			145	
Link Speed (k/h)		80			80			50			80	
Link Distance (m)		247.2			227.5			62.5			163.3	
Travel Time (s)		11.1			10.2			4.5			7.3	
Peak Hour Factor	0.96	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	8%	14%	0%	0%	11%	17%	0%	0%	0%	4%	0%	2%
Adj. Flow (vph)	504	670	2	5	793	224	4	4	4	125	1	145
Shared Lane Traffic (%)												
Lane Group Flow (vph)	504	672	0	5	793	224	4	8	0	125	146	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.04	1.01	1.01	1.11	1.01	1.01	1.01	1.01	1.01	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6		6	4			8		
Detector Phase	5	2		6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	20.0		20.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	10.0	37.6		37.6	37.6	37.6	38.6	38.6		38.6	38.6	
Total Split (s)	32.0	71.4		39.4	39.4	39.4	38.6	38.6		38.6	38.6	
Total Split (%)	29.1%	64.9%		35.8%	35.8%	35.8%	35.1%	35.1%		35.1%	35.1%	
Maximum Green (s)	29.0	63.8		31.8	31.8	31.8	30.0	30.0		30.0	30.0	
Yellow Time (s)	3.0	5.9		5.9	5.9	5.9	5.9	5.9		5.9	5.9	
All-Red Time (s)	0.0	1.7		1.7	1.7	1.7	2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.6		7.6	7.6	7.6	8.6	8.6		8.6	8.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max	Max	None	None		None	None	
Walk Time (s)		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		23.0		23.0	23.0	23.0	23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	
Act Effct Green (s)	68.5	63.9		33.7	33.7	33.7	14.2	14.2		14.2	14.2	
Actuated g/C Ratio	0.73	0.68		0.36	0.36	0.36	0.15	0.15		0.15	0.15	
v/c Ratio	0.80	0.32		0.02	0.69	0.35	0.02	0.03		0.61	0.40	
Control Delay	23.9	7.1		23.0	30.8	5.2	33.2	26.0		50.2	9.7	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	23.9	7.1		23.0	30.8	5.2	33.2	26.0		50.2	9.7	
LOS	C	A		C	C	A	C	C		D	A	
Approach Delay		14.3			25.2			28.4			28.4	
Approach LOS		B			C			C			C	
Queue Length 50th (m)	45.4	22.7		0.6	65.4	0.0	0.6	0.6		21.5	0.2	
Queue Length 95th (m)	#109.1	38.2		3.3	95.3	15.9	3.5	4.5		39.1	15.6	
Internal Link Dist (m)		223.2			203.5			38.5			139.3	
Turn Bay Length (m)	85.0			85.0		85.0				40.0		
Base Capacity (vph)	655	2123		248	1149	631	398	556		437	604	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.77	0.32		0.02	0.69	0.35	0.01	0.01		0.29	0.24	

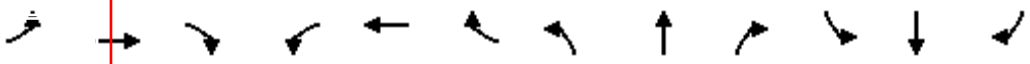
Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 94.3
Natural Cycle: 100
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 20.4 Intersection LOS: C
Intersection Capacity Utilization 78.3% ICU Level of Service D
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: #10819/Tottenham Road & Highway 9

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	107	670	0	0	587	91	0	0	0	252	0	489
Future Volume (vph)	107	670	0	0	587	91	0	0	0	252	0	489
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.5	2.9	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6
Storage Length (m)	85.0		0.0	85.0		85.0	0.0		0.0	40.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	75.0			80.0			7.6			40.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850					0.850	
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1616	3131	0	1752	3216	1365	1879	1879	0	1736	1583	0
Flt Permitted	0.368									0.757		
Satd. Flow (perm)	626	3131	0	1752	3216	1365	1879	1879	0	1383	1583	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						95					408	
Link Speed (k/h)		80			80			50			80	
Link Distance (m)		247.2			227.5			62.5			163.3	
Travel Time (s)		11.1			10.2			4.5			7.3	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	14%	0%	0%	11%	17%	0%	0%	0%	4%	0%	2%
Adj. Flow (vph)	111	698	0	0	611	95	0	0	0	263	0	509
Shared Lane Traffic (%)												
Lane Group Flow (vph)	111	698	0	0	611	95	0	0	0	263	509	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.04	1.01	1.01	1.11	1.01	1.01	1.01	1.01	1.01	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm			Perm	NA	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6		6	4			8		
Detector Phase	5	2		6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	20.0		20.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	10.0	37.6		37.6	37.6	37.6	38.6	38.6		38.6	38.6	
Total Split (s)	20.0	70.0		50.0	50.0	50.0	40.0	40.0		40.0	40.0	
Total Split (%)	18.2%	63.6%		45.5%	45.5%	45.5%	36.4%	36.4%		36.4%	36.4%	
Maximum Green (s)	17.0	62.4		42.4	42.4	42.4	31.4	31.4		31.4	31.4	
Yellow Time (s)	3.0	5.9		5.9	5.9	5.9	5.9	5.9		5.9	5.9	
All-Red Time (s)	0.0	1.7		1.7	1.7	1.7	2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.6		7.6	7.6	7.6	8.6	8.6		8.6	8.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max	Max	None	None		None	None	
Walk Time (s)		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		23.0		23.0	23.0	23.0	23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	
Act Effct Green (s)	67.2	62.6			51.0	51.0				24.7	24.7	
Actuated g/C Ratio	0.65	0.60			0.49	0.49				0.24	0.24	
v/c Ratio	0.23	0.37			0.39	0.13				0.80	0.74	
Control Delay	9.2	11.9			18.6	4.2				55.1	14.7	
Queue Delay	0.0	0.0			0.0	0.0				0.0	0.0	
Total Delay	9.2	11.9			18.6	4.2				55.1	14.7	
LOS	A	B			B	A				E	B	
Approach Delay		11.6			16.7						28.5	
Approach LOS		B			B						C	
Queue Length 50th (m)	8.1	36.6			40.2	0.0				49.8	16.5	
Queue Length 95th (m)	16.7	54.1			61.5	9.1				78.6	53.9	
Internal Link Dist (m)		223.2			203.5			38.5			139.3	
Turn Bay Length (m)	85.0					85.0				40.0		
Base Capacity (vph)	569	1892			1584	720				420	765	
Starvation Cap Reductn	0	0			0	0				0	0	
Spillback Cap Reductn	0	0			0	0				0	0	
Storage Cap Reductn	0	0			0	0				0	0	
Reduced v/c Ratio	0.20	0.37			0.39	0.13				0.63	0.67	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 103.6			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 18.8		Intersection LOS: B	
Intersection Capacity Utilization 85.3%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: #10819/Tottenham Road & Highway 9

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	534	718	3	5	849	239	4	4	4	133	1	155
Future Volume (vph)	534	718	3	5	849	239	4	4	4	133	1	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.5	2.9	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6
Storage Length (m)	85.0		0.0	85.0		85.0	0.0		0.0	40.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	75.0			80.0			7.6			40.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999				0.850		0.925			0.851	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1616	3130	0	1665	3216	1365	1785	1738	0	1736	1585	0
Flt Permitted	0.165			0.370			0.655			0.752		
Satd. Flow (perm)	281	3130	0	648	3216	1365	1231	1738	0	1374	1585	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				246		4			160	
Link Speed (k/h)		80			80			50			80	
Link Distance (m)		247.2			227.5			62.5			163.3	
Travel Time (s)		11.1			10.2			4.5			7.3	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	8%	14%	0%	0%	11%	17%	0%	0%	0%	4%	0%	2%
Adj. Flow (vph)	551	740	3	5	875	246	4	4	4	137	1	160
Shared Lane Traffic (%)												
Lane Group Flow (vph)	551	743	0	5	875	246	4	8	0	137	161	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.04	1.01	1.01	1.11	1.01	1.01	1.01	1.01	1.01	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6		6	4			8		
Detector Phase	5	2		6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	20.0		20.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	10.0	37.6		37.6	37.6	37.6	38.6	38.6		38.6	38.6	
Total Split (s)	32.0	71.4		39.4	39.4	39.4	38.6	38.6		38.6	38.6	
Total Split (%)	29.1%	64.9%		35.8%	35.8%	35.8%	35.1%	35.1%		35.1%	35.1%	
Maximum Green (s)	29.0	63.8		31.8	31.8	31.8	30.0	30.0		30.0	30.0	
Yellow Time (s)	3.0	5.9		5.9	5.9	5.9	5.9	5.9		5.9	5.9	
All-Red Time (s)	0.0	1.7		1.7	1.7	1.7	2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.6		7.6	7.6	7.6	8.6	8.6		8.6	8.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max	Max	None	None		None	None	
Walk Time (s)		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		23.0		23.0	23.0	23.0	23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	
Act Effct Green (s)	68.5	63.9		31.9	31.9	31.9	14.9	14.9		14.9	14.9	
Actuated g/C Ratio	0.72	0.67		0.34	0.34	0.34	0.16	0.16		0.16	0.16	
v/c Ratio	0.90	0.35		0.02	0.81	0.40	0.02	0.03		0.64	0.42	
Control Delay	40.2	7.7		23.8	36.8	5.5	32.8	25.6		51.1	9.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	40.2	7.7		23.8	36.8	5.5	32.8	25.6		51.1	9.3	
LOS	D	A		C	D	A	C	C		D	A	
Approach Delay		21.5			29.9			28.0			28.5	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	69.8	26.8		0.6	75.8	0.0	0.6	0.6		23.8	0.2	
Queue Length 95th (m)	#149.4	44.9		3.4	#117.9	16.7	3.5	4.5		42.5	16.2	
Internal Link Dist (m)		223.2			203.5			38.5			139.3	
Turn Bay Length (m)	85.0			85.0		85.0				40.0		
Base Capacity (vph)	610	2104		216	1077	620	389	552		434	610	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.90	0.35		0.02	0.81	0.40	0.01	0.01		0.32	0.26	

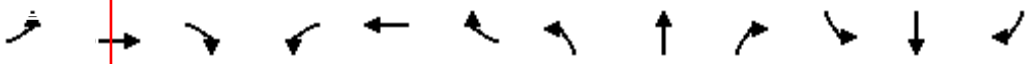
Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 95.1
Natural Cycle: 110
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 25.8 Intersection LOS: C
Intersection Capacity Utilization 83.9% ICU Level of Service E
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: #10819/Tottenham Road & Highway 9

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	542	13	12	475	73	16	7	14	204	13	396
Future Volume (vph)	87	542	13	12	475	73	16	7	14	204	13	396
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.5	2.9	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6
Storage Length (m)	85.0		0.0	85.0		85.0	0.0		0.0	40.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	75.0			80.0			7.6			40.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996				0.850		0.898			0.855	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1616	3128	0	1665	3216	1365	1785	1687	0	1736	1594	0
Flt Permitted	0.443			0.434			0.189			0.743		
Satd. Flow (perm)	753	3128	0	760	3216	1365	355	1687	0	1357	1594	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				85		15			413	
Link Speed (k/h)		80			80			50			80	
Link Distance (m)		247.2			227.5			62.5			163.3	
Travel Time (s)		11.1			10.2			4.5			7.3	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	14%	0%	0%	11%	17%	0%	0%	0%	4%	0%	2%
Adj. Flow (vph)	91	565	14	13	495	76	17	7	15	213	14	413
Shared Lane Traffic (%)												
Lane Group Flow (vph)	91	579	0	13	495	76	17	22	0	213	427	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.04	1.01	1.01	1.11	1.01	1.01	1.01	1.01	1.01	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6		6	4			8		
Detector Phase	5	2		6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	20.0		20.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	10.0	37.6		37.6	37.6	37.6	38.6	38.6		38.6	38.6	
Total Split (s)	20.0	70.0		50.0	50.0	50.0	40.0	40.0		40.0	40.0	
Total Split (%)	18.2%	63.6%		45.5%	45.5%	45.5%	36.4%	36.4%		36.4%	36.4%	
Maximum Green (s)	17.0	62.4		42.4	42.4	42.4	31.4	31.4		31.4	31.4	
Yellow Time (s)	3.0	5.9		5.9	5.9	5.9	5.9	5.9		5.9	5.9	
All-Red Time (s)	0.0	1.7		1.7	1.7	1.7	2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.6		7.6	7.6	7.6	8.6	8.6		8.6	8.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max	Max	None	None		None	None	
Walk Time (s)		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		23.0		23.0	23.0	23.0	23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	
Act Effct Green (s)	67.3	62.7		53.9	53.9	53.9	21.2	21.2		21.2	21.2	
Actuated g/C Ratio	0.67	0.63		0.54	0.54	0.54	0.21	0.21		0.21	0.21	
v/c Ratio	0.16	0.30		0.03	0.29	0.10	0.23	0.06		0.74	0.65	
Control Delay	7.7	9.9		15.6	15.2	3.5	39.3	17.0		52.6	8.7	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	7.7	9.9		15.6	15.2	3.5	39.3	17.0		52.6	8.7	
LOS	A	A		B	B	A	D	B		D	A	
Approach Delay		9.6			13.6			26.8			23.3	
Approach LOS		A			B			C			C	
Queue Length 50th (m)	5.5	24.8		1.2	27.3	0.0	2.7	1.1		38.7	2.2	
Queue Length 95th (m)	14.2	43.3		5.2	48.1	6.9	8.9	6.9		62.9	26.4	
Internal Link Dist (m)		223.2			203.5			38.5			139.3	
Turn Bay Length (m)	85.0			85.0		85.0				40.0		
Base Capacity (vph)	653	1959		408	1731	773	111	541		427	784	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.14	0.30		0.03	0.29	0.10	0.15	0.04		0.50	0.54	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 100.1
Natural Cycle: 90
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 15.7 Intersection LOS: B
Intersection Capacity Utilization 78.4% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: #10819/Tottenham Road & Highway 9

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	433	582	20	20	688	194	18	16	17	108	10	126
Future Volume (vph)	433	582	20	20	688	194	18	16	17	108	10	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.5	2.9	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6
Storage Length (m)	85.0		0.0	85.0		85.0	0.0		0.0	40.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	75.0			80.0			7.6			40.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995				0.850		0.921			0.861	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1616	3129	0	1665	3216	1365	1785	1730	0	1736	1606	0
Flt Permitted	0.302			0.416			0.668			0.735		
Satd. Flow (perm)	514	3129	0	729	3216	1365	1255	1730	0	1343	1606	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				200		18			130	
Link Speed (k/h)		80			80			50			80	
Link Distance (m)		247.2			227.5			62.5			163.3	
Travel Time (s)		11.1			10.2			4.5			7.3	
Peak Hour Factor	0.96	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	8%	14%	0%	0%	11%	17%	0%	0%	0%	4%	0%	2%
Adj. Flow (vph)	451	600	21	21	709	200	19	16	18	111	10	130
Shared Lane Traffic (%)												
Lane Group Flow (vph)	451	621	0	21	709	200	19	34	0	111	140	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.04	1.01	1.01	1.11	1.01	1.01	1.01	1.01	1.01	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	

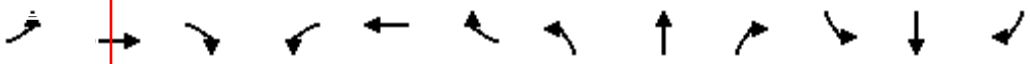
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6		6	4			8		
Detector Phase	5	2		6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	20.0		20.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	10.0	37.6		37.6	37.6	37.6	38.6	38.6		38.6	38.6	
Total Split (s)	32.0	71.4		39.4	39.4	39.4	38.6	38.6		38.6	38.6	
Total Split (%)	29.1%	64.9%		35.8%	35.8%	35.8%	35.1%	35.1%		35.1%	35.1%	
Maximum Green (s)	29.0	63.8		31.8	31.8	31.8	30.0	30.0		30.0	30.0	
Yellow Time (s)	3.0	5.9		5.9	5.9	5.9	5.9	5.9		5.9	5.9	
All-Red Time (s)	0.0	1.7		1.7	1.7	1.7	2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.6		7.6	7.6	7.6	8.6	8.6		8.6	8.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max	Max	None	None		None	None	
Walk Time (s)		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		23.0		23.0	23.0	23.0	23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	
Act Effct Green (s)	68.5	63.8		40.9	40.9	40.9	13.4	13.4		13.4	13.4	
Actuated g/C Ratio	0.73	0.68		0.44	0.44	0.44	0.14	0.14		0.14	0.14	
v/c Ratio	0.74	0.29		0.07	0.50	0.28	0.11	0.13		0.58	0.41	
Control Delay	14.4	6.6		21.2	22.8	4.7	35.4	22.0		49.5	11.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	14.4	6.6		21.2	22.8	4.7	35.4	22.0		49.5	11.6	
LOS	B	A		C	C	A	D	C		D	B	
Approach Delay		9.9			18.9			26.8			28.4	
Approach LOS		A			B			C			C	
Queue Length 50th (m)	24.4	19.6		2.1	46.5	0.0	3.0	2.5		18.9	1.6	
Queue Length 95th (m)	59.6	33.4		8.3	81.8	14.8	9.2	10.5		35.5	16.8	
Internal Link Dist (m)		223.2			203.5			38.5			139.3	
Turn Bay Length (m)	85.0			85.0		85.0				40.0		
Base Capacity (vph)	718	2138		318	1406	709	403	567		431	603	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.63	0.29		0.07	0.50	0.28	0.05	0.06		0.26	0.23	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 93.5
Natural Cycle: 90
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 15.9 Intersection LOS: B
Intersection Capacity Utilization 74.8% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: #10819/Tottenham Road & Highway 9

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	600	13	12	526	81	16	7	14	226	13	438
Future Volume (vph)	96	600	13	12	526	81	16	7	14	226	13	438
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.5	2.9	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6
Storage Length (m)	85.0		0.0	85.0		85.0	0.0		0.0	40.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	75.0			80.0			7.6			40.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997				0.850		0.898			0.854	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1616	3131	0	1665	3216	1365	1785	1687	0	1736	1592	0
Flt Permitted	0.410			0.409			0.174			0.743		
Satd. Flow (perm)	697	3131	0	717	3216	1365	327	1687	0	1357	1592	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				85		15			433	
Link Speed (k/h)		80			80			50			80	
Link Distance (m)		247.2			227.5			62.5			163.3	
Travel Time (s)		11.1			10.2			4.5			7.3	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	14%	0%	0%	11%	17%	0%	0%	0%	4%	0%	2%
Adj. Flow (vph)	100	625	14	13	548	84	17	7	15	235	14	456
Shared Lane Traffic (%)												
Lane Group Flow (vph)	100	639	0	13	548	84	17	22	0	235	470	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.04	1.01	1.01	1.11	1.01	1.01	1.01	1.01	1.01	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6		6	4			8		
Detector Phase	5	2		6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	20.0		20.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	10.0	37.6		37.6	37.6	37.6	38.6	38.6		38.6	38.6	
Total Split (s)	20.0	70.0		50.0	50.0	50.0	40.0	40.0		40.0	40.0	
Total Split (%)	18.2%	63.6%		45.5%	45.5%	45.5%	36.4%	36.4%		36.4%	36.4%	
Maximum Green (s)	17.0	62.4		42.4	42.4	42.4	31.4	31.4		31.4	31.4	
Yellow Time (s)	3.0	5.9		5.9	5.9	5.9	5.9	5.9		5.9	5.9	
All-Red Time (s)	0.0	1.7		1.7	1.7	1.7	2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.6		7.6	7.6	7.6	8.6	8.6		8.6	8.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max	Max	None	None		None	None	
Walk Time (s)		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		23.0		23.0	23.0	23.0	23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	
Act Effct Green (s)	67.3	62.6		53.6	53.6	53.6	23.0	23.0		23.0	23.0	
Actuated g/C Ratio	0.66	0.61		0.53	0.53	0.53	0.23	0.23		0.23	0.23	
v/c Ratio	0.19	0.33		0.03	0.32	0.11	0.23	0.06		0.77	0.68	
Control Delay	8.4	10.9		16.3	16.5	4.2	39.5	16.9		53.7	10.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	8.4	10.9		16.3	16.5	4.2	39.5	16.9		53.7	10.0	
LOS	A	B		B	B	A	D	B		D	A	
Approach Delay		10.5			14.9			26.7			24.6	
Approach LOS		B			B			C			C	
Queue Length 50th (m)	6.5	29.8		1.3	32.6	0.0	2.8	1.1		43.6	5.8	
Queue Length 95th (m)	15.4	48.5		5.2	54.0	8.4	9.0	6.9		69.8	34.3	
Internal Link Dist (m)		223.2			203.5			38.5			139.3	
Turn Bay Length (m)	85.0			85.0		85.0				40.0		
Base Capacity (vph)	614	1926		377	1692	758	101	532		419	791	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.16	0.33		0.03	0.32	0.11	0.17	0.04		0.56	0.59	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 101.9			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 16.8		Intersection LOS: B	
Intersection Capacity Utilization 81.3%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: #10819/Tottenham Road & Highway 9

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	479	644	20	21	761	215	18	16	17	119	10	139
Future Volume (vph)	479	644	20	21	761	215	18	16	17	119	10	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.5	2.9	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6
Storage Length (m)	85.0		0.0	85.0		85.0	0.0		0.0	40.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	75.0			80.0			7.6			40.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995				0.850		0.921			0.860	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1616	3128	0	1665	3216	1365	1785	1730	0	1736	1604	0
Flt Permitted	0.231			0.391			0.659			0.735		
Satd. Flow (perm)	393	3128	0	685	3216	1365	1238	1730	0	1343	1604	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				222		18			145	
Link Speed (k/h)		80			80			50			80	
Link Distance (m)		247.2			227.5			62.5			163.3	
Travel Time (s)		11.1			10.2			4.5			7.3	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.96
Heavy Vehicles (%)	8%	14%	0%	0%	11%	17%	0%	0%	0%	4%	0%	2%
Adj. Flow (vph)	494	664	21	22	785	222	19	16	18	123	10	145
Shared Lane Traffic (%)												
Lane Group Flow (vph)	494	685	0	22	785	222	19	34	0	123	155	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.04	1.01	1.01	1.11	1.01	1.01	1.01	1.01	1.01	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6		6	4			8		
Detector Phase	5	2		6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	20.0		20.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	10.0	37.6		37.6	37.6	37.6	38.6	38.6		38.6	38.6	
Total Split (s)	32.0	71.4		39.4	39.4	39.4	38.6	38.6		38.6	38.6	
Total Split (%)	29.1%	64.9%		35.8%	35.8%	35.8%	35.1%	35.1%		35.1%	35.1%	
Maximum Green (s)	29.0	63.8		31.8	31.8	31.8	30.0	30.0		30.0	30.0	
Yellow Time (s)	3.0	5.9		5.9	5.9	5.9	5.9	5.9		5.9	5.9	
All-Red Time (s)	0.0	1.7		1.7	1.7	1.7	2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.6		7.6	7.6	7.6	8.6	8.6		8.6	8.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max	Max	None	None		None	None	
Walk Time (s)		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		23.0		23.0	23.0	23.0	23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	
Act Effct Green (s)	68.5	63.9		34.7	34.7	34.7	14.2	14.2		14.2	14.2	
Actuated g/C Ratio	0.73	0.68		0.37	0.37	0.37	0.15	0.15		0.15	0.15	
v/c Ratio	0.79	0.32		0.09	0.66	0.35	0.10	0.12		0.61	0.43	
Control Delay	22.5	7.1		24.1	29.7	5.1	34.9	21.7		50.5	11.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	22.5	7.1		24.1	29.7	5.1	34.9	21.7		50.5	11.0	
LOS	C	A		C	C	A	C	C		D	B	
Approach Delay		13.6			24.3			26.4			28.5	
Approach LOS		B			C			C			C	
Queue Length 50th (m)	41.3	23.1		2.7	64.6	0.0	3.0	2.5		21.2	1.6	
Queue Length 95th (m)	#102.0	39.1		8.8	94.2	15.8	9.2	10.4		38.7	17.6	
Internal Link Dist (m)		223.2			203.5			38.5			139.3	
Turn Bay Length (m)	85.0			85.0		85.0				40.0		
Base Capacity (vph)	661	2120		252	1184	642	394	563		427	609	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.75	0.32		0.09	0.66	0.35	0.05	0.06		0.29	0.25	

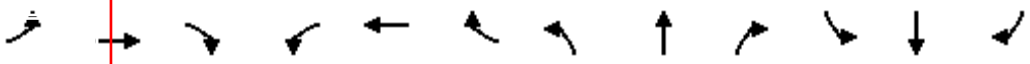
Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 94.3
Natural Cycle: 100
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 19.8 Intersection LOS: B
Intersection Capacity Utilization 79.4% ICU Level of Service D
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: #10819/Tottenham Road & Highway 9

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	663	13	12	581	90	16	7	14	250	13	484
Future Volume (vph)	106	663	13	12	581	90	16	7	14	250	13	484
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.5	2.9	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6
Storage Length (m)	85.0		0.0	85.0		85.0	0.0		0.0	40.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	75.0			80.0			7.6			40.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997				0.850		0.898			0.854	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1616	3130	0	1665	3216	1365	1785	1687	0	1736	1592	0
Flt Permitted	0.370			0.384			0.161			0.743		
Satd. Flow (perm)	629	3130	0	673	3216	1365	303	1687	0	1357	1592	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				94		15			411	
Link Speed (k/h)		80			80			50			80	
Link Distance (m)		247.2			227.5			62.5			163.3	
Travel Time (s)		11.1			10.2			4.5			7.3	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	14%	0%	0%	11%	17%	0%	0%	0%	4%	0%	2%
Adj. Flow (vph)	110	691	14	13	605	94	17	7	15	260	14	504
Shared Lane Traffic (%)												
Lane Group Flow (vph)	110	705	0	13	605	94	17	22	0	260	518	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.04	1.01	1.01	1.11	1.01	1.01	1.01	1.01	1.01	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	



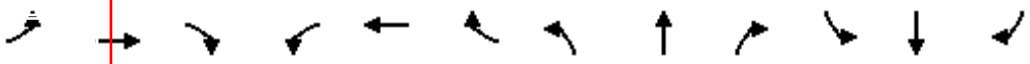
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6		6	4			8		
Detector Phase	5	2		6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	20.0		20.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	10.0	37.6		37.6	37.6	37.6	38.6	38.6		38.6	38.6	
Total Split (s)	20.0	70.0		50.0	50.0	50.0	40.0	40.0		40.0	40.0	
Total Split (%)	18.2%	63.6%		45.5%	45.5%	45.5%	36.4%	36.4%		36.4%	36.4%	
Maximum Green (s)	17.0	62.4		42.4	42.4	42.4	31.4	31.4		31.4	31.4	
Yellow Time (s)	3.0	5.9		5.9	5.9	5.9	5.9	5.9		5.9	5.9	
All-Red Time (s)	0.0	1.7		1.7	1.7	1.7	2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.6		7.6	7.6	7.6	8.6	8.6		8.6	8.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max	Max	None	None		None	None	
Walk Time (s)		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		23.0		23.0	23.0	23.0	23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	
Act Effct Green (s)	67.3	62.7		51.1	51.1	51.1	24.9	24.9		24.9	24.9	
Actuated g/C Ratio	0.65	0.60		0.49	0.49	0.49	0.24	0.24		0.24	0.24	
v/c Ratio	0.22	0.37		0.04	0.38	0.13	0.24	0.05		0.80	0.75	
Control Delay	9.3	12.0		17.2	18.6	4.2	39.6	16.6		55.6	15.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	9.3	12.0		17.2	18.6	4.2	39.6	16.6		55.6	15.1	
LOS	A	B		B	B	A	D	B		E	B	
Approach Delay		11.6			16.7			26.6			28.6	
Approach LOS		B			B			C			C	
Queue Length 50th (m)	8.1	37.2		1.4	39.8	0.0	2.8	1.1		49.3	17.6	
Queue Length 95th (m)	16.6	54.6		5.3	60.7	9.1	9.2	6.9		78.3	56.0	
Internal Link Dist (m)		223.2			203.5			38.5			139.3	
Turn Bay Length (m)	85.0			85.0		85.0				40.0		
Base Capacity (vph)	570	1890		331	1582	719	92	522		412	769	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.19	0.37		0.04	0.38	0.13	0.18	0.04		0.63	0.67	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 103.8
Natural Cycle: 90
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 19.1 Intersection LOS: B
Intersection Capacity Utilization 85.9% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 1: #10819/Tottenham Road & Highway 9

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	529	711	20	21	841	237	19	17	17	132	10	154
Future Volume (vph)	529	711	20	21	841	237	19	17	17	132	10	154
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.5	2.9	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6
Storage Length (m)	85.0		0.0	85.0		85.0	0.0		0.0	40.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	75.0			80.0			7.6			40.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996				0.850		0.925			0.859	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1616	3130	0	1665	3216	1365	1785	1738	0	1736	1602	0
Flt Permitted	0.168			0.366			0.650			0.734		
Satd. Flow (perm)	286	3130	0	641	3216	1365	1221	1738	0	1341	1602	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				244		18			159	
Link Speed (k/h)		80			80			50			80	
Link Distance (m)		247.2			227.5			62.5			163.3	
Travel Time (s)		11.1			10.2			4.5			7.3	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	8%	14%	0%	0%	11%	17%	0%	0%	0%	4%	0%	2%
Adj. Flow (vph)	545	733	21	22	867	244	20	18	18	136	10	159
Shared Lane Traffic (%)												
Lane Group Flow (vph)	545	754	0	22	867	244	20	36	0	136	169	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.04	1.01	1.01	1.11	1.01	1.01	1.01	1.01	1.01	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	



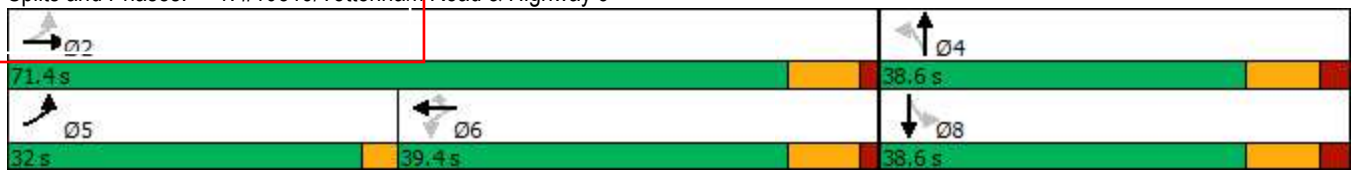
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6		6	4			8		
Detector Phase	5	2		6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	20.0		20.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	10.0	37.6		37.6	37.6	37.6	38.6	38.6		38.6	38.6	
Total Split (s)	32.0	71.4		39.4	39.4	39.4	38.6	38.6		38.6	38.6	
Total Split (%)	29.1%	64.9%		35.8%	35.8%	35.8%	35.1%	35.1%		35.1%	35.1%	
Maximum Green (s)	29.0	63.8		31.8	31.8	31.8	30.0	30.0		30.0	30.0	
Yellow Time (s)	3.0	5.9		5.9	5.9	5.9	5.9	5.9		5.9	5.9	
All-Red Time (s)	0.0	1.7		1.7	1.7	1.7	2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.6		7.6	7.6	7.6	8.6	8.6		8.6	8.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max	Max	None	None		None	None	
Walk Time (s)		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		23.0		23.0	23.0	23.0	23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	
Act Effct Green (s)	68.6	63.9		31.9	31.9	31.9	15.1	15.1		15.1	15.1	
Actuated g/C Ratio	0.72	0.67		0.33	0.33	0.33	0.16	0.16		0.16	0.16	
v/c Ratio	0.89	0.36		0.10	0.81	0.39	0.10	0.12		0.64	0.44	
Control Delay	38.4	7.8		25.3	36.6	5.5	34.5	21.7		51.5	10.4	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	38.4	7.8		25.3	36.6	5.5	34.5	21.7		51.5	10.4	
LOS	D	A		C	D	A	C	C		D	B	
Approach Delay		20.7			29.7			26.3			28.7	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	68.0	27.3		2.8	75.2	0.0	3.2	2.8		23.7	1.6	
Queue Length 95th (m)	#146.9	46.1		9.1	#116.9	16.7	9.5	11.1		42.3	17.9	
Internal Link Dist (m)		223.2			203.5			38.5			139.3	
Turn Bay Length (m)	85.0			85.0		85.0				40.0		
Base Capacity (vph)	611	2101		214	1075	619	385	560		423	614	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.89	0.36		0.10	0.81	0.39	0.05	0.06		0.32	0.28	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 95.3
Natural Cycle: 110
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 25.3 Intersection LOS: C
Intersection Capacity Utilization 85.2% ICU Level of Service E
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: #10819/Tottenham Road & Highway 9



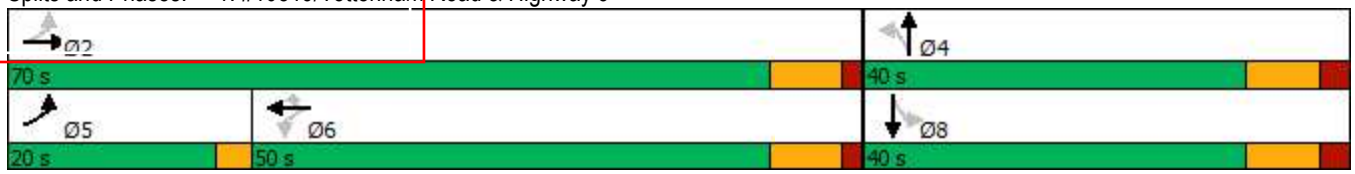
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	129	804	0	0	705	109	0	0	0	303	0	587
Future Volume (vph)	129	804	0	0	705	109	0	0	0	303	0	587
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.5	2.9	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6
Storage Length (m)	85.0		0.0	85.0		85.0	0.0		0.0	40.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	75.0			80.0			7.6			40.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850					0.850	
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1616	3131	0	1752	3216	1365	1879	1879	0	1736	1583	0
Flt Permitted	0.296									0.757		
Satd. Flow (perm)	503	3131	0	1752	3216	1365	1879	1879	0	1383	1583	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						114					374	
Link Speed (k/h)		80			80			50			80	
Link Distance (m)		247.2			227.5			62.5			163.3	
Travel Time (s)		11.1			10.2			4.5			7.3	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	14%	0%	0%	11%	17%	0%	0%	0%	4%	0%	2%
Adj. Flow (vph)	134	838	0	0	734	114	0	0	0	316	0	611
Shared Lane Traffic (%)												
Lane Group Flow (vph)	134	838	0	0	734	114	0	0	0	316	611	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.04	1.01	1.01	1.11	1.01	1.01	1.01	1.01	1.01	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm			Perm	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6		6	4			8		
Detector Phase	5	2		6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	20.0		20.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	10.0	37.6		37.6	37.6	37.6	38.6	38.6		38.6	38.6	
Total Split (s)	20.0	70.0		50.0	50.0	50.0	40.0	40.0		40.0	40.0	
Total Split (%)	18.2%	63.6%		45.5%	45.5%	45.5%	36.4%	36.4%		36.4%	36.4%	
Maximum Green (s)	17.0	62.4		42.4	42.4	42.4	31.4	31.4		31.4	31.4	
Yellow Time (s)	3.0	5.9		5.9	5.9	5.9	5.9	5.9		5.9	5.9	
All-Red Time (s)	0.0	1.7		1.7	1.7	1.7	2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.6		7.6	7.6	7.6	8.6	8.6		8.6	8.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max	Max	None	None		None	None	
Walk Time (s)		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		23.0		23.0	23.0	23.0	23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	
Act Effct Green (s)	67.1	62.5			50.1	50.1				28.3	28.3	
Actuated g/C Ratio	0.63	0.58			0.47	0.47				0.26	0.26	
v/c Ratio	0.33	0.46			0.49	0.16				0.87	0.88	
Control Delay	11.0	14.1			21.9	4.1				61.2	29.8	
Queue Delay	0.0	0.0			0.0	0.0				0.0	0.0	
Total Delay	11.0	14.1			21.9	4.1				61.2	29.8	
LOS	B	B			C	A				E	C	
Approach Delay		13.7			19.5						40.5	
Approach LOS		B			B						D	
Queue Length 50th (m)	11.4	52.8			57.0	0.0				62.8	51.5	
Queue Length 95th (m)	19.8	67.8			77.6	10.1				#106.4	#117.6	
Internal Link Dist (m)		223.2			203.5			38.5			139.3	
Turn Bay Length (m)	85.0					85.0				40.0		
Base Capacity (vph)	492	1828			1506	700				406	729	
Starvation Cap Reductn	0	0			0	0				0	0	
Spillback Cap Reductn	0	0			0	0				0	0	
Storage Cap Reductn	0	0			0	0				0	0	
Reduced v/c Ratio	0.27	0.46			0.49	0.16				0.78	0.84	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 107			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 24.5		Intersection LOS: C	
Intersection Capacity Utilization 95.1%		ICU Level of Service F	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: #10819/Tottenham Road & Highway 9



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	641	862	3	5	1018	287	4	4	4	160	1	186
Future Volume (vph)	641	862	3	5	1018	287	4	4	4	160	1	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.5	2.9	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6
Storage Length (m)	85.0		0.0	85.0		85.0	0.0		0.0	40.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	75.0			80.0			7.6			40.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850		0.925			0.851	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1616	3133	0	1665	3216	1365	1785	1738	0	1736	1585	0
Flt Permitted	0.115			0.316			0.592			0.752		
Satd. Flow (perm)	196	3133	0	554	3216	1365	1112	1738	0	1374	1585	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						299		4			194	
Link Speed (k/h)		80			80			50			80	
Link Distance (m)		247.2			227.5			62.5			163.3	
Travel Time (s)		11.1			10.2			4.5			7.3	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	14%	0%	0%	11%	17%	0%	0%	0%	4%	0%	2%
Adj. Flow (vph)	668	898	3	5	1060	299	4	4	4	167	1	194
Shared Lane Traffic (%)												
Lane Group Flow (vph)	668	901	0	5	1060	299	4	8	0	167	195	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.04	1.01	1.01	1.11	1.01	1.01	1.01	1.01	1.01	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6		6	4			8		
Detector Phase	5	2		6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	20.0		20.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	10.0	37.6		37.6	37.6	37.6	38.6	38.6		38.6	38.6	
Total Split (s)	32.0	71.4		39.4	39.4	39.4	38.6	38.6		38.6	38.6	
Total Split (%)	29.1%	64.9%		35.8%	35.8%	35.8%	35.1%	35.1%		35.1%	35.1%	
Maximum Green (s)	29.0	63.8		31.8	31.8	31.8	30.0	30.0		30.0	30.0	
Yellow Time (s)	3.0	5.9		5.9	5.9	5.9	5.9	5.9		5.9	5.9	
All-Red Time (s)	0.0	1.7		1.7	1.7	1.7	2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.6		7.6	7.6	7.6	8.6	8.6		8.6	8.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max	Max	None	None		None	None	
Walk Time (s)		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		23.0		23.0	23.0	23.0	23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	
Act Effct Green (s)	68.6	63.9		31.9	31.9	31.9	16.9	16.9		16.9	16.9	
Actuated g/C Ratio	0.71	0.66		0.33	0.33	0.33	0.17	0.17		0.17	0.17	
v/c Ratio	1.19	0.44		0.03	1.00	0.46	0.02	0.03		0.70	0.45	
Control Delay	127.2	9.4		25.4	63.0	5.8	31.8	24.6		53.3	8.5	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	127.2	9.4		25.4	63.0	5.8	31.8	24.6		53.3	8.5	
LOS	F	A		C	E	A	C	C		D	A	
Approach Delay		59.6			50.3			27.0			29.2	
Approach LOS		E			D			C			C	
Queue Length 50th (m)	~136.2	38.1		0.6	~104.6	0.0	0.6	0.6		29.7	0.2	
Queue Length 95th (m)	#227.0	63.4		3.6	#168.1	19.1	3.4	4.5		50.8	17.2	
Internal Link Dist (m)		223.2			203.5			38.5			139.3	
Turn Bay Length (m)	85.0			85.0		85.0				40.0		
Base Capacity (vph)	563	2063		181	1055	648	344	540		425	624	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	1.19	0.44		0.03	1.00	0.46	0.01	0.01		0.39	0.31	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 97.1
Natural Cycle: 150
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 1.19
Intersection Signal Delay: 52.3 Intersection LOS: D
Intersection Capacity Utilization 96.0% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: #10819/Tottenham Road & Highway 9

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	128	797	13	12	699	108	16	7	14	300	13	582
Future Volume (vph)	128	797	13	12	699	108	16	7	14	300	13	582
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.5	2.9	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6
Storage Length (m)	85.0		0.0	85.0		85.0	0.0		0.0	40.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	75.0			80.0			7.6			40.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998				0.850		0.898			0.853	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1616	3132	0	1665	3216	1365	1785	1687	0	1736	1590	0
Flt Permitted	0.299			0.335			0.141			0.743		
Satd. Flow (perm)	508	3132	0	587	3216	1365	265	1687	0	1357	1590	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				113		15			375	
Link Speed (k/h)		80			80			50			80	
Link Distance (m)		247.2			227.5			62.5			163.3	
Travel Time (s)		11.1			10.2			4.5			7.3	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	14%	0%	0%	11%	17%	0%	0%	0%	4%	0%	2%
Adj. Flow (vph)	133	830	14	13	728	113	17	7	15	313	14	606
Shared Lane Traffic (%)												
Lane Group Flow (vph)	133	844	0	13	728	113	17	22	0	313	620	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.04	1.01	1.01	1.11	1.01	1.01	1.01	1.01	1.01	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6		6	4			8		
Detector Phase	5	2		6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	20.0		20.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	10.0	37.6		37.6	37.6	37.6	38.6	38.6		38.6	38.6	
Total Split (s)	20.0	70.0		50.0	50.0	50.0	40.0	40.0		40.0	40.0	
Total Split (%)	18.2%	63.6%		45.5%	45.5%	45.5%	36.4%	36.4%		36.4%	36.4%	
Maximum Green (s)	17.0	62.4		42.4	42.4	42.4	31.4	31.4		31.4	31.4	
Yellow Time (s)	3.0	5.9		5.9	5.9	5.9	5.9	5.9		5.9	5.9	
All-Red Time (s)	0.0	1.7		1.7	1.7	1.7	2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.6		7.6	7.6	7.6	8.6	8.6		8.6	8.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max	Max	None	None		None	None	
Walk Time (s)		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		23.0		23.0	23.0	23.0	23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	
Act Effct Green (s)	67.1	62.5		50.1	50.1	50.1	28.4	28.4		28.4	28.4	
Actuated g/C Ratio	0.63	0.58		0.47	0.47	0.47	0.27	0.27		0.27	0.27	
v/c Ratio	0.32	0.46		0.05	0.48	0.16	0.24	0.05		0.87	0.89	
Control Delay	11.0	14.2		18.5	21.9	4.1	40.6	16.4		62.2	31.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	11.0	14.2		18.5	21.9	4.1	40.6	16.4		62.2	31.0	
LOS	B	B		B	C	A	D	B		E	C	
Approach Delay		13.8			19.5			26.9			41.5	
Approach LOS		B			B			C			D	
Queue Length 50th (m)	11.3	53.3		1.5	56.4	0.0	2.8	1.1		62.4	53.8	
Queue Length 95th (m)	19.7	68.3		5.4	76.9	10.1	9.5	6.9		#106.3	#120.9	
Internal Link Dist (m)		223.2			203.5			38.5			139.3	
Turn Bay Length (m)	85.0			85.0		85.0				40.0		
Base Capacity (vph)	494	1827		274	1505	699	77	506		398	731	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.27	0.46		0.05	0.48	0.16	0.22	0.04		0.79	0.85	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 107.1
Natural Cycle: 90
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 24.9 Intersection LOS: C
Intersection Capacity Utilization 95.6% ICU Level of Service F
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: #10819/Tottenham Road & Highway 9

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	637	855	20	21	1010	285	19	17	17	159	10	185
Future Volume (vph)	637	855	20	21	1010	285	19	17	17	159	10	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.5	2.9	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6
Storage Length (m)	85.0		0.0	85.0		85.0	0.0		0.0	40.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	75.0			80.0			7.6			40.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997				0.850		0.925			0.857	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1616	3131	0	1665	3216	1365	1785	1738	0	1736	1598	0
Flt Permitted	0.115			0.316			0.577			0.734		
Satd. Flow (perm)	196	3131	0	554	3216	1365	1084	1738	0	1341	1598	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				294		18			191	
Link Speed (k/h)		80			80			50			80	
Link Distance (m)		247.2			227.5			62.5			163.3	
Travel Time (s)		11.1			10.2			4.5			7.3	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	8%	14%	0%	0%	11%	17%	0%	0%	0%	4%	0%	2%
Adj. Flow (vph)	657	881	21	22	1041	294	20	18	18	164	10	191
Shared Lane Traffic (%)												
Lane Group Flow (vph)	657	902	0	22	1041	294	20	36	0	164	201	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.04	1.01	1.01	1.11	1.01	1.01	1.01	1.01	1.01	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6		6	4			8		
Detector Phase	5	2		6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	20.0		20.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	10.0	37.6		37.6	37.6	37.6	38.6	38.6		38.6	38.6	
Total Split (s)	32.0	71.4		39.4	39.4	39.4	38.6	38.6		38.6	38.6	
Total Split (%)	29.1%	64.9%		35.8%	35.8%	35.8%	35.1%	35.1%		35.1%	35.1%	
Maximum Green (s)	29.0	63.8		31.8	31.8	31.8	30.0	30.0		30.0	30.0	
Yellow Time (s)	3.0	5.9		5.9	5.9	5.9	5.9	5.9		5.9	5.9	
All-Red Time (s)	0.0	1.7		1.7	1.7	1.7	2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.6		7.6	7.6	7.6	8.6	8.6		8.6	8.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max	Max	None	None		None	None	
Walk Time (s)		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		23.0		23.0	23.0	23.0	23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	
Act Effct Green (s)	68.6	64.0		31.9	31.9	31.9	17.0	17.0		17.0	17.0	
Actuated g/C Ratio	0.71	0.66		0.33	0.33	0.33	0.17	0.17		0.17	0.17	
v/c Ratio	1.17	0.44		0.12	0.99	0.46	0.11	0.11		0.70	0.46	
Control Delay	120.0	9.4		27.3	58.9	5.8	33.8	20.8		53.7	9.5	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	120.0	9.4		27.3	58.9	5.8	33.8	20.8		53.7	9.5	
LOS	F	A		C	E	A	C	C		D	A	
Approach Delay		56.0			46.9			25.5			29.4	
Approach LOS		E			D			C			C	
Queue Length 50th (m)	~131.8	38.0		2.9	101.0	0.0	3.2	2.8		29.2	1.6	
Queue Length 95th (m)	#222.9	63.7		9.6	#164.2	18.9	9.4	10.9		49.9	18.9	
Internal Link Dist (m)		223.2			203.5			38.5			139.3	
Turn Bay Length (m)	85.0			85.0		85.0				40.0		
Base Capacity (vph)	563	2061		181	1054	645	335	550		414	626	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	1.17	0.44		0.12	0.99	0.46	0.06	0.07		0.40	0.32	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 97.2
Natural Cycle: 150
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 1.17
Intersection Signal Delay: 48.9 Intersection LOS: D
Intersection Capacity Utilization 95.8% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: #10819/Tottenham Road & Highway 9

APPENDIX F

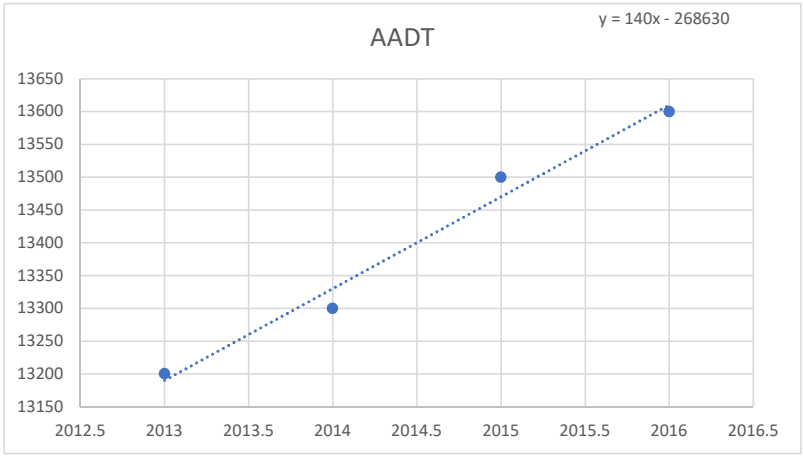
Growth Rate Analysis

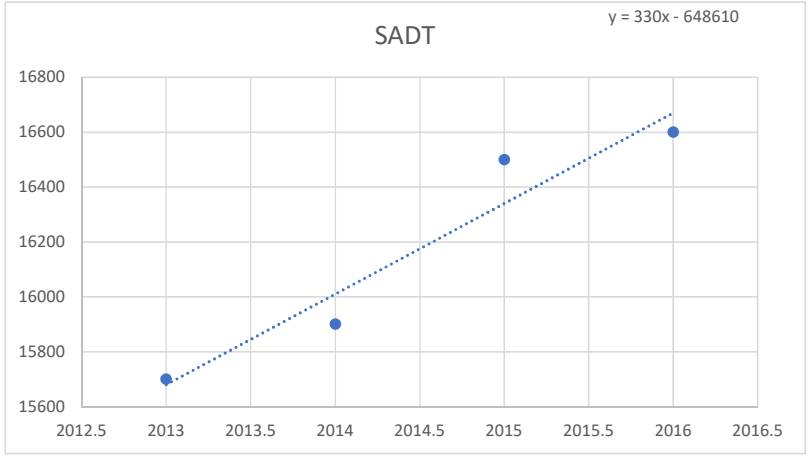
MTO Data - Hwy 9 @ SIMCOE ROAD 10(N)

Year	AADT	SADT		
2013	13200	15700	18.9%	20.7%
2014	13300	15900	19.5%	20.0%
2015	13500	16500	22.2%	
2016	13600	16600	22.1%	

	AADT
2013	13200
2016	13600
Growth Rate	1.00%

	SADT
2013	15700
2016	16600
Growth Rate	1.88%





APPENDIX G

ITE Trip Generation Excerpts

Land Use: 945
Gasoline/Service Station with Convenience Market

Description

This land use includes gasoline/service stations with convenience markets where the primary business is the fueling of motor vehicles. These service stations may also have ancillary facilities for servicing and repairing motor vehicles and may have a car wash. Some commonly sold convenience items are newspapers, coffee or other beverages, and snack items that are usually consumed in the car. The sites included in this land use category have the following two specific characteristics:

- The gross floor area of the convenience market is between 2,000 and 3,000 gross square feet
- The number of vehicle fueling positions is at least 10

Convenience market (Land Use 851), convenience market with gasoline pumps (Land Use 853), gasoline/service station (Land Use 944), truck stop (Land Use 950), and super convenience market/gas station (Land Use 960) are related uses.

Additional Data

The independent variable, vehicle fueling positions, is defined as the maximum number of vehicles that can be fueled simultaneously.

Gasoline/service stations in this land use include “pay-at-the-pump” and traditional fueling stations.

Time-of-day distribution data for this land use are presented in Appendix A. For the five general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:30 and 8:30 a.m. and 3:45 and 4:45 p.m., respectively.

A multi-variable regression analysis based on both the convenience market gross floor area (GFA) and the number of vehicle fueling positions (VFP) produced a series of fitted curve equations. The equations are in the form of:

Vehicle Trips = [(VFP Factor) x (Number of VFP)] + [(GFA Factor) x (GFA)] + (Constant)

The values for the VFP factor, GFA factor, and constant are presented in the following table for each time period for which a fitted curve equation could produce an R^2 value of at least 0.50.

Time Period	VFP Factor	GFA Factor	Constant	R^2
Weekday, AM Peak Hour of Generator	15.6	108	-295	0.62
Weekday, PM Peak Hour of Generator	Not Available			
Weekday, AM Peak Hour of Adjacent Street	15.7	97.3	-284	0.59
Weekday, PM Peak Hour of Adjacent Street	Not Available			

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alberta (CA), California, Connecticut, Florida, Indiana, Iowa, Kentucky, Minnesota, New Hampshire, New Jersey, Texas, and Wisconsin.

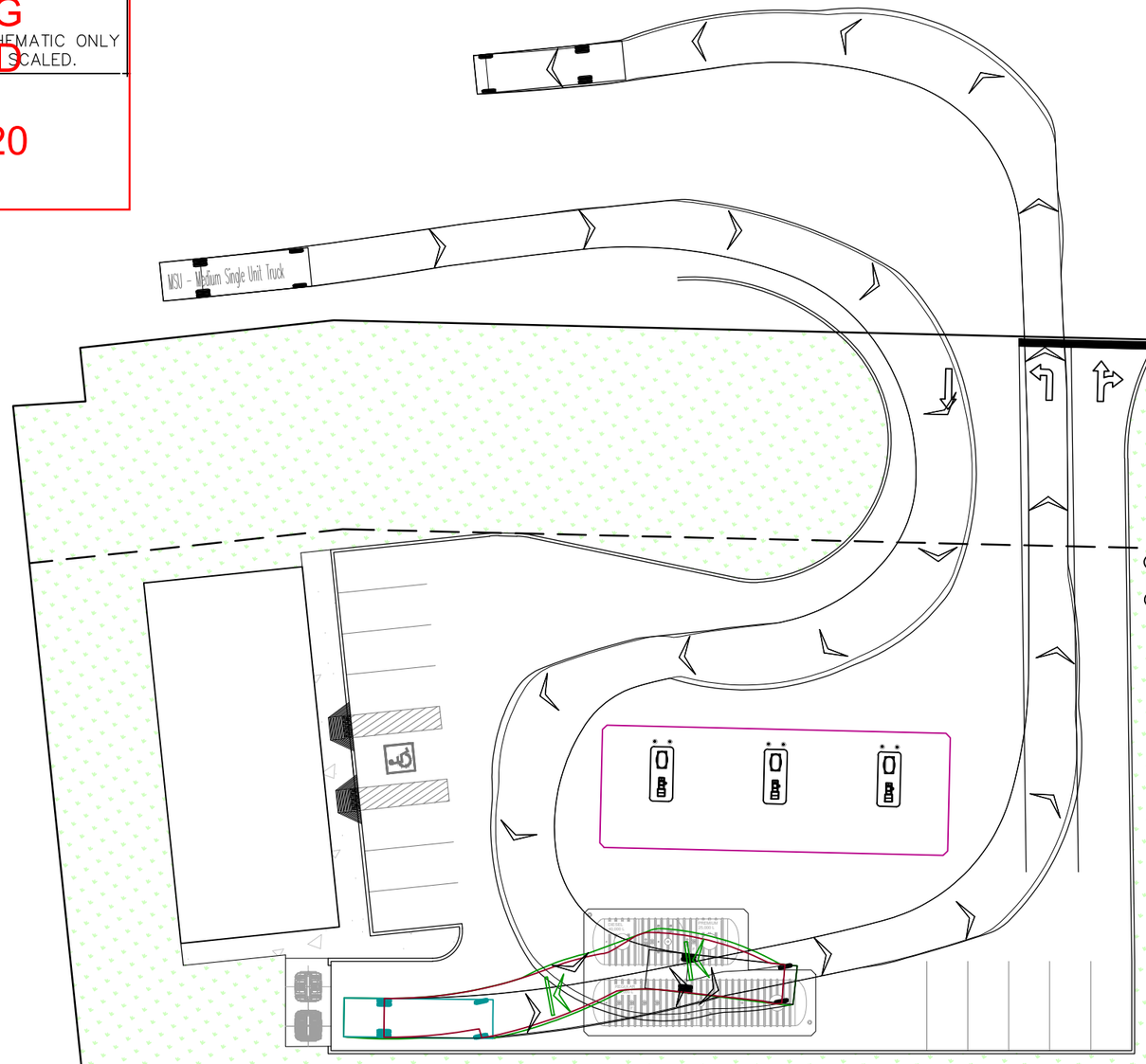
Source Numbers

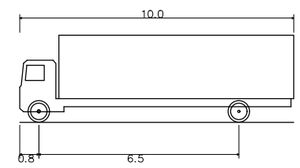
245, 340, 350, 385, 440, 617, 813, 864, 865, 883, 888, 954, 960, 977

APPENDIX H

Vehicle Turning Analysis

NOTE:
THIS FIGURE IS SCHEMATIC ONLY AND IS NOT TO BE SCALED.





MSU – MEDIUM SINGLE UNIT TRUCK	
Overall Length	10.00m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	11.100m

10795 & 10819 HIGHWAY 9
TOWN OF CALEDON

MEDIUM SINGLE UNIT
TRUCK TURNING DIAGRAM

CROZIER &ASSOCIATES Consulting Engineers
2800 High Point Drive
Suite 100
Milton, ON L9T 6P4
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www.cfcrozier.ca

Drawn	Design	Project No.	
A.K.	A.K.		1651-5095
Check	Check	Scale	Dwg.
	D.L.	N.T.S	APP. J

LIST OF FIGURES

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Figure 2: Boundary Road Network
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Figure 5: 2027 Future Background Traffic Volumes
Figure 6: 2032 Future Background Traffic Volumes
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Figure 8: Pass-By Trip Distribution
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Figure 10: Pass-By Trip Assignment
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Figure 12: 2027 Future Total Traffic Volumes
Figure 13: 2032 Future Total Traffic Volumes
Figure 14: 2032 Future Background Sensitivity Traffic Volumes
Figure 15: 2032 Future Total Sensitivity Traffic Volumes

Legend

Project

LIONS GROUP INC.
10819 HIGHWAY 9

Drawing

KEY PLAN

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THE HARBOUREDGE BUILDING,
40 HURON STREET, SUITE 301,
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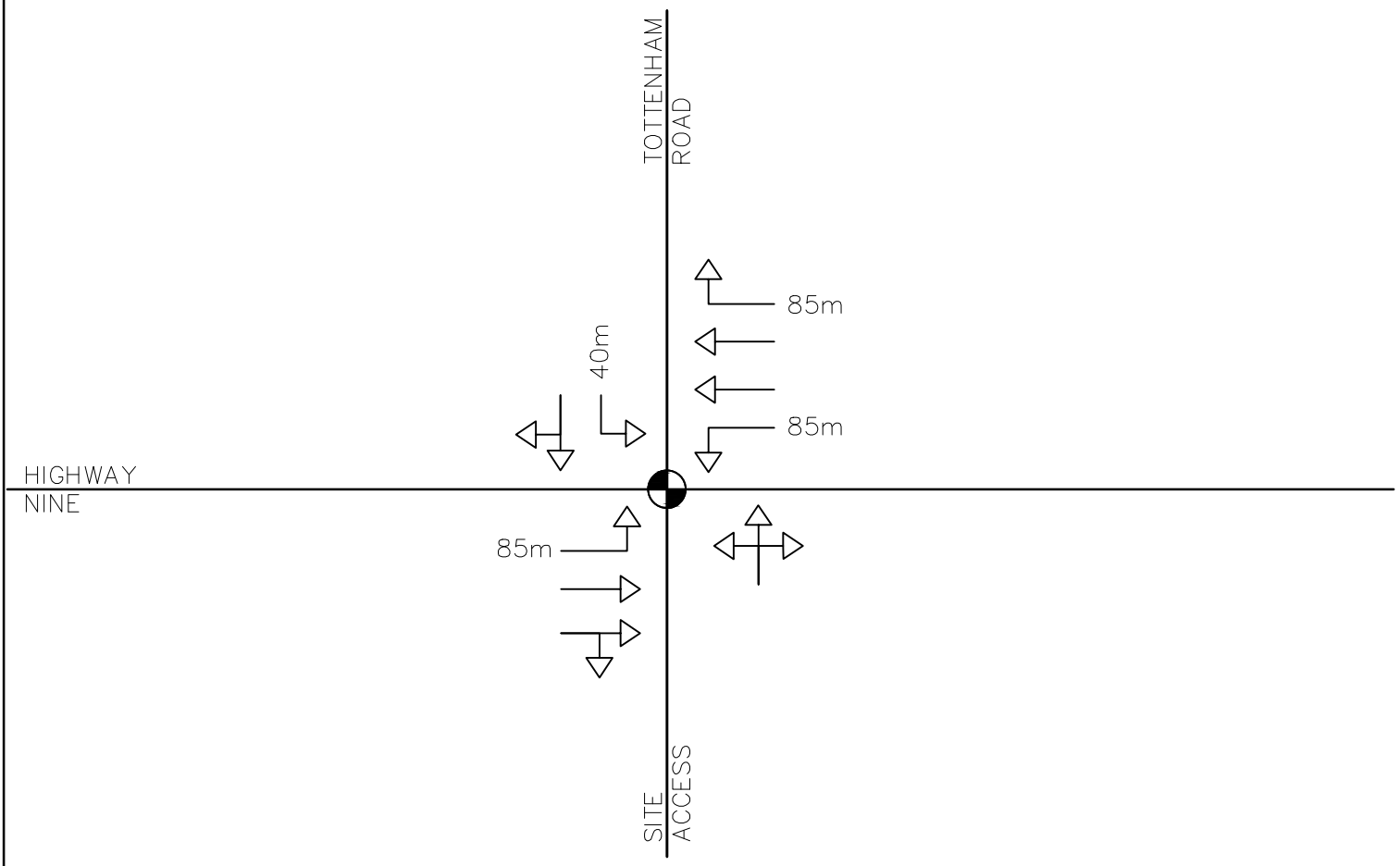
Drawn By	Design By	Project
S.K.	D.L.	1651-5095

Scale	Date	Check By	Drawing
N.T.S.	2020/03/23	A.F.	FIG. 1



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

- SIGNAL CONTROL
- STOP CONTROL
- XXm — STORAGE LENGTH OF AUXILIARY TURN LANES

Project: LIONS GROUP INC.
10819 HIGHWAY 9

Drawing: Boundary Road Network

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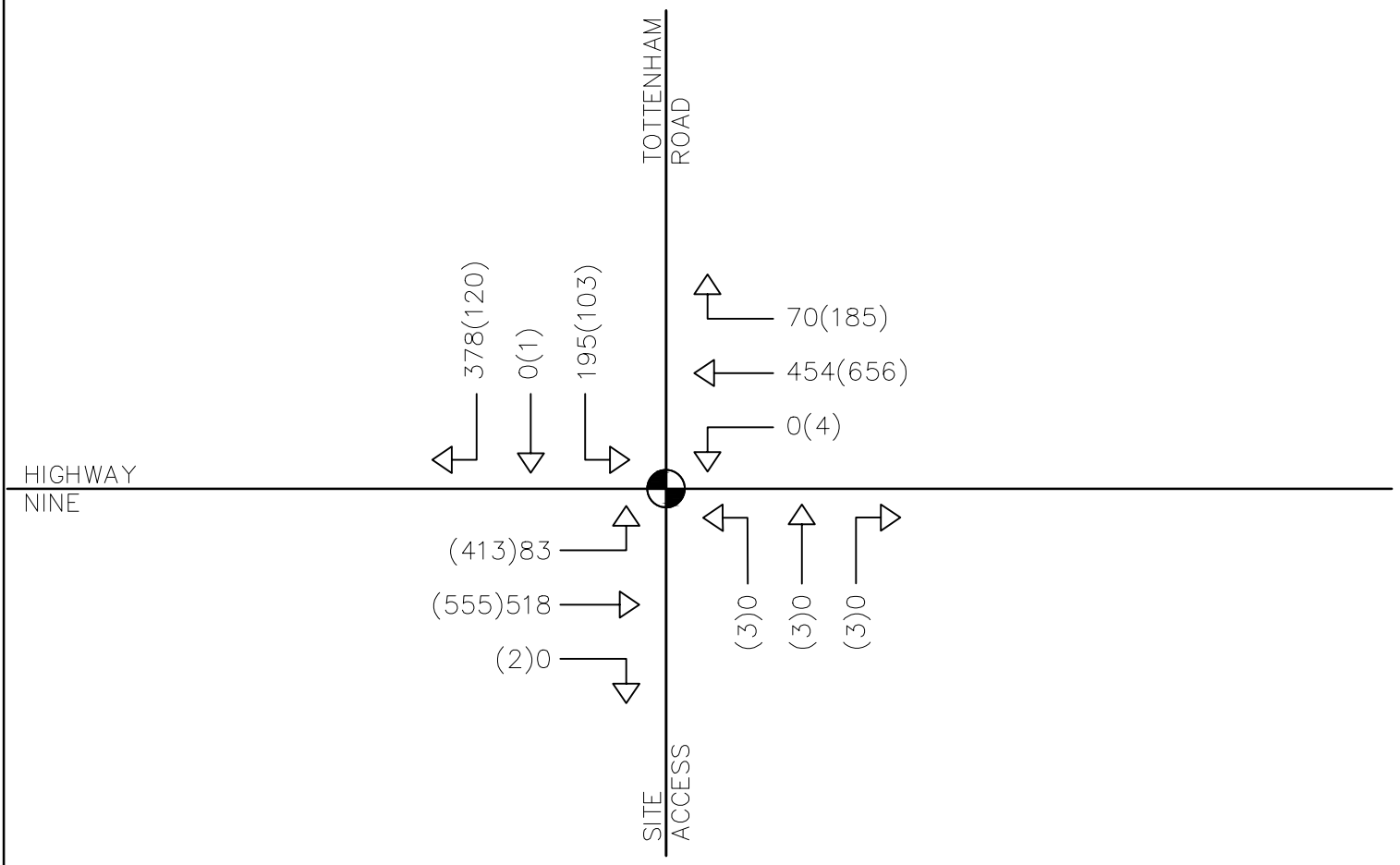
Drawn By	Design By	Project
S.K.	D.L.	1651-5095

Scale	Date	Check By	Drawing
N.T.S.	2020/03/23	A.F.	FIG. 3



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

- SIGNAL CONTROL
- STOP CONTROL
- XX(YY) WEEKDAY A.M. (WEEKDAY P.M.) PEAK HOUR VOLUMES

Project: LIONS GROUP INC.
10819 HIGHWAY 9

Drawing: 2019 EXISTING TRAFFIC VOLUMES

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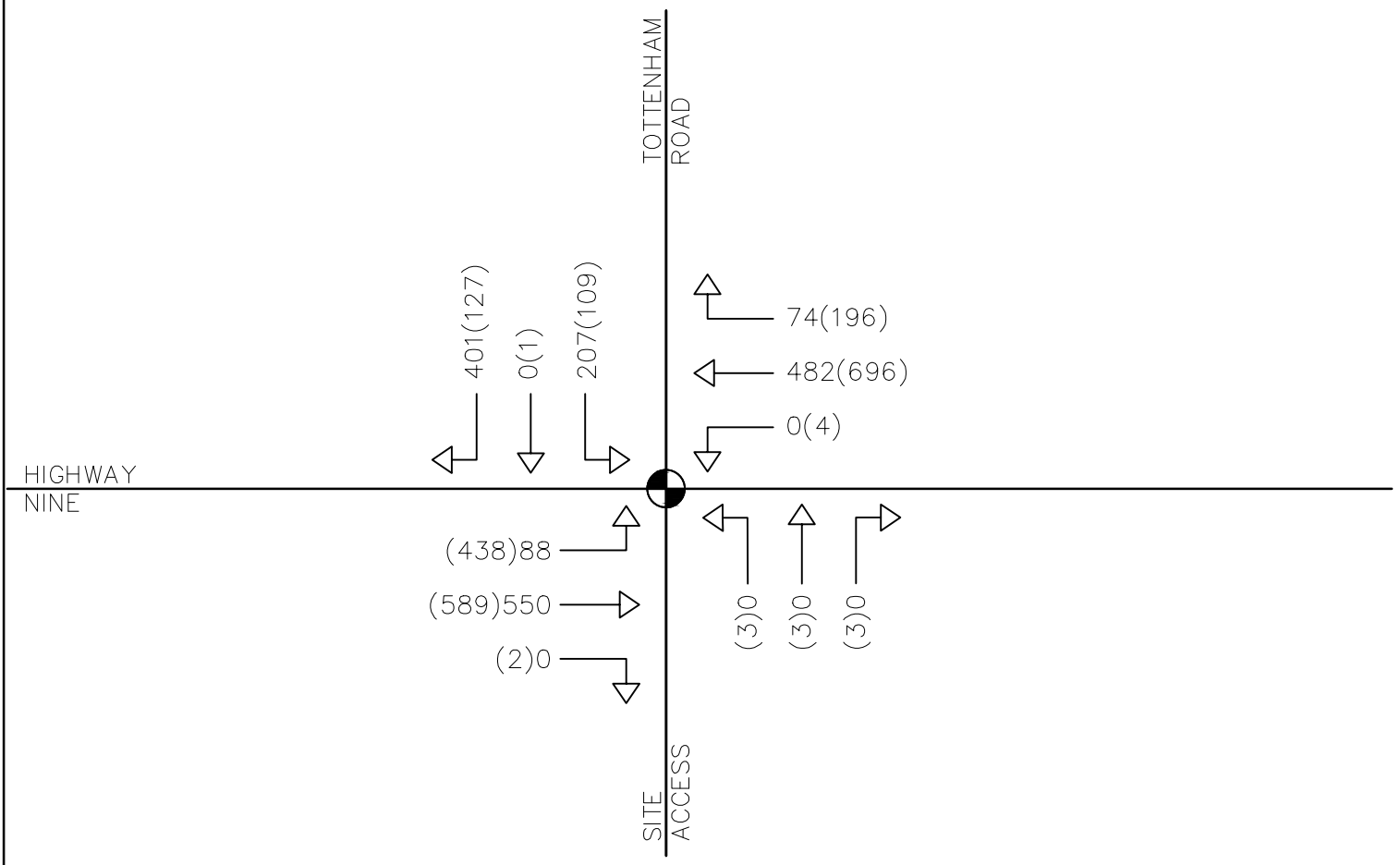
Drawn By	Design By	Project	Scale	Date	Check By	Drawing
S.K.	D.L.	1651-5095	N.T.S.	2020/03/23	A.F.	FIG. 3



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

- SIGNAL CONTROL
- STOP CONTROL
- XX(YY) WEEKDAY A.M. (WEEKDAY P.M.) PEAK HOUR VOLUMES

Project: LIONS GROUP INC.
10819 HIGHWAY 9

Drawing: 2022 FUTURE BACKGROUND TRAFFIC VOLUMES

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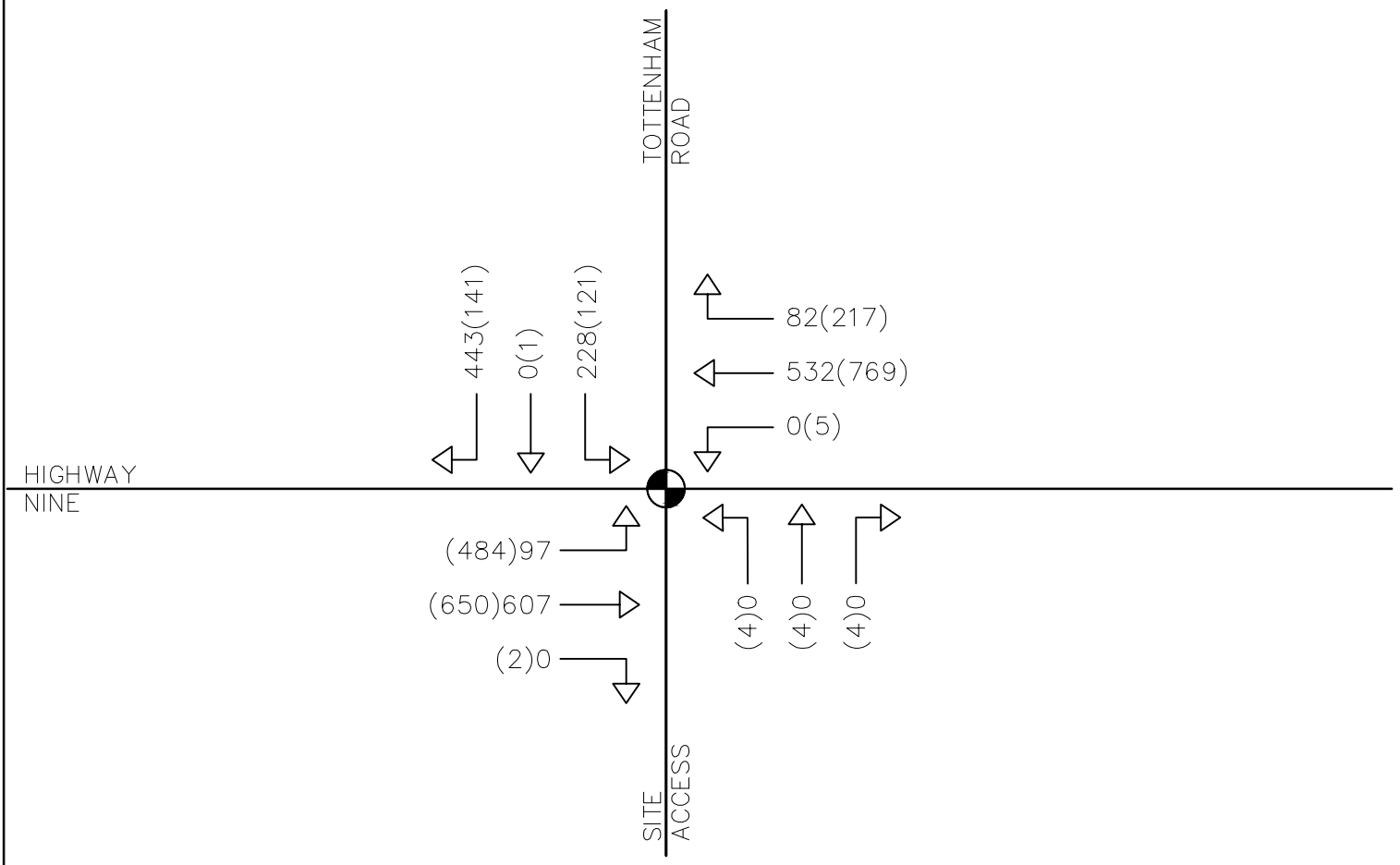
Drawn By	Design By	Project	Scale	Date	Check By	Drawing
S.K.	D.L.	1651-5095	N.T.S.	2020/03/23	A.F.	FIG. 4



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

SIGNAL CONTROL

STOP CONTROL

XX(YY) WEEKDAY A.M. (WEEKDAY P.M.) PEAK HOUR VOLUMES

Project: LIONS GROUP INC.
10819 HIGHWAY 9

Drawing: 2027 FUTURE BACKGROUND TRAFFIC VOLUMES

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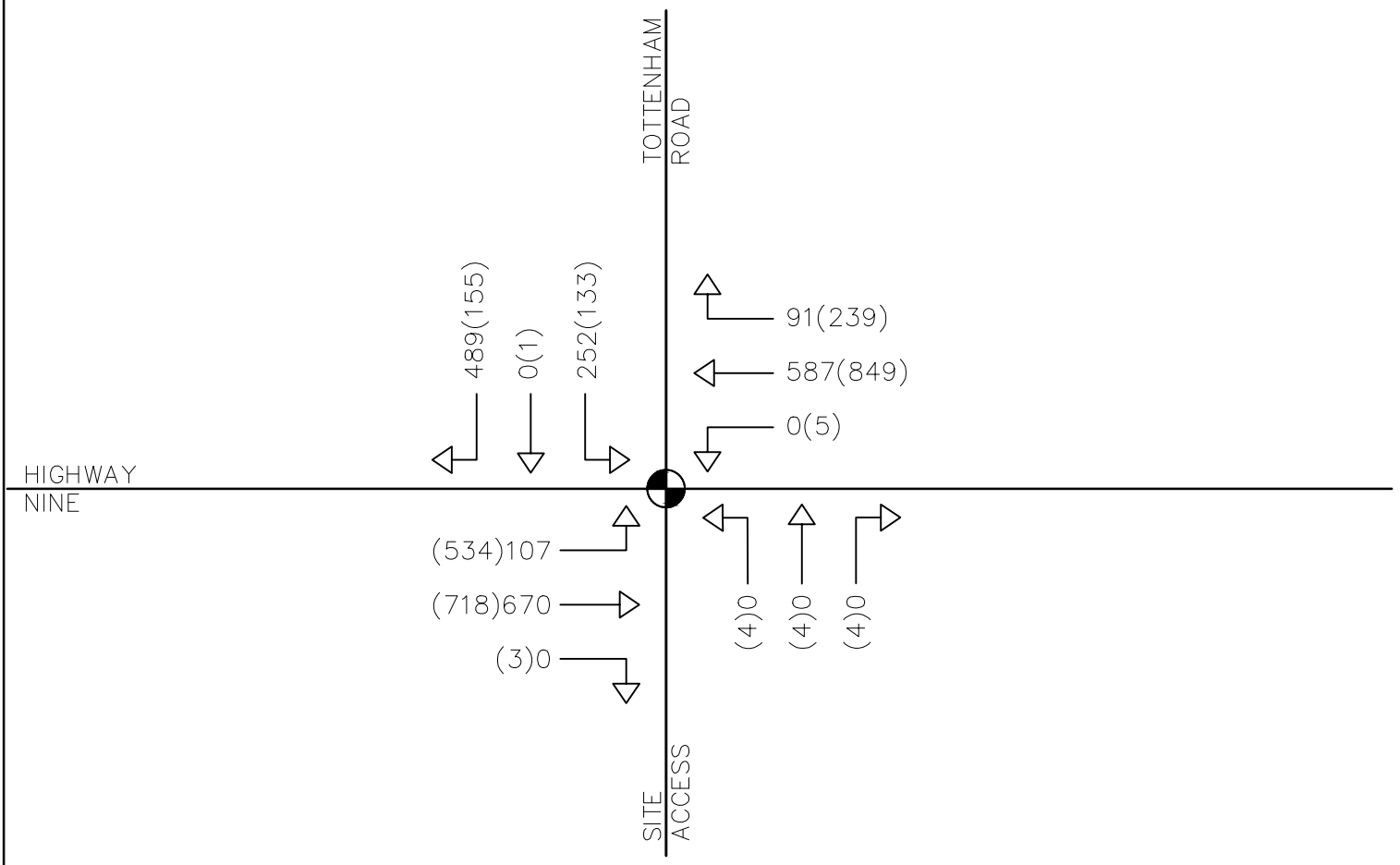
Drawn By	Design By	Project
S.K.	D.L.	1651-5095

Scale	Date	Check By	Drawing
N.T.S.	2020/03/23	A.F.	FIG. 5



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

- SIGNAL CONTROL
- STOP CONTROL
- XX(YY) WEEKDAY A.M. (WEEKDAY P.M.) PEAK HOUR VOLUMES

Project: LIONS GROUP INC.
10819 HIGHWAY 9

Drawing: 2032 FUTURE BACKGROUND TRAFFIC VOLUMES

CROZIER CONSULTING ENGINEERS
THE HARBOUREDGE BUILDING,
40 HURON STREET, SUITE 301,
COLLINGWOOD, ON L9Y 4R3
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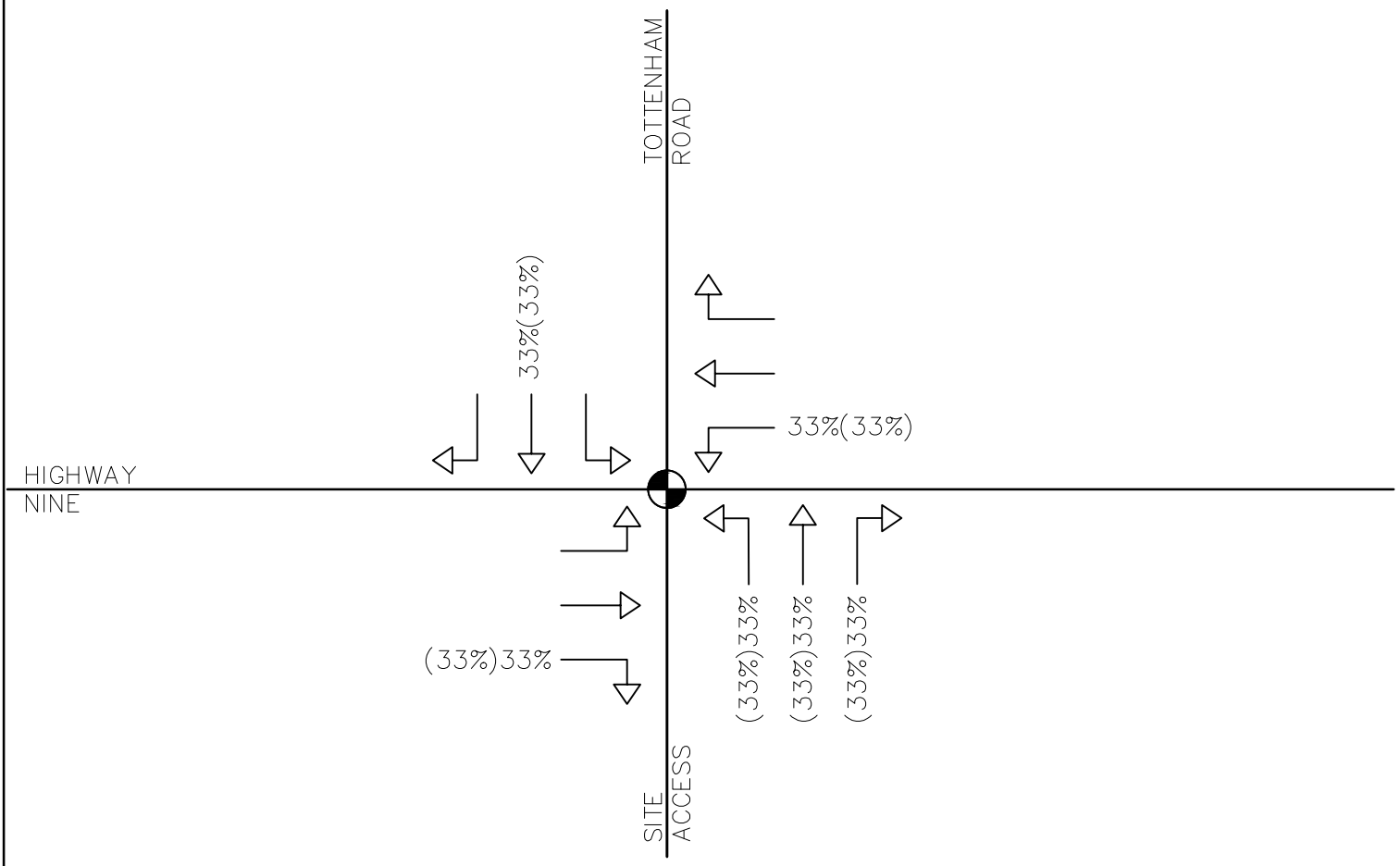
Drawn By	Design By	Project	Scale	Date	Check By	Drawing
S.K.	D.L.	1651-5095	N.T.S.	2020/03/23	A.F.	FIG. 6



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

SIGNAL CONTROL

STOP CONTROL

XX(YY) WEEKDAY A.M. (WEEKDAY P.M.) PEAK HOUR VOLUMES

Project: LIONS GROUP INC.
10819 HIGHWAY 9

Drawing: PRIMARY TRIP DISTRIBUTION

CROZIER CONSULTING ENGINEERS
THE HARBOUREDGE BUILDING,
40 HURON STREET, SUITE 301,
COLLINGWOOD, ON L9Y 4R3
705 446-3510 T
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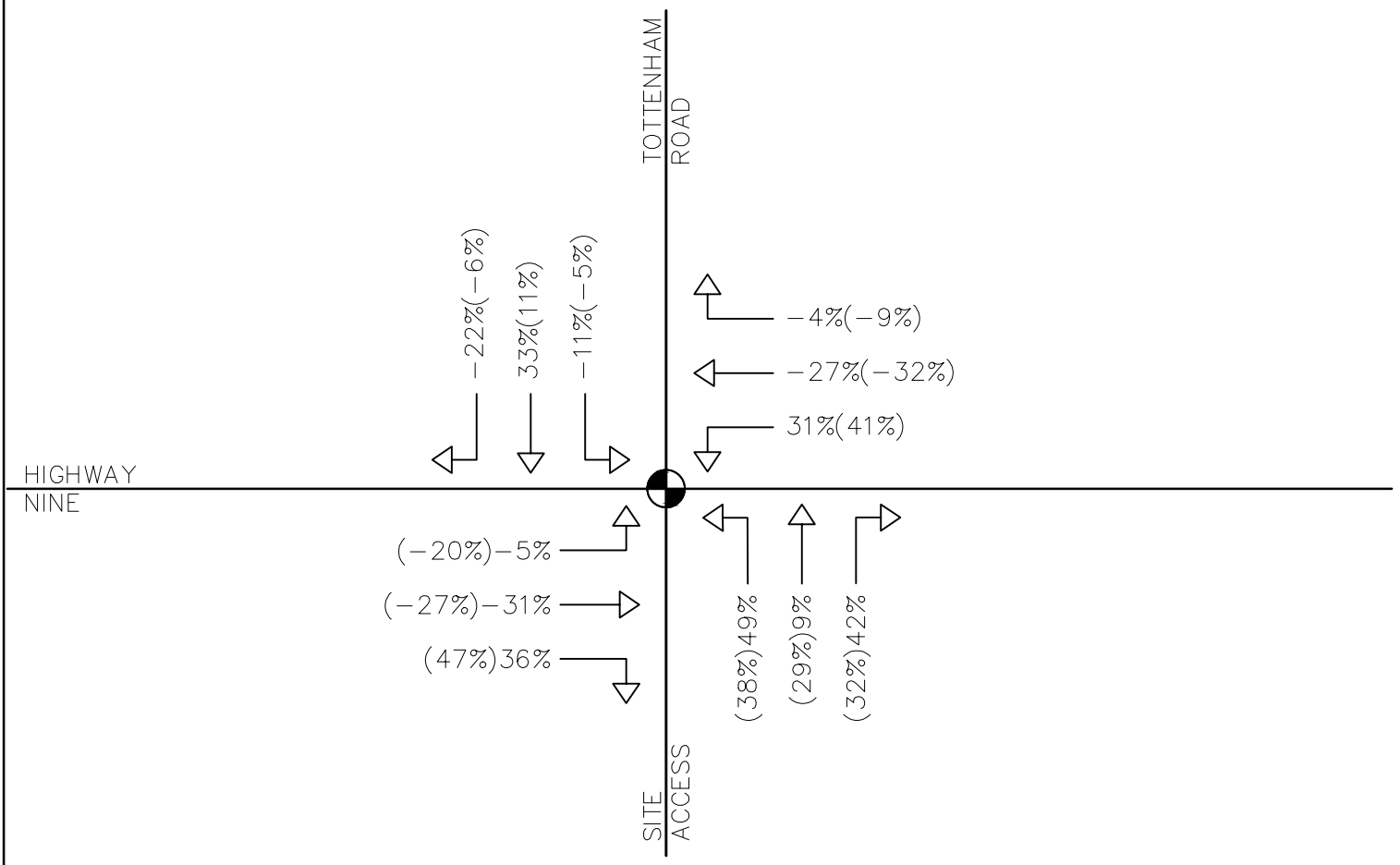
Drawn By	Design By	Project
S.K.	D.L.	1651-5095

Scale	Date	Check By	Drawing
N.T.S.	2020/03/23	A.F.	FIG. 7



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

- SIGNAL CONTROL
- STOP CONTROL
- XX(YY) WEEKDAY A.M. (WEEKDAY P.M.) PEAK HOUR VOLUMES

Project: LIONS GROUP INC.
10819 HIGHWAY 9

Drawing: PASS-BY TRIP DISTRIBUTION

CROZIER CONSULTING ENGINEERS
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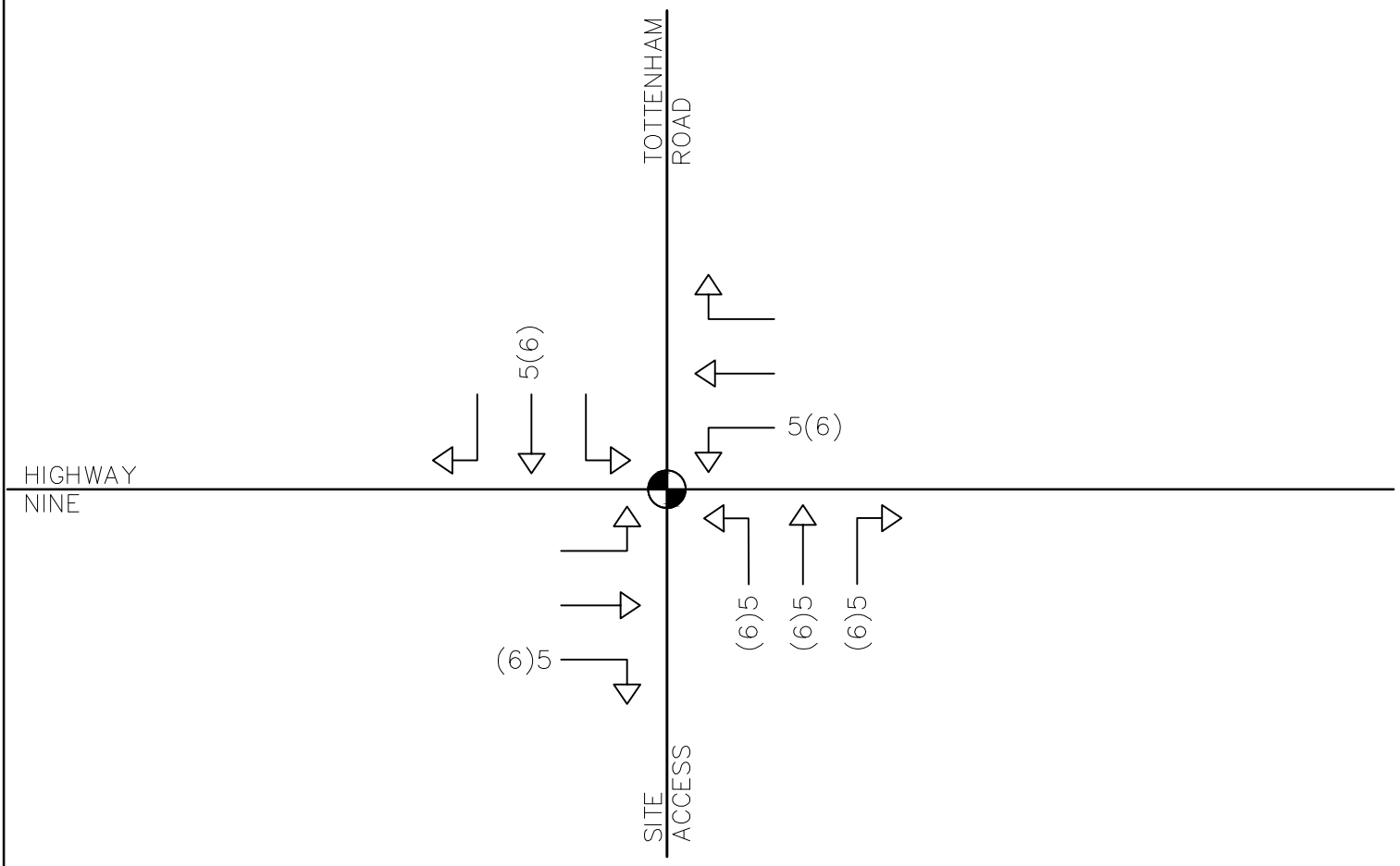
Drawn By	Design By	Project
S.K.	D.L.	1651-5095

Scale	Date	Check By	Drawing
N.T.S.	2020/03/23	A.F.	FIG. 8



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

- SIGNAL CONTROL
- STOP CONTROL
- XX(YY) WEEKDAY A.M. (WEEKDAY P.M.) PEAK HOUR VOLUMES

Project: LIONS GROUP INC.
10819 HIGHWAY 9

Drawing: PRIMARY TRIP ASSIGNMENT

CROZIER CONSULTING ENGINEERS
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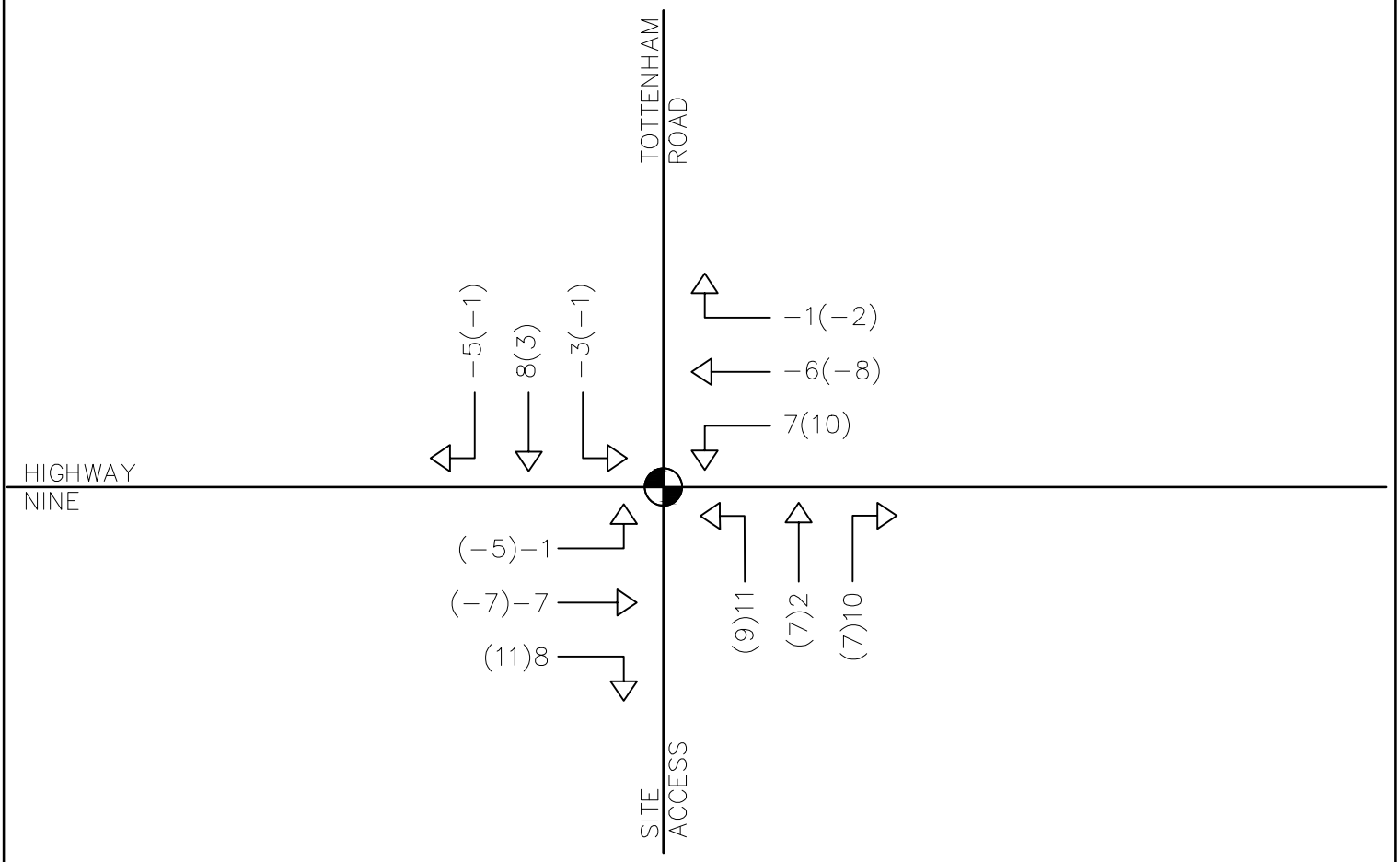
Drawn By	Design By	Project	Scale	Date	Check By	Drawing
S.K.	D.L.	1651-5095	N.T.S.	2020/03/23	A.F.	FIG. 9



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

- SIGNAL CONTROL
- STOP CONTROL
- XX(YY) WEEKDAY A.M. (WEEKDAY P.M.) PEAK HOUR VOLUMES

Project: LIONS GROUP INC.
10819 HIGHWAY 9

Drawing: PASS-BY TRIP ASSIGNMENT

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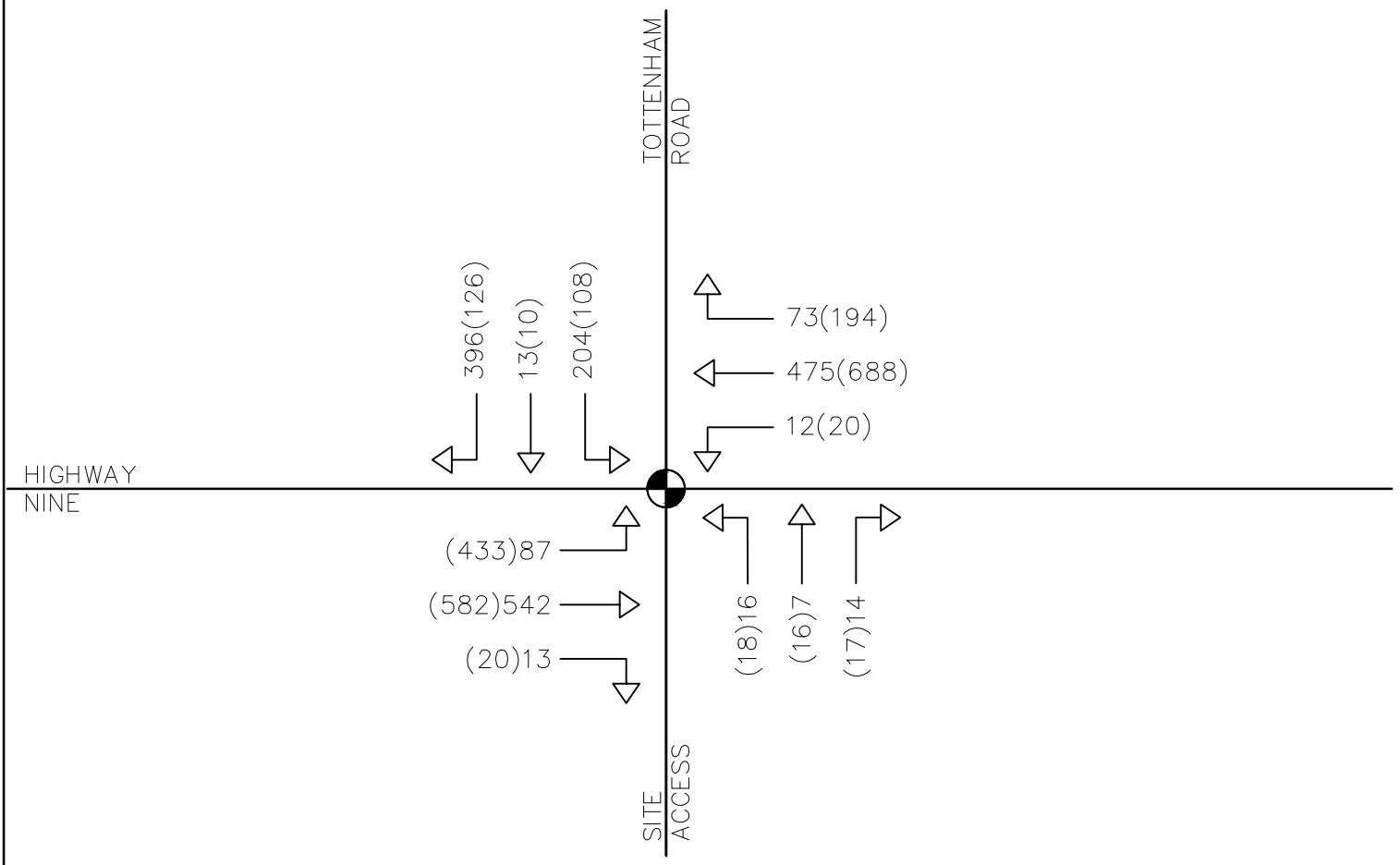
Drawn By	Design By	Project
S.K.	D.L.	1651-5095

Scale	Date	Check By	Drawing
N.T.S.	2020/03/23	A.F.	FIG. 10



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

- SIGNAL CONTROL
- STOP CONTROL
- XX(YY) WEEKDAY A.M. (WEEKDAY P.M.) PEAK HOUR VOLUMES

Project: LIONS GROUP INC.
10819 HIGHWAY 9

Drawing: 2022 FUTURE TOTAL TRAFFIC VOLUMES

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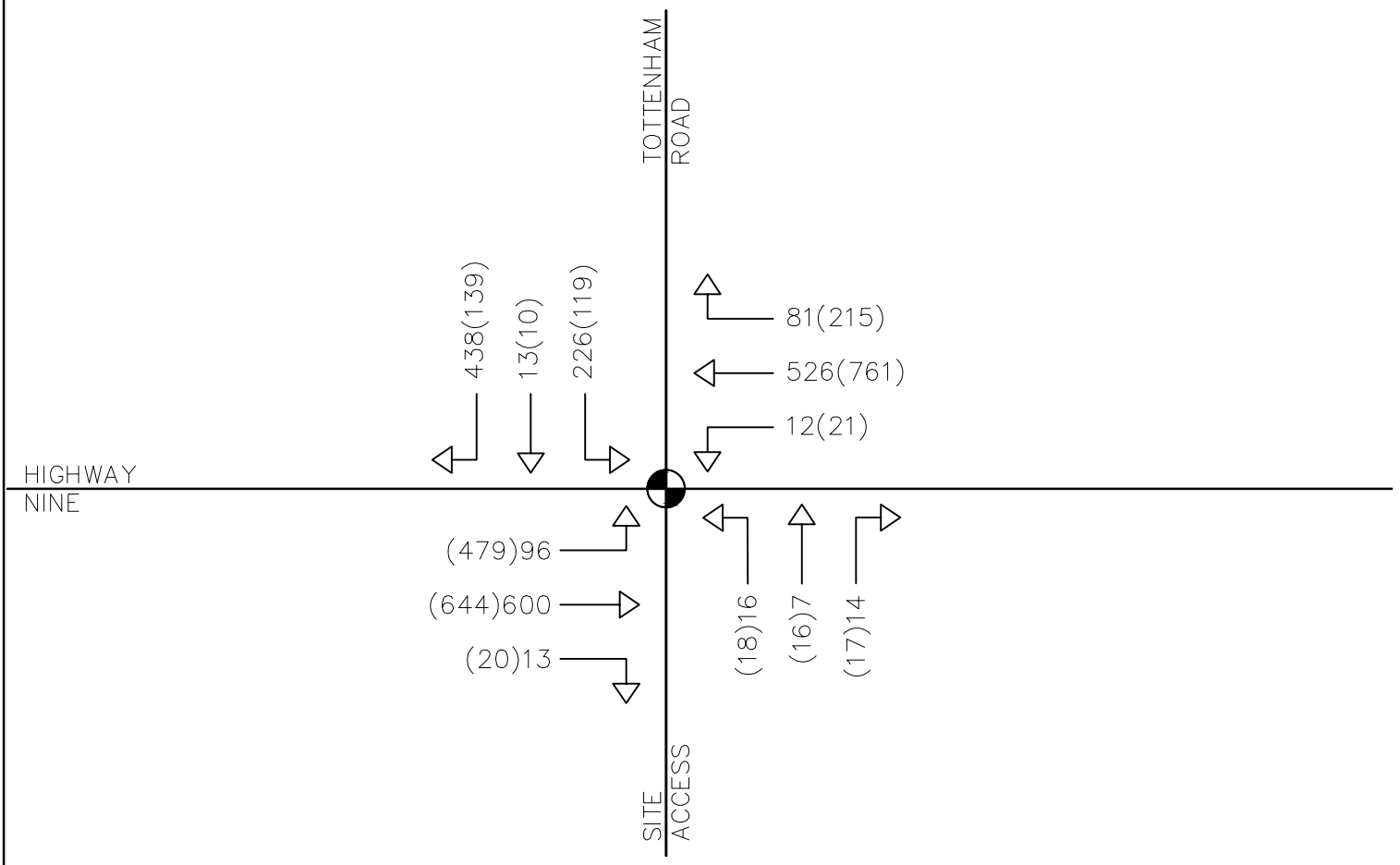
Drawn By	Design By	Project
S.K.	D.L.	1651-5095

Scale	Date	Check By	Drawing
N.T.S.	2020/03/23	A.F.	FIG. 11



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

- SIGNAL CONTROL
- STOP CONTROL
- XX(YY) WEEKDAY A.M. (WEEKDAY P.M.) PEAK HOUR VOLUMES

Project: LIONS GROUP INC.
10819 HIGHWAY 9

Drawing: 2027 FUTURE TOTAL TRAFFIC VOLUMES

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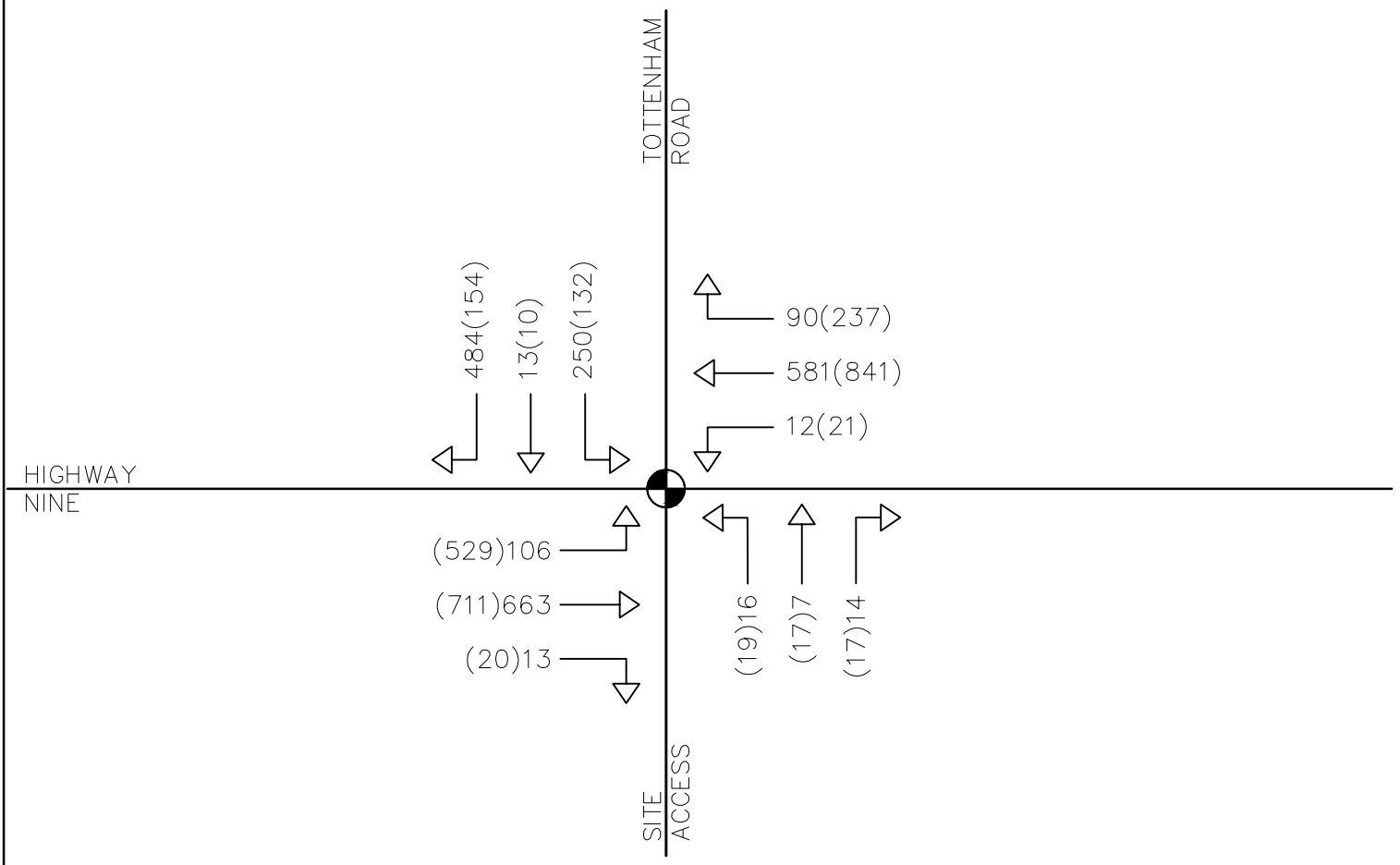
Drawn By	Design By	Project	Scale	Date	Check By	Drawing
S.K.	D.L.	1651-5095	N.T.S.	2020/03/23	A.F.	FIG. 12



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

SIGNAL CONTROL

STOP CONTROL

XX(YY) WEEKDAY A.M. (WEEKDAY P.M.) PEAK HOUR VOLUMES

Project: LIONS GROUP INC.
10819 HIGHWAY 9

Drawing: 2032 FUTURE TOTAL TRAFFIC VOLUMES

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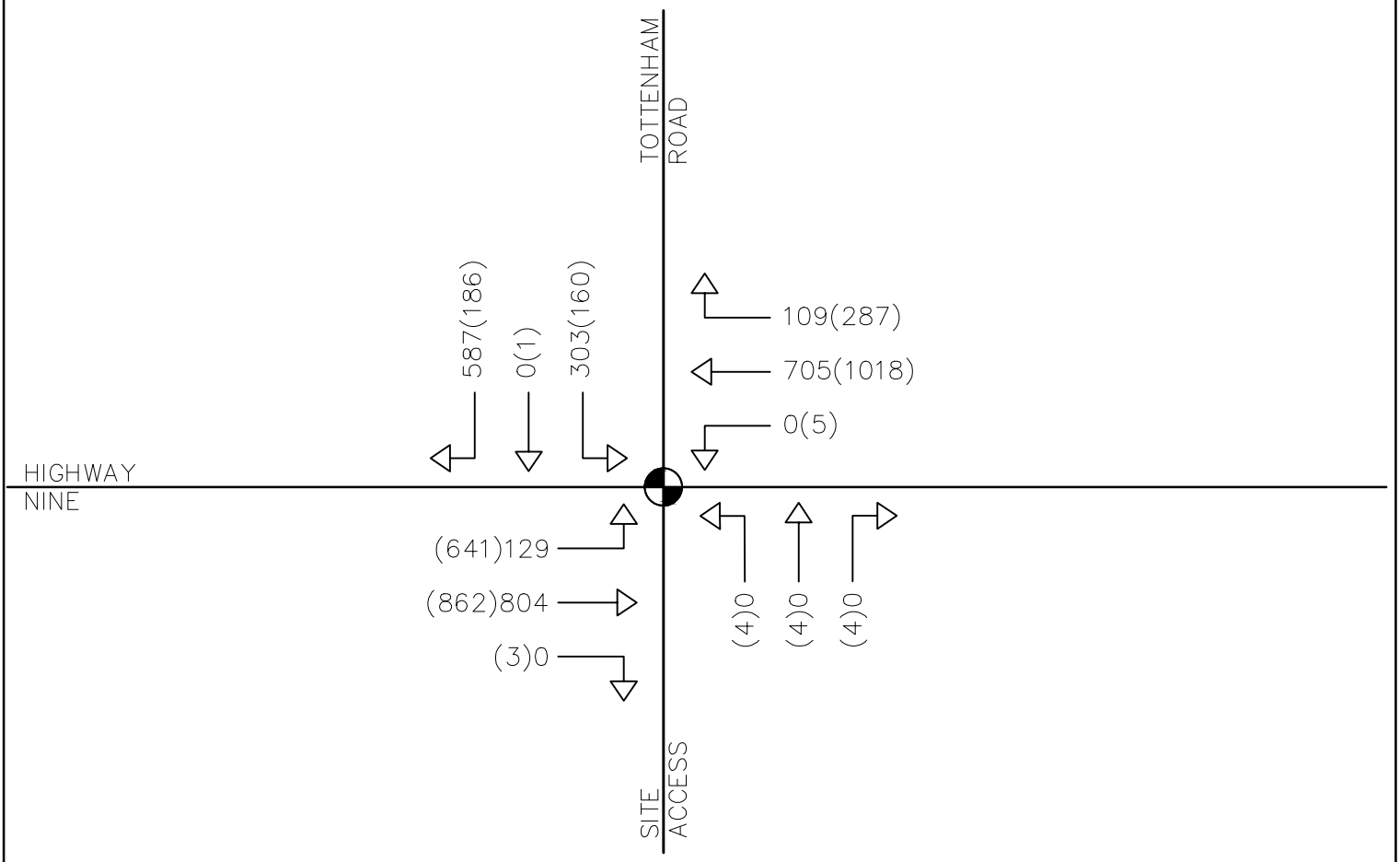
Drawn By	Design By	Project
S.K.	D.L.	1651-5095

Scale	Date	Check By	Drawing
N.T.S.	2020/03/23	A.F.	FIG. 13



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

- SIGNAL CONTROL
- STOP CONTROL
- XX(YY) WEEKDAY A.M. (WEEKDAY P.M.) PEAK HOUR VOLUMES

Project: LIONS GROUP INC.
10819 HIGHWAY 9

Drawing: 2032 FUTURE BACKGROUND SENSITIVITY TRAFFIC VOLUMES

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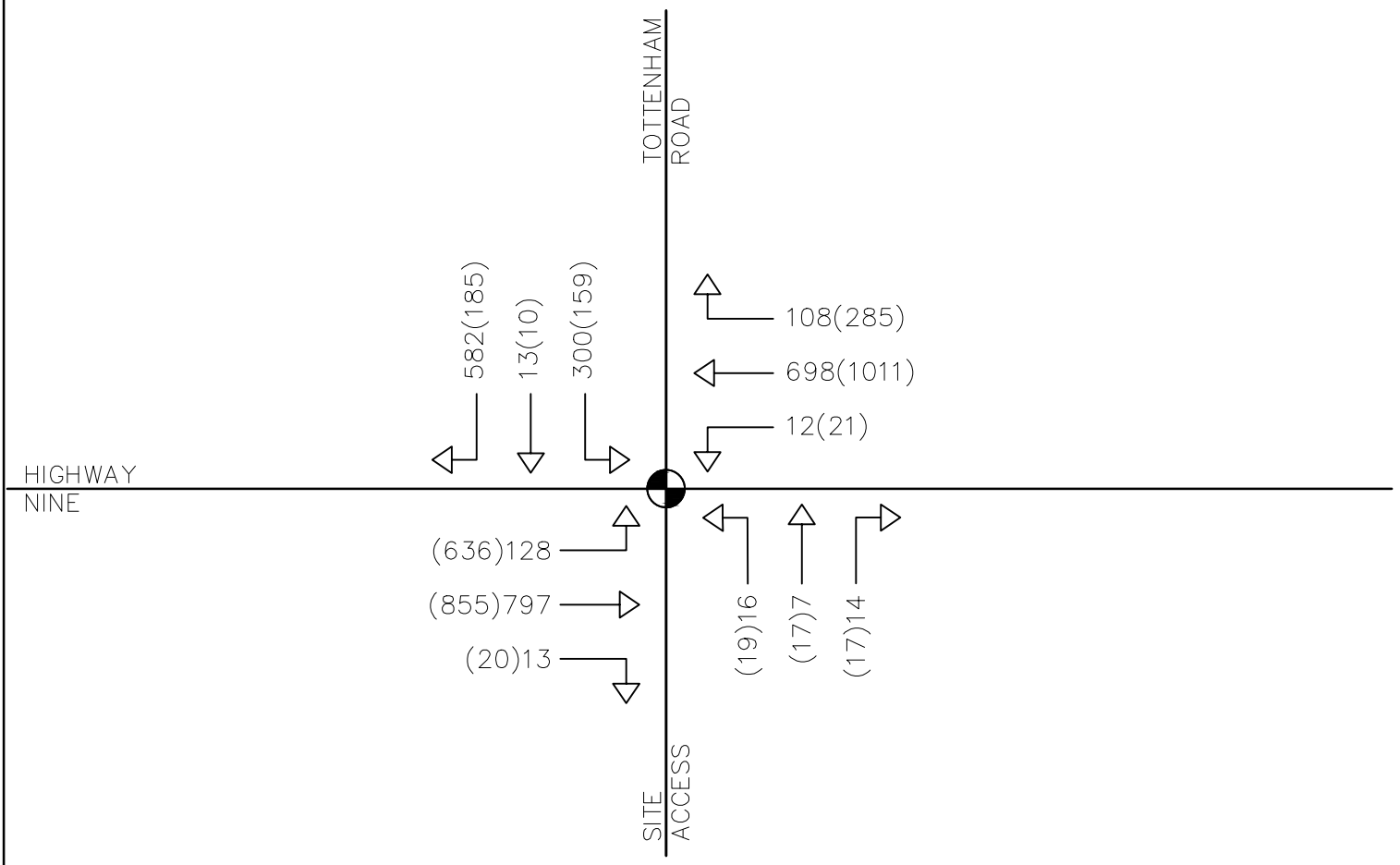
Drawn By	Design By	Project
S.K.	D.L.	1651-5095

Scale	Date	Check By	Drawing
N.T.S.	2020/03/23	A.F.	FIG. 14



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

- SIGNAL CONTROL
- STOP CONTROL
- XX(YY) WEEKDAY A.M. (WEEKDAY P.M.) PEAK HOUR VOLUMES

Project: LIONS GROUP INC.
10819 HIGHWAY 9

Drawing: 2032 FUTURE TOTAL SENSITIVITY TRAFFIC VOLUMES

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Drawn By	Design By	Project
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Scale	Date	Check By	Drawing
N.T.S.	2020/03/23	A.F.	FIG. 15