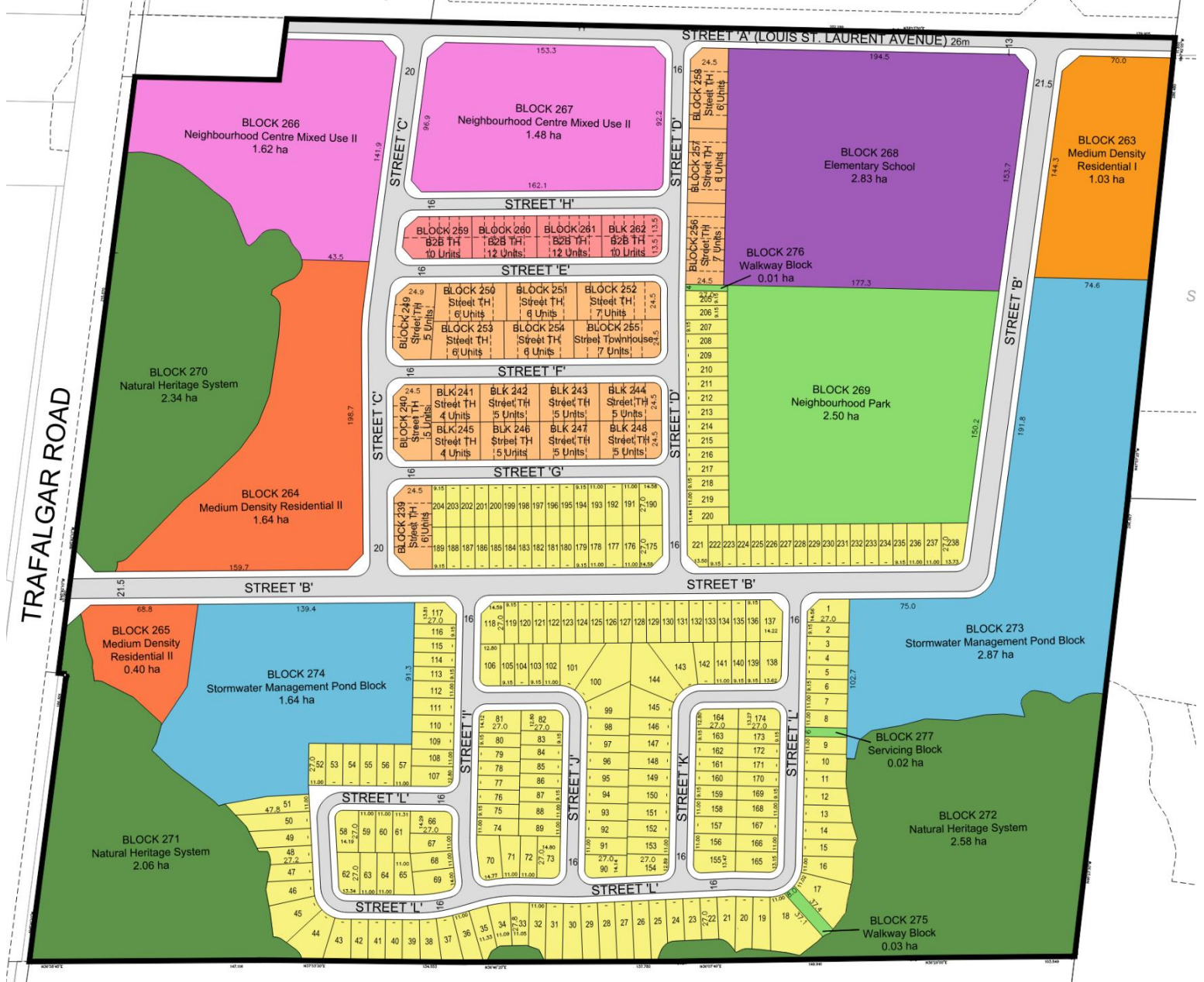




Traffic Impact Study

Remington Draft Plan of Subdivision – MP4 Trafalgar

July 2025 | Project # 10494
Remington Group Inc



TYLin

EXECUTIVE SUMMARY

Introduction

- ▶ T.Y. Lin International Canada Inc. (TYLin) was retained by Milton P4 Trafalgar Landowners Group Inc. to prepare a Tertiary Plan Road Network Assessment (RNA) for all lands within the Trafalgar Secondary Plan area. Envisioned as a complete community, the Trafalgar Secondary Plan is focused on delivering connected neighbourhoods, parks and open space and a mix of uses and built form with densities that support future higher order transit.
- ▶ In order to realize the vision, the Secondary Plan requires a more detailed Tertiary Plan, the last layer between the policies and implementation by the draft plans of subdivision. The preparation of this Tertiary Plan has been guided by the objectives and detailed policies of the Secondary Plan.
- ▶ The RNA, required by the Town of Milton and Halton Region, was prepared in tandem with, and in support of, the overall Tertiary Plan for the Trafalgar lands within Milton's Phase 4 Lands. The Phase 4 Lands are defined in the Town's 2018 TMP as the next Urban Expansion Area for the year 2021 and beyond.
- ▶ Subsequently, TYLin was retained by Remington Inc., to prepare a Traffic Impact Study (TIS) in support of a Draft Plan of Subdivision (DPS) Application for the Remington subdivision (herein referred to as the Remington lands), located within Trafalgar Secondary Plan (herein referred to as the MP4TC lands) in the Town of Milton.
- ▶ The base of the traffic forecast utilized within this study is sourced within the RNA study for the MP4TC lands, with changes to the densities considered for various land parcels as applicable.
- ▶ The study intersections have been detailed below:
 - ▶ Trafalgar Road and Derry Road
 - ▶ Trafalgar Road and Britannia Road
 - ▶ Trafalgar Road and Street 'A' (Louis St Laurent Avenue / Collector L)
 - ▶ Street 'A' (Louis St Laurent Avenue / Collector L) and Street 'C' (Collector G)
 - ▶ Street 'A' (Louis St Laurent Avenue / Collector L) and Street 'B' (Collector H)
 - ▶ Trafalgar Road and Street 'B' (Collector H)
 - ▶ Street 'B' (Collector H) and Street 'C' (Collector G)
- ▶ As per the subdivision draft plan dated April 3, 2025, the development statistics for the Remington lands consist of the following:
 - ▶ Single Detached Dwellings – 238 Units

- ▶ Street Townhouse Dwellings – 111 Units
 - ▶ Back-to-Back Townhouse Dwellings – 44 Units
 - ▶ Medium Density Residential Dwellings
 - ▶ Neighborhood Centre Mixed Use Dwellings
 - ▶ 1 Elementary School
 - ▶ The remaining development areas include Neighbourhood Park, Natural Heritage System (NHS) and Stormwater Management Pond.
- ▶ TYLin completed a review of the proposed subdivision draft plan design for the Remington lands based on the requirements on ROW, road bends and horizontal curvature, intersection spacing, intersection angle, daylight triangle / rounding and minimum tangent length at intersections. It is considered that the design of the roadways is deemed acceptable.
 - ▶ TYLin's 2023 TMC data, sourced from the RNA study, was collected after the recent (2022) Highway 401 widening from Mississauga to Milton. To reflect regional traffic growth, an annual growth rate of 2.65% was applied to traffic volumes on regional roadways. This adjusted dataset forms the 2025 baseline traffic volume analysis for this study.
 - ▶ The horizon years of 2031 (build-out year of the Remington Lands) and 2041 (ten-year horizon) were adopted to assess the future traffic conditions. The study horizons align with the horizons assessed in the ongoing Trafalgar Tertiary Plan RNA study. The future traffic volume in 2031 horizon will include the Remington Lands trips plus the balance of MP4 Phase 1 lands, while the 2041 horizon will further incorporate the balance of MP4 Phase 2 lands.
 - ▶ 3 out of total 38 TAZs within the Remington lands are identified as the proposed subdivision for trip generation purposes. The resulting trips were then assigned to the collector road and broader transportation network based on each TAZ's location within the Tertiary Plan.
 - ▶ A total of 825 net auto trips, consisting of 318 inbound and 507 outbound trips, are estimated to be generated by the Remington Lands during the weekday AM peak hour. During the weekday PM peak hour, 368 inbound and 244 outbound net auto site trips are estimated, totaling 612 trips.
 - ▶ The updated Remington Lands (TAZs 12, 13 and F) trip generation would result in a net difference of +12 and -35 two-way trips in the AM and PM when compared to MP4 RNA Study.
 - ▶ Based on the recommendations outlined in the Milton Transportation Master Plan (TMP) and the proposed lane configuration modifications detailed in the RNA for the MP4TC area, phased improvements have been adopted for the study intersections.



2031 Future Lane Configuration Modification and Responsibility

Intersection	Approach	Modification	Responsibility
Existing Intersections			
Trafalgar Road & Derry Road	Northbound	▶ Dual left turn lanes ▶ 1 additional through lane (HOV) ▶ Auxiliary right turn lane	Region
	Eastbound and Southbound	▶ Dual left turn lanes ▶ 1 additional through lane (HOV)	
	Westbound	▶ 1 additional through lane (HOV) ▶ Auxiliary right turn lane	
Trafalgar Road & Britannia Road	Eastbound and Westbound	▶ Auxiliary left turn lane	
	All directions	▶ 1 additional through lane (HOV) ▶ Auxiliary right turn lane	
Arterial-to-Collector Intersections			
Trafalgar Road & Collector L	Northbound	▶ 1 additional through lane (HOV)	Region
		▶ Auxiliary right turn lane	MP4 Developers
	Southbound	▶ 1 additional through lane (HOV)	Region
		▶ Auxiliary left turn lane	MP4 Developers
	Westbound	▶ Auxiliary left turn lane ▶ Auxiliary right turn lane	MP4 Developers
Trafalgar Road & Collector H	Northbound	▶ 1 additional through lane (HOV)	Region
		▶ Shared right turn movement	MP4 Developers
	Southbound	▶ 1 additional through lane (HOV)	Region
		▶ Auxiliary left turn lane	MP4 Developers
	Westbound	▶ Auxiliary left turn lane ▶ Auxiliary right turn lane	MP4 Developers
Collector-to-Collector Intersections			
Collector G & Collector L	Northbound and Southbound	▶ Single lane approach (shared all movements)	MP4 Developers
	Eastbound and Westbound	▶ Auxiliary left turn lane ▶ 1 shared through/right turn lane	

Intersection	Approach	Modification	Responsibility
Collector H & Collector L	Northbound and Southbound	▶ Auxiliary left turn lane ▶ 1 shared through/right turn lane	
	Eastbound and Westbound	▶ Single lane approach (shared all movements)	
Collector G & Collector H	Eastbound	▶ 1 Shared through/left turn lane	
	Southbound	▶ Single lane with shared left/right movements	
	Westbound	▶ 1 Shared through/right turn lane	

2041 Future Lane Configuration Modification and Responsibility

Intersection	Approach	Modification	Responsibility
Existing Intersections			
Trafalgar Road & Derry Road	Westbound	▶ Dual left turn lanes	Region
Trafalgar Road & Britannia Road	Northbound and Southbound	▶ Dual left-turn lanes	
Arterial-to-Collector Intersections			
Trafalgar Road & Collector L	Northbound	▶ Auxiliary left turn lane	MP4 Developers
	Eastbound	▶ Auxiliary right turn lane	
		▶ 1 shared through/left turn lane	
	Southbound	▶ Auxiliary right turn lane	
	Westbound	▶ Shared through movement	

Baseline Traffic Conditions

- ▶ All study intersections are generally operating well overall, with acceptable delays and capacity during both the weekday AM and PM peak hours.

2031 Future Background Traffic Conditions

- ▶ Trafalgar Road at Derry Road is expected to operate with reserve capacity maintained during both AM and PM peak hours. Although some individual turning movements experience higher delays (LOS 'E' or 'F'), all v/c ratios remain below 1.0, indicating no capacity exceedance.
- ▶ The intersection of Trafalgar Road at Britannia Road is anticipated to operate with some reserve capacity. Some critical movements are identified as approaching theoretical capacity (i.e., v/c between 0.85 and 1.00).

2031 Future Total Traffic Conditions

- ▶ All existing, arterial-to-collector and collector-to-collector intersections are projected to operate within reserve capacity during both AM and PM peak hours, except for the intersection of Trafalgar Road and Britannia Road. Some individual movements experience LOS 'E' or 'F' due to longer delays but remain within capacity ($v/c < 1.00$). These delays are partly attributed to the 140-second cycle lengths implemented along regional corridors, which increase delays for dedicated turning movements and minor approach vehicles.
- ▶ For Trafalgar Road at Britannia Road, consistent with 2031 future background conditions, the intersection is projected to operate with reserve capacity. However, critical movements approaching theoretical capacity (v/c between 0.85 and 1.00). This performance is typical for major arterial intersections during peak hours, where operations approach theoretical capacity. Outside peak hours, traffic flow at this intersection is expected to return to manageable levels.

2041 Future Background Traffic Conditions

- ▶ The intersection of Trafalgar Road at Derry Road is anticipated to operate at reserve capacity. Some critical movements are identified as approaching theoretical capacity (i.e., v/c between 0.85 and 1.00).
- ▶ The intersection of Trafalgar Road at Britannia Road is anticipated to operate with reserve capacity during PM peak hour.

2041 Future Total Traffic Conditions

- ▶ The existing intersections are anticipated to operate with critical capacity, while the arterial-to-collector and collector-to-collector intersections are projected to operate within reserve capacity during both AM and PM peak hours.
- ▶ For Trafalgar Road at Derry Road, similar to 2041 future background condition, the intersection is expected to operate with reserve capacity. This performance is typical for the intersection of two major arterial roads during peak hours, where operations are expected to approach theoretical capacity. Outside of peak periods, traffic flow at this intersection is anticipated to return to manageable levels.
- ▶ For Trafalgar Road at Britannia Road, the intersection is anticipated to operate above theoretical capacity during PM peak hour, with v/c ratio of 1.01.
- ▶ This performance is typical for the intersection of two major arterial roads during peak hours, where operations are expected to approach theoretical capacity. Outside of peak periods, traffic flow at this intersection is anticipated to return to manageable levels.
- ▶ In additions, the operation of some critical movements is primarily attributed to the inability

to exclude Trafalgar site traffic from the 2051 JBPE forecasting model growth rates, as requested by the Region. This limitation stems from challenges in aligning trip distribution between the traffic models, resulting in the double counting of some Trafalgar site traffic. Consequently, this has led to an overestimation of traffic volumes for the 2041 future background and future total scenario.

- ▶ The proposed active transportation facilities within the site are designed to support internal connectivity for pedestrians and cyclists, while also linking to the broader active transportation network identified in the Trafalgar Tertiary Plan as below.

Proposed Active Transportation Facilities

Road Name	Active Transportation Facilities
Trafalgar Road	▶ multi-use paths (MUPs) on both sides
Collector L (26.0m ROW)	▶ in-boulevard bike lanes and sidewalks on both sides
Collector H (21.5m ROW)	▶ in-boulevard bike lanes and sidewalks on both sides
Collector G (20m ROW)	▶ a MUP on one side and a sidewalk on the other side
Other local roads (16m ROW)	▶ a sidewalk on either side of the road

- ▶ The on-street parking plan is subject to refinement at the detailed design stage once residential driveways and all utilities are confirmed.



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1 INTRODUCTION

1.1 Scope and Objective

T.Y. Lin International Canada Inc. (TYLin) was retained by The Remington Group Inc., to prepare a Traffic Impact Study (TIS) in support of a Draft Plan of Subdivision (DPS) Application for the Remington subdivision (herein referred to as the Remington lands), located within Trafalgar Secondary Plan (herein referred to as the MP4TC lands) in the Town of Milton.

This TIS study, along with the other traffic studies in support of the Draft Plan of Subdivision Applications for the other land parcels within the MP4TC, have been completed using the most up-to-date development statistics available for each land parcel at the time of study completion.

This study is prepared to assess the land use plan and associated density proposed by The Remington Group Inc. and proceed with the application process for the site. The base of the traffic forecast utilized within this study is sourced within the RNA study for the MP4TC lands, with changes to the densities considered for various land parcels as applicable. All analysis has been detailed within this report, and includes the following review:

- ▶ Review traffic forecast completed as part of the RNA study and update development density for the applicable land parcels to account for the latest development statistics proposed by each individual landowner.
- ▶ Using the updated traffic forecast, derive the 2031 (build-out year of the Remington Lands) and 2041 (ten-year horizon year) future background traffic volumes at the study intersections in order to assess projected traffic operations without the proposed site traffic in place and derive remedial measures as required.
- ▶ Remove and replace the estimated site traffic volumes assumed in the Trafalgar RNA as per updated subdivision statistics. As such, the estimated site generated traffic will be built upon the forecasted traffic volumes provided by the Trafalgar RNA study, which in turn will become our future traffic base model.
- ▶ Create a future conditions traffic operations model to assess the traffic impacts of the proposed development after introducing the estimated site generated traffic into the future background traffic model. Report any operational deficiencies and recommend mitigating measures, if necessary, to improve traffic operations, including recommending lane configuration changes, and/or traffic control alterations.
- ▶ Determine the future site-related impacts in the context of local transportation modes including reviews of transit, cycling and pedestrian facilities and circulation from the proposed development to the external road network.

- ▶ Compare trip generation assumptions provided in the Trafalgar RNA and the currently proposed draft plan.
- ▶ Review the subdivision plan with a study area road inventory review to confirm lane assignments, traffic controls, speed limits, and surrounding land uses and general study area characteristics.

The objective of this study is to determine the traffic volumes anticipated to be generated by the proposed development during the critical weekday AM and PM peak periods; to assess the impact of this traffic on the existing and future roadway network, recommend improvements to accommodate the projected traffic if any are needed, and confirm that the internal road network is consistent with Town standards and provides safe operation of vehicles within the proposed subdivision.

A copy of the Terms of Reference communication to date between the Town, Region, and TYLin is provided in **Appendix A**.

1.2 Planning Context and Relevant Background Studies

The Trafalgar Tertiary Plan has been developed within the context of provincial, regional, and municipal planning policies and initiatives. Transportation plans and studies that apply to the Trafalgar Tertiary Plan area have been summarized for reference purposes.

1.2.1 Town of Milton Transportation Master Plan (2018)

The 2018 Milton TMP is a document which outlines the long-term vision for the future of the Town of Milton's transportation system. More specifically, the TMP refers to itself as a "guiding document" for a "more balanced, multi-modal future." As with most master plans, the document provides policy context for the approach to achieving the vision, which includes an outline of capital improvements and additional studies, as required. Input from staff and decision makers, stakeholders, and resident were used to inform the direction of the TMP.

A total of twelve objectives were outlined in the Town's TMP, and a selection of the objectives that are most applicable to the Trafalgar Tertiary Plan are as follows:

- ▶ Development of a long-term transportation vision and overall road network philosophy to support the Town's future population projections and employment growth to 2031 and beyond;
- ▶ Providing overall direction for the Town to expand its transportation network in an integrated, efficient, and effective manner with respect to safety, transit, active transportation, complete streets, and environmental considerations;
- ▶ Development of a road classification hierarchy that reflects the dynamic shift towards

sustainable and alternate modes of transportation, and develop road cross sections to reflect any changes;

- ▶ Providing input to the preparation of the next Secondary Plan areas, including the Phase 4 Lands, and the required engineering input to develop the road network;
- ▶ Review and make recommendations on the Town's current road standards, design criteria, and policies (including roundabouts) to ensure they meet the needs of all modes of transportation, while promoting the development of safe, efficient, livable and traffic calmed street networks;
- ▶ Investigate the need and justification for additional Highway 400 series overpasses, railway grade separations as well as mid-block flyovers;
- ▶ Investigate current and future deficiencies in roadway connectivity; and
- ▶ Enhancing active transportation routes, facilities, and connections throughout the Town's urban and rural areas;
- ▶ Provide a framework by which decisions regarding the Town's transportation system can be informed;
- ▶ Develop a transportation policy framework for the next Official Plan. This framework will be developed in consultation with all interested parties;
- ▶ Meaningfully engage the public and interested stakeholders in a dialogue to help shape the outcomes of the T.M.P;
- ▶ Review major rights-of-ways to ensure responsibility is appropriately aligned with planned roadway function.

In the context of the MP4TC lands, the TMP provided an evaluation of conceptual road network alternatives, including considerations for land use, transit connectivity, active transportation opportunities, cost, and goods movement. A preferred set of road network alternatives for the MP4TC lands were identified, which has influenced the proposed road network presented herein.

1.2.2 Town of Milton Transportation Master Plan for the Trafalgar and Agerton Secondary Plan (2019-2022)

The TMP for the Trafalgar Agerton Secondary Plan was first completed in March of 2019, with an updated version circulated in December of 2020. Further drafts/addendums were circulated after this while the document was under review by Town and Regional Staff, with the most recent final traffic addendum circulated in March of 2022. The December 2020 TMP and the March 2022 Traffic Addendum were both reviewed as part of the preparation of the enclosed TIS.

The Trafalgar and Agerton TMP was prepared using Milton's 2018 TMP as a guiding document and further developed the traffic planning already in place for the Trafalgar and Agerton

Secondary Plan areas. The TMP assessed the high-level impacts of the proposed Trafalgar and Agerton Secondary Plans on the adjacent arterial roads, collector roads, and major intersections.

The March 2022 TMP Addendum concluded that should the projected future total volumes be actualized, a total of five study intersections are expected to experience capacity issues under future total conditions.

The 2022 TMP Addendum recommends that in addition to applying signal timing optimization to study intersections, dedicated turning lanes, including dual left-turn lanes, can also be implemented to help improve operations for turning movements. However, many intersections will continue to operate with over-capacity movements under future total conditions despite these improvements should the projected volume be actualized. Regarding the dedicated turn lane improvements, TMP recommends that the “rights-of-way requirement be protected now, and the intersections be monitored regularly through the Region’s Traffic Count Program and be further considered in the future Municipal Class Environmental Assessment Studies.”

1.2.3 Trafalgar Secondary Plan (2019, 2024)

The Trafalgar Secondary Plan was adopted by the Town of Milton on March 25, 2019 (By-law 030-2019), and has since been amended in accordance with Ontario Land Tribunal Orders issued on February 8, 2024 and July 22, 2024. The Tertiary Plan for the TSPA has been prepared in accordance with the goals and objectives of the Trafalgar Secondary Plan.

From a transportation perspective, the Secondary Plan document outlines several goals and objectives for the TSPA, resulting in the vision of a multi-modal, connected community, requiring a road network of complete streets that are accessible to all users. Three of the mobility goals listed in section C.11.3.2 of the Trafalgar Secondary Plan are:

- ▶ Foster a connected and accessible on- and off-road pedestrian and cycling path network which promotes a culture of active transportation;
- ▶ Provide the opportunity for a local transit network that can support higher-order transit service on Trafalgar Road;
- ▶ Realize a network of Complete Streets that balance the needs of all road users, including pedestrians, cyclists, transit users, and motorists.

The Trafalgar Tertiary Plan includes a robust collector road network that proposes modifications to the Town’s standard right-of-way (ROW) collector road cross-sections. These proposed modifications often include active transportation elements, such as in-boulevard cycle tracks, buffered on-street cycle lanes, and Multi-use Paths (MUPs), that differ from the Town’s ROW standards in order to better achieve the level of active transportation connectivity envisioned by the Secondary Plan.

In addition to ensuring active transportation infrastructure is available and accessible to all users, the

proposed Trafalgar Tertiary Plan collector roads maintain general automobile travel lanes that are able to accommodate local transit vehicles (3.35m wide) while also providing on-street parking on at least one side of the road.

1.2.4 Planning Changes and Population Pledges

In accordance with the planning changes over the last few years, the 2022 Trafalgar TMP aims to target 30% of its new residential units to be designated as either affordable housing, assisted housing, stacked townhouses, back-to-back townhouses or apartments.

Since the completion of the 2022 Trafalgar TMP, the Trafalgar Tertiary Plan has increased its forecasted population and employment to align with the Region's Joint Best Planning Estimates. Population of 32,000 people has increased to 54,681 people. As for the employment population, the 2022 Trafalgar TMP forecasted 4,000 jobs while the Trafalgar Tertiary Plan forecasted 6,040 jobs. It should be noted that the employment jobs forecast in the Trafalgar Tertiary Plan includes work-from-home jobs estimates which accounts for 10% of the population translating to 1,493 jobs consisting of 1,140 commercial, 80 secondary school, 360 elementary school, and 4,500 work-from-home jobs.

1.2.5 Town of Milton Transportation Master Plan (2025)

The 2025 Milton TMP finalized on February, 2025 serves as an update to the previous 2018 Milton TMP that was discussed in **Section 1.2.1**. While the 2025 TMP maintains many of the objectives and goals identified in the 2018 TMP, there are some notable differences between the two plans such as active transportation infrastructure, right-of-way (ROW) widths, and road classifications.

In the 2025 TMP, the Town has recommended updated road classification and right-of-way widths to better accommodate the anticipated growth within Milton by incorporating active transportation infrastructure in urban areas. All ROWs except the laneway and rural roadway ROWs in the 2025 TMP were revised. One of the main differences is the revised ROWs in the 2025 TMP where on-street bicycle lanes were shifted to in-boulevard cycle tracks for all collector and arterial road cross-sections to provide that physical separation between cyclists and vehicles. This change also eliminates the multi-use paths that were previously identified in the 2018 TMP, by incorporating and separating both sidewalks and cycle tracks to be provided on both sides of the collector and arterial roads. In the previous 2018 TMP and Town standards, sidewalk widths were identified to be 1.5m for all local, collector, and arterial roads. In the 2025 TMP, sidewalk widths were increased from 1.5m to 1.8m for all roadway types.

1.2.6 Region of Halton Integrated Master Plan

The Region of Halton's Integrated Master Plan (IMP) is a long-term plan that aims to expand water, wastewater, and transportation infrastructure to accommodate the growing population in

the local municipalities within the Region to 2051 and beyond. The IMP states that it will:

- ▶ Guide the management and development of the Region's water, wastewater and transportation systems (including the active transportation network and master plan);
- ▶ Maximize capacity, system flexibility and extend the life expectancy of Regional water, wastewater and transportation infrastructure; and
- ▶ Outline the strategies for maintaining and improving these critical systems to ensure we meet the needs of the community now and in the future.

A selection of transportation strategies was also outlined in the IMP, in which are applicable to the Trafalgar Tertiary Plan, and are as follow:

- ▶ Optimizing existing/planned transportation network;
- ▶ Localized corridor widening and improvements;
- ▶ Flexibility and adaptability to support the evolution of Transit Priority Corridors;
- ▶ Prioritizing walking and cycling facilities, including at intersections;
- ▶ Identifying supporting strategies and technologies (for example, transit signal priority).

1.2.7 Trafalgar Tertiary Plan – Road Network Assessment

The Road Network Assessment (RNA) is under preparation in tandem with, and in support of, the overall tertiary plan for the Trafalgar lands within Milton's Phase 4 Lands (MP4TC).

The context of the RNA consists of the following:

- ▶ Review of applicable information from the Trafalgar & Agerton Secondary Plan;
- ▶ Review of existing transportation infrastructure and traffic operations within study area;
- ▶ Assessment of future background traffic operations for the planning horizons of 2031 and 2041 associated with background growth and developments surrounding the Trafalgar lands;
- ▶ Identification of traffic operations concerns and the potential mitigation measures or infrastructure improvements necessary to accommodate the impacts of background growth and site generated traffic for the planning horizons of 2031, 2041, and 2051;
- ▶ Assessment of Transit and Active Transportation Infrastructure; and
- ▶ Recommended public street network that incorporates more sustainable modes of transportation to reduce automobile dependency.

The base of the traffic forecast utilized within this study is sourced within the RNA study for the MP4TC lands, with changes to the densities considered for various land parcels as applicable.

2 SITE CHARACTERISTICS

2.1 Overall Study Area

The Remington lands are located within the MP4TC study area, which is contained between Derry Road to the north, E Lower Base Line to the south, Eight Line to the east and Sixth Line to the West. The development bounds, shown in green, are shown within the MP4TC lands, shown in red, in **Figure 2-1**.

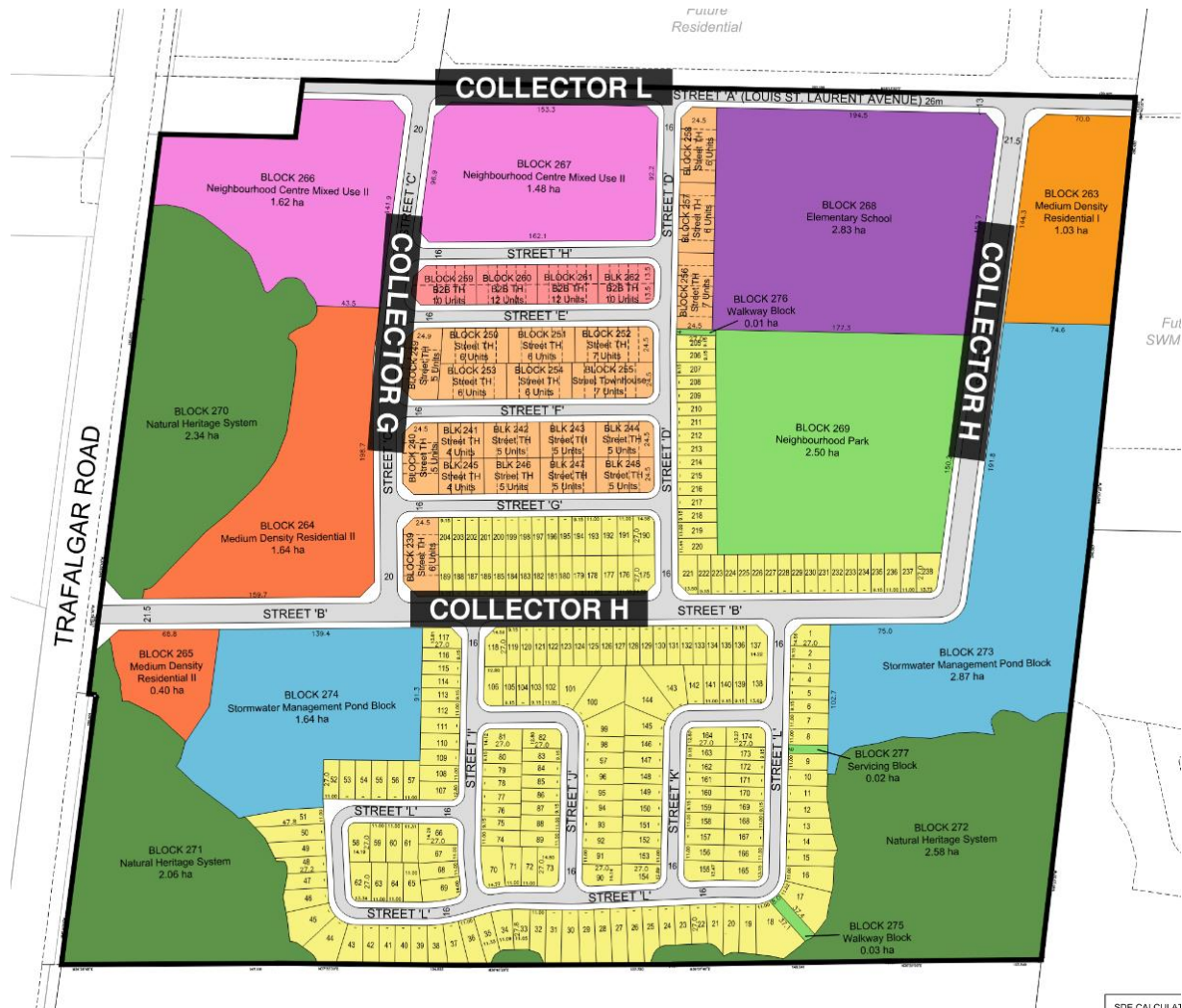
Figure 2-1 MP4TC Study Area



2.2 Subject Lands Area

The Remington lands are located in the northern half of the MP4TC lands within the Town of Milton. The site is bounded by Trafalgar Road to the west, a Natural Heritage System to the south and with adjacent development lands in other directions. An excerpt of proposed draft plan, dated April 3, 2025, has been included in **Figure 2-2** and detailed layout is attached in **Appendix B**.

Figure 2-2 Remington Lands Draft Plan Excerpt



2.3 Study Intersections

For the purposes of this study, intersections were selected as the boundary road network intersections surrounding directly adjacent to the site along with the proposed access intersections to the external municipal roadway system. The study intersections have been detailed below (The proposed street names adopted in the draft plan correspond to the collector

naming used in RNA study, as noted below):

- ▶ Trafalgar Road and Derry Road
- ▶ Trafalgar Road and Britannia Road
- ▶ Trafalgar Road and Street 'A' (Louis St Laurent Avenue / Collector L)
- ▶ Street 'A' (Louis St Laurent Avenue / Collector L) and Street 'C' (Collector G)
- ▶ Street 'A' (Louis St Laurent Avenue / Collector L) and Street 'B' (Collector H)
- ▶ Trafalgar Road and Street 'B' (Collector H)
- ▶ Street 'B' (Collector H) and Street 'C' (Collector G)

The remainder of the study intersections that are encompassed by the MP4TC lands are to be assessed as part of the TIS reports completed in support of the surrounding development lands and would consider traffic generated by the Remington lands as part of their review. As such the impacts of the overall MP4TC lands development on the overall study area roadway network will be reviewed when looking at the analysis completed for all TIS reports in support of the lands proposed within the area.

2.4 Development Plan Density

As per the subdivision draft plan dated April 3, 2025, the development statistics for the Remington lands consist of the following:

- ▶ Single Detached Dwellings – 238 Units
- ▶ Street Townhouse Dwellings – 111 Units
- ▶ Back-to-Back Townhouse Dwellings – 44 Units
- ▶ Medium Density Residential Dwellings
- ▶ Neighborhood Centre Mixed Use Dwellings
- ▶ 1 Elementary School
- ▶ The remaining development areas include Neighbourhood Park, Natural Heritage System (NHS) and Stormwater Management Pond.

2.5 Development Road Network

The road network is proposed to be compliant with the road classification set forth as part of the Tertiary Plan for the MP4TC lands, dated December 2021. The Remington lands are proposed to be accessible from the boundary road network as follows:

- ▶ Via one full-moves intersection to Trafalgar Road;

- ▶ Via three full-moves intersections to Street 'A' (Louis St Laurent Avenue).

The internal roadways intersecting the boundary road network are proposed as collector roadways, except for Street D at Street A (Louis St. Laurent Avenue), while the remainder of the internal roadway network is proposed to consist of minor local roads.

2.5.1 Proposed Road Network

Within the subject site, two future collector roads and local roads are proposed, as per the proposed Trafalgar Tertiary Plan road network and illustrated in **Figure 2-2**.

- ▶ **Collector G** is a north-south collector (labeled as Street C) intersecting Street A (Louis St. Laurent Avenue) to the north and extending to the south to Collector H. The collector is designed with a proposed 20m ROW as outlined in Trafalgar Tertiary Plan.

As discussed with the Town, a general 20m ROW collector (character, within node) cross section consists of two general purpose driving lanes with an on-street parking lane, sidewalks on both sides and one buffered commuter cycle track on either side of the road.

- ▶ **Collector H** is a north-west collector (labeled as Street B) with bended alignment, originating at the proposed Street A (Louis St. Laurent Avenue) at the northern boundary and extending westward beyond Trafalgar Road. The collector is designed, with a proposed 21.5m ROW as outlined in Trafalgar Tertiary Plan and RNA.

The 21.5m ROW collector cross section for minor collectors consists of two general purpose driving lanes with an on-street parking lane, sidewalks and in-boulevard bike lanes on both sides of the road.

- ▶ **Collector L** is an east-west collector (labeled as Street A – Louis St. Laurent Avenue) intersecting Trafalgar Road to the east and extending to the western boundary of the site ultimately to further east into future development lands. The collector is designed with a proposed 26m ROW as outlined in Trafalgar Tertiary Plan and RNA.

The 26m ROW collector cross section for major collectors consists of two general purpose driving lanes, one turning lane, one on-street parking lane, in-boulevard bike lanes and sidewalks on both sides of the road.

- ▶ **Local Roads** are proposed throughout the subject site to provide residents and visitors with access to collector roads and surrounding road networks. The proposed local roads will have a 16m ROW cross-section, consisting of two travel lanes with a sidewalk on at least one side of the road. The local laneways will facilitate the circulation of waste collection vehicles and fire vehicles.

Illustrative ROW cross sections discussed with the Town, provided by DSEL are attached in **Appendix C** and the detailed requirements are discussed in **Section 3.1**.

3 DRAFT PLAN REVIEW

TYLin completed a review of the proposed subdivision draft plan design for the Remington lands. The proposed design was evaluated based on the standards set forth by the Town of Milton 2024 Engineering and Parks Standards Manual (EPSM), the 2015 Halton Region Access Management Guidelines, the Tertiary Plan completed for the MP4TC lands (dated December 2021), as well as the Transportation Association of Canada (TAC) 2017 Geometric Design Guide for Canadian Roads.

It is considered that the design of the roadways is deemed acceptable and detailed review and findings have been summarized below.

3.1 ROW

According to the Town of Milton standards, the minimum ROW width requirement for minor collector roads is 24m, while it is 16m for minor local roads.

According to the Tertiary Plan for the MP4TC lands, collector roads are proposed with a ROW width of 21.5m or 20m depending on the roadway.

The proposed ROW widths established as part of the Tertiary Plan for the MP4TC lands derived specifically for the study area would take precedence over the Town of Milton standards.

Based on the draft plan of proposed subdivisions for Remington lands, the ROW widths of collector roads, local roads and laneways are summarized in **Table 3-1** below and illustrated in **Figure 3-1**.

Table 3-1 Proposed Right-of-Ways (ROW) Width

ROW Types	Collector Name	Street Index	Design Requirement		Proposed Width
			Town of Milton	Tertiary Plan for the MP4TC lands	
Minor Collector Roads	Collector H	Street 'B'	24m	21.5m or 20m	21.5m
	Collector G	Street 'C'			20m
Minor Local Road		Streets 'D' to 'L'	16m	-	16m

The proposed ROW widths of 21.5m and 20m for collector roads and 16m for local roads fall in line with the requirements specified in the Tertiary Plan for the MP4TC lands and Milton's EPSM.

3.2 Road Bends and Horizontal Curvature

All roadway bends in the draft plan are designed with a radius of 12m or more. The centreline radius complies with the radius requirement of 12m specified in Ontario Building Code's Access Route Design and is deemed acceptable for the site.

Per the Town of Milton standards, a minimum horizontal curvature radius is 90m for local and minor collector roadways and 130m for major collector roads.

These requirements regarding road bends and horizontal curvature have been met within the proposed draft plan design, as illustrated in **Figure 3-1**.

3.3 Intersection Spacing

According to the Town of Milton standards and TAC, the minimum intersection spacing required along local and collector roadways is measured centreline to centreline and summarized as below.

- ▶ 60m for four-legged intersections;
- ▶ 40m for three-legged intersections.

In addition, the Region guidelines specify the following minimum spacing for a C4 urban road, measured from stop bar to stop bar, encompassing Trafalgar Road and Britannia Road.

- ▶ 300m for a full-move intersection;
- ▶ 115m for a right-in/right-out intersection.

The above requirements have been met within the proposed draft plan. Please refer to **Figure 3-2** for a review of intersection spacing within the lands.

3.4 Intersection Angle

According to the Town and Region design standards, intersection angles are subject to the following requirements:

- ▶ 90 degrees for intersections with arterial and collector roadways;
- ▶ 80 – 100 degrees for intersections with local roads and laneways.

The majority of proposed intersections within the draft plan conform to the above requirements, with the exception of select collector intersections involving collector roads, which are proposed with intersection angles ranging from 80 to 100 degrees.

All proposed intersection angles, however, fall within the TAC-approved range of 70 – 100 degrees. Given this, the proposed intersection angles would not result in safety concerns and are

considered acceptable for the development lands.

Please refer to **Figure 3-2** for a review of intersection angles within the lands.

3.5 Daylight Triangle / Rounding

According to the Town standards, the following minimum daylight triangle/rounding are applicable to the study intersections:

- ▶ 15m x 15m daylight triangles for any intersection with arterial roadways;
- ▶ 10m x 10m daylight triangles at collector-to-collector intersections;
- ▶ 7.5m x 7.5m daylight triangles at collector-to-local intersections;
- ▶ 5m daylight rounding at local-to-local and local-laneway intersections.

All the above minimum requirements have been met or exceeded within the proposed draft plan as illustrated in **Figure 3-3**.

3.6 Minimum Tangent Length at Intersections

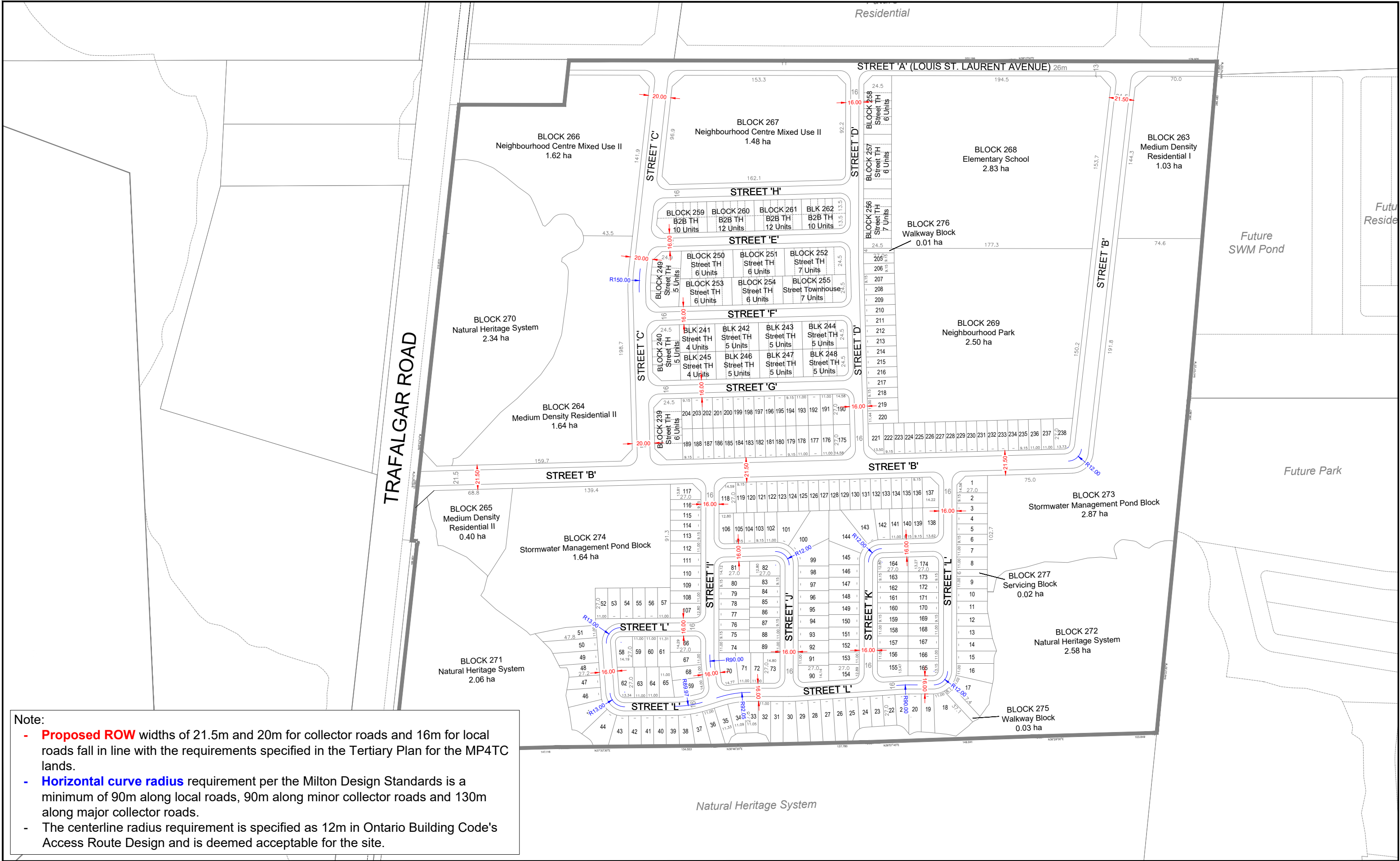
According to the Town standards, the minimum tangent length requirements at intersections are summarized as follows:

- ▶ 30m along local roads and laneways;
- ▶ 50m along minor collector roads;

The above requirement has been met at most of the intersections.

For intersections where the minimum tangent length is not met or situated along curved road sections, TYLin completed a review of the intersection sight distance, which is required to be 65m for collector roadways and 30m for local roadways.

The review indicated that the available sightlines are fully contained within the ROW, and no concerns are projected regarding visibility or safety at these locations. The tangent length and intersection sight distance reviews have been illustrated in **Figure 3-4**.



Note:

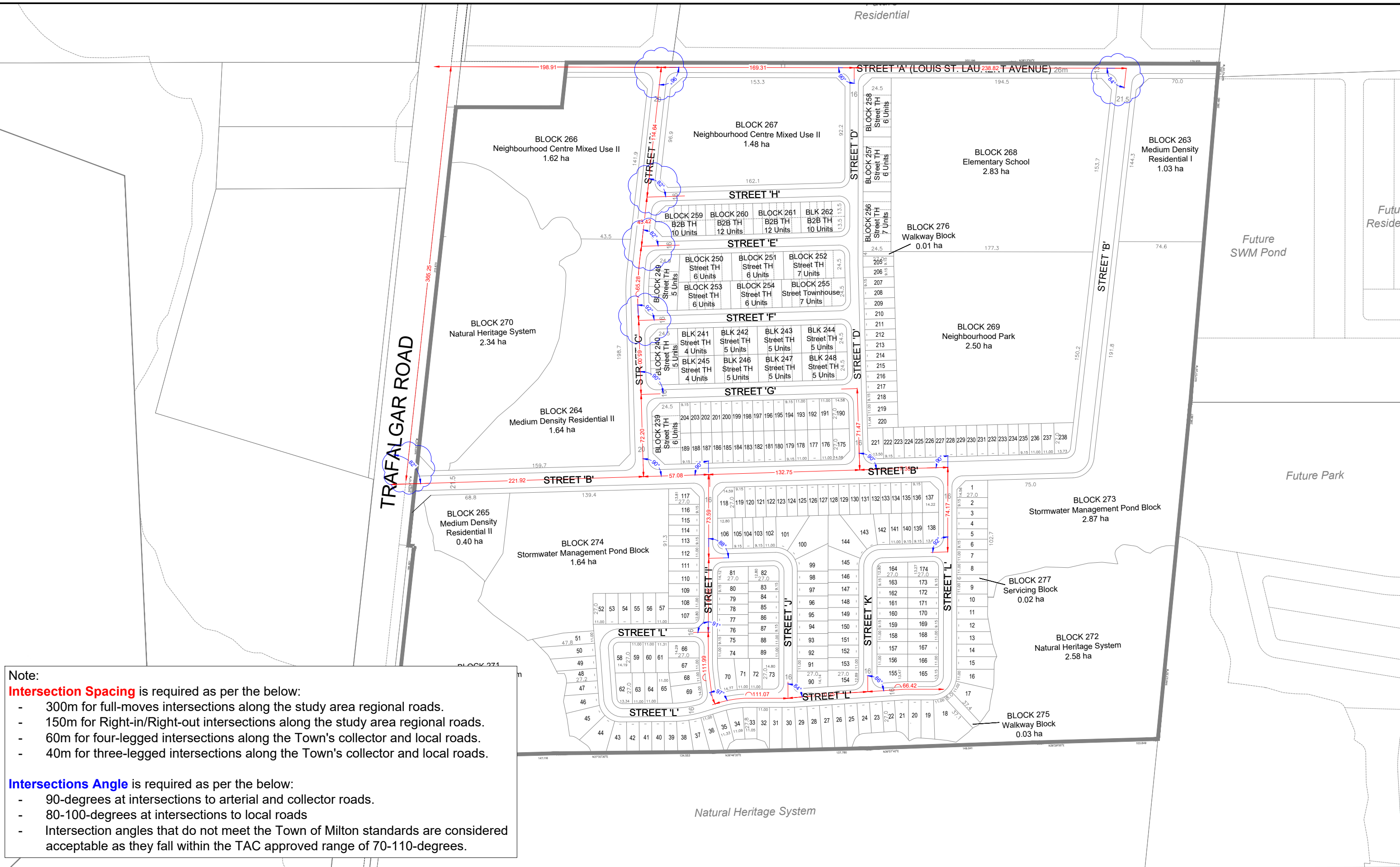
- **Proposed ROW** widths of 21.5m and 20m for collector roads and 16m for local roads fall in line with the requirements specified in the Tertiary Plan for the MP4TC lands.
- **Horizontal curve radius** requirement per the Milton Design Standards is a minimum of 90m along local roads, 90m along minor collector roads and 130m along major collector roads.
- The centerline radius requirement is specified as 12m in Ontario Building Code's Access Route Design and is deemed acceptable for the site.

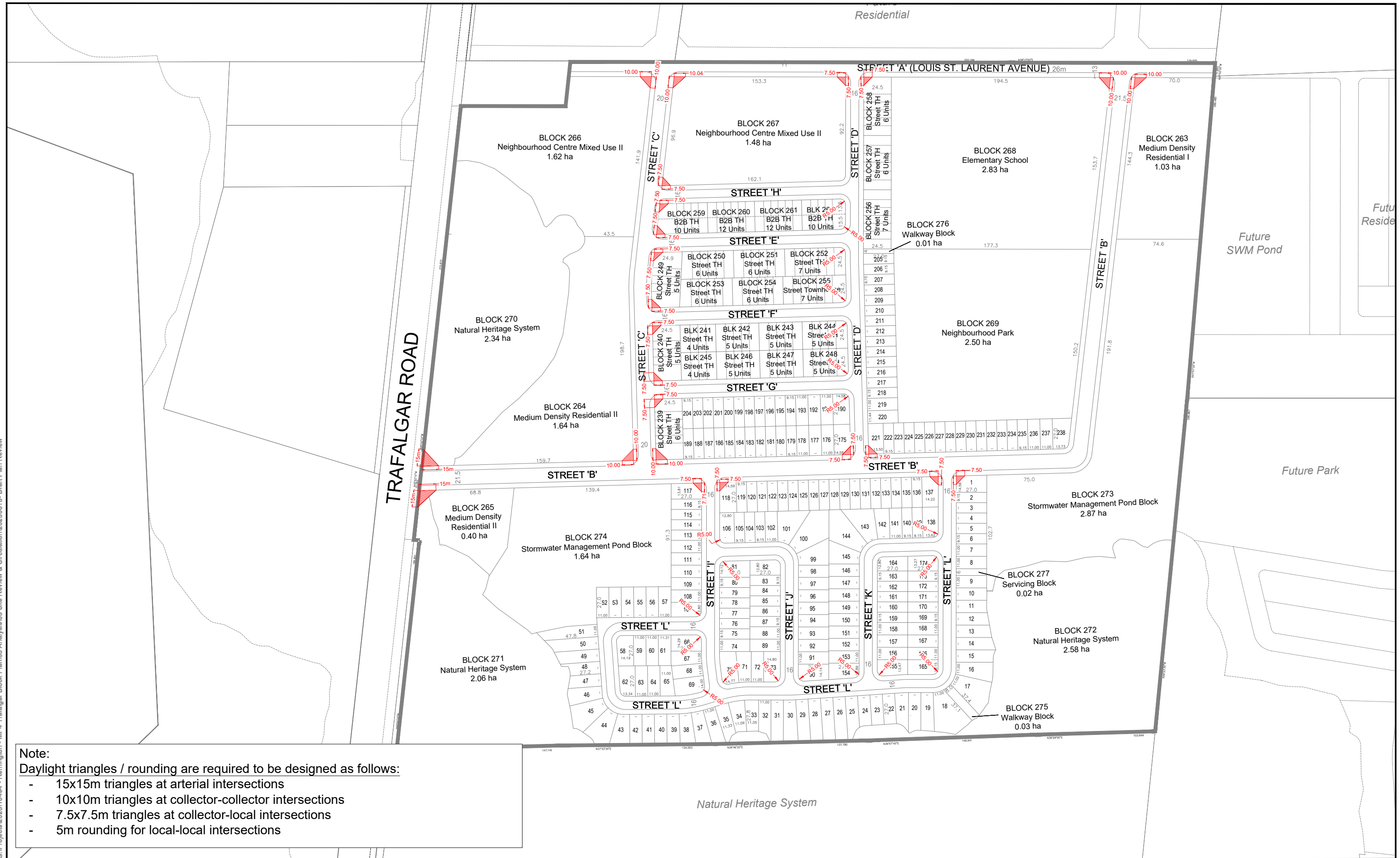
Note:**Intersection Spacing** is required as per the below:

- 300m for full-moves intersections along the study area regional roads.
- 150m for Right-in/Right-out intersections along the study area regional roads.
- 60m for four-legged intersections along the Town's collector and local roads.
- 40m for three-legged intersections along the Town's collector and local roads.

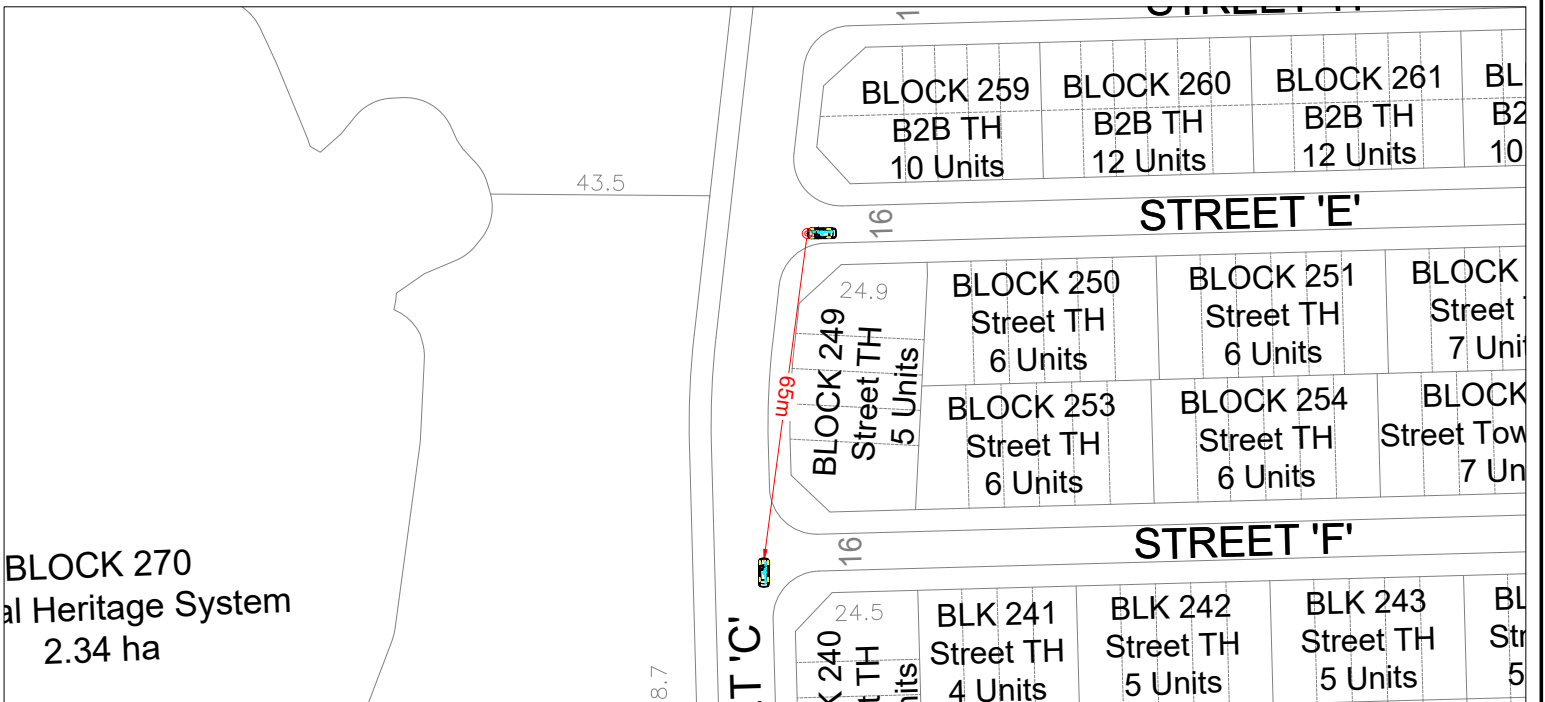
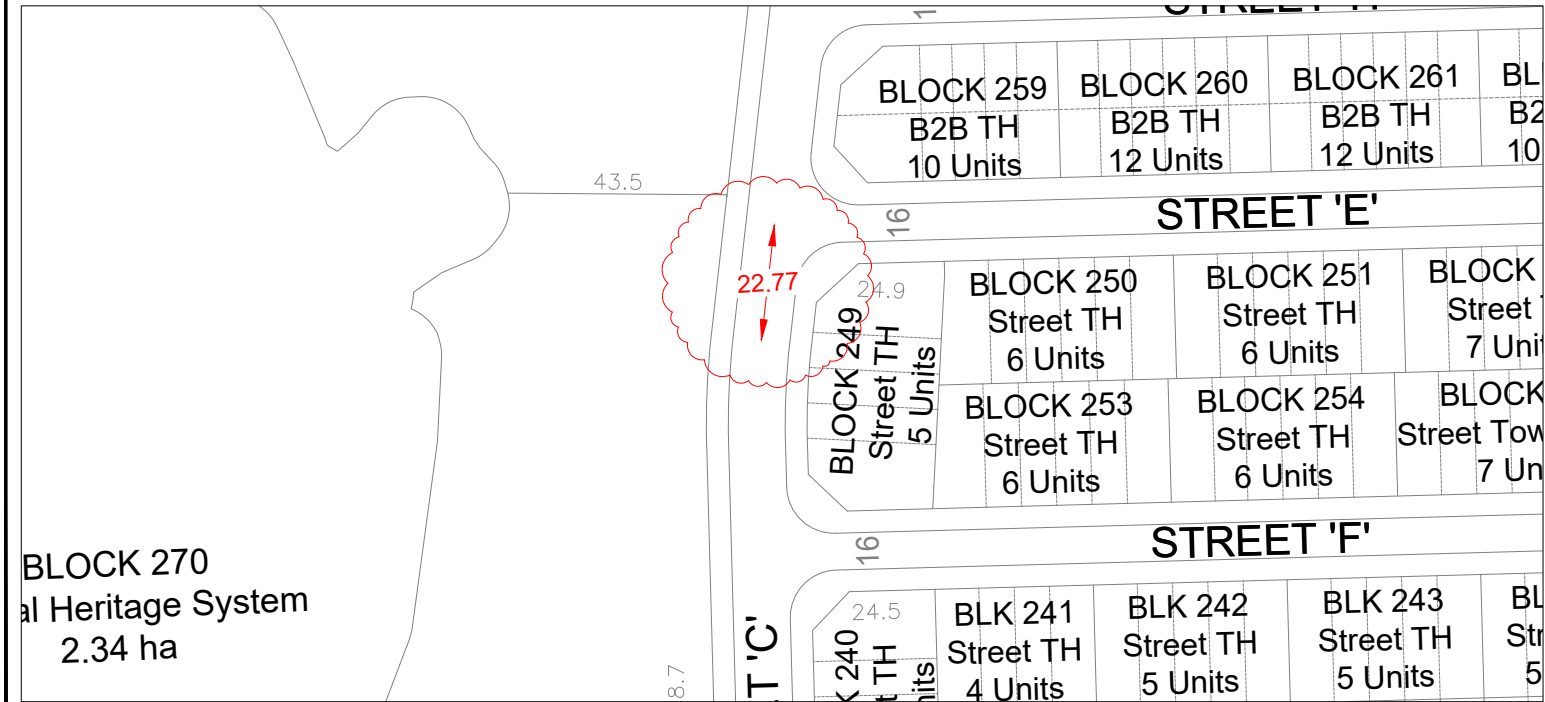
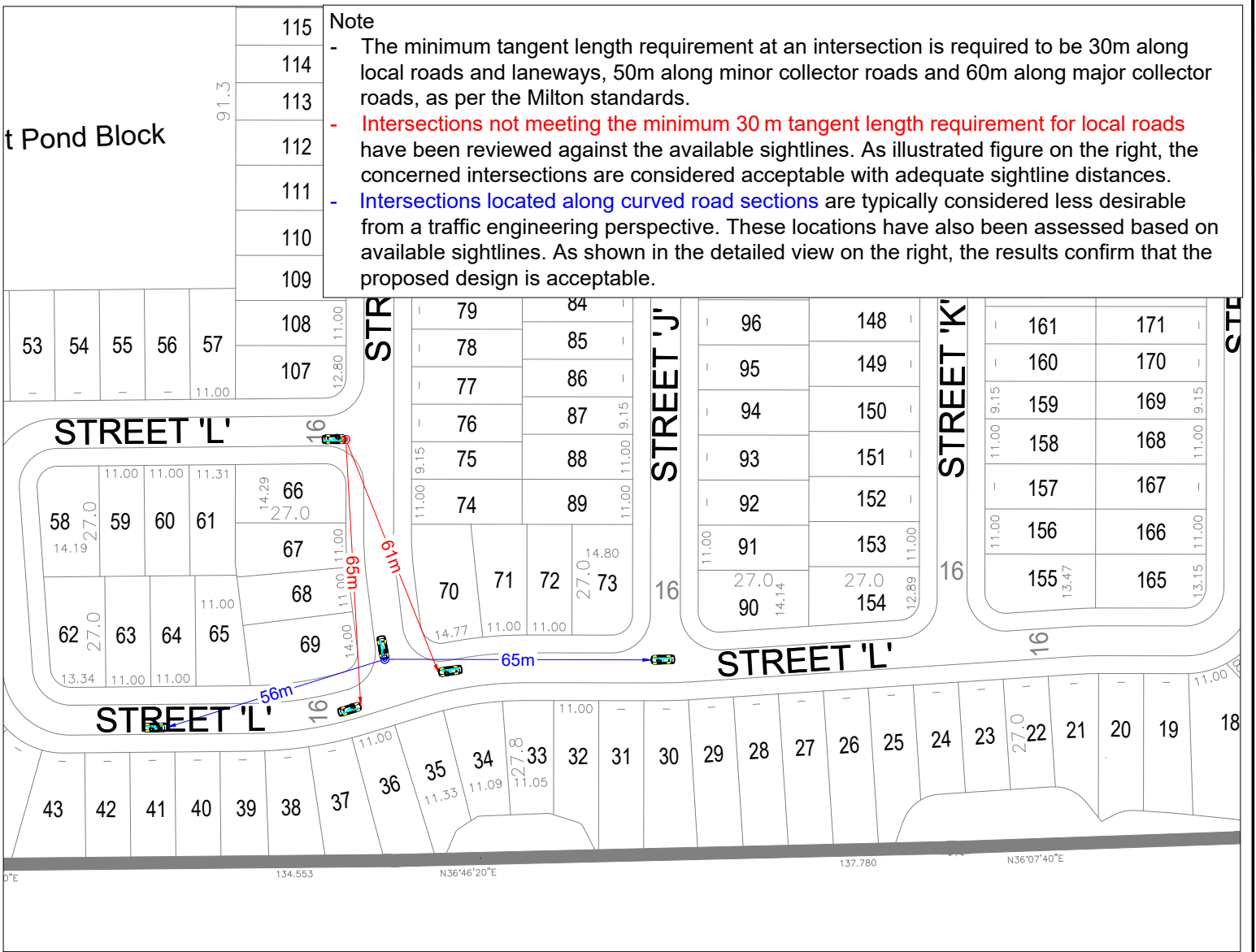
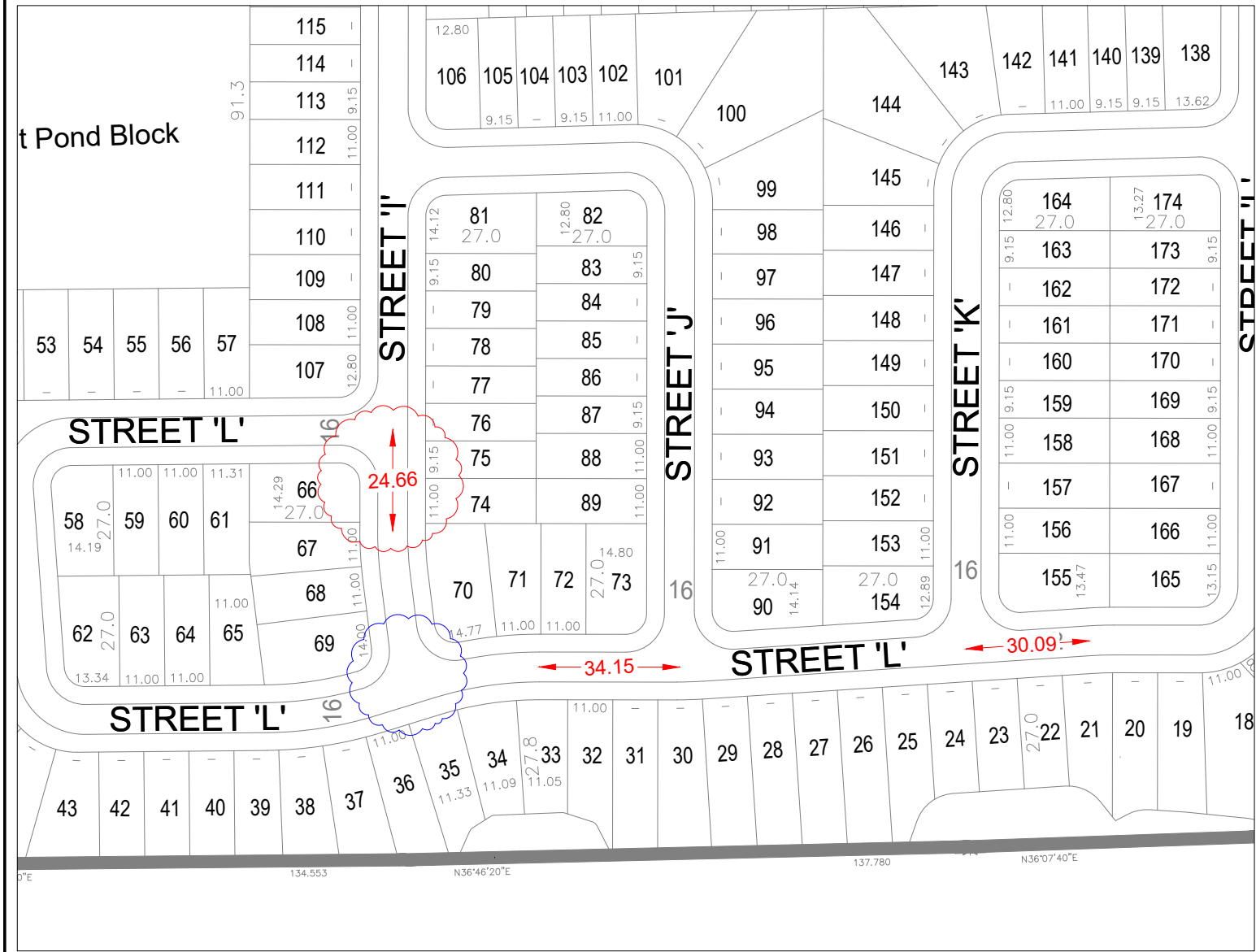
Intersections Angle is required as per the below:

- 90-degrees at intersections to arterial and collector roads.
- 80-100-degrees at intersections to local roads
- Intersection angles that do not meet the Town of Milton standards are considered acceptable as they fall within the TAC approved range of 70-110-degrees.





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4 EXISTING CONDITIONS

4.1 Existing Roadway Network

The existing roadways included as part of this traffic impact study assessment include the following:

- ▶ **Trafalgar Road** is a north-south major arterial roadway under the jurisdiction of the Region of Halton, as per the Region of Halton Official Plan. Currently, the roadway has a five-lane rural cross-section consisting of two lanes in each direction and a centre median. Trafalgar Road has a posted speed limit of 70 km/h in the vicinity of Britannia Road, with paved shoulders and no sidewalks.

4.2 Existing Traffic Data

Existing signal timing plans (STPs) were obtained from Halton Region Staff for the existing study intersections, as applicable.

Turning movement count (TMC) data was collected on January 18, 2023 from 6:00 AM to 9:00 AM, 11:00 AM to 1:00 PM, and from 4:00 PM to 7:00 PM, from which the weekday AM and PM peak hours were identified.

TYLin's 2023 TMC data, sourced from the RNA study, was collected after the recent (2022) Highway 401 widening from Mississauga to Milton. To reflect regional traffic growth, an annual growth rate of 2.65% was applied to traffic volumes on regional roadways. This adjusted dataset forms the 2025 baseline traffic volume analysis for this study.

The existing signal timing plans and baseline traffic data are provided in **Appendix D**. Baseline lane configurations and traffic volumes at the existing study area intersections are provided in **Figure 4-1** and **Figure 4-2** respectively.

Figure 4-1 Existing Lane Configuration

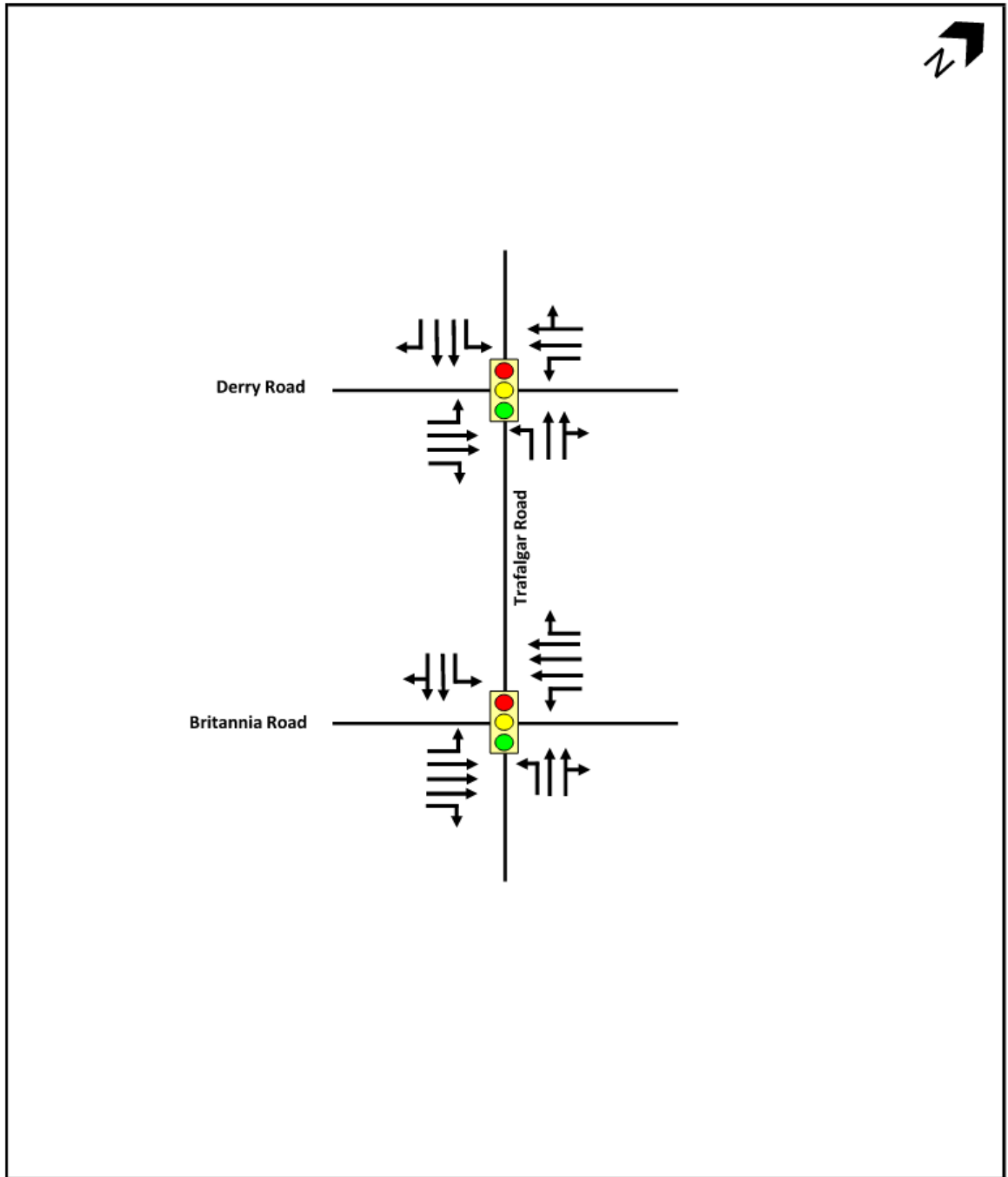
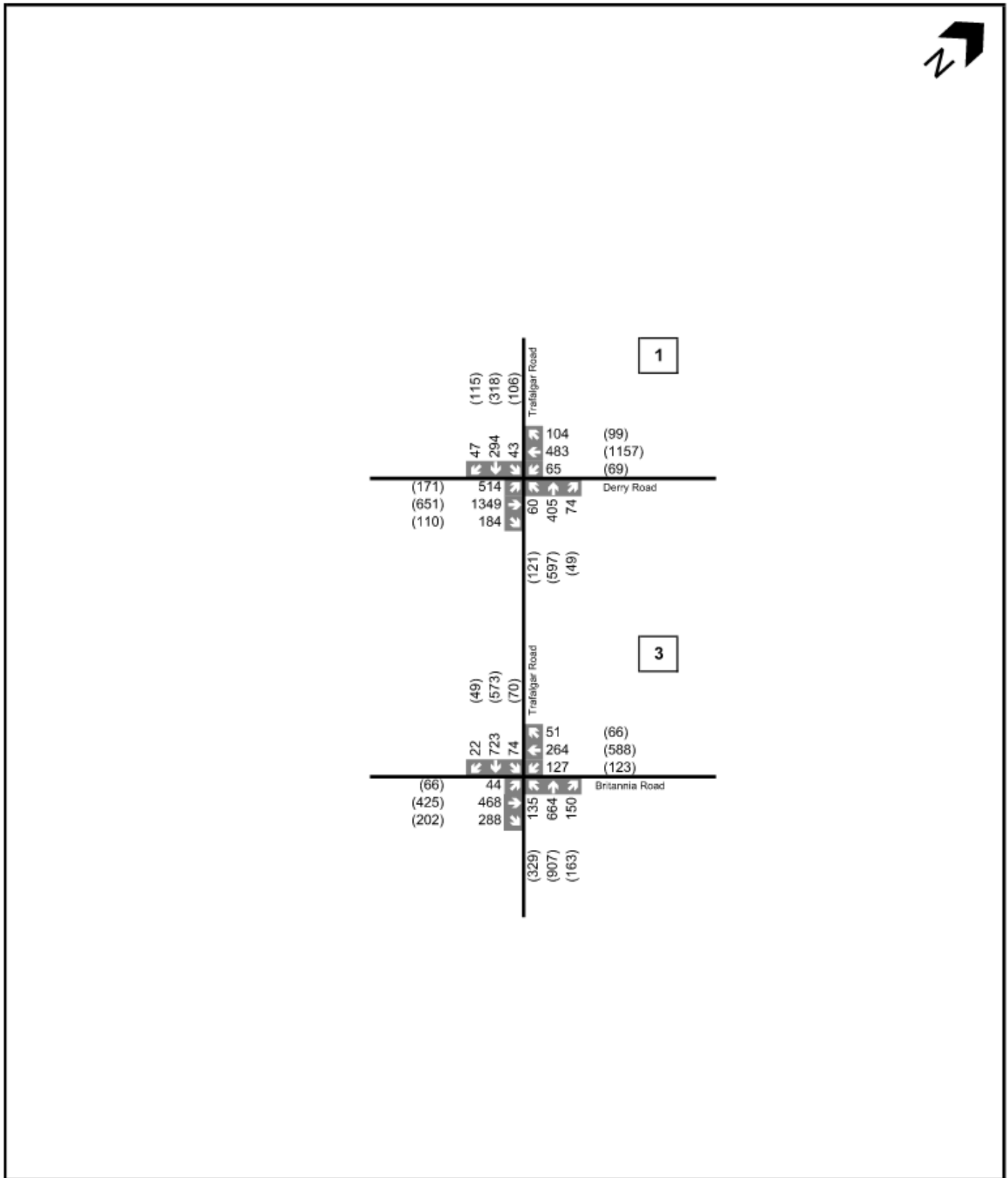


Figure 4-2 Baseline Traffic Volume



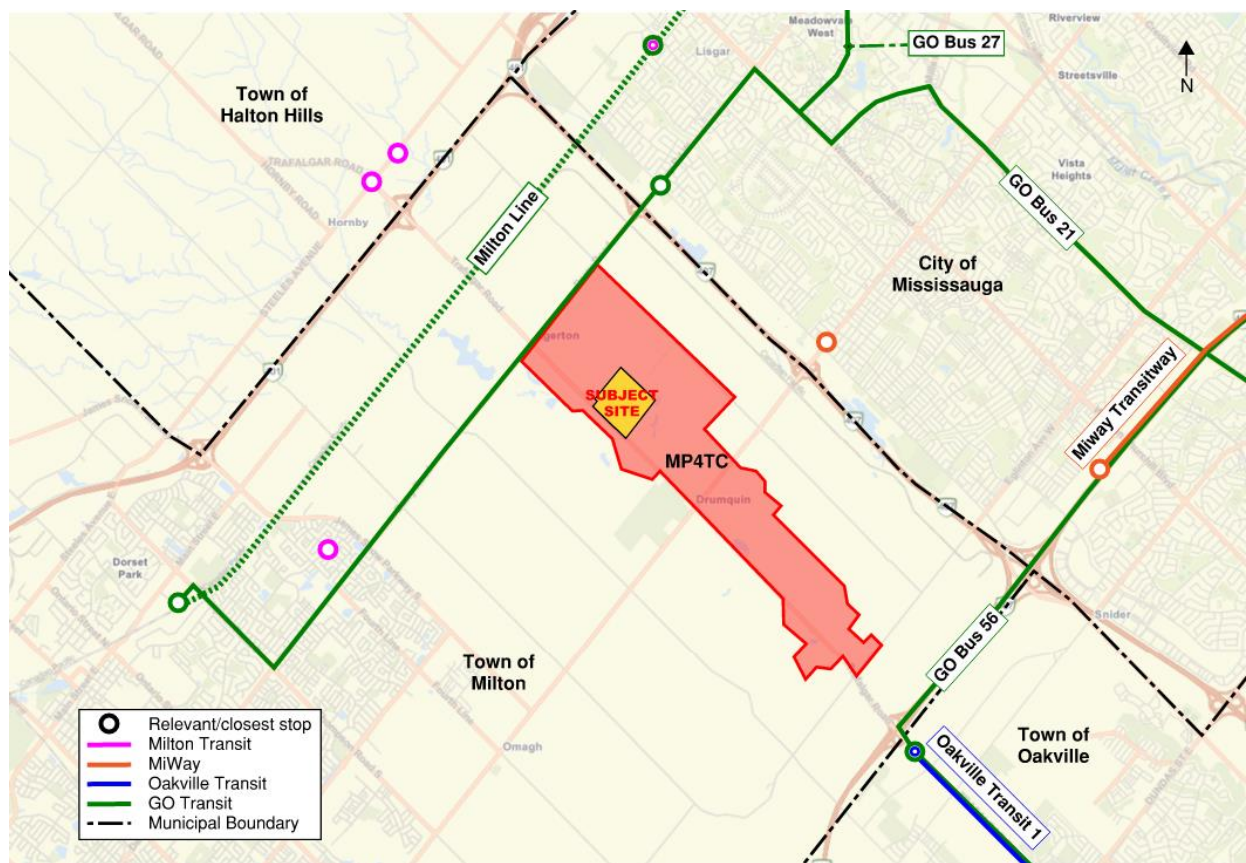
4.3 Existing Active Transportation Network

Given the rural context of the subject site, the existing road network does not provide sidewalks for pedestrians or other dedicated active transportation infrastructure, such as on-road bicycle lanes. While cyclists may use these roads under existing conditions, sharing the general purpose lanes with vehicles traveling at high operating speeds (70 km/h or higher) or using the paved shoulders, these are not considered safe cycling conditions.

4.4 Existing Transit Network

The study area is located outside of existing urban areas that provide local transit services, such as Milton to the northwest, Mississauga to the east, and Oakville to the south. Regional GO Transit routes and Bus Rapid Transit (BRT) Stations are located within the vicinity of the study area, however, the study area is not directly serviced by Regional transit at the time of this report. The existing transit route and stop plan is illustrated in **Figure 4-3**.

Figure 4-3 Existing Transit Routes and Stops



4.4.1 GO Transit

The Milton GO Station, located west of the subject site, is approximately 10 km away from Trafalgar Road. The Milton GO Station provides access to the GO Train Milton Line, GO bus routes 21 – Milton and 27 – Milton / North York.

GO Train Milton Line is a generally east-west train line that operates from Union Station in the City of Toronto to Milton Station in the Town of Milton. The line runs on weekdays with a frequency of as low as 15 minutes. Eastbound service is available between 6:00 AM and 8:30 AM, while westbound service is available between 3:40 PM and 7:10 PM.

There are two stops in the vicinity of the study area.

- ▶ Milton Station is located approximately 9 km from the northwestern limit of the MP4 area and is a 13-minute drive away.
- ▶ Lisgar Station, located in Mississauga, is located approximately 7 km from the northeastern limit of the MP4 area and is a 9-minute drive away. This train service is not provided at weekends.

GO Bus Route 21 – Milton is a generally east-west bus route that operates between Union Station in the City of Toronto and Milton Station in the Town of Milton. Eastbound service is provided throughout the day on weekdays, except during the times which overlap with the GO Train schedule, starting from 3:45 AM to 12:25 AM into the following day. The earliest westbound service towards Milton Station departs Union Station at 5:40 AM while the final bus departs at 2:20 AM the next day. Service frequency is approximately 1 hour for both directions. At the weekend the route operates with 1-hour service frequency from 4:55 AM to 2:20 AM.

GO Bus Route 27 – Milton / North York is a generally east-west bus route that operates from Finch Bus Terminal in the City of Toronto to Milton Station in the Town of Milton, with special departures stopping at Meadowvale Go Station. The route runs on weekdays in the eastbound direction between 5:05 AM and 18:25 PM. Westbound service is provided between 5:30 and 12:15 AM on weekdays. During the weekends, only one complete route service is provided in the eastbound direction, departing Milton GO at 5:35 AM and in the westbound direction, departing Finch Bus Terminal at 6:30 AM.

The nearest stop of Go Bus route 21 and 27 is at Ninth Road / Derry Road, which is located approximately 4 km from the study area.

4.4.2 Milton Transit

The urban area of the Town of Milton is located to the northwest of the study area, and Milton Transit operates a total of 10 bus routes. The closest Milton Transit bus stops are located at the Lisgar GO Station, Toronto Premium Outlets, Eighth Line at Steeles Avenue, and Trudeau Drive at Croft Avenue as indicated in **Figure 4-3**.

4.4.3 MiWay Transit

The City of Mississauga is generally located east and southeast of the study area, and MiWay Transit operates an extensive network of bus routes through the entire city. The closest bus stop is located at Britannia Road and the Ninth Line which is approximately 2 km from the eastern edge of MP4 area. **Figure 4-3** illustrates the existing transit routes in proximity to the study area.

4.4.4 City of Mississauga's Transitway

The western terminus of the Mississauga Transitway (BRT service that serves as an east-west transit spine through Mississauga), located at the interchange of Highway 403 and Winston Churchill, is approximately an 8 km drive away from the MP4 area and provides potential connections to other Mississauga bus routes and Toronto transit at the eastern terminus of the Transitway.

5 BACKGROUND CONDITIONS

5.1 Study Horizon Years

In this TIS, the horizon years of 2031 (build-out year of the Remington Lands) and 2041 (ten-year horizon) were adopted to assess the future traffic conditions. The study horizons align with the horizons assessed in the ongoing Trafalgar Tertiary Plan RNA study. The future traffic volume in 2031 horizon will include the Remington Lands trips plus the balance of MP4 Phase 1 lands, while the 2041 horizon will further incorporate the balance of MP4 Phase 2 lands.

5.2 Study Area Road Network Improvement

The existing Trafalgar Road within the study area is expected to have road improvements completed by 2031, as per Halton Region's TMP, and recommendations made in Milton's TMP update (Feb 2025). Improvements to the existing road network to accommodate future development are also addressed in this report, as well as the RNA study.

The Region's TMP classifies Trafalgar Road as C4 Urban roads with a 47 metre right-of-way that includes six vehicular travel lanes, as shown in **Figure 5-1** and **Figure 5-2**, excerpts from the Halton TMP. The details of **Figure 5-1** from the Halton TMP has been attached in **Appendix E** for clarity.

This will result in the existing roadways being widened from two lanes in each direction to three lanes, accommodating a High Occupancy Vehicle (HOV) lane in addition to two general purpose travel lanes in each direction. The urbanization of the roads will occur when they are widened, and the C4 urban road cross section includes provision for new active transportation infrastructure such as sidewalks, multi-use paths, and/or on-street bicycle lanes.

According to Halton Region's 2024 Budget and Business Plan, construction to widen Trafalgar Road to six lanes within the RNA study area is scheduled to begin in 2029/2030. Britannia Road, which was widened to six lanes near the end of 2024, was analyzed as a six-lane road in this assessment.

To assess the impacts of the Regional Road widening projects, Trafalgar Road and Britannia Road were evaluated as six-lane roads under 2031 future traffic conditions, as well as the 2041 horizon. Lane configuration improvements are proposed under both future background and total traffic scenarios to accommodate projected traffic volumes. These proposed improvements are consistent with the recommendations outlined in the Transportation Master Plan for the Trafalgar and Agerton Secondary Plan Areas Traffic Addendum, dated March 2022 (Trafalgar TMP).

Figure 5-1 Right-of-Way Classification for Regional Roads

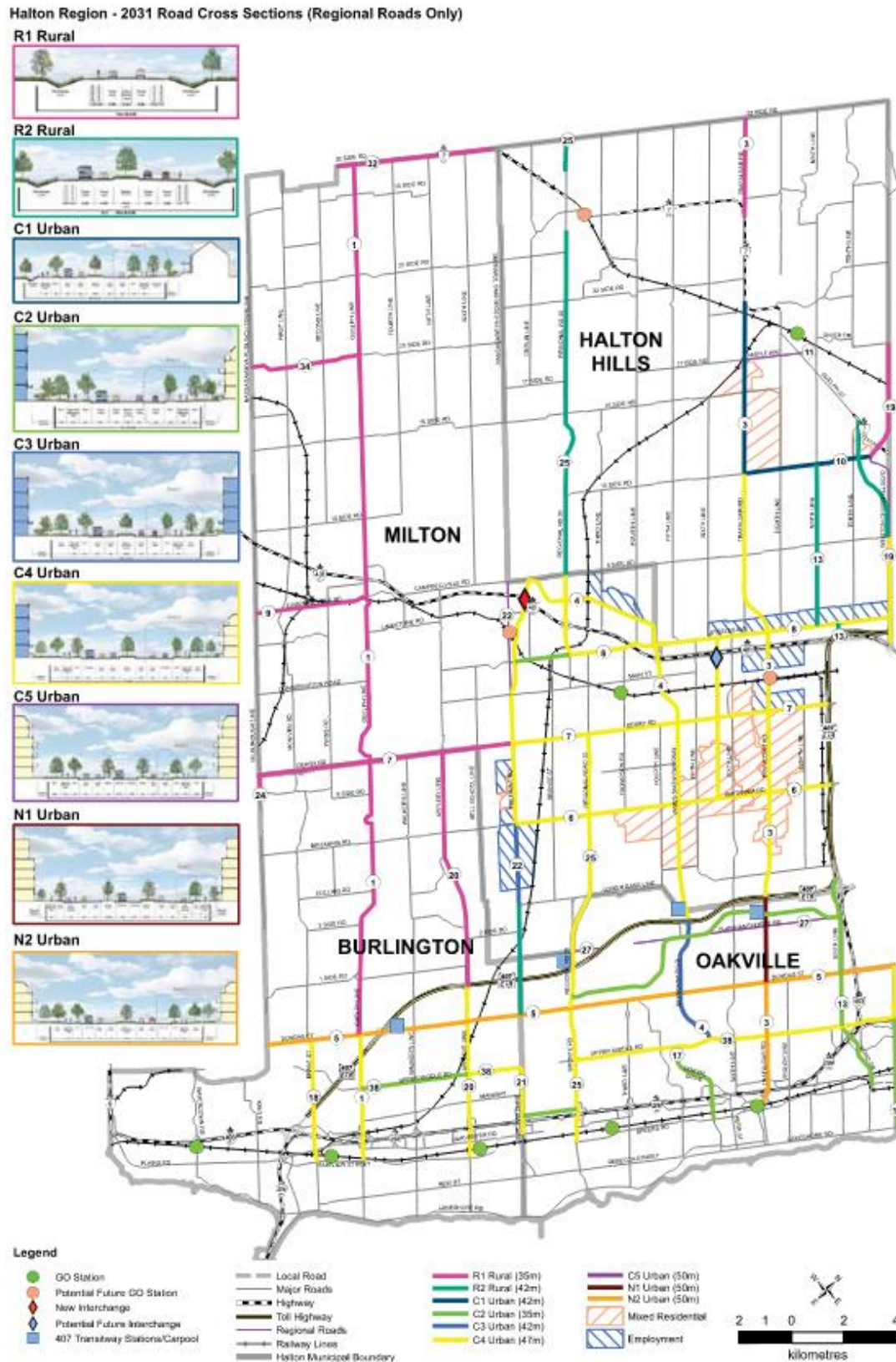
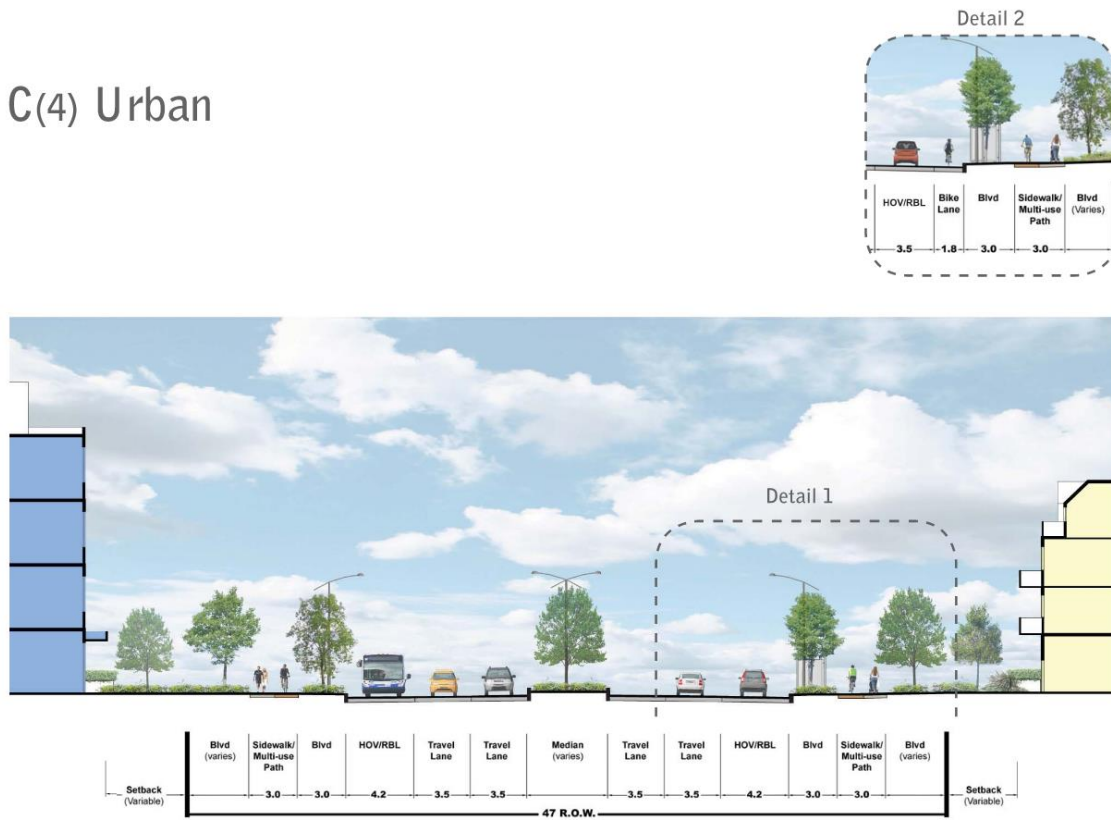
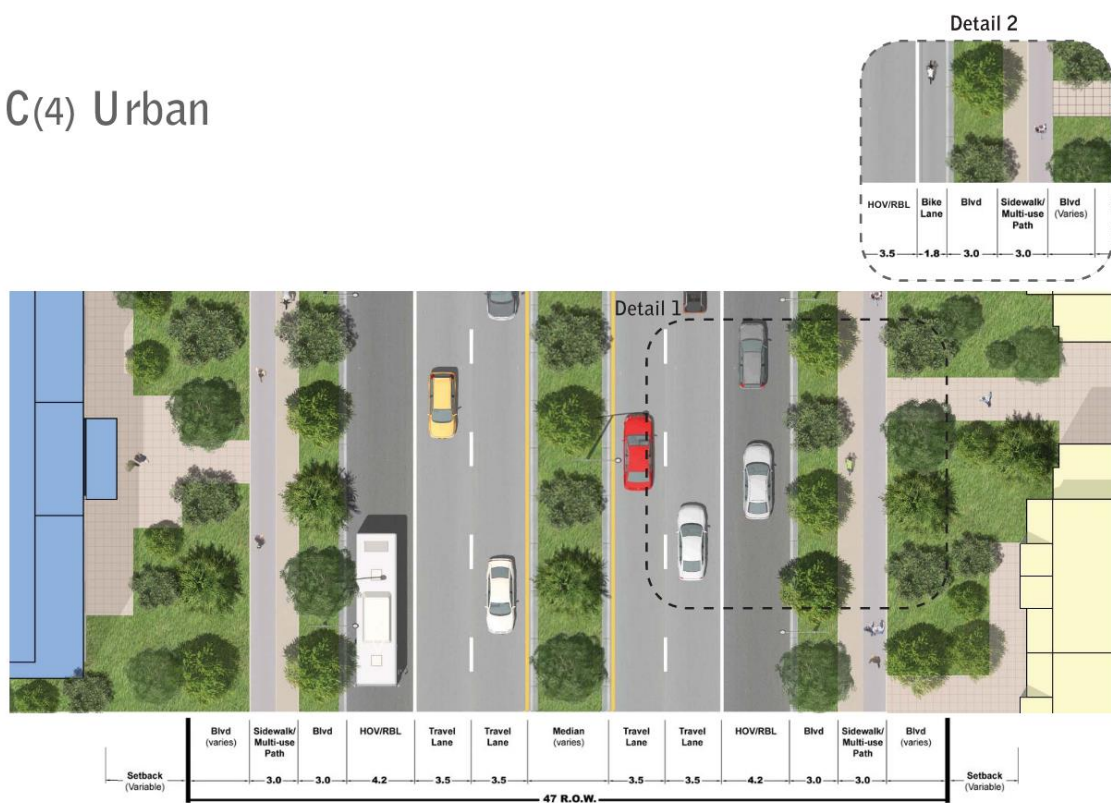


Figure 5-2 Halton Region C(4) Urban 2031 Road Cross Section

C(4) Urban



C(4) Urban



5.3 Background Corridor Growth

In alignment with the methodology used in the MP4TC RNA study, the background growth rates for the Remington Lands study area were derived consistently with the MP4 RNA analysis for the 2031 and 2041 planning horizons. These growth rates account for cumulative impacts of population and employment forecasts based on the Region's Joint Best Practices Estimates (JBPE) travel demand model to 2051 including background developments such as the Trafalgar GO Station and Agerton lands.

The Trafalgar GO Station is a significant transit development within the vicinity of the subject site. It is proposed to be located within the Agerton Secondary Plan Lands, north of the Trafalgar Tertiary Plan area. The Trafalgar GO Station is proposed to be placed within the Major Transit Station Area (MTSA) to provide effective rail connections to users as this is planned to have high-density employment and residential areas. As per the Transportation Master Plan for the Trafalgar and Agerton Secondary Plan (dated March 2022), the preferred location for the proposed Trafalgar GO Station is west of Trafalgar Road along the existing rail line.

For the 2031 horizon, the same background growth rate of 2.65%, applied to Regional Roads in the MP4 RNA, was used to project traffic volumes within this study area.

For the 2041 horizon, growth rates provided by Region and Town staff were applied to the 2031 volumes to reflect full background development impacts. As the Town's growth rates did not include all of these developments, a combined growth rate approach was used for Town roads. Regional growth rates were added to the Town's to better capture total background traffic growth, in line with MP4 RNA assumptions.

The updated growth rates applied to the study area corridors are summarized in **Table 5-1**.

Table 5-1 Updated Growth Rates Applied to Network

Corridor	2031 to 2041
Trafalgar Road	1%
Derry Road and Britannia Road east of Trafalgar Road	2%

5.4 Background Development

The RNA study incorporates a set of tertiary plan land uses and statistics provided by SGL for trip generation estimates. These site statistics are derived from the JBPE for the Trafalgar Secondary Plan area, as provided by the Town to the MP4TC Local Operations Group (LOG).

For this TIS, the site statistics and trip generation estimate from the RNA study have been adjusted by excluding the subject site to be included in background development traffic.

5.4.1 2031 Background Development – MP4 Phase 1

For the 2031 horizon year, the MP4 Phase 1 developments, excluding the subject site, were used to compute the 2031 background development traffic volume. To ensure consistency with RNA, the same site statistics assumption was adopted, and the corresponding trip generations were derived using Institute of Transportation Engineers (ITE) 10th edition trip rates.

The ITE Land Use Codes for residential and non-residential land uses within MP4 Phase 1 are presented in **Table 5-2**, with detailed trip generation calculations provided in **Appendix F**. The overall MP4 Phase 1 developments were expected to generate a total of 3,782 vehicle trips during the AM peak hour, consisting of 1,411 inbound and 2,371 outbound trips, and 3,833 trips during the PM peak hour, consisting of 2,246 inbound and 1,587 outbound trips.

5.4.1.1 Updated Subdivision Draft Plan

Within the MP4 Phase 1 developments, ongoing subdivision applications for specific land parcels provide the most current site statistics throughout the application process. As a result, updated statistics for these parcels were utilized instead of RNA assumptions and excluded from the trip generation calculation using ITE 10th edition trip rates above.

The total site statistics and corresponding ITE Land Use Codes for the updated draft plan are summarized in **Table 5-2**. The trip generation was derived separately, using ITE 11th Edition trip rates to reflect the latest development parameters.

This TIS incorporated the updated draft plans, including the subdivision developed by Frontenac Forest Estates Inc. and White Squadron Inc. The overall design parameters include 832 single family detached houses, 1,250 multi-family housing (low-rise) units, 406 multi-family housing (mid-rise) units, 2,072 multi-family housing (high-rise) units, shopping centre of 182,000 ft² GFA and elementary school of 1,450 students.

► Frontenac Forest Estates Inc. Subdivision

The proposed Frontenac development is located on the northern end of the MP4TC lands, bounded by Derry Road to the north, Eighth Line to the east, Trafalgar Road to the west and future development in MP4TC lands to the south. It is proposed to comprise 435 units of detached house dwellings, 855 units of townhouse dwellings, 356 units of medium density residential units, 701 units of neighbourhood centre, retail and commercial areas and 1 school.

Trip generation for the Frontenac development was estimated by applying ITE 11th Edition trip rates, with calculations detailed in **Appendix F**. It was expected to generate a total of 1,278 vehicle trips during the AM peak hour, consisting of 483 inbound and 795 outbound trips, and 1,297 trips during the PM peak hour, consisting of 749 inbound and 548 outbound trips.

► White Squadron Inc. Subdivision

The proposed White Squadron development is located on the northern half of the MP4TC lands, bounded by Trafalgar Road to the west, Britannia Road to the south and with adjacent MP4TC development lands in other directions. It is proposed to comprise 397 units of detached house dwellings, 395 units of townhouse dwellings, medium density residential dwellings (assumed 50 units), neighbourhood centre (assumed 1,371 units), retail and commercial areas and 1 school.

Trip generation for the White Squadron development was estimated by applying ITE 11th Edition trip rates, with calculations detailed in **Appendix F**. It was expected to generate a total of 1,039 vehicle trips during the AM peak hour, consisting of 387 inbound and 652 outbound trips, and 1,125 trips during the PM peak hour, consisting of 648 inbound and 477 outbound trips.

Table 5-2 MP4 Phase 1 (without Remington Lands) – Overall Site Statistics

Land Use Type	Land Use	ITE Land Use Code	Parameters		Total
			RNA Assumption	Updated Draft Plan	
Residential	Single Family Detached	LUC 210	1,322	832	2,154
	Multifamily Housing (Low-rise)	LUC 220	1,048	1,250	2,298
	Multifamily Housing (Mid-rise)	LUC 221	402	406	808
	Multifamily Housing (High-rise)	LUC 222	5,732	2,072	7,804
	Total Residential Units		8,504	4,560	13,064
Non-Residential	Shopping Center (ft ²)	LUC 820	181,000	182,000	363,000
	Elementary School (Students)	LUC 520	1,450	1,450	2,900
	High School (Students)	LUC 530	1,500	-	1,500
	District Park (Acres)	LUC 411	15	-	15

5.4.2 2041 Background Development – MP4 Full Build-out

For the 2041 horizon year, the design parameters for the full build-out of the MP4 developments, excluding the subject site, were utilized, together with updated draft plan statistics, to estimate the 2041 background development trip generation.

Similar to the 2031 horizon, trip generation estimates were derived using ITE 10th Edition trip rates for site statistics from the RNA and ITE 11th Edition trip rates for updated site statistics from the ongoing subdivision draft plans. The overall site statistics are presented in **Table 5-3** and the corresponding trip generation calculations for the 2041 background development traffic are summarized in **Appendix F**.

The overall MP4 full build-out developments were expected to generate a total of 7,215 vehicle trips during the AM peak hour, consisting of 2,592 inbound and 4,623 outbound trips, and 7,392 trips during the PM peak hour, consisting of 4,349 inbound and 3,043 outbound trips.

Table 5-3 MP4 Full Build-out (without Remington Lands) – Overall Site Statistics

Land Use Type	Land Use	ITE Land Use Code	Parameters		Total
			RNA Assumption	Updated Draft Plan	
Residential	Single Family Detached	LUC 210	2,558	832	3,390
	Multifamily Housing (Low-rise)	LUC 220	2,741	1,250	3,991
	Multifamily Housing (Mid-rise)	LUC 221	893	406	1,299
	Multifamily Housing (High-rise)	LUC 222	10,159	2,072	12,231
	Total Residential Units		16,351	4,560	20,911
Non-Residential	Shopping Center (ft ²)	LUC 820	331,000	182,000	513,000
	Elementary School (Students)	LUC 520	3,625	1,450	5,075
	High School (Students)	LUC 530	1,500	-	1,500
	District Park (Acres)	LUC 411	30	-	30

5.5 Future Background Traffic Volumes

For each horizon year, future background traffic volumes were derived by applying annual background corridor growth rates to the baseline traffic volumes and incorporating traffic from background developments.

For the 2031 horizon, growth rates were applied to existing baseline volumes without including traffic from the Agerton development or the full build-out of the Trafalgar Tertiary Plan's collector road network and arterial-to-collector intersections, as confirmed through RNA discussions with Region and Town staff.

For the 2041 horizon, traffic volumes were updated to reflect continued growth, and background volumes were adjusted to account for cumulative traffic from planned developments, including the Agerton lands.

The resulting 2031 and 2041 future background volumes are provided in **Figure 5-3** and, **Figure 5-4** respectively.

Figure 5-3 2031 Future Background Volumes

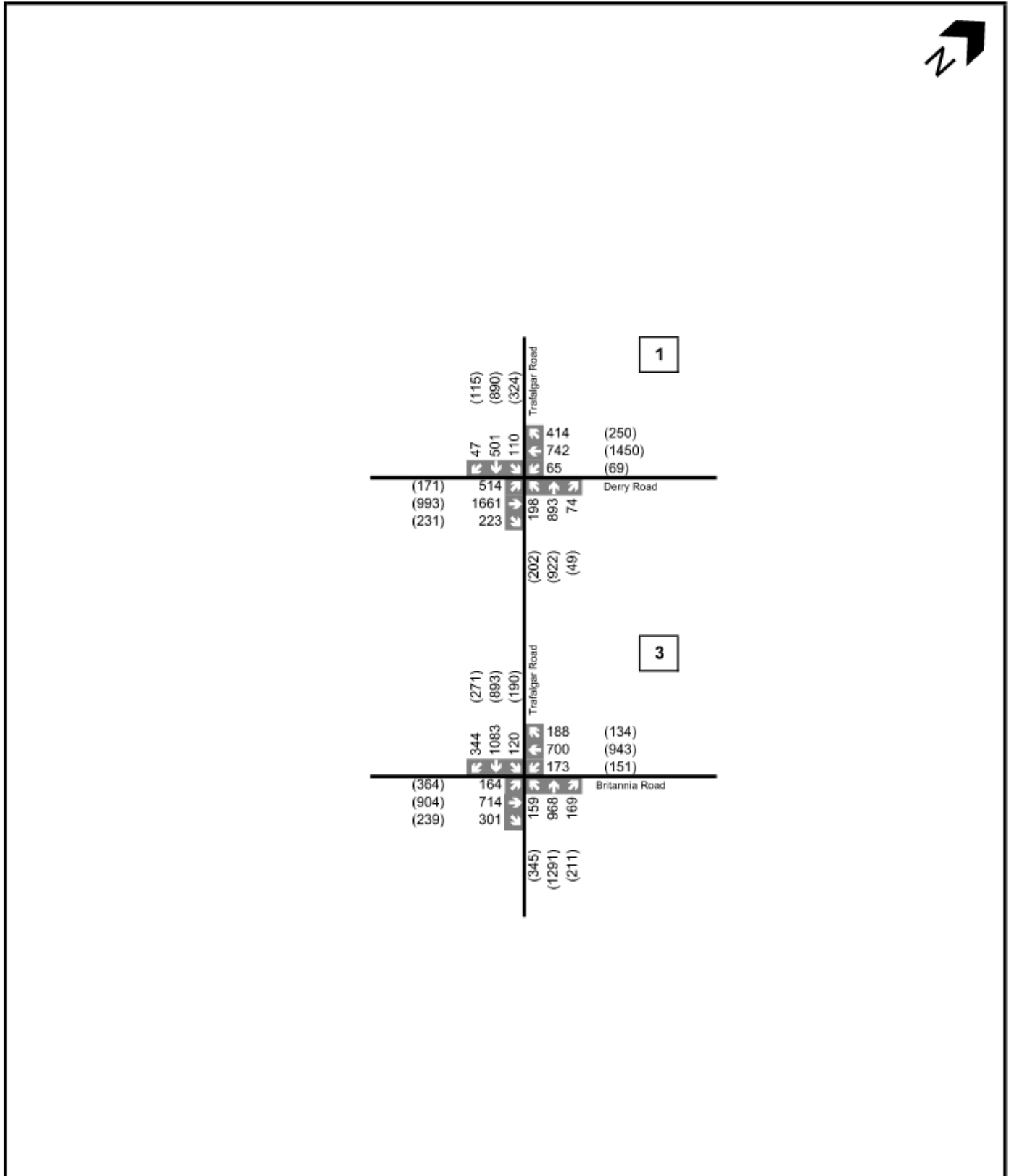
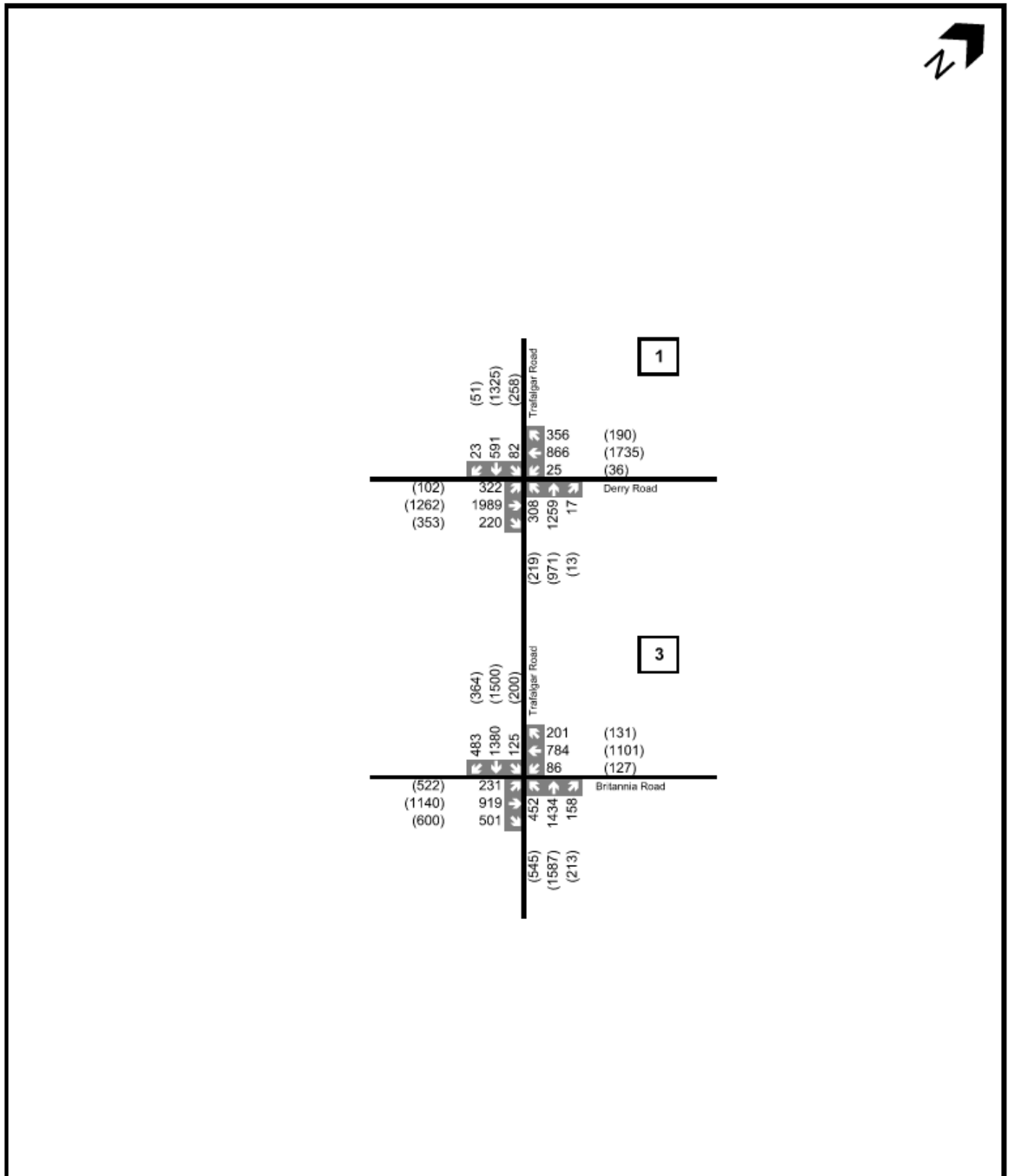


Figure 5-4 2041 Future Background Volumes



5.6 Future Active Transportation Network

The active transportation network planned across the RNA and Trafalgar Tertiary Plan area consists of a range of facilities including sidewalks, on-street bicycle lanes, multi-use paths (MUPs), and off-road trails. These elements are intended to support walking and cycling connections throughout the community.

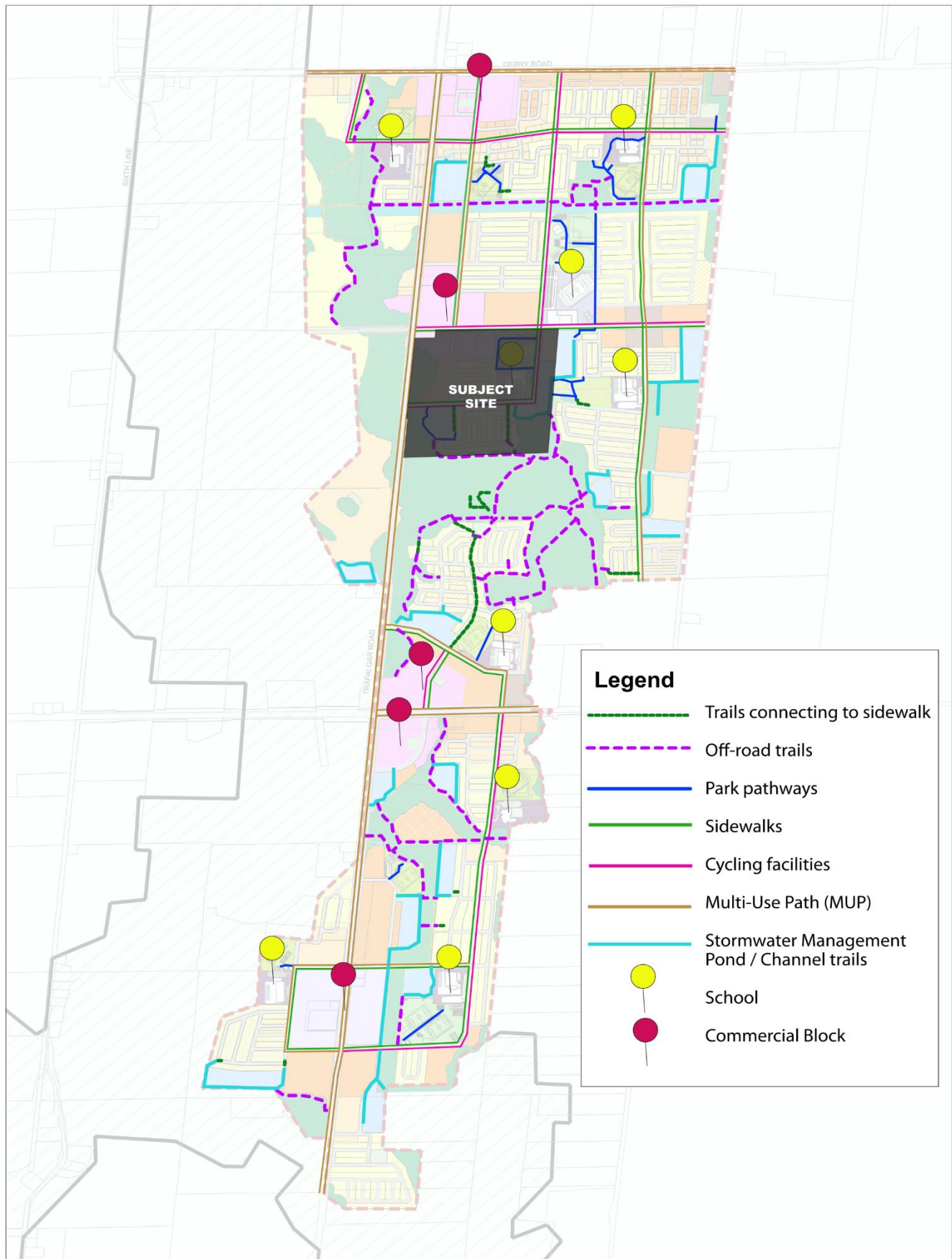
MUPs are identified along both sides of Trafalgar Road and Britannia Road, aligning with Halton Region's 2015 Active Transportation Master Plan. These facilities are expected to enhance connections across the Tertiary Plan area and will be confirmed through future stages of the Municipal Class Environmental Assessment process.

Within the RNA, the road network includes various classifications of collector roads with right-of-way (ROW) widths ranging from 20 to 26 metres. These collectors are planned to accommodate active transportation facilities such as sidewalks, MUPs and buffered cycle tracks or in-boulevard bike lanes, with specific configurations depending on the road classification and ROW. The Remington Lands includes three collector roads, Collector G (20m ROW), Collector H (21.5m ROW) and Collector L (26m ROW), which will contribute to the broader connectivity framework.

An off-road trail network is also proposed, offering connections between residential areas and key community amenities including parks, schools, and the Natural Heritage System. These trails complement the on-street facilities and are planned to integrate with both internal and external active transportation systems.

Figure 5-5 illustrates the proposed active transportation and trail networks, highlighting key connectivity points and community amenities.

Figure 5-5 Active Transportation Network



5.7 Future Transit Network

As identified in Halton Region's 2011 TMP, a future GO Train Station on the Milton line is to be located north of the subject lands. The proposed location is to be located along the existing Milton Line railway and its crossing of Trafalgar Road to the north of Derry Road. This future GO Train Station has also been identified within the TMP for the Trafalgar Agerton Secondary Plan area. The construction of a GO Train station at this location will provide future residents of the subject site access to regional, higher-order transit within the immediate vicinity of the site.

Based on Figure 7.1 – Transit Servicing Concept in Halton Region's TMP (attached in **Appendix E**), Trafalgar Road has been identified as a higher order transit corridor with conceptual plans for transit in reserved right of way. Similarly, Britannia Road within the MP4 RNA study area (south of the subject site) has also been identified as a regional higher order transit corridor and has been planned in concept to have semi-exclusive and/or exclusive right of way for transit operations. The Trafalgar Tertiary Plan has located higher density development along Trafalgar Road to provide the needed density of residences and employment uses to support the planned higher order transit corridor.

The planned regional higher order transit corridors within the broader Trafalgar Agerton Secondary Plan area could be further supplemented by local transit routes. These local transit routes would serve the residential areas and neighbourhood mixed use nodes while also providing connections to regional transit, such as GO Train and bus routes at the future GO Station within the Agerton lands. Provision of local transit routes through the subject site and the MP4 RNA area will be confirmed through the development application process.

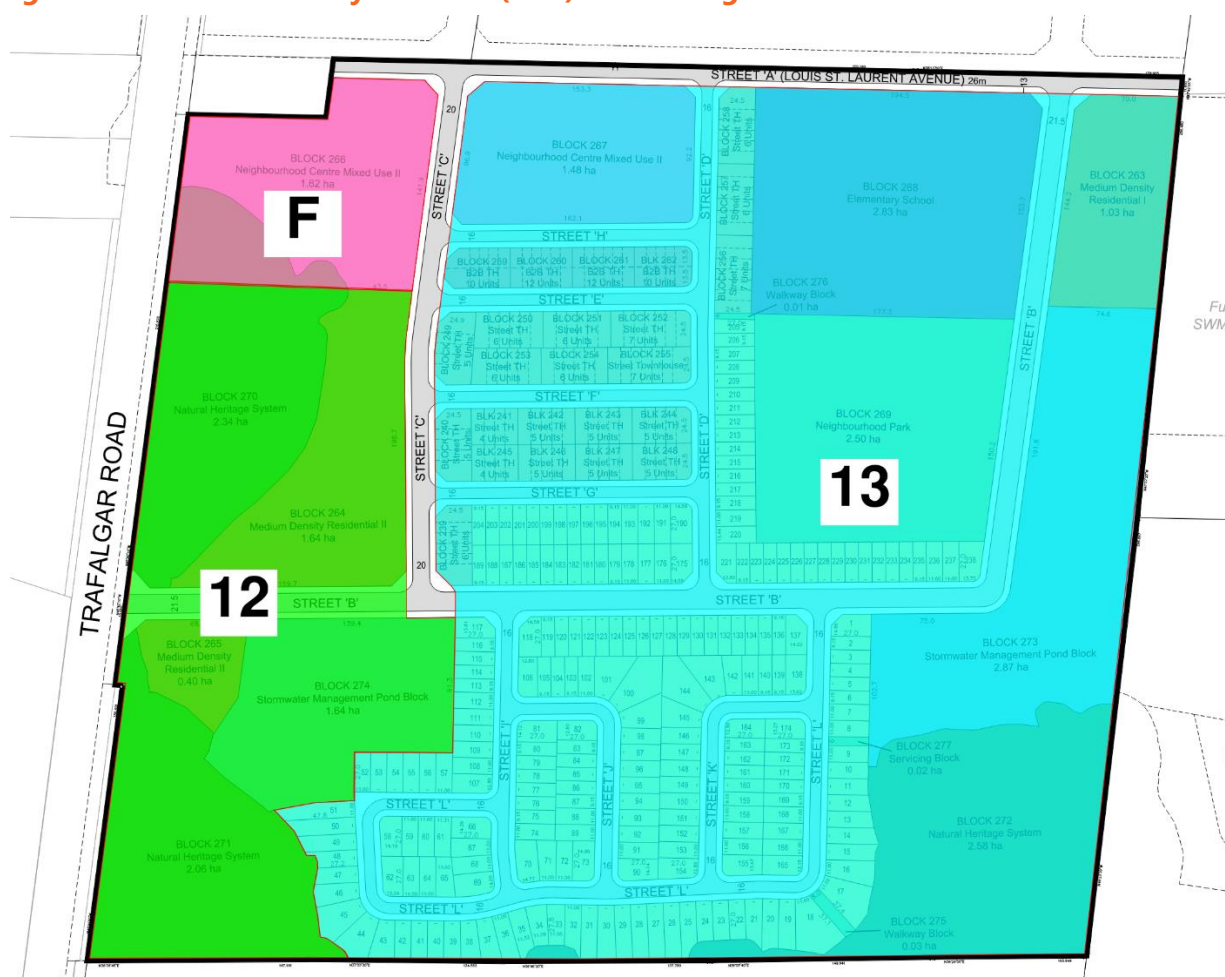
6 SITE GENERATED TRAFFIC

6.1 Traffic Analysis Zones

The overall Trafalgar Tertiary Plan was divided into a total of 38 Traffic Analysis Zones (TAZs) for trip generation and assignment. The TAZ boundaries are generally defined by the collector road network and Natural Heritage System features, mostly conforming to the shape of future development blocks where possible.

3 out of total 38 TAZs (Zone 12, 13 and part of Zone F) within the Remington lands are identified as the proposed subdivision for trip generation purposes. The resulting trips were then assigned to the collector road and broader transportation network based on each TAZ's location within the Tertiary Plan. The boundaries of these 3 TAZs are illustrated in **Figure 6-1**.

Figure 6-1 Traffic Analysis Zones (TAZ) for Remington Lands



6.2 Mode Split

A non-automobile mode split reduction of 28% was applied to trips generated by all land use types in the Tertiary Plan area. The 28% mode split reduction is in line with that applied in the Trafalgar TMP, which was explained as being applied “as per the 2031 targets specified by the Region’s 2011 TMP (5 percent active transportation, 20 percent transit, and 3 percent other transportation demand management)”.

Taking into account the future active transportation infrastructure, trail network, High-Occupancy-Vehicle (HOV) / Transit priority lanes, and Trafalgar GO Stations that will be implemented within, or in close proximity to, the Trafalgar Tertiary Plan, it is TYLin’s opinion that a mode split reduction of 28% is reasonable.

6.3 Site Trip Generation

As outlined in **Section 2.4**, the proposed development includes a mix of land uses comprising single-family detached dwellings, townhouse units, a neighbourhood centre, medium and high-density residential developments, retail and commercial areas, a school, and lands designated for other uses. For the purpose of trip generation analysis, the development components have been classified using the Institute of Transportation Engineers (ITE) Land Use Codes (LUCs), as per the ITE Trip Generation Manual, 11th Edition.

Table 6-1 provides a summary of the land use types and corresponding unit quantities used in the trip generation analysis for the Remington Draft Plan – Phases 12, 13, and F.

Table 6-1 Remington Draft Plan– Overall Site Statistics for Trip Generation

Land Use Type	Proposed Land Use	ITE Land Use	LUC	Parameters	Units
Residential	Single Detached House	Single-Family	210	238	Residential Units
	Street Townhouse	Multi-Family Housing (Low-Rise)	220	155	
	Back-to-Back Townhouse				
	Medium Density Residential Dwellings	Multi-Family Housing (Mid-Rise)	221	332 ¹	
	Neighbourhood Centre Mixed Use Dwellings	Multi-Family Housing (High-Rise)	222	951 ¹	
	Total Residential Units			1,676	
Non-Residential	Elementary School	Elementary School	520	725	Students

Note 1 – The design parameters for medium density residential, neighbourhood centre dwellings and Elementary School are to be confirmed in the later stage. To ensure consistency, the GFA and number of students adopted in RNA study were applied for analysis of this TIS.

Site trips of different zones, illustrated in **Figure 6-1**, were estimated using the ITE 11th Edition LUCs as noted in **Table 6-1**. The detailed estimated trip generation of the development from each zone are summarized in **Table 6-2** to **Table 6-4**.

Table 6-2 Zone 12 – Trip Generation Summary

Land Use	Parameter	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Multi-family Housing (Mid-rise) ITE LUC 221 201 Units	Trip Generation Equation or Average Rate	$T = 0.44(X) - 11.61$			$T = 0.39(X) + 0.34$		
	Directional Split	23%	77%	-	61%	39%	-
	Gross Trips	18	59	77	48	31	79
	Mode Split Reduction (28%)	-5	-17	-22	-13	-9	-22
	Net Trips	13	42	55	35	22	57
Total Trips Zone 12		13	42	55	35	22	57

Table 6-3 Zone 13 – Trip Generation Summary

Land Use	Parameter	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Single-Family Detached Housing ITE LUC 210 238 Units	Trip Generation Equation or Average Rate	$\ln(T) = 0.91\ln(X) + 0.12$			$\ln(T) = 0.94\ln(X) + 0.27$		
	Directional Split	25%	75%	-	63%	37%	-
	Gross Trips	41	123	164	142	83	225
	Mode Split Reduction (28%)	-11	-34	-45	-40	-23	-63
	Net Trips	30	89	119	102	60	162
Multi-family Housing (Low-rise) ITE LUC 220 155 Units	Trip Generation Equation or Average Rate	$T = 0.31(X) + 22.85$			$T = 0.43(X) + 20.55$		
	Directional Split	24%	76%	-	63%	37%	-
	Gross Trips	17	54	71	55	32	87
	Mode Split Reduction (28%)	-5	-15	-20	-15	-9	-24
	Net Trips	12	39	51	40	23	63
Multi-family Housing (Mid-rise) ITE LUC 221 131 Units	Trip Generation Equation or Average Rate	$T = 0.44(X) - 11.61$			$T = 0.39(X) + 0.34$		
	Directional Split	23%	77%	-	61%	39%	-
	Gross Trips	11	37	48	31	20	51
	Mode Split Reduction (28%)	-3	-10	-13	-9	-6	-15
	Net Trips	8	27	35	22	14	36
Multi-family Housing (High-rise)	Trip Generation Equation or Average Rate	$T = 0.22(X) + 18.85$			$T = 0.26(X) + 23.12$		

Land Use	Parameter	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
rise) ITE LUC 222 551 Units	Directional Split	26%	74%	-	62%	38%	-
	Gross Trips	36	104	140	103	63	166
	Mode Split Reduction (28%)	-10	-29	-39	-29	-18	-47
	Net Trips	26	75	101	74	45	119
Elementary School ITE LUC 520 725 Students	Trip Generation Equation or Average Rate	0.74			0.16		
	Directional Split	54%	46%	-	46%	54%	-
	Gross Trips	290	247	537	53	63	116
	Mode Split Reduction (28%)	-81	-69	-150	-15	-18	-33
	Net Trips	209	178	387	38	45	83
	Net Trips (85% Internal)	178	151	329	32	38	70
	Net Trips (15% External)	31	27	58	6	7	13
Total Trips Zone 13		285	408	693	276	187	463

Table 6-4 Zone F – Trip Generation Summary

Land Use	Parameter	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Multi-family Housing (High-rise) ITE LUC 222 400 Units	Trip Generation Equation or Average Rate	$T = 0.22(X) + 18.85$			$T = 0.26(X) + 23.12$		
	Directional Split	26%	74%	-	62%	38%	-
	Gross Trips	28	79	107	79	48	127
	Mode Split Reduction (28%)	-8	-22	-30	-22	-13	-35
	Net Trips	20	57	77	57	35	92
Total Trips Zone F		20	57	77	57	35	92

Table 6-5 Remington Lands Total – Trip Generation Summary

Land Use	Parameter	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Total Trips	Gross Trips	441	703	1144	511	340	851
	Mode Split Reduction (28%)	-123	-196	-319	-143	-96	-239
	Net Trips	318	507	825	368	244	612
Adopted Trips in Remington TIS		318	507	825	368	244	612
Adopted Trips (TAZ 12, 13, F ¹) in Trafalgar RNA		300	513	813	387	260	647
Net Difference		+18	-6	+12	-19	-16	-35

Note 1 – The TAZ F land identified within the Remington lands accounts for approximately 0.31 of the total TAZ F area. Hence, an adjustment factor of 0.31 is applied to the total trips generated by TAZ F for comparison.



As summarized in **Table 6-5**, a total of 825 net auto trips, consisting of 318 inbound and 507 outbound trips, are estimated to be generated by the Remington Lands during the weekday AM peak hour. During the weekday PM peak hour, 368 inbound and 244 outbound net auto site trips are estimated, totaling 612 trips.

The updated Remington Lands (TAZs 12, 13 and F) trip generation would result in a net difference of +12 and -35 two-way trips in the AM and PM when compared to MP4 RNA Study.

6.4 Site Trip Distribution and Assignment

To ensure consistency, the site trip distribution and assignment adopted for this TIS is sourced from the RNA study conducted for the MP4TC area. The key assumptions made in the RNA study are as follows.

Due to the current rural / greenfield status of the Remington lands, the Transportation Tomorrow Survey (TTS) data would not properly reflect the future land uses and associated travel patterns within the study area. Further, near future infrastructure improvements, the proposed GO Station, and other proposed developments will all contribute to changes in existing traffic patterns within the vicinity of the study area.

The Trafalgar TMP estimated the trip distribution of the Trafalgar and Agerton Secondary Plans using the Region's 2031 EMME model. The external distribution was broken down by locations in the GTA, as summarized in Table 4-7 of the 2022 Trafalgar TMP Addendum, which is provided in **Appendix G**. TYLin used Table 4-7 as a base for trip distribution for the RNA area (also applied to this TIS study area) to remain in line with data upon which the Trafalgar TMP was based. TYLin's distribution calculations based on the percentages and destinations in the TMP's Table 4-7 have also been provided in **Appendix G**.

Table 6-6 summarizes the overall trip distribution for the TIS study area, while **Table 6-7** details the trip distribution at specific external gateways along the study area boundaries.

Table 6-6 Overall Directional Trip Distribution

Direction	AM Peak Hour		PM Peak Hour	
	Inbound	Outbound	Inbound	Outbound
North	21.7%	26.7%	26.7%	21.7%
South	15.3%	14.5%	14.5%	15.3%
East	19.1%	14.8%	14.8%	19.1%
West	43.9%	44.0%	44.0%	43.9%
Total	100%	100%	100%	100%

Table 6-7 External Gateway Trip Distribution

Direction	AM Peak Hour		PM Peak Hour	
	Inbound	Outbound	Inbound	Outbound
Trafalgar Road to/from North	21.74%	26.74%	26.74%	21.74%
Derry Road to/from East	5.25%	4.12%	4.12%	5.25%
Britannia Road to/from East	8.45%	6.52%	6.52%	8.45%
Lower Baseline to/from East	5.39%	4.11%	4.11%	5.39%
Trafalgar Road to/from South	15.28%	14.47%	14.47%	15.28%
Lower Baseline to/from West	1.76%	1.91%	1.91%	1.76%
Britannia Road to/from West	28.53%	26.87%	26.87%	28.53%
Derry Road to/from West	13.60%	15.26%	15.26%	13.60%
Total	100%	100%	100%	100%

6.5 Site Trip Assignment

Site assignment was based on a TAZ-specific level, as trip generation estimates were tailored to each TAZ's proposed land uses and residential unit types. Trips were further subdivided into internal and external trips for assignment purposes.

The location of existing and future study intersections throughout the TIS study area is outlined in **Figure 6-2**, providing the intersection ID number assigned to each intersection and collector road names to be used in conjunction with site traffic volume figures.

The estimated site traffic volumes at intersections in the study area are provided in **Figure 6-3**.

6.5.1 External Assignment

External trips to/from each TAZ were assigned first to a collector road within or adjacent to the TAZ and then traveled via logical routing to one of the eight external road network gateways, dependent upon the direction of the trip and overall distribution of trips.

6.5.2 Internal Assignment

Internal site assignment was applied to non-residential land uses such as schools and commercial blocks that would attract vehicle trips from within the Tertiary Plan's boundaries. The internal assignment of site trips did not further reduce the total net trips generated by the Tertiary Plan, it merely kept a portion of the trips internal to the site instead of 100% of the net trips being assigned to external road network gateways.



In the case of land uses for which internal assignment applied, such as schools, a “catchment area” approach as taken. For example, inbound and outbound internal trips generated by the school were assigned to/from each TAZ in the catchment area proportionate to the number of residential units in each TAZ.

Completing internal assignments should be considered a conservative measure, particularly when it comes to the design of the collector road intersections and assessment of capacity. Internal assignment accounts for trips completed between TAZs (between residential and non-residential land uses), and not just commuter traffic in and out of the Tertiary Plan area. This results in more varied travel patterns throughout the collector road network, ensuring the collector roads and intersections have been designed with sufficient capacity for both internal and external traffic travel patterns.

Figure 6-2 Study Intersections Key Map – Future Conditions

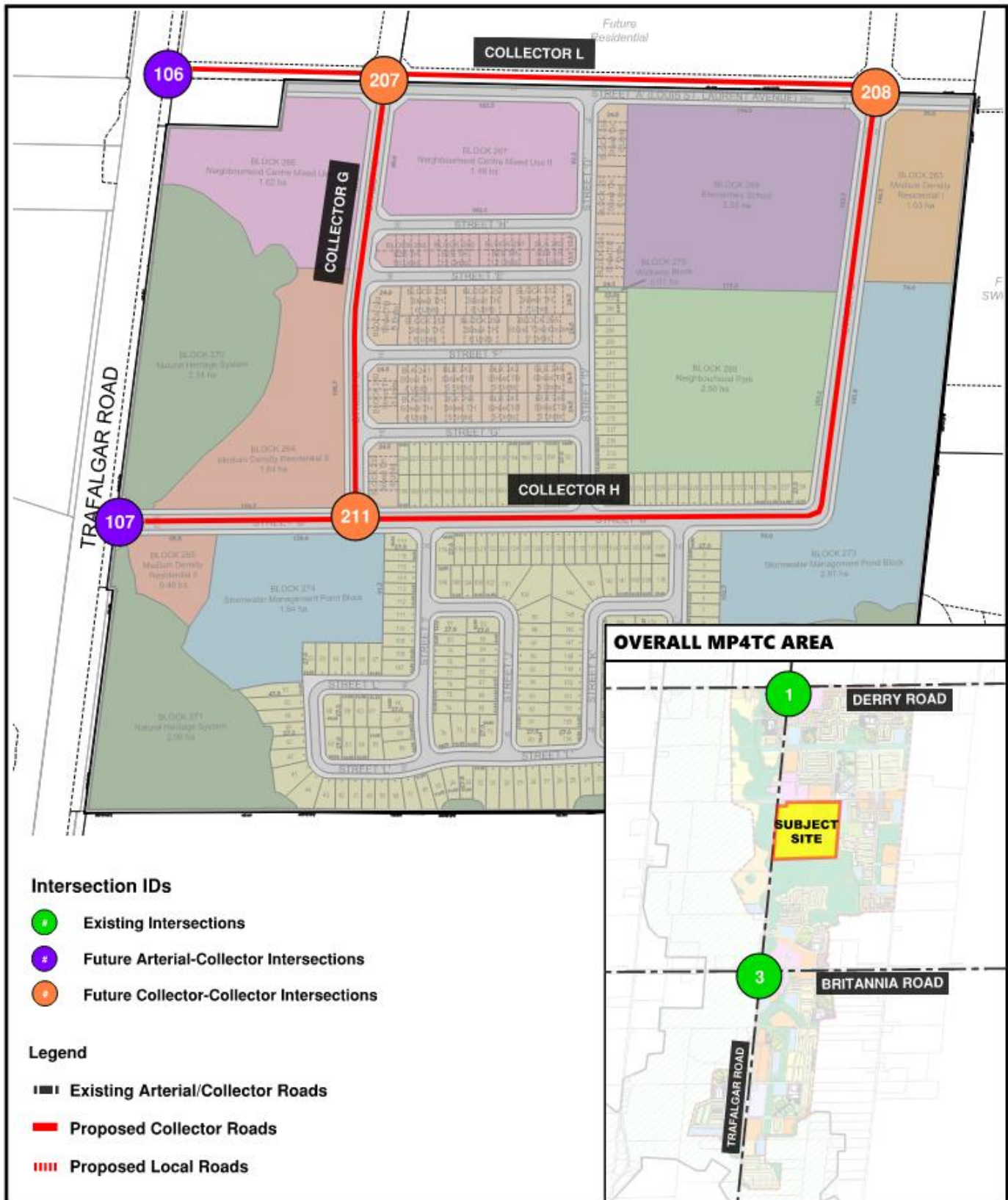


Figure 6-2
Study Intersections Key Map-
Future Conditions

Figure 6-3 Site Traffic Volumes

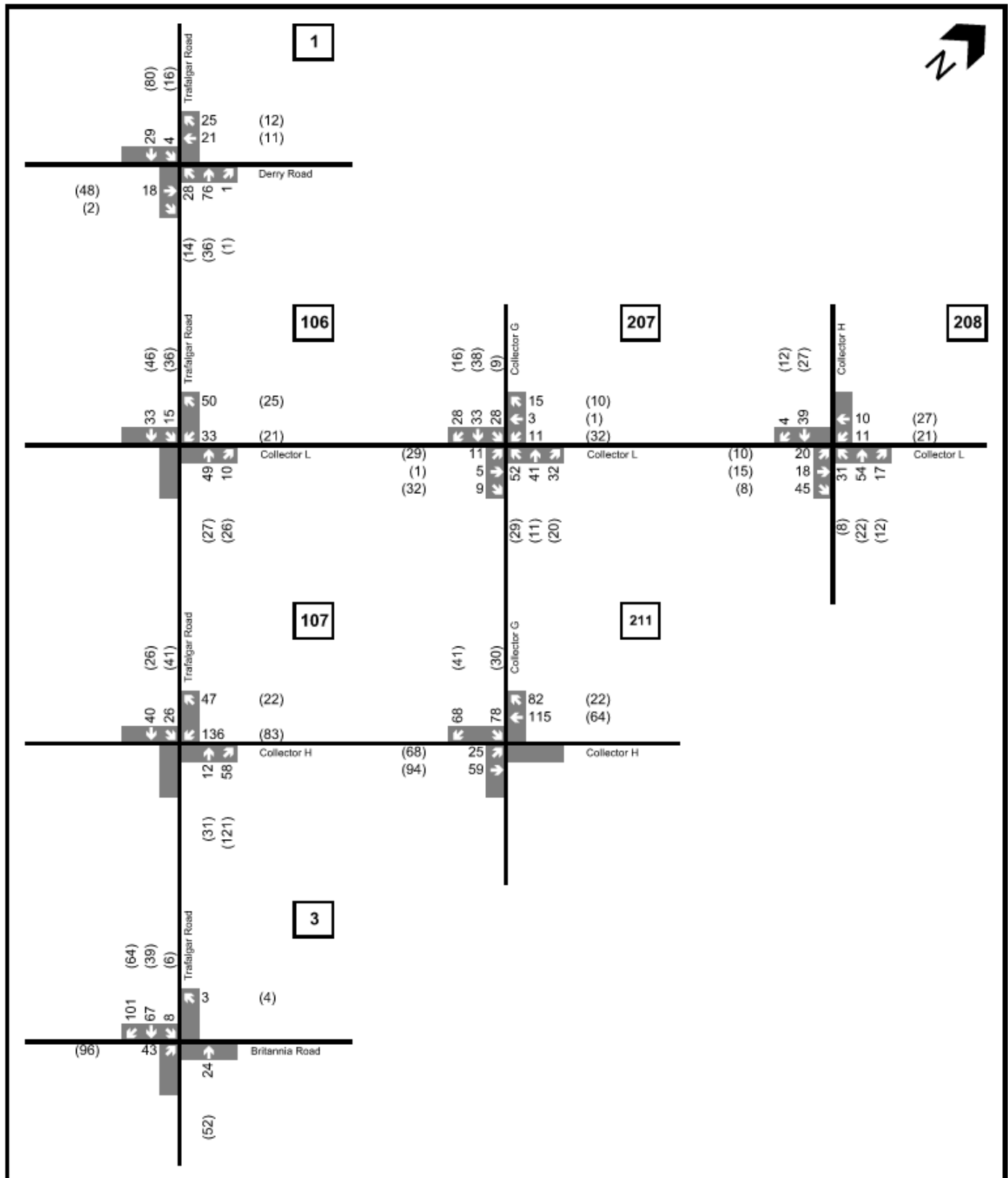


Figure 6-3



7 FUTURE CONDITIONS

7.1 2031 Future Total

The 2031 future total volumes were developed by combining the 2031 future background volumes with the estimated site generated traffic. The resulting 2031 future total traffic volumes are provided in **Figure 7-1**.

7.2 2041 Future Total

The 2041 future total volumes were developed by combining the 2041 future background volumes with the estimated site generated traffic, Agerton development trips, and the background traffic rerouting adjustments derived from the March 2022 Trafalgar TMP Addendum. The resulting 2041 future total traffic volumes are provided in **Figure 7-2**.

Figure 7-1 2031 Future Total Traffic Volumes

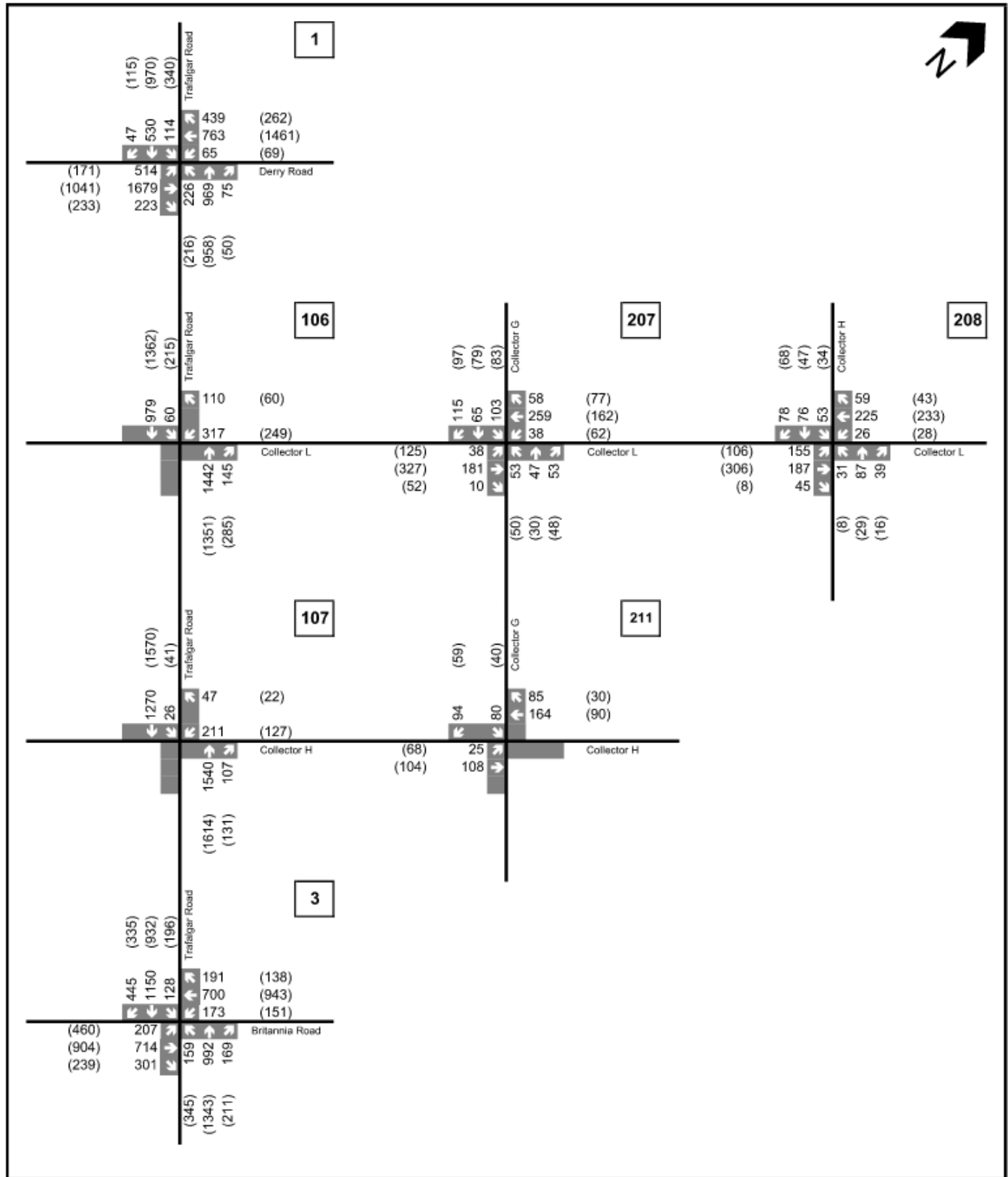


Figure 7-1

Figure 7-2 2041 Future Total Traffic Volumes

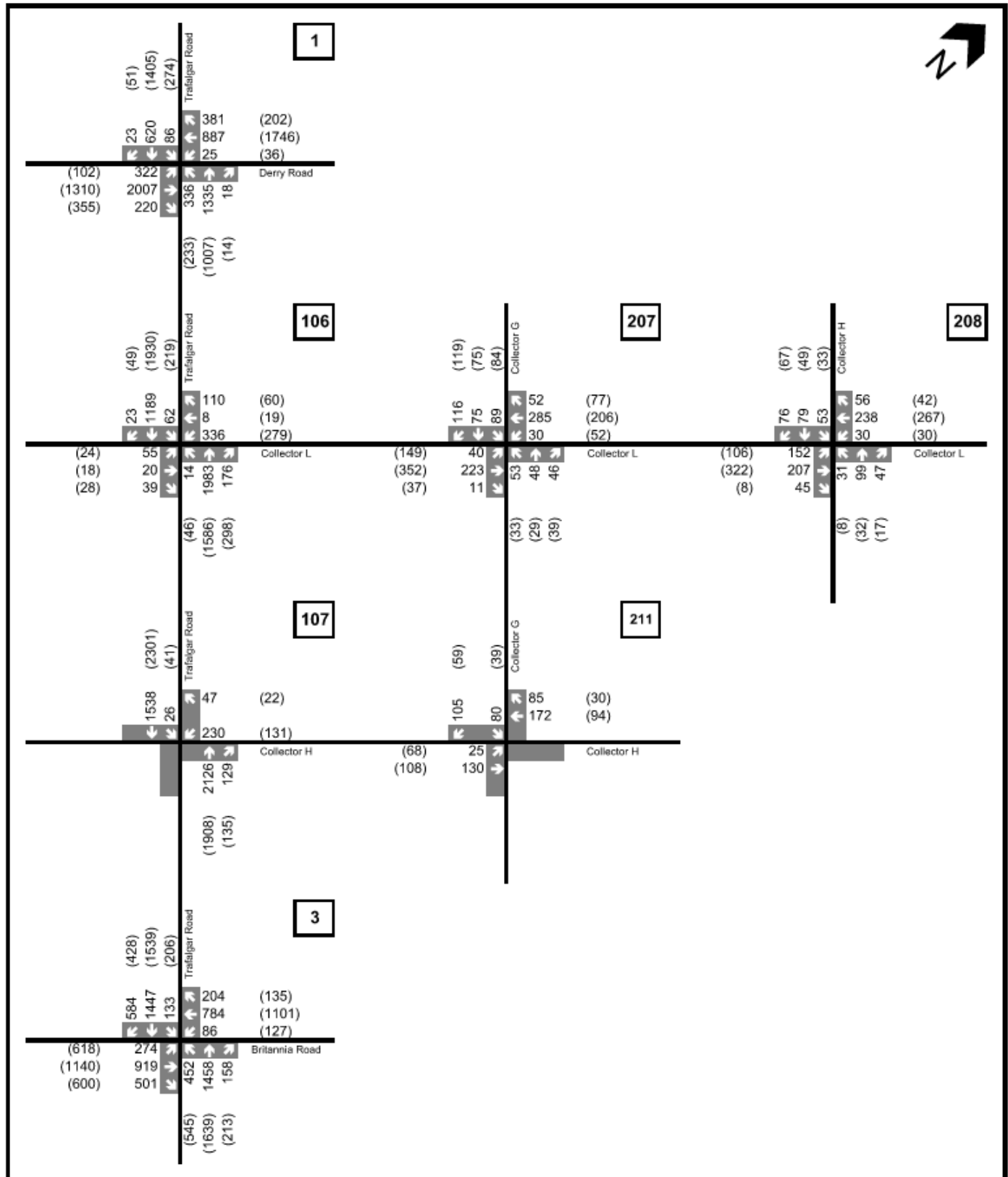


Figure 7-2

7.3 Lane Configuration Modifications

Based on the recommendations outlined in the Milton Transportation Master Plan (TMP) and the proposed lane configuration modifications detailed in the RNA for the MP4TC area, phased improvements have been adopted for the study intersections.

For the 2031 horizon year, Phase 1 improvements, including the implementation of a High Occupancy Vehicle (HOV) curb lane on the regional road (Trafalgar Road), have been incorporated into both the future background and future total scenarios. Detailed improvement and associated responsibility for 2031 scenario are summarized in **Table 7-1** and illustrated in **Figure 7-3**.

Table 7-1 2031 Future Lane Configuration Modification and Responsibility

Intersection	Approach	Modification	Responsibility
Existing Intersections			
Trafalgar Road & Derry Road	Northbound	▶ Dual left turn lanes ▶ 1 additional through lane (HOV) ▶ Auxiliary right turn lane	Region
	Eastbound and Southbound	▶ Dual left turn lanes ▶ 1 additional through lane (HOV)	
	Westbound	▶ 1 additional through lane (HOV) ▶ Auxiliary right turn lane	
Trafalgar Road & Britannia Road	Eastbound and Westbound	▶ Auxiliary left turn lane	
	All directions	▶ 1 additional through lane (HOV) ▶ Auxiliary right turn lane	
Arterial-to-Collector Intersections			
Trafalgar Road & Collector L	Northbound	▶ 1 additional through lane (HOV)	Region
		▶ Auxiliary right turn lane	MP4 Developers
	Southbound	▶ 1 additional through lane (HOV)	Region
		▶ Auxiliary left turn lane	MP4 Developers
	Westbound	▶ Auxiliary left turn lane ▶ Auxiliary right turn lane	MP4 Developers
Trafalgar Road & Collector H	Northbound	▶ 1 additional through lane (HOV)	Region
		▶ Shared right turn movement	MP4 Developers
	Southbound	▶ 1 additional through lane (HOV)	Region

Intersection	Approach	Modification	Responsibility
		▶ Auxiliary left turn lane	MP4 Developers
	Westbound	▶ Auxiliary left turn lane ▶ Auxiliary right turn lane	MP4 Developers
Collector-to-Collector Intersections			
Collector G & Collector L	Northbound and Southbound	▶ Single lane approach (shared all movements)	MP4 Developers
	Eastbound and Westbound	▶ Auxiliary left turn lane ▶ 1 shared through/right turn lane	
Collector H & Collector L	Northbound and Southbound	▶ Auxiliary left turn lane ▶ 1 shared through/right turn lane	
	Eastbound and Westbound	▶ Single lane approach (shared all movements)	
Collector G & Collector H	Eastbound	▶ 1 Shared through/left turn lane	
	Southbound	▶ Single lane with shared left/right movements	
	Westbound	▶ 1 Shared through/right turn lane	

For the 2041 horizon year, the full build-out improvements identified in the MP4TC, along with associated improvements related to the Agerton developments, have been incorporated into both the future background and future total traffic scenarios. The 2041 lane configuration modifications and responsibilities are summarized in **Table 7-2** and illustrated in **Figure 7-4**.

Table 7-2 2041 Future Lane Configuration Modification and Responsibility

Intersection	Approach	Modification	Responsibility
Existing Intersections			
Trafalgar Road & Derry Road	Westbound	➤ Dual left turn lanes	Region
Trafalgar Road & Britannia Road	Northbound and Southbound	➤ Dual left-turn lanes	
Arterial-to-Collector Intersections			
Trafalgar Road & Collector L	Northbound	➤ Auxiliary left turn lane	MP4 Developers
	Eastbound	➤ Auxiliary right turn lane ➤ 1 shared through/left turn lane	
		Southbound	
	Westbound	➤ Shared through movement	

Figure 7-3 2031 Future Total Lane Configuration

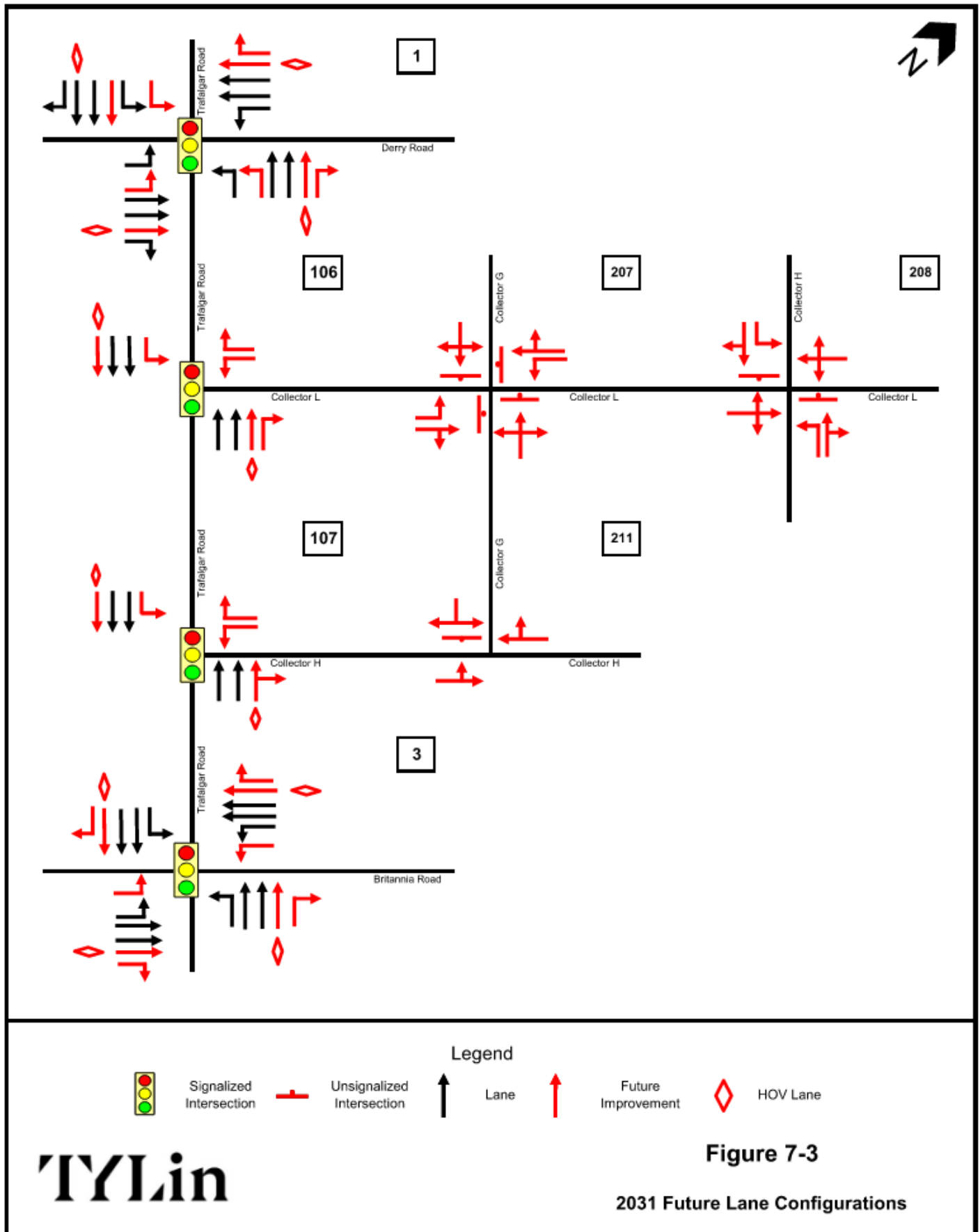
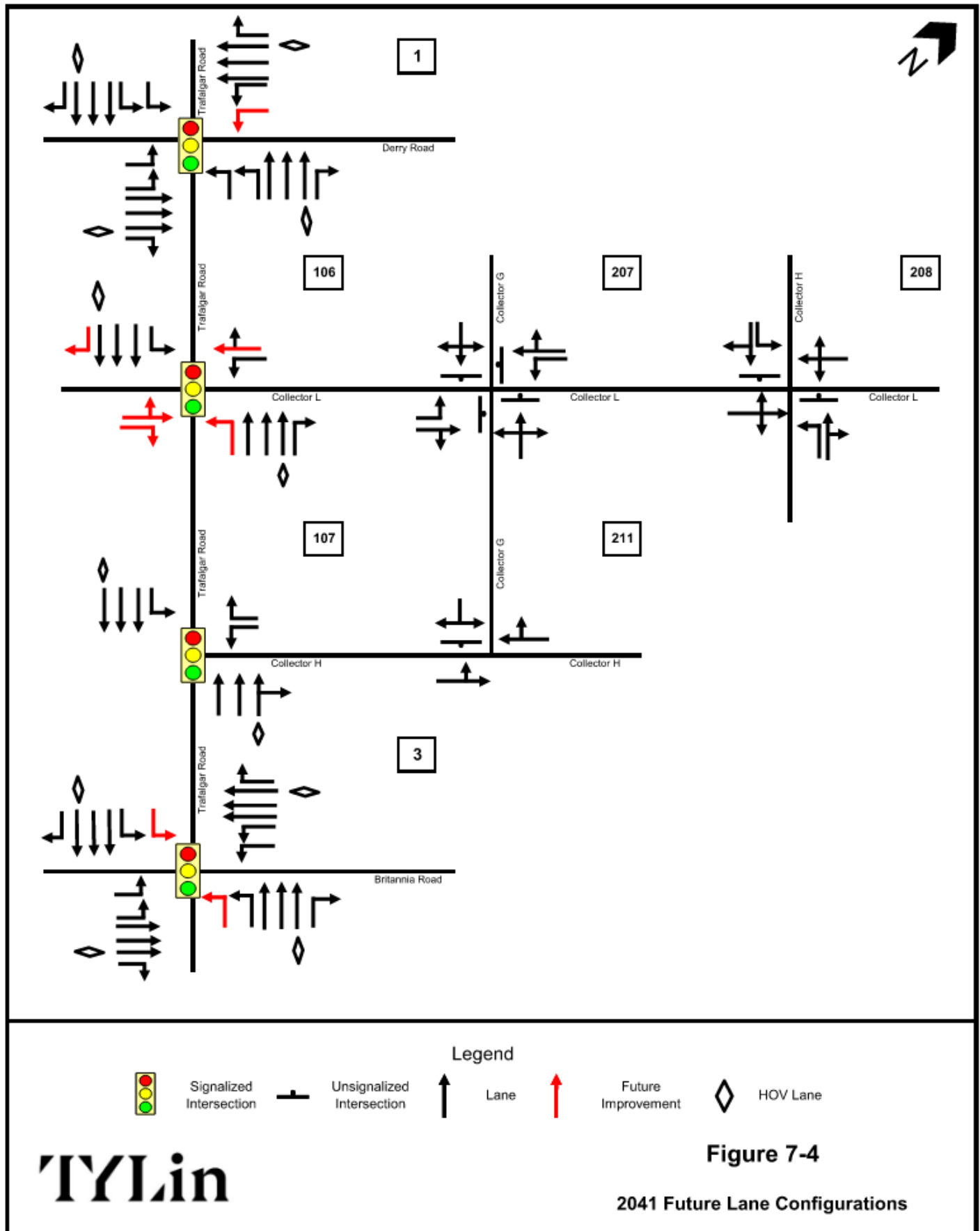


Figure 7-4 2041 Future Total Lane Configuration



8 TRAFFIC CAPACITY ANALYSIS

The capacity analysis identifies how well the existing and proposed intersections are operating and how they are expected to operate in the future. The analysis contained in this report utilized the Highway Capacity Manual (HCM) 2000 techniques within the Synchro Version 11 Software package. The reported intersection volume-to-capacity ratios (v/c) are a measure of the saturation volume for each turning movement, while the levels-of-service (LOS) are a measure of the average delay for each turning movement.

The analysis includes identification of all intersections and for all movements; v/c ratios, LOS indicators and 95th percentile queue lengths. 'Critical' intersections and movements, as defined by Halton Region, include:

Signalized Intersections

- ▶ v/c ratios for overall intersection operations, through movements, or shared through/turning movements increased to 0.85 or above;
- ▶ v/c ratios for exclusive turning movements increased to 0.95 or above; or
- ▶ queues for an individual movement are projected to exceed available turning lane storage.

Unsignalized Intersections

- ▶ LOS, based on average delay per vehicle, on individual movements exceeds LOS 'D'; or
- ▶ The estimated 95th percentile queue length for an individual movement exceeds the available queue storage.

The following tables summarize the capacity analysis results for the study intersections during the weekday AM and PM peak hours under baseline, future background and future total traffic conditions. Detailed Synchro reports are attached in **Appendix H**, **Appendix I** and **Appendix J** respectively.

8.1 Baseline Conditions

Under baseline 2025 conditions, some assumptions were made based on the signal timing plans (STP) received from the Region. The details of these assumptions and any related modifications are presented in **Table 8-1**. Existing Signal Timing Plans are provided in **Appendix D**. It should be noted that calibrations applied to existing intersections by the Trafalgar TMP (such as lost time adjustments) have also been applied to the analysis to remain consistent with prior analysis efforts of the Trafalgar TMP.

An excerpt of the Trafalgar TMP calibrations is attached in **Appendix D** and summarized below for each intersection to calibrate the existing baseline conditions:

► **Trafalgar Road and Derry Road**

1. Assumed to be semi-actuated with minimum recall in Derry Road;
2. Lost time adjustment of -1.0 second for protected/permitted left-turn -movements and -2.0 seconds for through or right-turn movements for both peak hours; and
3. Phasing splits were optimized for both peak hours.

► **Trafalgar Road and Britannia Road**

- Lost time adjustment of -1.0 seconds for protected/permitted left-turn movements and -2.0 seconds for through or right-turn movements in the PM peak hour; and
- Phasing splits were optimized in the peak hour

Existing Peak Hour Factors (PHF) from the TMC data was applied to the baseline analysis.

The capacity results for study intersections during the weekday AM and PM peak hours under baseline traffic conditions are summarized in **Appendix H**.

Table 8-1 Baseline Signal Timing Interpretation and Modifications

Intersection	AM Peak Hour	PM Peak Hour
All	"Max" timings assumed to be maximum split timings and not maximum green time. Max 1 and Max 2 were used for the AM and PM peak periods accordingly. If a vehicle extension was not identified for a particular phase, a default value of 3 seconds was implemented.	
Trafalgar Road & Derry Road	Assumed a 110-second cycle length.	Assumed a 125-second cycle length.
	In order to maintain a cycle length of 110 seconds, the minimum initial times for the left turning phases were changed from 7 seconds to 6 seconds.	–
	–	Added 5 seconds to the total split time for the northbound through phase (phase 8) to have a total split time of 45 seconds.
Trafalgar Road & Britannia Road	Assumed a 104-second cycle length.	Assumed a 130-second cycle length.
	Modified the "Flash don't Walk" times to 26 seconds for NB/SB phases (phases 2 and 6) and 29 seconds for EB/WB phases (phases 4 and 8).	
	Added 4 seconds to the total split time for the southbound through phase (phase 6) to have a total split time of 45 seconds.	–

Intersection	AM Peak Hour	PM Peak Hour
	–	Added 14 seconds to the total split time for the northbound through phase (phase 2) to have a total split time of 64 seconds.
	–	Added 15 seconds to the total split time for the westbound through phase (phase 8) to have a total split time of 55 seconds.
	Total split for eastbound movement (phase 4) less than the minimum split warning.	

Table 8-2 Baseline Capacity Analysis Summary

Intersection	Movement	Weekday AM Peak Hour			Weekday PM Peak Hour		
		v/c	Delay (s)	LOS	v/c	Delay (s)	LOS
Trafalgar Road & Derry Road (Signalized)	<i>Overall</i>	<i>0.85</i>	<i>34</i>	<i>C</i>	<i>0.80</i>	<i>43</i>	<i>D</i>
	EBL	1.00	57	E	0.78	52	D
	EBT	0.84	30	C	0.46	27	C
	EBR	0.15	17	B	0.07	22	C
	WBL	0.32	23	C	0.21	21	C
	WBTR	0.49	29	C	0.98	58	E
	NBL	0.22	30	C	0.30	26	C
	NBTR	0.60	39	D	0.69	43	D
	SBL	0.20	30	C	0.42	31	C
	SBT	0.39	35	D	0.36	38	D
	SBR	0.05	32	C	0.09	35	C
Trafalgar Road & Britannia Road (Signalized)	<i>Overall</i>	<i>0.54</i>	<i>25</i>	<i>C</i>	<i>0.61</i>	<i>28</i>	<i>C</i>
	EBL	0.20	31	C	0.45	45	D
	EBT	0.42	32	C	0.41	40	D
	EBR	0.25	31	C	0.13	39	D
	WBL	0.43	24	C	0.40	30	C
	WBT	0.16	22	C	0.36	30	C
	WBR	0.03	21	C	0.04	28	C
	NBL	0.43	15	B	0.70	19	B
	NBTR	0.60	24	C	0.62	22	C

Intersection	Movement	Weekday AM Peak Hour			Weekday PM Peak Hour		
		v/c	Delay (s)	LOS	v/c	Delay (s)	LOS
	SBL	0.26	15	B	0.31	19	B
	SBTR	0.56	24	C	0.45	25	C

Under baseline conditions, all study intersections are generally operating well overall, with acceptable delays and capacity during both the weekday AM and PM peak hours.

However, at the intersection of Derry Road and Trafalgar Road, the eastbound left movement is a notable performance concern in the AM peak hour, operating at a v/c ratio of 1.00, with 57 seconds of delay and a LOS E. The westbound through right movement also shows signs of congestion in the PM peak hour, operating at a v/c ratio of 0.98, with 58 seconds of delay and LOS E, indicating it is approaching capacity.

Given the high volume of eastbound and westbound traffic on Derry Road, it is likely that northbound and southbound traffic are more aggressive in their movements and accept smaller gaps in traffic than is typical in the HCM analysis methodology. Adjustments to saturation flow and other Synchro settings would need to be applied to bring the unsignalized movement to a v/c ratio of 1.0 or less. The issue instead is addressed under future conditions upon signalization of the intersection after Derry Road is widened to 6 lanes.

8.2 2031 Future Background Conditions

In accordance with the MP4TC RNA study, adjustments to the signal timing plans were implemented for the 2031 horizon year to accommodate the additional traffic generated by the MP4 development in the Phase 1 scenario. For analysis purposes, these modifications were incorporated into the future background scenario to address the increased traffic volumes across the MP4TC area. A summary of these adjustments is provided in **Table 8-3**.

Table 8-3 2031 Future Background Signal Timing Assumptions and Modifications

Intersection	AM Peak Hour	PM Peak Hour
All	It is noted that several intersections have additional lanes added under future conditions. Therefore, additional phases have been added to the signal timing plans accordingly.	
Trafalgar Road & Derry Road	Increased cycle length to 140 seconds with optimized splits.	
Trafalgar Road & Britannia Road	Increased cycle length to 140 seconds with optimized splits.	

HOV / Bus lanes are planned for implementation in 2031, contingent upon the widening of

Trafalgar Road and Britannia Road to three lanes in each direction. To simulate the impact of the HOV lane in the SYNCHRO model, a lane utilization factor of 0.80 was applied to through movements on these roads.

For 2031 future background scenario, the intersections of Trafalgar Road at Derry Road and Trafalgar Road at Britannia Road were analyzed in SYNCHRO suite using the future lane configurations outlined in **Session 7.3** and **Table 7-1**. The capacity results for study intersections during the weekday AM and PM peak hours are summarized in **Table 8-4**.

Table 8-4 2031 Future Background Capacity Analysis Summary

Intersection	Movement	Weekday AM Peak Hour			Weekday PM Peak Hour		
		v/c	Delay (s)	LOS	v/c	Delay (s)	LOS
Trafalgar Road & Derry Road (Signalized)	<i>Overall</i>	<i>0.76</i>	<i>53</i>	<i>D</i>	<i>0.76</i>	<i>41</i>	<i>D</i>
	EBL	0.80	69	E	0.64	64	E
	EBT	0.75	29	C	0.50	35	D
	EBR	0.14	34	C	0.14	90	F
	WBL	0.45	37	D	0.31	18	B
	WBT	0.48	37	D	0.79	33	C
	WBR	0.55	41	D	0.22	26	C
	NBL	0.55	84	F	0.60	83	F
	NBT	0.72	54	D	0.77	25	C
	NBR	0.05	702	F	0.03	38	D
	SBL	0.54	69	E	0.73	66	E
	SBT	0.51	47	D	0.67	45	D
	SBR	0.05	41	D	0.08	36	D
Trafalgar Road & Britannia Road (Signalized)	<i>Overall</i>	<i>0.60</i>	<i>38</i>	<i>D</i>	<i>0.83</i>	<i>41</i>	<i>D</i>
	EBL	0.52	62	E	0.72	62	E
	EBT	0.60	46	D	0.58	38	D
	EBR	0.45	45	D	0.15	32	C
	WBL	0.52	77	E	0.56	89	F
	WBT	0.60	39	D	0.76	32	C
	WBR	0.14	44	D	0.08	8	A
	NBL	0.61	37	D	0.89	67	E
	NBT	0.47	12	B	0.76	24	C
	NBR	0.10	1	A	0.18	4	A
	SBL	0.44	27	C	0.84	62	E
	SBT	0.55	35	D	0.69	46	D

Intersection	Movement	Weekday AM Peak Hour			Weekday PM Peak Hour		
		v/c	Delay (s)	LOS	v/c	Delay (s)	LOS
	SBR	0.21	85	F	0.17	84	F

Under 2031 future background conditions, Trafalgar Road at Derry Road is expected to operate with reserve capacity maintained during both AM and PM peak hours. Although some individual turning movements experience higher delays (LOS 'E' or 'F'), all v/c ratios remain below 1.0, indicating no capacity exceedance.

The intersection of Trafalgar Road at Britannia Road is anticipated to operate with some reserve capacity. Some critical movements are identified as approaching theoretical capacity (i.e., v/c between 0.85 and 1.00). These include the eastbound left-turn and northbound left-turn movements during the PM peak hour, with v/c ratio of 0.88 and 0.92 respectively.

8.3 2031 Future Total Conditions

Under the 2031 future total traffic conditions, no additional adjustment was made to the signal timing plans compared to future background scenario.

The capacity results for existing arterial, arterial-to-collector, and collector-to-collector intersections during the weekday AM and PM peak hours under 2031 future total traffic conditions are summarized in **Table 8-5**.

Table 8-5 2031 Future Total Capacity Analysis Summary

Intersection	Movement	Weekday AM Peak Hour			Weekday PM Peak Hour		
		v/c	Delay (s)	LOS	v/c	Delay (s)	LOS
Existing Arterial Intersections							
Trafalgar Road & Derry Road (Signalized)	Overall	0.79	53	D	0.78	41	D
	EBL	0.80	69	E	0.64	64	E
	EBT	0.77	30	C	0.52	36	D
	EBR	0.14	38	D	0.15	91	F
	WBL	0.46	38	D	0.33	19	B
	WBT	0.50	36	D	0.79	34	C
	WBR	0.61	41	D	0.23	27	C
	NBL	0.62	86	F	0.63	88	F
	NBT	0.76	54	D	0.80	24	C
	NBR	0.05	654	F	0.03	38	D
	SBL	0.56	70	E	0.76	68	E
	SBT	0.52	47	D	0.73	47	D



Intersection	Movement	Weekday AM Peak Hour			Weekday PM Peak Hour		
		v/c	Delay (s)	LOS	v/c	Delay (s)	LOS
	SBR	0.05	40	D	0.08	36	D
Trafalgar Road & Britannia Road (Signalized)	<i>Overall</i>	<i>0.64</i>	<i>37</i>	<i>D</i>	<i>0.87</i>	<i>44</i>	<i>D</i>
	EBL	0.60	63	E	0.81	65	E
	EBT	0.60	46	D	0.57	38	D
	EBR	0.45	45	D	0.15	31	C
	WBL	0.52	76	E	0.56	89	F
	WBT	0.62	40	D	0.80	35	D
	WBR	0.18	42	D	0.09	11	B
	NBL	0.65	45	D	0.92	75	E
	NBT	0.49	12	B	0.81	26	C
	NBR	0.10	1	A	0.19	4	A
	SBL	0.48	28	C	0.87	68	E
	SBT	0.58	36	D	0.74	49	D
	SBR	0.35	50	D	0.22	106	F
Arterial-to-Collector Intersections							
Trafalgar Road & Collector L (Signalized)	<i>Overall</i>	<i>0.58</i>	<i>19</i>	<i>B</i>	<i>0.69</i>	<i>17</i>	<i>B</i>
	WBL	0.80	62	E	0.78	67	E
	WBR	0.07	43	D	0.04	48	D
	NBT	0.52	18	B	0.51	13	B
	NBR	0.12	18	B	0.23	9	A
	SBL	0.30	9	A	0.65	33	C
	SBT	0.32	4	A	0.41	10	B
Trafalgar Road & Collector H (Signalized)	<i>Overall</i>	<i>0.53</i>	<i>10</i>	<i>B</i>	<i>0.51</i>	<i>8</i>	<i>A</i>
	WBL	0.76	68	E	0.65	67	E
	WBR	0.03	50	D	0.01	56	E
	NBTR	0.49	7	A	0.49	4	A
	SBL	0.20	5	A	0.32	13	B
	SBT	0.37	3	A	0.43	7	A
Collector-to-Collector Intersections							
Collector G & Collector L	EBL	0.07	9	B	0.24	11	C
	EBTR	0.34	12	A	0.66	19	A
	WBL	0.07	9	B	0.12	10	B
	WBTR	0.54	15	A	0.43	13	A
	NBLTR	0.26	11	B	0.23	12	B

Intersection	Movement	Weekday AM Peak Hour			Weekday PM Peak Hour		
		v/c	Delay (s)	LOS	v/c	Delay (s)	LOS
	SBLTR	0.45	13	B	0.45	14	B
Collector H & Collector L	EBLTR	0.12	4	A	0.08	3	A
	WBLTR	0.02	1	A	0.02	1	A
	NBL	0.20	35	D	0.04	26	D
	NBTR	0.39	23	C	0.13	17	C
	SBL	0.33	38	E	0.15	24	C
	SBTR	0.40	20	C	0.26	16	C
	EBLT	0.02	2	A	0.05	3	A
Collector H & Collector G	WBTR	0.15	0	A	0.07	0	A
	SBLR	0.24	12	B	0.13	10	B

Under 2031 future total conditions, all existing, arterial-to-collector and collector-to-collector intersections are projected to operate within reserve capacity during both AM and PM peak hours, except for the intersection of Trafalgar Road and Britannia Road. Some individual movements experience LOS 'E' or 'F' due to longer delays but remain within capacity ($v/c < 1.00$). These delays are partly attributed to the 140-second cycle lengths implemented along regional corridors, which increase delays for dedicated turning movements and minor approach vehicles.

For Trafalgar Road at Britannia Road, consistent with 2031 future background conditions, the intersection is projected to operate with reserve capacity. However, critical movements approaching theoretical capacity (v/c between 0.85 and 1.00) include northbound left-turn ($v/c = 0.92$), and southbound left-turn ($v/c = 0.87$) during the PM peak hour. This performance is typical for major arterial intersections during peak hours, where operations approach theoretical capacity. Outside peak hours, traffic flow at this intersection is expected to return to manageable levels.

8.4 2041 Future Background Conditions

The previous signal modifications made under the 2031 future conditions were carried over and applied to the 2041 future background conditions.

For 2041 future background scenario, the intersections of Trafalgar Road at Derry Road and Trafalgar Road at Britannia Road were analyzed in SYNCHRO suite using the future lane configurations outlined in **Session 7.3**. The capacity results for study intersections during the weekday AM and PM peak hours under 2041 future background conditions are summarized in **Table 8-6**.

Table 8-6 2041 Future Background Capacity Analysis Summary

Intersection	Movement	Weekday AM Peak Hour			Weekday PM Peak Hour		
		v/c	Delay (s)	LOS	v/c	Delay (s)	LOS
Trafalgar Road & Derry Road (Signalized)	<i>Overall</i>	0.87	<i>42</i>	<i>D</i>	<i>0.85</i>	<i>44</i>	<i>D</i>
	EBL	0.67	80	E	0.50	88	F
	EBT	0.96	33	C	0.64	20	B
	EBR	0.16	20	B	0.32	8	A
	WBL	0.19	71	E	0.22	63	E
	WBT	0.53	41	D	0.91	57	E
	WBR	0.45	45	D	0.18	59	E
	NBL	0.64	60	E	0.87	84	F
	NBT	0.80	42	D	0.65	39	D
	NBR	0.01	30	C	0.01	32	C
	SBL	0.41	67	E	0.79	76	E
	SBT	0.49	44	D	0.83	47	D
	SBR	0.01	38	D	0.03	31	C
Trafalgar Road & Britannia Road (Signalized)	<i>Overall</i>	<i>0.76</i>	<i>42</i>	<i>D</i>	0.97	58	E
	EBL	0.65	65	E	0.88	71	E
	EBT	0.66	44	D	0.67	38	D
	EBR	0.66	47	D	0.74	44	D
	WBL	0.43	47	D	0.63	88	F
	WBT	0.66	48	D	0.92	48	D
	WBR	0.20	49	D	0.08	48	D
	NBL	0.87	80	E	1.14	156	F
	NBT	0.67	23	C	0.86	28	C
	NBR	0.12	14	B	0.20	13	B
	SBL	0.51	65	E	0.88	103	F
	SBT	0.77	41	D	0.99	73	E
	SBR	0.57	38	D	0.29	76	E

Under 2041 future background conditions, the intersection of Trafalgar Road at Derry Road is anticipated to operate at reserve capacity. Some critical movements are identified as approaching theoretical capacity (i.e., v/c between 0.85 and 1.00). These include the eastbound through movement during the AM peak hour, and the westbound through and northbound left-turn movements during the PM peak hour.

The intersection of Trafalgar Road at Britannia Road is anticipated to operate with reserve capacity

during PM peak hour, with v/c ratio of 0.97. During PM peak hour, critical movement of northbound left-turn is identified exceeding capacity with v/c = 1.14. Additionally, movements approaching capacity (v/c between 0.85 and 1.00) include the northbound left-turn movements in AM peak and the eastbound left-turn, westbound through, northbound through, southbound left-turn and southbound through movements in PM Peak.

8.5 2041 Future Total Conditions

Under the 2041 future total traffic conditions, no additional adjustment was made to the signal timing plans compared to 2041 future background scenario.

The capacity results for study intersections during the weekday AM and PM peak hours under 2041 future total traffic conditions are summarized in **Table 8-7**.

Table 8-7 2041 Future Total Capacity Analysis Summary

Intersection	Movement	Weekday AM Peak Hour			Weekday PM Peak Hour		
		v/c	Delay (s)	LOS	v/c	Delay (s)	LOS
Existing Arterial Intersections							
Trafalgar Road & Derry Road (Signalized)	Overall	0.90	43	D	0.87	46	D
	EBL	0.67	80	E	0.50	88	F
	EBT	0.97	34	C	0.67	20	C
	EBR	0.16	20	C	0.32	9	A
	WBL	0.19	72	E	0.22	63	E
	WBT	0.55	41	D	0.91	57	E
	WBR	0.49	44	D	0.19	58	E
	NBL	0.69	59	E	0.92	99	F
	NBT	0.84	47	D	0.68	41	D
	NBR	0.01	30	C	0.01	32	C
	SBL	0.43	67	E	0.84	81	F
	SBT	0.51	45	D	0.89	50	D
	SBR	0.01	38	D	0.03	31	C
Trafalgar Road & Britannia Road (Signalized)	Overall	0.78	43	D	1.01	61	E
	EBL	0.74	69	E	1.02	99	F
	EBT	0.66	44	D	0.67	38	D
	EBR	0.66	47	D	0.74	44	D
	WBL	0.43	47	D	0.63	88	F
	WBT	0.67	48	D	0.93	50	D



Intersection	Movement	Weekday AM Peak Hour			Weekday PM Peak Hour		
		v/c	Delay (s)	LOS	v/c	Delay (s)	LOS
	WBR	0.21	49	D	0.08	42	D
	NBL	0.87	80	E	1.14	156	F
	NBT	0.68	23	C	0.89	29	C
	NBR	0.12	13	B	0.20	14	B
	SBL	0.54	66	E	0.91	108	F
	SBT	0.81	43	D	1.02	78	E
	SBR	0.73	44	D	0.41	62	E
Arterial-to-Collector Intersections							
Trafalgar Road & Collector L (Signalized)	<i>Overall</i>	<i>0.78</i>	<i>24</i>	<i>C</i>	<i>0.79</i>	<i>33</i>	<i>C</i>
	EBL	0.15	37	D	0.30	65	E
	EBTR	0.06	36	D	0.19	64	E
	WBL	0.84	62	E	0.74	52	D
	WBTR	0.08	36	D	0.08	39	D
	NBL	0.07	15	B	0.35	18	B
	NBT	0.78	22	C	0.70	19	B
	NBR	0.16	16	B	0.29	17	B
	SBL	0.45	46	D	0.76	34	C
	SBT	0.45	14	B	0.72	44	D
	SBR	0.01	13	B	0.03	13	B
Trafalgar Road & Collector H (Signalized)	<i>Overall</i>	<i>0.68</i>	<i>12</i>	<i>B</i>	<i>0.62</i>	<i>9</i>	<i>A</i>
	WBL	0.77	68	E	0.65	67	E
	WBR	0.13	50	D	0.01	56	E
	NBTR	0.66	10	A	0.56	11	B
	SBL	0.48	31	C	0.48	16	B
	SBT	0.44	5	A	0.62	3	A
Collector-to-Collector Intersections							
Collector G & Collector L	EBL	0.08	10	B	0.30	12	C
	EBTR	0.43	13	A	0.69	21	A
	WBL	0.06	9	C	0.11	10	B
	WBTR	0.60	17	A	0.51	15	A
	NBLTR	0.27	12	B	0.19	12	B
	SBLTR	0.51	16	C	0.49	15	C
Collector H & Collector L	EBLTR	0.12	4	A	0.08	3	A
	WBLTR	0.02	1	A	0.02	1	A

Intersection	Movement	Weekday AM Peak Hour			Weekday PM Peak Hour		
		v/c	Delay (s)	LOS	v/c	Delay (s)	LOS
	NBL	0.22	37	E	0.05	28	D
	NBTR	0.46	26	D	0.15	18	C
	SBL	0.38	46	E	0.16	26	D
	SBTR	0.42	22	C	0.28	17	C
Collector H & Collector G	EBLT	0.02	1	A	0.05	3	A
	WBTR	0.15	0	A	0.07	0	A
	SBLR	0.26	12	B	0.13	10	B

Under 2041 future total conditions, the existing intersections are anticipated to operate with critical capacity, while the arterial-to-collector and collector-to-collector intersections are projected to operate within reserve capacity during both AM and PM peak hours. Some individual movements are expected to experience LOS 'E' due to increased delays, though these movements remain within capacity.

For Trafalgar Road at Derry Road, similar to 2041 future background condition, the intersection is expected to operate with reserve capacity. However, some critical movements are identified, approaching theoretical capacity (i.e., v/c between 0.85 and 1.00). These include the eastbound through movement during the AM peak hour, and the westbound through, northbound left-turn, and southbound through movements during the PM peak hour. This performance is typical for the intersection of two major arterial roads during peak hours, where operations are expected to approach theoretical capacity. Outside of peak periods, traffic flow at this intersection is anticipated to return to manageable levels.

For Trafalgar Road at Britannia Road, the intersection is anticipated to operate above theoretical capacity during PM peak hour, with v/c ratio of 1.01. Critical movements are identified exceeding capacity (v/c > 1.00), including the eastbound left-turn, northbound left-turn, and southbound through movements. Additionally, movements approaching capacity (v/c between 0.85 and 1.00) include the westbound through, northbound through, and southbound left-turn movements.

This performance is typical for the intersection of two major arterial roads during peak hours, where operations are expected to approach theoretical capacity. Outside of peak periods, traffic flow at this intersection is anticipated to return to manageable levels.

In additions, the operation of some critical movements is primarily attributed to the inability to exclude Trafalgar site traffic from the 2051 JBPE forecasting model growth rates, as requested by the Region. This limitation stems from challenges in aligning trip distribution between the traffic models, resulting in the double counting of some Trafalgar site traffic. Consequently, this has led to an overestimation of traffic volumes for the 2041 future background and future total scenario.

9 QUEUEING ANALYSIS

As part of the traffic analysis, the 50th and 95th percentile queue lengths were derived from the Synchro HCM queueing reports for the baseline, 2031 & 2041 future background, and 2031 & 2041 future total traffic conditions. The queueing reports were prepared using Synchro version 11 software and full queueing results are attached in **Appendix H**, **Appendix I** and **Appendix J** respectively.

9.1 Existing Baseline Queues

Under existing conditions, intersections at Trafalgar Road & Derry Road and Trafalgar Road & Britannia Road generally operate within acceptable queue storage limits during both weekdays AM and PM peak hours. Most turning movements have adequate storage to accommodate current traffic volumes.

The only exception is the eastbound left-turn at Trafalgar Road & Derry Road during the AM peak hour, where the 95th percentile queue (168m) exceeds the available storage (110m). This exceedance, estimated at fewer than nine vehicles, is expected to clear within a single signal cycle and is not considered operationally critical. Ongoing monitoring by the Region is recommended.

Table 9-1 Existing Baseline Queueing Analysis

Intersection	Movement	Storage (m)	Weekday AM Peak Hour		Weekday PM Peak Hour	
			50 th Percentile Queue (m)	95 th Percentile Queue (m)	50 th Percentile Queue (m)	95 th Percentile Queue (m)
Trafalgar Road & Derry Road	EBL	110	77	168	-	-

9.2 2031 Future Background Queues

Under 2031 future background conditions, all exclusive turning movements at the intersections of Trafalgar Road & Derry Road and Trafalgar Road & Britannia Road operate within their available storage lengths during both weekdays AM and PM peak hours. Queue lengths remain well below capacity, indicating efficient intersection performance. The queueing results are summarized in **Table 9-2**.

Table 9-2 2031 Future Background Queueing Analysis

Intersection	Movement	Storage (m)	Weekday AM Peak Hour		Weekday PM Peak Hour	
			50 th Percentile Queue (m)	95 th Percentile Queue (m)	50 th Percentile Queue (m)	95 th Percentile Queue (m)
Trafalgar Road & Derry Road	EBL	130	79	97	24	37
	EBR	110	0	22	11	33
	WBL	300	9	18	7	12
	WBR	70	70	52	18	35
	NBL	110	30	43	24	41
	NBR	70	3	16	1	2
	SBL	130	16	26	46	62
	SBR	85	0	0	0	13
Trafalgar Road & Britannia Road	EBL	125	23	34	50	65
	EBR	85	35	63	0	18
	WBL	90	26	36	23	35
	WBR	70	4	15	0	3
	NBL	165	11	42	49	117
	NBR	70	1	1	3	1
	SBL	140	14	38	41	79
	SBR	140	10	48	6	28

9.3 2031 Future Total Queues

Under 2031 future total traffic conditions, all exclusive turning movements at the study intersections operate within their available storage lengths during both the weekday AM and PM peak hours. The 50th and 95th percentile queues remain below the respective storage capacities across all intersections, indicating that the planned infrastructure is sufficient to accommodate forecasted traffic volumes. No queueing issues or storage deficiencies are identified. Intersection operations are expected to remain efficient under future total traffic conditions. The queueing results are summarized in **Table 9-3**.

Table 9-3 2031 Future Total Queueing Analysis

Intersection	Movement	Storage (m)	Weekday AM Peak Hour		Weekday PM Peak Hour	
			50 th Percentile Queue (m)	95 th Percentile Queue (m)	50 th Percentile Queue (m)	95 th Percentile Queue (m)
Trafalgar Road & Derry Road	EBL	130	79	97	24	37
	EBR	110	0	23	11	34
	WBL	300	8	18	7	13
	WBR	70	53	57	21	38
	NBL	110	35	48	26	44
	NBR	70	4	17	0	2
	SBL	130	17	27	48	65
	SBR	85	0	0	0	13
Trafalgar Road & Britannia Road	EBL	125	29	41	63	82
	EBR	85	36	64	0	18
	WBL	90	26	36	23	35
	WBR	70	4	20	3	3
	NBL	165	14	45	53	124
	NBR	70	1	1	3	1
	SBL	140	16	37	42	82
	SBR	140	34	59	7	45
Trafalgar Road & Collector L	WBL	110	84	108	67	91
	WBR	50	0	14	0	12
	NBR	50	7	25	7	35
	SBL	100	4	11	37	62
Trafalgar Road & Collector H	WBL	90	57	80	35	54
	WBR	50	0	11	0	8
	SBL	50	1	4	3	14

9.4 2041 Future Background Queues

Under 2041 future background conditions, most turning movements operate within their available storage lengths during peak hours. However, all eastbound right-turn (EBR) queues at Trafalgar Road & Britannia Road exceed the 85 m storage length in both AM and PM peaks, with 95th percentile queues up to 108 m (AM) and 145 m (PM). This exceedance is estimated to be less than five vehicles in length beyond the storage capacity. These queues are expected to clear within a single signal cycle but should be monitored by the Region to ensure operational efficiency and to identify if further mitigation is needed. The queueing results are summarized in **Table 9-4** below.

Table 9-4 2041 Future Background Queueing Analysis

Intersection	Movement	Storage (m)	Weekday AM Peak Hour		Weekday PM Peak Hour	
			50 th Percentile Queue (m)	95 th Percentile Queue (m)	50 th Percentile Queue (m)	95 th Percentile Queue (m)
Trafalgar Road & Derry Road	EBL	130	44	52	16	23
	EBR	110	5	14	7	15
	WBL	130	4	8	6	9
	WBR	70	37	59	21	40
	NBL	110	36	56	28	53
	NBR	70	0	0	0	1
	SBL	130	12	21	37	56
	SBR	85	0	0	0	2
Trafalgar Road & Britannia Road	EBL	125	32	46	74	101
	EBR	85	64	108	93	145
	WBL	90	13	18	16	31
	WBR	70	22	42	14	9
	NBL	165	68	91	90	125
	NBR	70	2	9	0	13
	SBL	140	18	28	29	52
	SBR	140	67	105	15	72

9.5 2041 Future Total Queues

Under 2041 future total traffic conditions, most turning movements operate within their available storage lengths during both weekdays AM and PM peak hours. However, a few movements at Trafalgar Road & Britannia Road exceed their designated storage capacities:

- ▶ Eastbound left-turn (EBL): The 95th percentile queue reaches 131 m in the PM peak, exceeding the 125 m storage by approximately 1–2 vehicles.
- ▶ Eastbound right-turn (EBR): Queues exceed the 85 m storage in both peak periods, reaching 108 m in the AM and 93 m (50th percentile) / 145 m (95th percentile) in the PM, indicating consistent and significant exceedances.
- ▶ Southbound right-turn (SBR): The 95th percentile queue reaches 150 m in the AM, exceeding the 140 m storage by about 1–2 vehicles.

These queues are expected to clear within a single signal cycle under most conditions. However, continued monitoring by the Region is recommended to ensure intersection performance remains acceptable and to determine if future mitigation may be needed.

All other turning movements at the study intersections operate within their available storage capacities. The queueing results are summarized in **Table 9-5** below.

Table 9-5 2041 Future Total Queueing Analysis

Intersection	Movement	Storage (m)	Weekday AM Peak Hour		Weekday PM Peak Hour	
			50 th Percentile Queue (m)	95 th Percentile Queue (m)	50 th Percentile Queue (m)	95 th Percentile Queue (m)
Trafalgar Road & Derry Road	EBL	130	44	52	16	22
	EBR	110	5	13	8	18
	WBL	130	4	8	6	9
	WBR	70	42	63	22	41
	NBL	110	40	64	31	58
	NBR	70	0	0	0	1
	SBL	130	12	21	40	62
	SBR	85	0	0	0	2
Trafalgar Road & Britannia	EBL	125	39	54	94	131
	EBR	85	64	108	93	145



Intersection	Movement	Storage (m)	Weekday AM Peak Hour		Weekday PM Peak Hour	
			50 th Percentile Queue (m)	95 th Percentile Queue (m)	50 th Percentile Queue (m)	95 th Percentile Queue (m)
Road	WBL	90	13	18	16	31
	WBR	70	23	43	15	10
	NBL	165	68	92	91	125
	NBR	70	2	9	1	13
	SBL	140	19	30	30	53
	SBR	140	100	150	24	80
Trafalgar Road & Collector L	EBL	50	12	20	7	16
	WBL	130	88	111	66	92
	NBL	50	2	3	3	9
	NBR	50	11	26	43	44
	SBL	100	8	22	53	68
	SBR	50	0	3	1	4
Trafalgar Road & Collector H	WBL	90	62	86	36	55
	WBR	50	8	19	0	8
	SBL	50	2	18	1	1

10 ACTIVE TRANSPORTATION

10.1 Existing Facilities

The following summary of active transportation facilities is based on a review of Halton Region's 2015 Active Transportation Master Plan (ATMP) and current infrastructure conditions within the study area.

10.1.1 Sidewalk / Pedestrian Routes

There are currently no continuous pedestrian facilities (i.e., sidewalks or designated pedestrian pathways) along Britannia Road, Trafalgar Road, and Eighth Line within the study area limits.

10.1.2 Bicycle Paths and Connectivity

There are no dedicated on-road bicycle lanes or signed cycling routes currently provided along Britannia Road, Trafalgar Road, or Eighth Line within the study area.

For Britannia Road, it has recently been upgraded as an urban 6-lane cross section between Trafalgar Road and Eighth Line within the study area. It has incorporated an on-street bike lane, providing cycling connectivity.

10.1.3 Off-Road Trails

There is no public off-road multi-use trails currently located within the study area.

For Britannia Road, it has recently been upgraded as an urban 6-lane cross section between Trafalgar Road and Eighth Line within the study area. It has incorporated multi-use paths (MUP) on both sides of the road, providing pedestrian and cycling connectivity.

10.2 Proposed Facilities

The proposed active transportation facilities within the site are designed to support internal connectivity for pedestrians and cyclists, while also linking to the broader active transportation network identified in the Trafalgar Tertiary Plan, as discussed in **Section 5.6**.

These facilities are intended to support walking and cycling within the site while ensuring strong connections to the broader transportation network. The proposed active transportation plan within the Remington lands is summarized in **Table 10-1** and illustrated in



Figure 10-1, providing a detailed overview of multi-use paths and cycling facilities within the site boundary.

Table 10-1 Proposed Active Transportation Facilities

Road Name	Active Transportation Facilities
Trafalgar Road	▶ multi-use paths (MUPs) on both sides
Collector L (26.0m ROW)	▶ in-boulevard bike lanes and sidewalks on both sides
Collector H (21.5m ROW)	▶ in-boulevard bike lanes and sidewalks on both sides
Collector G (20m ROW)	▶ sidewalks on both sides and one in-boulevard cycle track on either side of the road
Other local roads (16m ROW)	▶ a sidewalk on either side of the road

G:\Projects\2025\10494 - Remington - MP4 Trafalgar Block Plan\03 Analysis\04 Active Transportation Plan



LEGEND

- MULTI-USE PATH
- BIKE LANE
- SIDEWALK



3381 STEELES AVE E,
Suite 315
Toronto, ON
M2H 3S8
P: 905.738.5700

REMINGTON TRAFALGAR DRAFT PLAN STUDY
ACTIVE TRANSPORTATION PLAN



N.T.S

DRAWING No.	01
DATE	JUN 2025



11 PARKING PLAN

11.1 On-Street Parking Plan

A conceptual on-street parking plan is conducted and shown in **Appendix K**.

The on-street parking plan is subject to refinement at the detailed design stage once residential driveways and all utilities are confirmed.

12 CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations for the analysis associated with the proposed development are as follows:

- ▶ A review of the proposed subdivision draft plan design for the Remington lands is completed based on the requirements on ROW, road bends and horizontal curvature, intersection spacing, intersection angle, daylight triangle / rounding and minimum tangent length at intersections. It is considered that the design of the roadways is deemed acceptable.

Baseline Traffic Conditions

- ▶ All study intersections are generally operating well overall, with acceptable delays and capacity during both the weekday AM and PM peak hours.
- ▶ Based on the recommendations outlined in the Milton Transportation Master Plan (TMP) and the proposed lane configuration modifications detailed in the RNA for the MP4TC area, phased improvements have been adopted for the study intersections.
- ▶ Based on the recommendations outlined in the Milton Transportation Master Plan (TMP) and the proposed lane configuration modifications detailed in the RNA for the MP4TC area, phased improvements have been adopted for the study intersections.

2031 Future Lane Configuration Modification and Responsibility

Intersection	Approach	Modification	Responsibility
Existing Intersections			
Trafalgar Road & Derry Road	Northbound	Dual left turn lanes 1 additional through lane (HOV) Auxiliary right turn lane	Region
	Eastbound and Southbound	Dual left turn lanes 1 additional through lane (HOV)	
	Westbound	1 additional through lane (HOV) Auxiliary right turn lane	
	Trafalgar Road & Britannia Road	Eastbound and Westbound	
All directions		1 additional through lane (HOV) Auxiliary right turn lane	
Arterial-to-Collector Intersections			
Trafalgar Road &	Northbound	1 additional through lane (HOV)	Region

Intersection	Approach	Modification	Responsibility
Collector L		▶ Auxiliary right turn lane	MP4 Developers
	Southbound	▶ 1 additional through lane (HOV)	Region
		▶ Auxiliary left turn lane	MP4 Developers
	Westbound	▶ Auxiliary left turn lane ▶ Auxiliary right turn lane	MP4 Developers
Trafalgar Road & Collector H	Northbound	▶ 1 additional through lane (HOV)	Region
		▶ Shared right turn movement	MP4 Developers
	Southbound	▶ 1 additional through lane (HOV)	Region
		▶ Auxiliary left turn lane	MP4 Developers
	Westbound	▶ Auxiliary left turn lane ▶ Auxiliary right turn lane	MP4 Developers
Collector-to-Collector Intersections			
Collector G & Collector L	Northbound and Southbound	▶ Single lane approach (shared all movements)	MP4 Developers
	Eastbound and Westbound	▶ Auxiliary left turn lane ▶ 1 shared through/right turn lane	
Collector H & Collector L	Northbound and Southbound	▶ Auxiliary left turn lane ▶ 1 shared through/right turn lane	
	Eastbound and Westbound	▶ Single lane approach (shared all movements)	
Collector G & Collector H	Eastbound	▶ 1 Shared through/left turn lane	
	Southbound	▶ Single lane with shared left/right movements	
	Westbound	▶ 1 Shared through/right turn lane	

Baseline Traffic Conditions

- ▶ All study intersections are generally operating well overall, with acceptable delays and capacity during both the weekday AM and PM peak hours.

2031 Future Background Traffic Conditions

- ▶ Trafalgar Road at Derry Road is expected to operate with reserve capacity maintained during both AM and PM peak hours. Although some individual turning movements experience higher delays (LOS 'E' or 'F'), all v/c ratios remain below 1.0, indicating no capacity exceedance.

- ▶ The intersection of Trafalgar Road at Britannia Road is anticipated to operate with some reserve capacity. Some critical movements are identified as approaching theoretical capacity (i.e., v/c between 0.85 and 1.00).

2031 Future Total Traffic Conditions

- ▶ All existing, arterial-to-collector and collector-to-collector intersections are projected to operate within reserve capacity during both AM and PM peak hours, except for the intersection of Trafalgar Road and Britannia Road. Some individual movements experience LOS 'E' or 'F' due to longer delays but remain within capacity (v/c < 1.00). These delays are partly attributed to the 140-second cycle lengths implemented along regional corridors, which increase delays for dedicated turning movements and minor approach vehicles.
- ▶ For Trafalgar Road at Britannia Road, consistent with 2031 future background conditions, the intersection is projected to operate with reserve capacity. However, critical movements approaching theoretical capacity (v/c between 0.85 and 1.00). This performance is typical for major arterial intersections during peak hours, where operations approach theoretical capacity. Outside peak hours, traffic flow at this intersection is expected to return to manageable levels.

2041 Future Lane Configuration Modification and Responsibility

Intersection	Approach	Modification	Responsibility
Existing Intersections			
Trafalgar Road & Derry Road	Westbound	▶ Dual left turn lanes	Region
Trafalgar Road & Britannia Road	Northbound and Southbound	▶ Dual left-turn lanes	
Arterial-to-Collector Intersections			
Trafalgar Road & Collector L	Northbound	▶ Auxiliary left turn lane	MP4 Developers
	Eastbound	▶ Auxiliary right turn lane	
		▶ 1 shared through/left turn lane	
	Southbound	▶ Auxiliary right turn lane	
	Westbound	▶ Shared through movement	

2041 Future Background Traffic Conditions

- ▶ The intersection of Trafalgar Road at Derry Road is anticipated to operate at reserve capacity. Some critical movements are identified as approaching theoretical capacity (i.e., v/c between 0.85 and 1.00).
- ▶ The intersection of Trafalgar Road at Britannia Road is anticipated to operate with reserve

capacity during PM peak hour.

2041 Future Total Traffic Conditions

- ▶ The existing intersections are anticipated to operate with critical capacity, while the arterial-to-collector and collector-to-collector intersections are projected to operate within reserve capacity during both AM and PM peak hours.
- ▶ For Trafalgar Road at Derry Road, similar to 2041 future background condition, the intersection is expected to operate with reserve capacity. This performance is typical for the intersection of two major arterial roads during peak hours, where operations are expected to approach theoretical capacity. Outside of peak periods, traffic flow at this intersection is anticipated to return to manageable levels.
- ▶ For Trafalgar Road at Britannia Road, the intersection is anticipated to operate above theoretical capacity during PM peak hour, with v/c ratio of 1.01.
- ▶ This performance is typical for the intersection of two major arterial roads during peak hours, where operations are expected to approach theoretical capacity. Outside of peak periods, traffic flow at this intersection is anticipated to return to manageable levels.
- ▶ In additions, the operation of some critical movements is primarily attributed to the inability to exclude Trafalgar site traffic from the 2051 JBPE forecasting model growth rates, as requested by the Region. This limitation stems from challenges in aligning trip distribution between the traffic models, resulting in the double counting of some Trafalgar site traffic. Consequently, this has led to an overestimation of traffic volumes for the 2041 future background and future total scenario.



Appendix A

Terms of Reference

Alex Cheng

From: Michael Dowdall
Sent: Thursday, May 1, 2025 9:17 AM
To: Loro, Darren; Sian.Younan@milton.ca
Cc: Jessica Deng; Baharak Hosseini; Alex Cheng
Subject: RE: Trafalgar Tertiary Plan Mattamy Remington lands - TIS Terms of Reference
Attachments: Remington Trafalgar - Draft Plan - Apr 3 25_kc.pdf

Darren/Sian,

TYLin has been retained to prepare a Transportation Impact Study (TIS) for the proposed Remington lands draft plan of subdivision located east of Trafalgar Road, between Derry Road and Britannia Road in the Town of Milton, Halton Region.

The proposed subdivision comprises a mix of residential land uses, including single detached dwellings, street townhouses, back-to-back townhouses, medium-density residential/mixed-use blocks, and an elementary school. As per the preliminary concept plan dated April 3, 2025, the development will include 238 single detached units, 111 street townhouse units, and 44 back-to-back townhouse units.

In accordance with the pre-consultation checklist and subsequent discussions with Town and Regional staff, the following components are to be addressed and consolidated into one comprehensive submission titled "Transportation Impact Study":

- Traffic Impact Study
- Active Transportation and Pedestrian Routing Plan
- Parking Justification Report - On-Street Parking Plan

In order to properly scope this project, we ask that the Town & Region provide comments on the following terms of reference and confirm if there are any additional items required as part of the study.

Terms of Reference

- 1) The Study shall be prepared in accordance with Town of Milton and Halton Region's Transportation Impact Study Guidelines.
- 2) Conduct a study area road inventory review to confirm lane assignments, traffic controls, speed limits, and surrounding land uses and general study area characteristics. The proposed study intersections consist of:
 - Trafalgar Road and Street 'A' (Louis St Laurent Avenue)
 - Street 'A' (Louis St Laurent Avenue) and Street 'C'
 - Street 'A' (Louis St Laurent Avenue) and Street 'B'
 - Trafalgar Road and Street 'B'
 - Street 'B' and Street 'C'
- 3) Develop future background traffic estimates for any nearby and relevant developments in the immediate vicinity of the subject site. This will include our experience working on the Trafalgar RNA. Background traffic growth rates within the Study Area will also be extracted from the Trafalgar RNA as part of this study. Additionally, the Trafalgar Teritary Plan Phase 1 and Phase 2 site traffic will be included as part of the background traffic estimates.
- 4) Obtain any available information relating to potential/committed future road / intersection / other transportation infrastructure improvements in the vicinity of the subject site, beyond those proposed in the

Trafalgar RNA, that could impact local traffic distribution or assignments. Their effects on traffic patterns will be accounted for in the appropriate planning horizon as specified by Town/Regional staff.

- 5) As per Town and Regional guidelines, traffic analyses will include the year of anticipated full occupancy year (full build-out) plus a five-year horizon year analysis. The proposed 2031 (build-out) and 2041 horizon years have been selected to remain consistent with the Trafalgar RNA.
- 6) Remove and replace the estimated site traffic volumes assumed in the Trafalgar RNA as per updated subdivision statistics. As such, the estimated site generated traffic will be built upon the forecasted traffic volumes provided by the Trafalgar RNA study, which in turn will become our future traffic base model. Ensure that all assumptions and methodologies are well documented within the report including supporting diagrams, excerpts, and detailed text with justification.
- 7) Estimate the weekday a.m. and p.m. peak period traffic to be generated by the proposed development using the industry-accepted, and agency-preferred data published in the Institute of Transportation Engineers, Trip Generation (11th Edition). The directional distribution of traffic approaching and departing the site will be based upon the distribution derived as part of the Trafalgar..
- 8) Create a future conditions traffic operations model to assess the traffic impacts of the proposed development after introducing the estimated site generated traffic into the future background traffic model. Report any operational deficiencies and recommend mitigating measures, if necessary, to improve traffic operations, including recommending lane configuration changes, and/or traffic control alterations.
- 9) Prepare peak-hour operational analyses to investigate and document the impacts of the proposed development on the site accesses and study area intersections using Synchro (an industry-accepted analysis software). This will include a review of turning movement delays, volume-to-capacity ratios, and vehicular queuing. Input parameters to the Synchro software will be consistent with the recommended municipal practices and guidelines.
- 10) Based on the results of the traffic analyses, recommend any improvements to the study area roadway system and traffic controls, as necessary, to accommodate future traffic volumes (be they triggered by background and/or site related trips).
- 11) A comparison of trip generation assumptions provided in the Trafalgar RNA and the currently proposed draft plan will be provided.

Thank you in advance for your attention to this matter. We look forward to your comments on the preceding scope of work and the requested information.

Regards,

Michael Dowdall

DIRECTOR, TRAFFIC

M +1 437.993.2662

TYLin



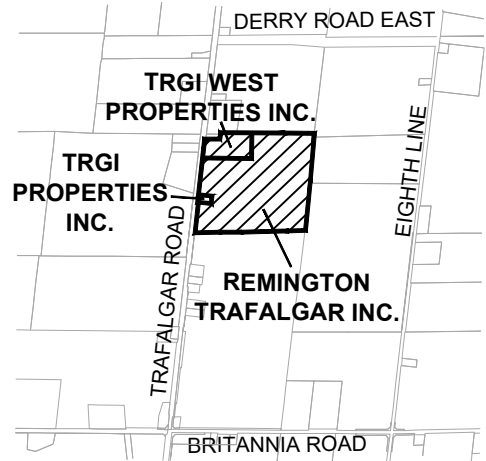
Appendix B

Site Plan

DRAFT PLAN OF SUBDIVISION
FILE 24T -

PART OF LOT 8
CONCESSION 8, NEW SURVEY

(GEOGRAPHIC TOWNSHIP OF TRAFALGAR)
TOWN OF MILTON
REGIONAL MUNICIPALITY OF HALTON



KEY MAP
N.T.S.

OWNER'S AUTHORIZATION

I HEREBY AUTHORIZE KORSIAK URBAN PLANNING TO PREPARE AND SUBMIT THIS DRAFT
PLAN OF SUBDIVISION TO THE TOWN OF MILTON FOR APPROVAL.

SIGNED _____ DATE _____
Christopher Bratty
Remington Trafalgar Inc.
TRGI Properties Inc.
TRGI West Properties Inc.

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AS SHOWN
ON THIS PLAN AND THEIR RELATIONSHIP TO ADJACENT LANDS ARE CORRECTLY AND
ACCURATELY SHOWN.

SIGNED _____ DATE _____
Dan Dzaldov, Ontario Land Surveyor
SCHAEFFER DZALDOV PURCELL LTD.
ONTARIO LAND SURVEYORS
64 JARDIN DRIVE
CONCORD, ONTARIO L4K 3P3

ADDITIONAL INFORMATION (UNDER SECTION 51 (17) OF THE PLANNING ACT)

A) SHOWN ON PLAN	G) SHOWN ON PLAN
B) SHOWN ON PLAN	H) MUNICIPAL AND PIPED WATER TO BE PROVIDED
C) SHOWN ON PLAN	I) CLAY LOAM
D) SHOWN ON PLAN	J) SHOWN ON PLAN
E) SHOWN ON PLAN	K) SANITARY AND STORM SEWERS TO BE PROVIDED
F) SHOWN ON PLAN	L) SHOWN ON PLAN

LAND USE SCHEDULE

Land Use	Lots/Blocks	Block Total	Area (ha)	Units
Single Detached	1-238	238	7.36	238
Street Townhouse (TH) (7.01 m)	239-258	20	2.17	111
Back to Back Townhouse (B2B) (6.4 m)	259-262	4	0.44	44
Medium Density Residential I	263	1	1.03	TBD
Medium Density Residential II	264, 265	2	2.04	TBD
Neighborhood Centre Mixed Use II	266, 267	2	3.10	TBD
Elementary School	268	1	2.83	
Neighbourhood Park Block	269	1	2.50	
Natural Heritage System (NHS)	270-272	3	6.98	
Stormwater Management Pond Block	273, 274	2	4.51	
Walkway Block	275, 276	2	0.04	
Servicing Block	277	1	0.02	
16m ROW (2,152 m)			3.53	
20m ROW (341 m)			0.70	
21.5m ROW (922 m)			2.02	
26m ROW (572 m)			0.74	
Total	277	277	40.01	393

Apr. 3, 2025	First Submission	AS	AS
DATE	REVISION	DWG	BY

NOTES:

* Local/Local corner radii = 5m
* Local/Collector daylight triangle = 7.5m
* Collector/Collector daylight triangle = 10m
* Collector/Regional Road daylight triangle = 15m
* Pavement illustration is diagrammatic



SCALE 1:1500 April 3, 2025
DRAWN BY: AS CHECKED BY: KC

KORSIAK Urban
Planning

SDE CALCULATIONS

Unit Type	Blocks	Units	SDE*
Single Detached	1-238	238	238.0
Street Townhouse	239-258	111	89.9
Back-to-Back Townhouse	259-262	44	21.6
Totals		393	327.9

* SDE Factors:
Single Detached - 1.00
Townhouse - 0.81
Back-to-Back Townhouse - 0.49

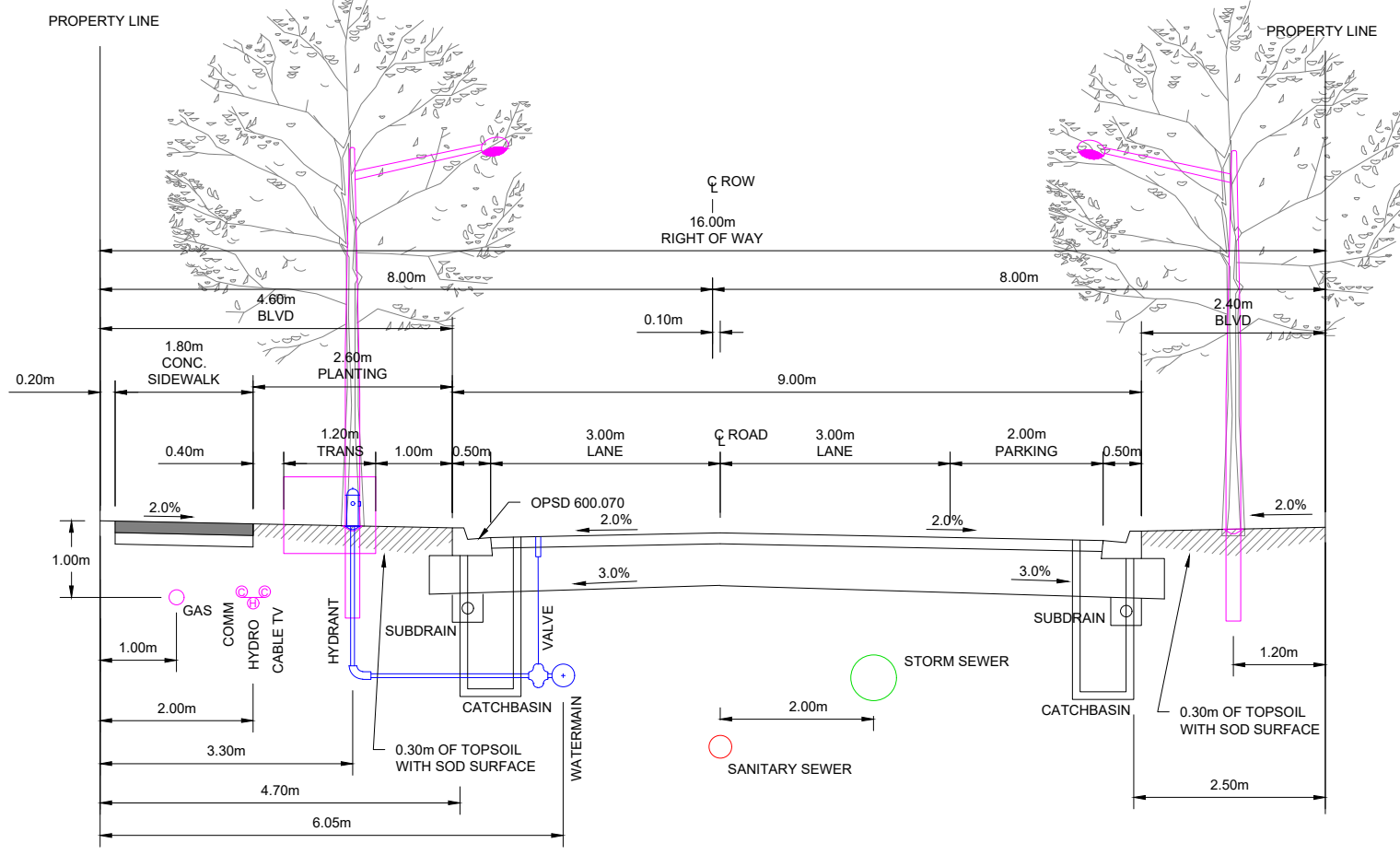




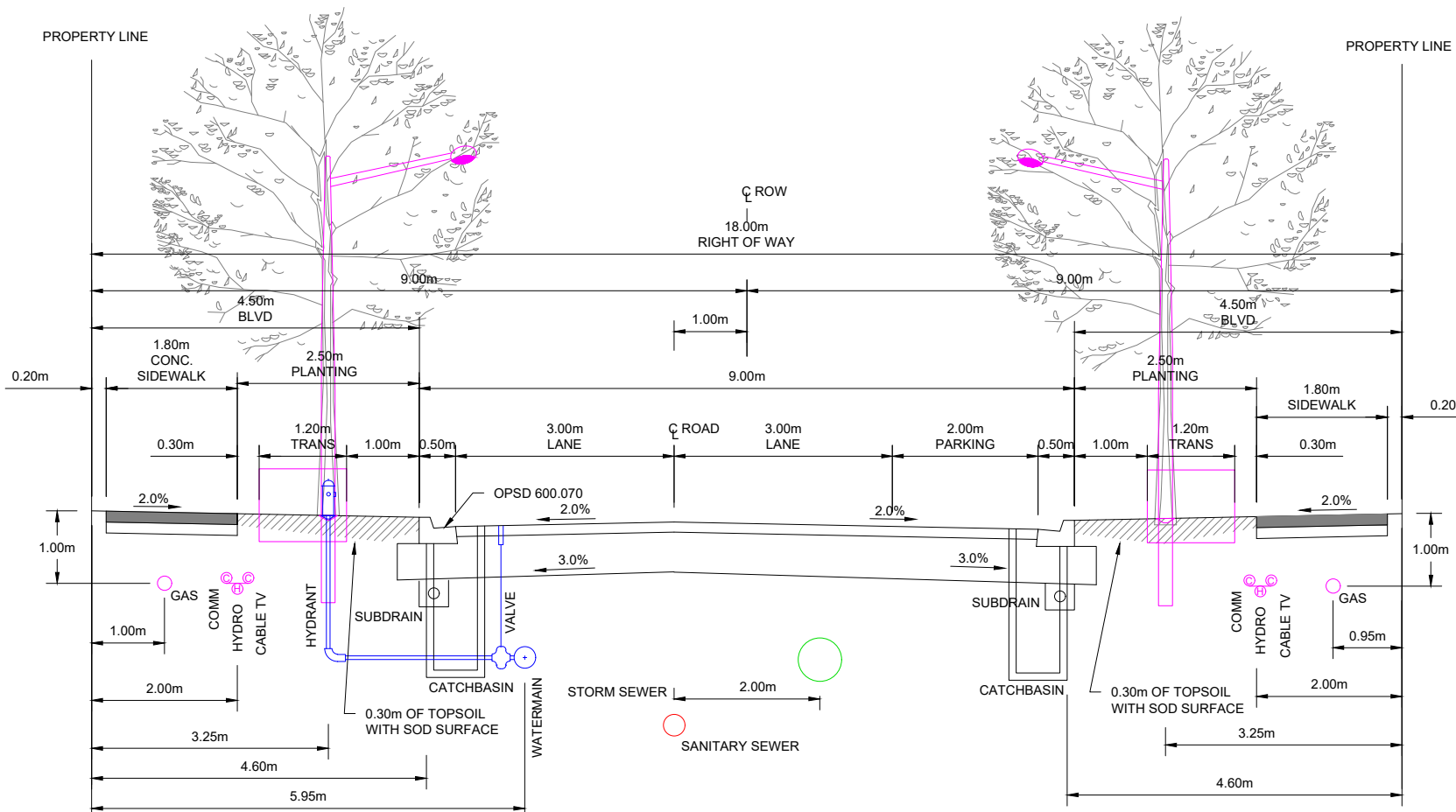
Appendix C

ROW Cross Section

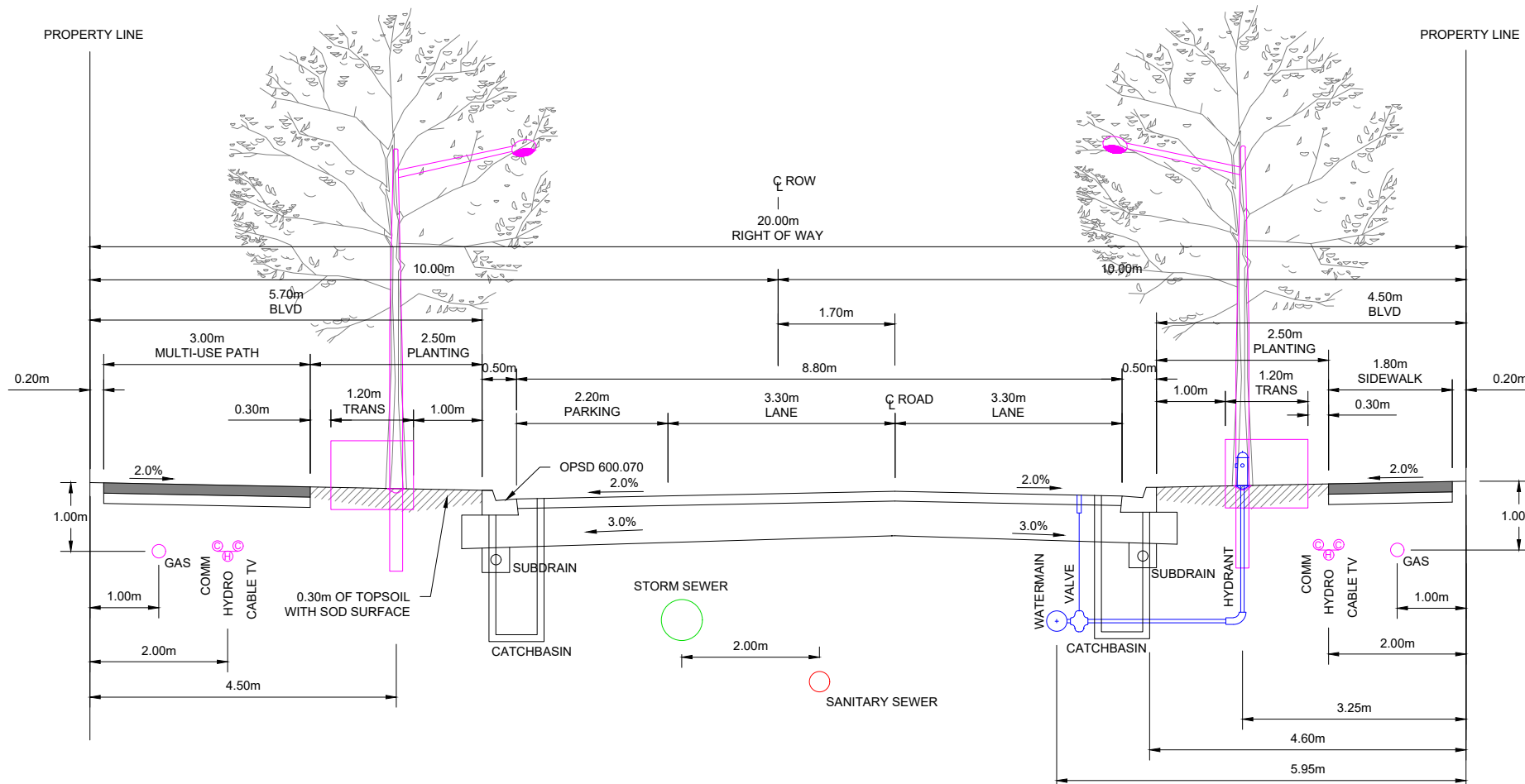
16.0m LOCAL ROAD



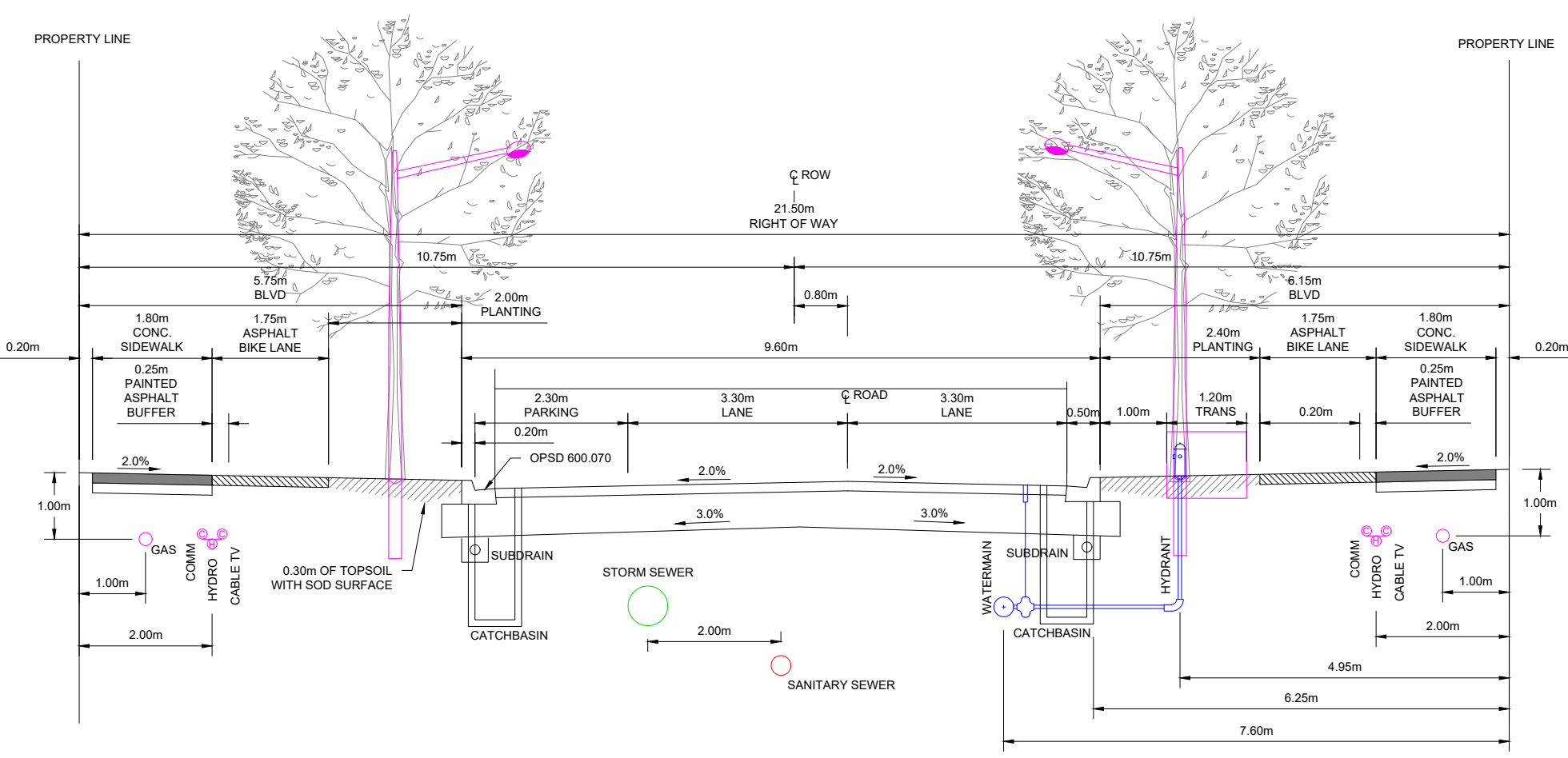
18.0m LOCAL ROAD



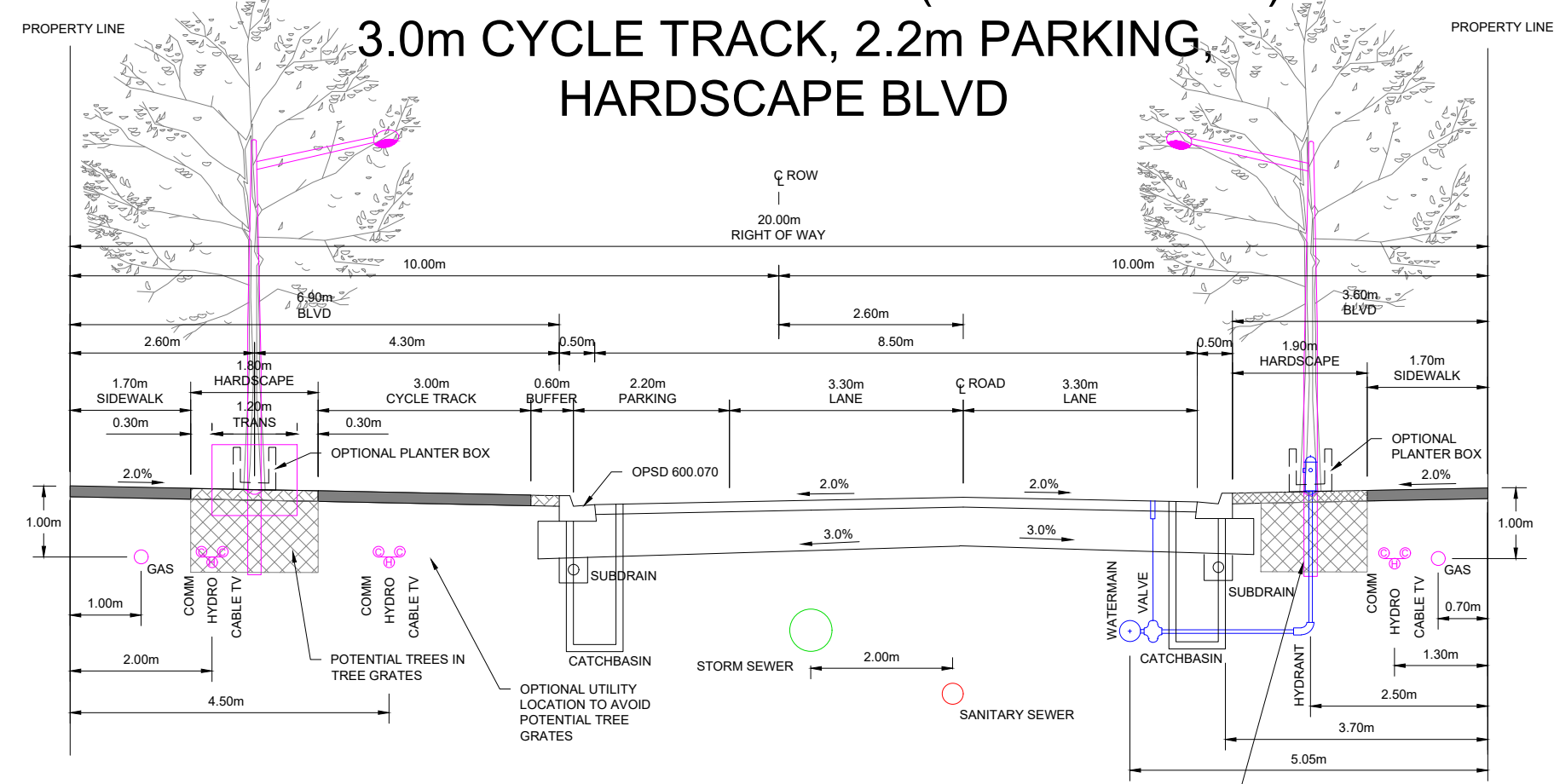
20m COLLECTOR ROAD WITH MULTI-USE PATH (MUP)



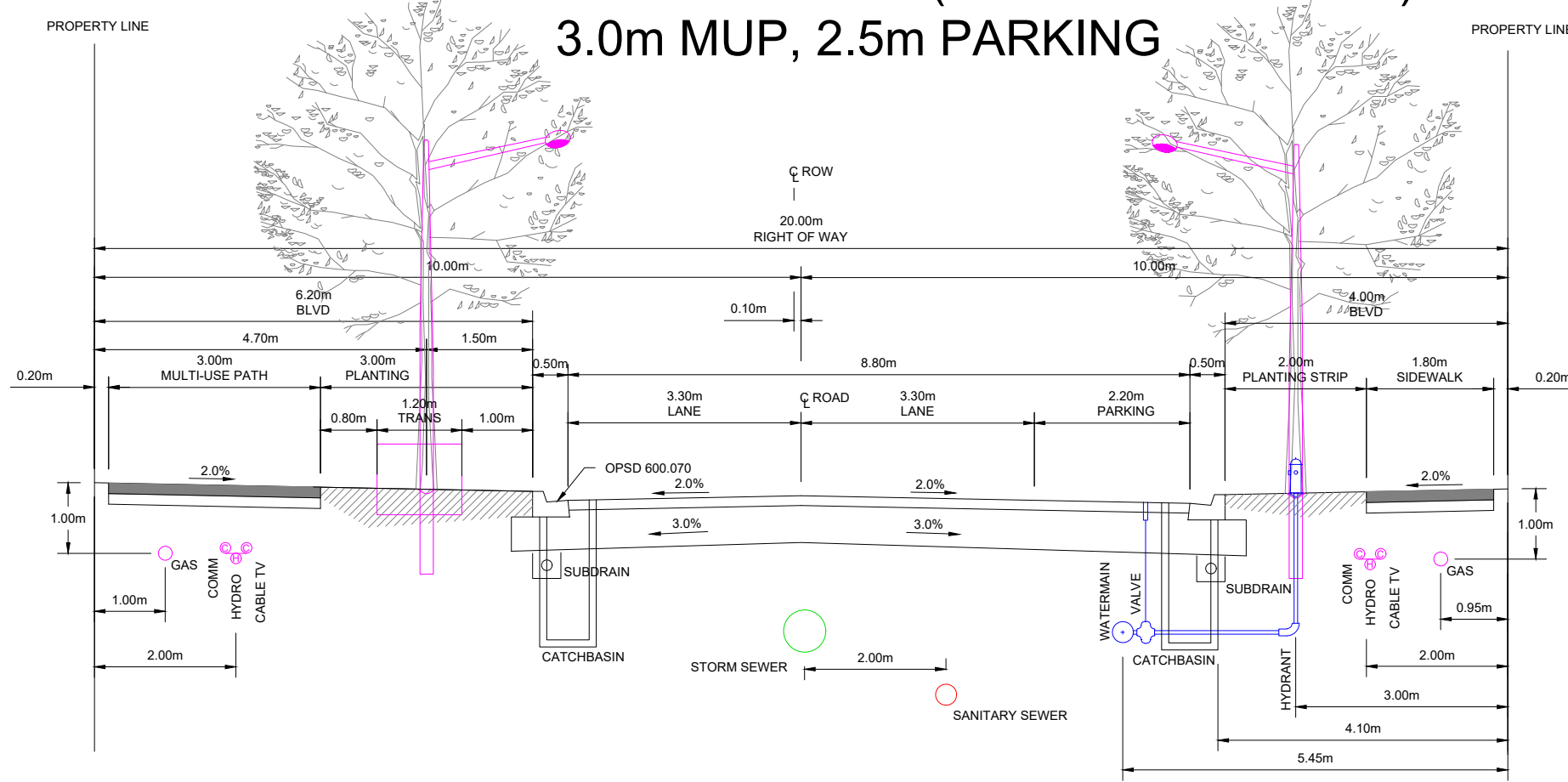
21.5m COLLECTOR ROAD



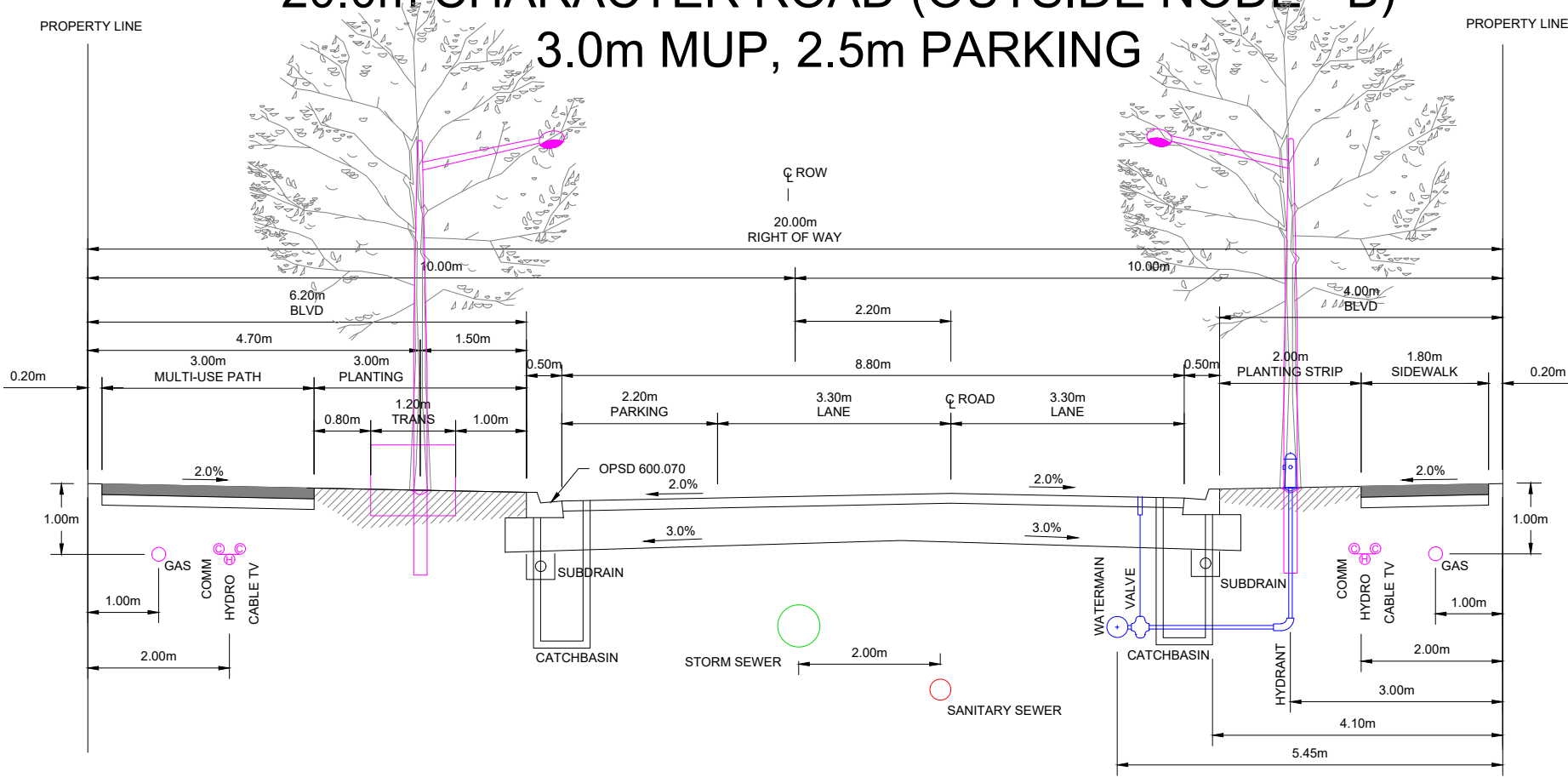
20.0m CHARACTER ROAD (WITHIN NODE)
3.0m CYCLE TRACK, 2.2m PARKING,
HARDSCAPE BLVD



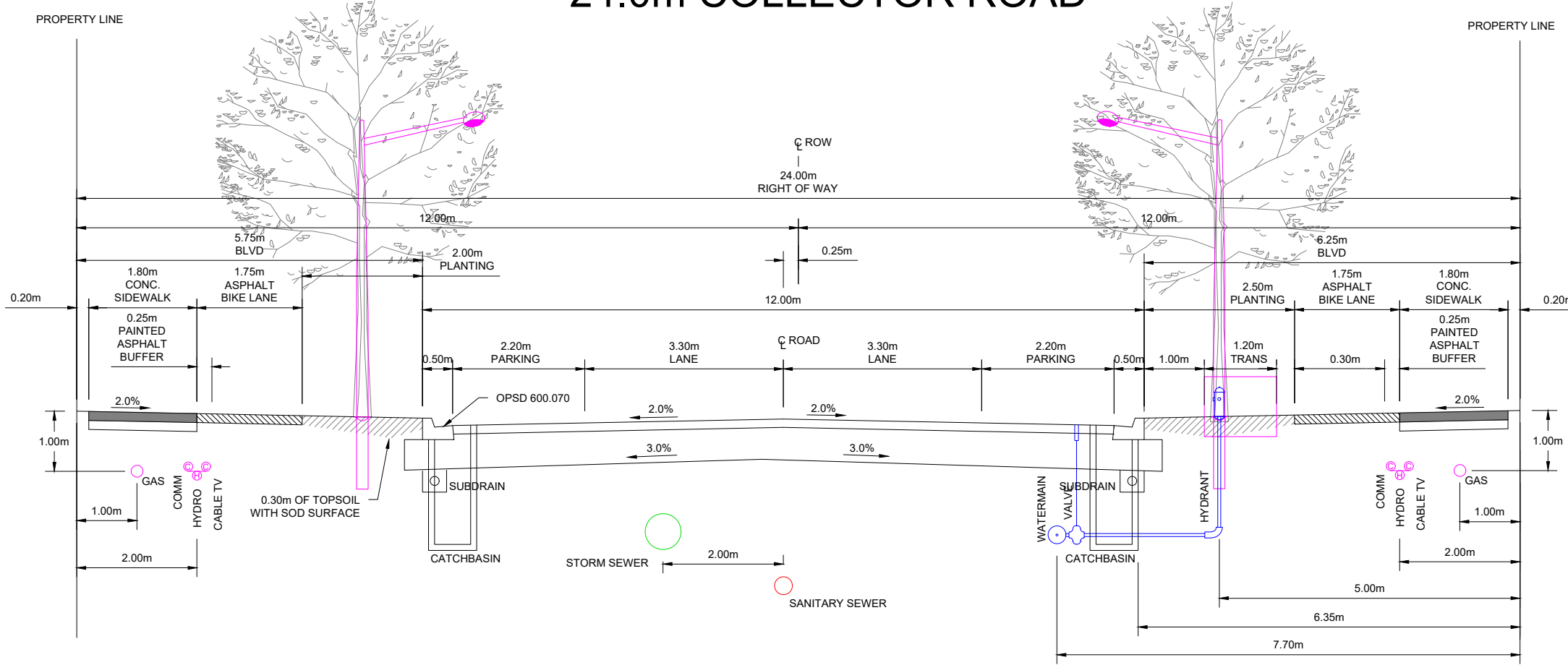
20.0m CHARACTER ROAD (OUTSIDE NODE - A)
3.0m MUP, 2.5m PARKING



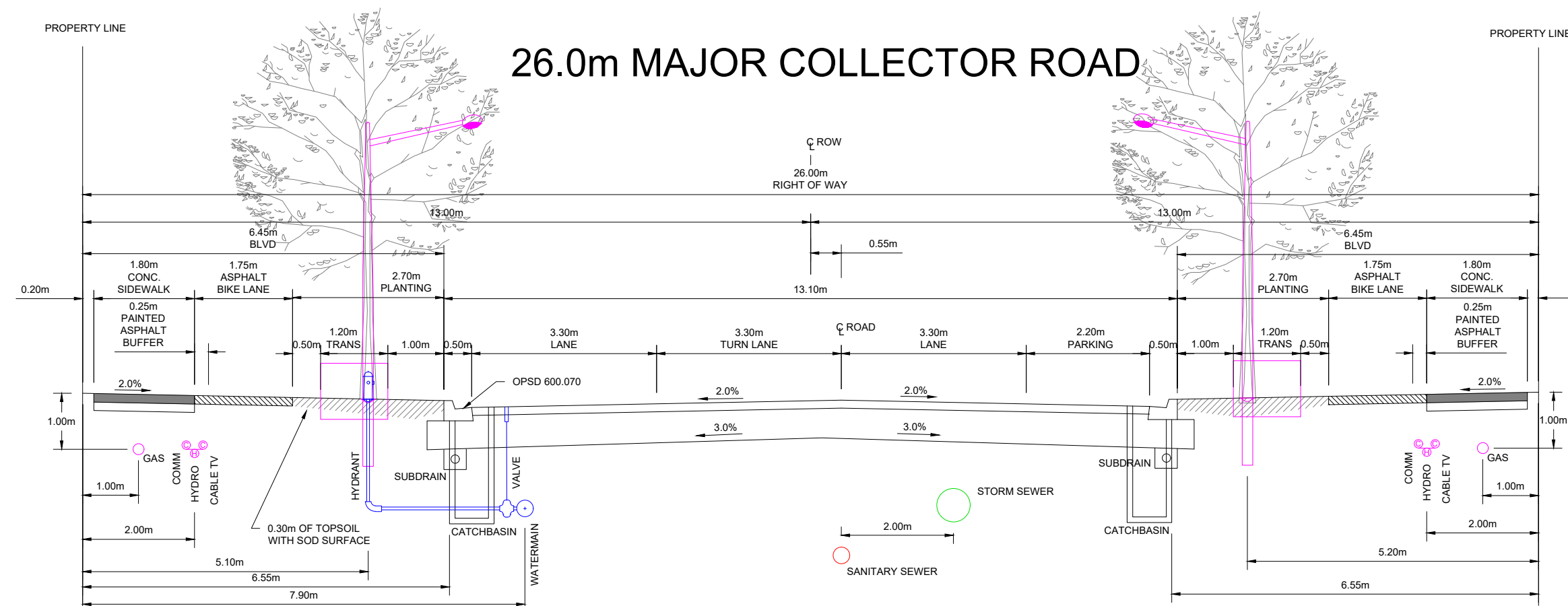
20.0m CHARACTER ROAD (OUTSIDE NODE - B)
3.0m MUP, 2.5m PARKING



24.0m COLLECTOR ROAD



26.0m MAJOR COLLECTOR ROAD



TRAFALGAR SECONDARY PLAN AREA PHASE 1 DAEFSS

LEGEND

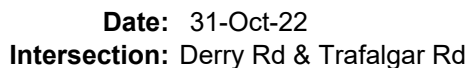
FIGURE 2.6.1
TYPICAL ROW SECTIONS

May 2025



Appendix D

Existing Traffic Data



Intersection: Derry Rd & Trafalgar Rd

8 Phase Basic Timing Sheet												
	1	2	3	4	5	6	7	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use	X	X	X	X	X	X	X	X	X	X	X	X
Direction	WBL	EB	NBL	SB	EBL	WB	SBL	NB				
Min Green	7	10	7	20	7	10	7	20				
Veh Ext.	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Yellow	3	4.6	3	4.2	3	4.6	3	4.2				
Red	1	2.3	1	2.6	1	2.3	1	2.6				
Walk		7		7		7		7				
Don't Walk		24		23		24		23				
Max 1	10	45	10	45	10	45	10	45				
Max 2	15	50	20	40	15	50	15	40				
Max 3	10	45	10	45	10	45	10	45				
Veh Recall		x				x						
Ped Recall												
Notes:	Sync Reference 3:15											



Date: 29-May-2020

Intersection: Britannia Rd @ Trafalgar Rd

8 Phase Basic Timing Sheet												
	1	2	3	4	5	6	7	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use	X	X	X	X	X	X		X				
Direction	SBLT	NB	WBLT	EB	NBLT	SB		WB				
Min Green	7	25	7	15	7	25		15				
Veh Ext.	3.0	5.0	3.0	5.0	3.0	5.0		5.0				
Yellow	3	5	3	4	3	5		4				
Red	1	2	1	2	1	2		2				
Walk		7		7		7		7				
Don't Walk		30		33		15		18				
Max 1	15	41	11	37	11	41		48				
Max 2	11	50	15	40	25	50		40				
Max 3	11	40	11	28	11	40		39				
Max 4												
Veh Recall		x				x						
Ped Recall		x				x						
Notes:	Sync Reference 3:15											
	Max 1 6:00-9:00											
	Max 2 15:00-19:00											
	Max 3 9:00-15:00											

2.4 Model Calibration

The traffic models were calibrated according to the Region's TIS Guidelines and using the existing traffic data. Peak hour factors (PHF) were calculated based on the 15-minute volume breakdown of existing TMCs and are summarized in **Table 2-3**. Saturation flow rates and lane widths were set to the Synchro defaults of 1,900 vehicles per hour and 3.7 metres, respectively, as no specific values were provided in the Region's guidelines.

Table 2-3: Modeled Intersection Peak Hour Factors

No.	Intersection	Intersection Control	Peak Hours	
			a.m.	p.m.
1	Trafalgar Road and Highway 401 Westbound Off-Ramp	Signalized	0.94	0.93
2	Trafalgar Road and Highway 401 Eastbound Off-Ramp	Signalized	0.97	0.89
3	Trafalgar Road and Derry Road	Signalized	0.98	0.95
4	Eighth Line and Derry Road	Two-way-stop-controlled	0.96	0.97
5	Trafalgar Road and Britannia Road	Signalized	0.97	0.97
6	Eighth Line and Britannia Road	Two-way-stop-controlled	0.95	0.96
7	Trafalgar Road and E Lower Base Line	Signalized	0.99	0.94

After applying the calculated parameters noted above to the base model, three out of the seven analyzed intersections were either operating over capacity overall or had several movements operating over capacity based on the Region's critical intersection criteria, which is:

- V/C ratios of 0.85 or above for overall intersection operations, through movements, or shared through/turning movements;
- V/C ratios of 0.95 or above for exclusive movements; or
- Queues for an individual movement are projected to exceed available turning lane storage.

The following measures were implemented at the signalized intersection to calibrate the existing traffic models:

- Trafalgar Road and Derry Road:
 - Assumed to be semi-actuated with minimum recall on Derry Road;
 - Lost time adjustment of -1.0 seconds for protected/permitted left-turn movements and -2.0 seconds for through or right-turn movements for both peak hours; and
 - Phasing splits were optimized for both peak hours.
- Trafalgar Road and Britannia Road:
 - Lost time adjustment of -1.0 seconds for protected/permitted left-turn movements and -2.0 seconds for through or right-turn movements in the p.m. peak hour; and
 - Phasing splits were optimized in the peak hour.
- Trafalgar Road and E Lower Base Line:
 - Only southbound and westbound left-turn phases are included in the provided signal timing plan. However, an examination of Google Maps street view demonstrates a northbound left-turn signal head in operation. Therefore, northbound left-turn phases were coded into the signal timing plan for both peak hours;
 - The timing plan specifies Max 2 during the p.m. peak period (3:00 – 7:00 p.m.), which does not include left-turn phases. With this timing plan the southbound left-turn movement is significantly over capacity. Therefore, we have assumed the timing plan follows Max 1 in the p.m. peak hour with the addition of the northbound left-turn phase (same as the a.m. peak hour);
 - Lost time adjustment of -1.0 seconds for protected/permitted left-turn movements and -2.0 seconds for through or right-turn movements for both peak hours; and
 - Phasing splits were optimized for both peak hours.

The additional calibration measures such as optimizing signal timing plans and implementing lost time adjustments used to calibrate the existing traffic models are described in the following subsections.

2.4.1 Optimizing Signal Timing Plans

When the provided signal timing plans were combined with the existing traffic volumes in Synchro, there were several movements at most of the intersections that were operating over capacity. This is not possible under existing conditions as this would mean that some vehicles could not clear the intersection, but all the vehicles counted have done so after they clear the intersection. The Region advised that they regularly review and update their signal timing plans to accommodate the most current traffic volumes, and that optimizing signal timing plans under existing conditions would be acceptable to calibrate the traffic model for a Secondary Plan level study. More detailed studies should conform to the current version of the Regional Synchro Guidelines.

2.4.2 Lost Time Adjustment

Total lost time represents the time that is not usable by vehicles for a signal phase. It is the sum of the start-up lost time at the beginning of each green period and a portion of each clearance interval (yellow plus all-red time). Start-up lost time occurs at the beginning of the cycle when the traffic signal changes from red to green; it is the time that elapses between the signal changing and the queued vehicles moving through the intersection. The extension of effective green is the time that vehicles continue to pass through the intersection after the yellow interval begins. Total lost time is calculated via the following formula:

$$\text{Total Lost Time} = \text{Yellow plus All Red Time} + \text{Start Up Lost Time} - \text{Extension of Effective Green}$$

It is typical driver behaviour in the GTA to treat a portion or even all of the yellow time as green time, entering the intersection during the yellow interval, which impacts the intersection capacity. The Lost Time Adjustment (LTA) parameter in Synchro, defined as the following formula, is used in estimating the overall capacity of the intersection:

$$\text{Lost Time Adjustment} = \text{Start Up Lost Time} - \text{Extension of Effective Green}$$

The default start-up lost time and extension of effective green time are both 2.0 seconds according to the Highway Capacity Manual (HCM). This explains the default LTA of zero seconds.

Recognizing that the extension of effective green is increased when motorists enter the intersection during the yellow time, several municipalities, including York Region, Niagara Region, City of Mississauga and City of Toronto, recognize these driver behaviours and include recommendations for applying LTA to reflect these conditions within their TIS guidelines. Although this driver behaviour is not limited to only locations or time periods that experience traffic congestion, in the interest of providing a more conservative analysis, LTA was only applied to the three critical intersections based on the Region's criteria.

Also, as the length of clearance interval (yellow plus all-red time) increases for a phase, the extension of effective green time increases. However, as a rule of thumb, the maximum extension of effective green does not exceed the yellow interval time.

Therefore, a lost time adjustment of -1.0 second was applied to left-turn movements and -2.0 seconds for through movements at these intersections, considering the typical yellow interval of 3.0 seconds for a left-turn phase and 4.0 seconds for a through movement phase.

As a reference, the following are some guidelines from other municipalities and regions:

- York Region: Reasonable adjustment values of less than three seconds are permitted for critical movements (Source: Section 1.12 Software and Input Parameters, page 18, York Region Transportation Mobility Plan Guidelines for Development Applications, November 2016).
- City of Toronto: -1.0 second is the default LTA for all movements for peak period analysis (Source: Section 5.2.11 Lost Time Adjust, page 120, City of Toronto Guidelines for Using Synchro 9, March 2016).



Turning Movement Count (1 . DERRY RD & TRAFALGAR RD)

Start Time	N Approach TRAFALGAR RD						E Approach DERRY RD						S Approach TRAFALGAR RD						W Approach DERRY RD						Int. Total (15 min)	Int. Total (1 hr)	
	Right N-W	Thru N-S	Left N-E	UTurn N-N	Peds N:	Approach Total	Right E-N	Thru E-W	Left E-S	UTurn E-E	Peds E:	Approach Total	Right S-E	Thru S-N	Left S-W	UTurn S-S	Peds S:	Approach Total	Right W-S	Thru W-E	Left W-N	UTurn W-W	Peds W:	Approach Total			
06:00:00	1	64	11	0	0	76	7	34	5	0	0	46	3	29	7	0	0	39	20	101	107	0	0	228	389		
06:15:00	7	89	7	0	0	103	14	40	5	0	0	59	7	49	12	0	0	68	20	123	86	0	0	229	459		
06:30:00	8	92	12	0	0	112	20	76	6	0	0	102	12	72	9	0	0	93	26	147	98	0	0	271	578		
06:45:00	10	75	12	0	0	97	14	68	15	0	0	97	7	48	10	0	0	65	29	153	118	0	0	300	559	1985	
07:00:00	14	84	14	0	0	112	21	59	7	0	0	87	10	71	7	0	0	88	33	163	113	0	0	309	596	2192	
07:15:00	4	80	17	0	0	101	19	82	7	0	0	108	16	85	15	0	0	116	49	256	142	0	0	447	772	2505	
07:30:00	7	72	14	0	0	93	31	105	19	0	0	155	26	82	18	0	0	126	44	239	112	0	0	395	769	2696	
07:45:00	11	78	18	0	0	107	21	123	9	0	0	153	14	86	12	0	0	112	50	337	121	0	0	508	880	3017	
08:00:00	14	55	6	0	0	75	22	117	17	0	0	156	17	92	18	0	0	127	42	299	119	0	0	460	818	3239	
08:15:00	9	78	12	0	0	99	33	107	20	0	0	160	17	100	16	0	0	133	45	337	138	0	0	520	912	3379	
08:30:00	13	68	7	1	0	89	28	111	19	0	0	158	26	106	14	0	0	146	47	307	136	0	0	490	883	3493	
08:45:00	7	69	20	0	0	96	27	113	12	0	0	152	26	77	25	0	0	128	46	226	104	0	0	376	752	3365	
BREAK																											
11:00:00	17	59	5	0	0	81	9	69	8	0	0	86	6	78	19	0	0	103	22	79	45	0	0	146	416		
11:15:00	32	64	11	0	0	107	18	82	3	0	0	103	9	74	24	0	0	107	27	98	46	0	0	171	488		
11:30:00	27	64	2	0	0	93	16	94	11	0	0	121	4	77	24	0	0	105	25	122	56	0	0	203	522		
11:45:00	20	54	5	0	0	79	12	70	7	0	0	89	9	66	17	0	0	92	18	101	59	0	0	178	438	1864	
12:00:00	20	61	6	0	0	87	19	83	6	0	0	108	9	52	9	0	0	70	19	97	62	0	0	178	443	1891	
12:15:00	19	71	10	0	0	100	15	94	10	0	0	119	7	70	19	0	0	96	23	90	55	0	0	168	483	1886	
12:30:00	17	63	16	0	0	96	13	89	3	0	0	105	8	74	26	0	0	108	25	98	50	0	0	173	482	1846	
12:45:00	18	58	12	0	0	88	10	84	6	0	0	100	5	66	12	0	0	83	20	85	53	0	0	158	429	1837	
BREAK																											
16:00:00	24	77	20	0	0	121	19	254	19	0	0	292	17	136	32	0	0	185	29	146	40	0	0	215	813		
16:15:00	44	72	21	0	0	137	17	219	21	0	0	257	11	136	43	0	0	190	28	147	47	0	0	222	806		
16:30:00	24	71	18	0	0	113	28	232	25	0	0	285	9	156	27	0	0	192	14	164	43	0	0	221	811		
16:45:00	36	75	31	0	0	142	26	279	21	0	0	326	6	140	24	0	0	170	25	136	37	0	0	198	836	3266	
17:00:00	36	71	31	0	0	138	20	216	12	0	0	248	9	166	39	0	0	214	33	153	50	0	0	236	836	3289	
17:15:00	24	78	23	0	0	125	31	311	20	0	0	362	16	142	28	0	0	186	30	174	41	0	0	245	918	3401	
17:30:00	19	77	21	0	0	117	22	292	16	0	0	330	18	118	30	0	0	166	22	154	43	0	0	219	832	3422	
17:45:00	36	68	21	0	0	125	19	232	12	0	0	263	16	118	26	0	0	160	23	156	36	0	0	215	763	3349	
18:00:00	19	72	18	0	0	109	8	166	22	0	0	196	14	110	25	0	0	149	21	127	32	0	0	180	634	3147	
18:15:00	19	69	31	0	0	119	15	165	17	0	0	197	14	95	29	0	0	138	16	131	37	0	0	184	638	2867	
18:30:00	19	55	15	0	0	89	13	175	14	0	0	202	11	84	30	0	0	125	26	101	47	0	0	174	590	2625	
18:45:00	20	64	13	0	0	97	9	133	9	0	0	151	9	80	27	0	0	116	23	96	36	0	0	155	519	2381	
Grand Total	595	2247	480	1	0	3323	596	4374	403	0	0	5373	388	2935	673	0	0	3996	920	5143	2309	0	0	8372	21064	-	
Approach%	17.9%	67.6%	14.4%	0%		-	11.1%	81.4%	7.5%	0%		-	9.7%	73.4%	16.8%	0%		-	11%	61.4%	27.6%	0%		-	-	-	
Totals %	2.8%	10.7%	2.3%	0%		15.8%	2.8%	20.8%	1.9%	0%		25.5%	1.8%	13.9%	3.2%	0%		19%	4.4%	24.4%	11%	0%		39.7%	-	-	
Heavy	190	183	8	0		-	18	133	12	0		-	3	196	31	0		-	43	132	191	0		-	-	-	
Heavy %	31.9%	8.1%	1.7%	0%		-	3%	3%	3%	0%		-	0.8%	6.7%	4.6%	0%		-	4.7%	2.6%	8.3%	0%		-	-	-	
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	



Peak Hour: 07:45 AM - 08:45 AM Weather: Overcast Clouds (3.3 °C)

Start Time	N Approach TRAFALGAR RD						E Approach DERRY RD						S Approach TRAFALGAR RD						W Approach DERRY RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
07:45:00	11	78	18	0	0	107	21	123	9	0	0	153	14	86	12	0	0	112	50	337	121	0	0	508	880
08:00:00	14	55	6	0	0	75	22	117	17	0	0	156	17	92	18	0	0	127	42	299	119	0	0	460	818
08:15:00	9	78	12	0	0	99	33	107	20	0	0	160	17	100	16	0	0	133	45	337	138	0	0	520	912
08:30:00	13	68	7	1	0	89	28	111	19	0	0	158	26	106	14	0	0	146	47	307	136	0	0	490	883
Grand Total	47	279	43	1	0	370	104	458	65	0	0	627	74	384	60	0	0	518	184	1280	514	0	0	1978	3493
Approach%	12.7%	75.4%	11.6%	0.3%		-	16.6%	73%	10.4%	0%		-	14.3%	74.1%	11.6%	0%		-	9.3%	64.7%	26%	0%		-	-
Totals %	1.3%	8%	1.2%	0%		10.6%	3%	13.1%	1.9%	0%		18%	2.1%	11%	1.7%	0%		14.8%	5.3%	36.6%	14.7%	0%		56.6%	-
PHF	0.84	0.89	0.6	0.25		0.86	0.79	0.93	0.81	0		0.98	0.71	0.91	0.83	0		0.89	0.92	0.95	0.93	0		0.95	-
Heavy	34	34	0	0		68	0	17	0	0		17	0	33	4	0		37	7	15	13	0		35	-
Heavy %	72.3%	12.2%	0%	0%		18.4%	0%	3.7%	0%	0%		2.7%	0%	8.6%	6.7%	0%		7.1%	3.8%	1.2%	2.5%	0%		1.8%	-
Lights	13	245	43	1		302	104	441	65	0		610	74	351	56	0		481	177	1265	501	0		1943	-
Lights %	27.7%	87.8%	100%	100%		81.6%	100%	96.3%	100%	0%		97.3%	100%	91.4%	93.3%	0%		92.9%	96.2%	98.8%	97.5%	0%		98.2%	-
Single-Unit Trucks	25	8	0	0		33	0	8	0	0		8	0	20	2	0		22	4	6	12	0		22	-
Single-Unit Trucks %	53.2%	2.9%	0%	0%		8.9%	0%	1.7%	0%	0%		1.3%	0%	5.2%	3.3%	0%		4.2%	2.2%	0.5%	2.3%	0%		1.1%	-
Buses	0	0	0	0		0	0	6	0	0		6	0	0	1	0		1	2	5	0	0		7	-
Buses %	0%	0%	0%	0%		0%	0%	1.3%	0%	0%		1%	0%	0%	1.7%	0%		0.2%	1.1%	0.4%	0%	0%		0.4%	-
Articulated Trucks	9	26	0	0		35	0	3	0	0		3	0	13	1	0		14	1	4	1	0		6	-
Articulated Trucks %	19.1%	9.3%	0%	0%		9.5%	0%	0.7%	0%	0%		0.5%	0%	3.4%	1.7%	0%		2.7%	0.5%	0.3%	0.2%	0%		0.3%	-



Peak Hour: 11:15 AM - 12:15 PM Weather: Overcast Clouds (4.24 °C)

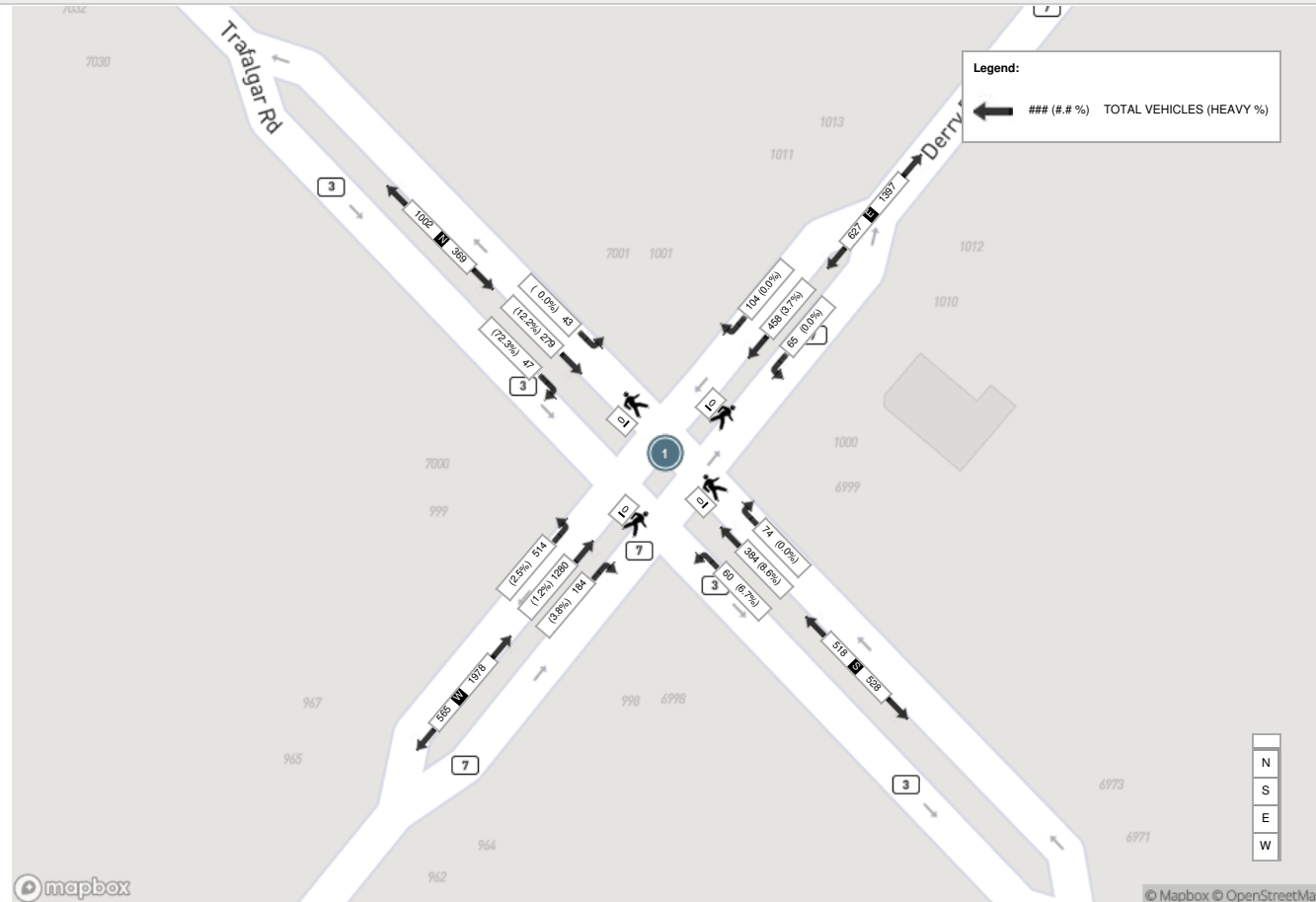
Start Time	N Approach TRAFALGAR RD						E Approach DERRY RD						S Approach TRAFALGAR RD						W Approach DERRY RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
11:15:00	32	64	11	0	0	107	18	82	3	0	0	103	9	74	24	0	0	107	27	98	46	0	0	171	488
11:30:00	27	64	2	0	0	93	16	94	11	0	0	121	4	77	24	0	0	105	25	122	56	0	0	203	522
11:45:00	20	54	5	0	0	79	12	70	7	0	0	89	9	66	17	0	0	92	18	101	59	0	0	178	438
12:00:00	20	61	6	0	0	87	19	83	6	0	0	108	9	52	9	0	0	70	19	97	62	0	0	178	443
Grand Total	99	243	24	0	0	366	65	329	27	0	0	421	31	269	74	0	0	374	89	418	223	0	0	730	1891
Approach%	27%	66.4%	6.6%	0%		-	15.4%	78.1%	6.4%	0%		-	8.3%	71.9%	19.8%	0%		-	12.2%	57.3%	30.5%	0%		-	-
Totals %	5.2%	12.9%	1.3%	0%		19.4%	3.4%	17.4%	1.4%	0%		22.3%	1.6%	14.2%	3.9%	0%		19.8%	4.7%	22.1%	11.8%	0%		38.6%	-
PHF	0.77	0.95	0.55	0		0.86	0.86	0.88	0.61	0		0.87	0.86	0.87	0.77	0		0.87	0.82	0.86	0.9	0		0.9	-
Heavy	66	20	1	0		87	2	36	1	0		39	1	33	6	0		40	7	25	52	0		84	-
Heavy %	66.7%	8.2%	4.2%	0%		23.8%	3.1%	10.9%	3.7%	0%		9.3%	3.2%	12.3%	8.1%	0%		10.7%	7.9%	6%	23.3%	0%		11.5%	-
Lights	33	223	23	0		279	63	293	26	0		382	30	236	68	0		334	82	393	171	0		646	-
Lights %	33.3%	91.8%	95.8%	0%		76.2%	96.9%	89.1%	96.3%	0%		90.7%	96.8%	87.7%	91.9%	0%		89.3%	92.1%	94%	76.7%	0%		88.5%	-
Single-Unit Trucks	52	5	1	0		58	1	32	1	0		34	0	19	5	0		24	4	20	46	0		70	-
Single-Unit Trucks %	52.5%	2.1%	4.2%	0%		15.8%	1.5%	9.7%	3.7%	0%		8.1%	0%	7.1%	6.8%	0%		6.4%	4.5%	4.8%	20.6%	0%		9.6%	-
Buses	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	1	2	0	0		3	-
Buses %	0%	0%	0%	0%		0%	0%	0.3%	0%	0%		0.2%	0%	0%	0%	0%		0%	1.1%	0.5%	0%	0%		0.4%	-
Articulated Trucks	14	15	0	0		29	1	3	0	0		4	1	14	1	0		16	2	3	6	0		11	-
Articulated Trucks %	14.1%	6.2%	0%	0%		7.9%	1.5%	0.9%	0%	0%		1%	3.2%	5.2%	1.4%	0%		4.3%	2.2%	0.7%	2.7%	0%		1.5%	-



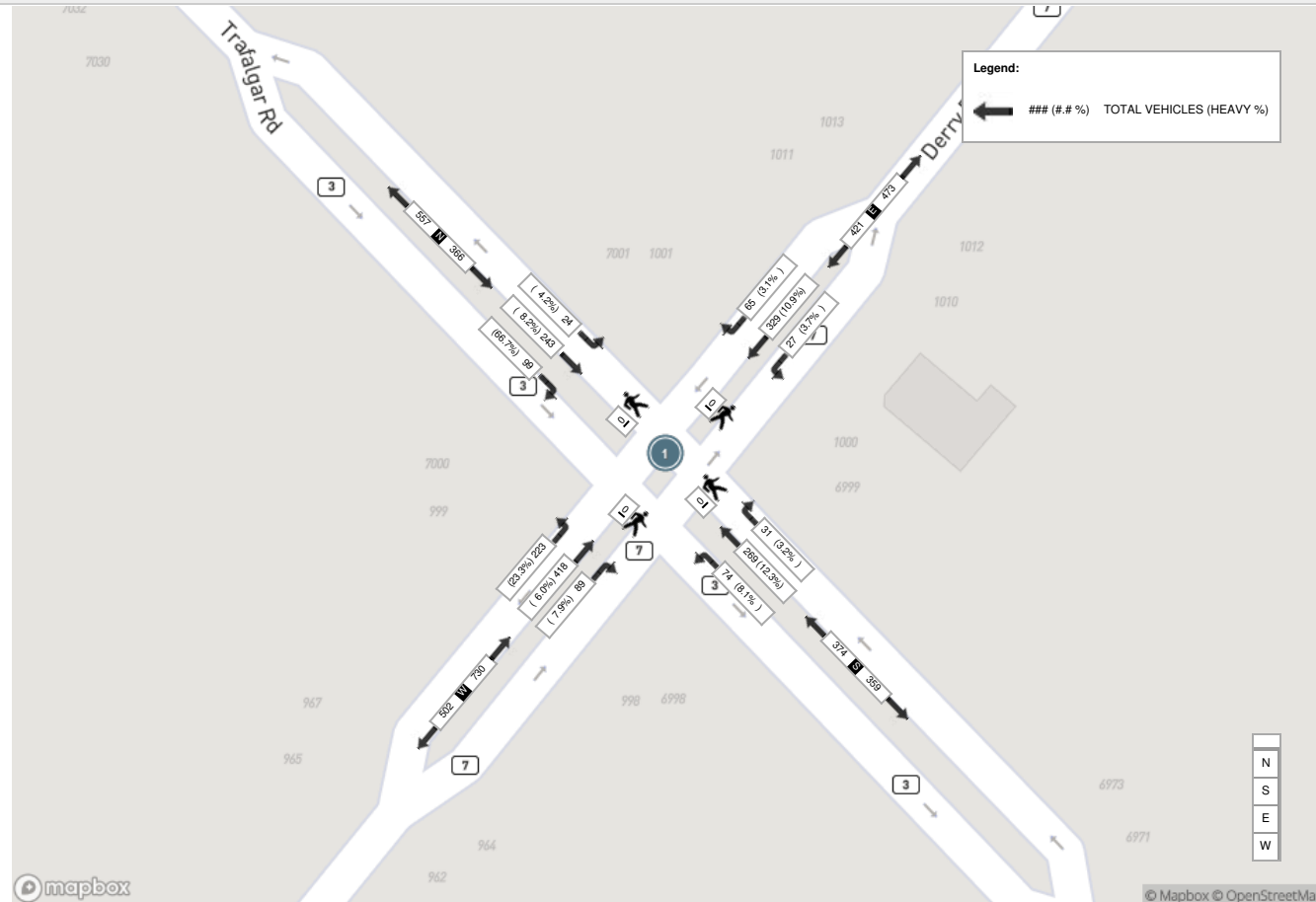
Peak Hour: 04:45 PM - 05:45 PM Weather: Overcast Clouds (4.09 °C)

Start Time	N Approach TRAFALGAR RD						E Approach DERRY RD						S Approach TRAFALGAR RD						W Approach DERRY RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:45:00	36	75	31	0	0	142	26	279	21	0	0	326	6	140	24	0	0	170	25	136	37	0	0	198	836
17:00:00	36	71	31	0	0	138	20	216	12	0	0	248	9	166	39	0	0	214	33	153	50	0	0	236	836
17:15:00	24	78	23	0	0	125	31	311	20	0	0	362	16	142	28	0	0	186	30	174	41	0	0	245	918
17:30:00	19	77	21	0	0	117	22	292	16	0	0	330	18	118	30	0	0	166	22	154	43	0	0	219	832
Grand Total	115	301	106	0	0	522	99	1098	69	0	0	1266	49	566	121	0	0	736	110	617	171	0	0	898	3422
Approach%	22%	57.7%	20.3%	0%		-	7.8%	86.7%	5.5%	0%		-	6.7%	76.9%	16.4%	0%		-	12.2%	68.7%	19%	0%		-	-
Totals %	3.4%	8.8%	3.1%	0%		15.3%	2.9%	32.1%	2%	0%		37%	1.4%	16.5%	3.5%	0%		21.5%	3.2%	18%	5%	0%		26.2%	-
PHF	0.8	0.96	0.85	0		0.92	0.8	0.88	0.82	0		0.87	0.68	0.85	0.78	0		0.86	0.83	0.89	0.86	0		0.92	-
Heavy	17	9	1	0		27	0	9	2	0		11	0	17	2	0		19	2	17	29	0		48	-
Heavy %	14.8%	3%	0.9%	0%		5.2%	0%	0.8%	2.9%	0%		0.9%	0%	3%	1.7%	0%		2.6%	1.8%	2.8%	17%	0%		5.3%	-
Lights	98	292	105	0		495	99	1089	67	0		1255	49	549	119	0		717	108	600	142	0		850	-
Lights %	85.2%	97%	99.1%	0%		94.8%	100%	99.2%	97.1%	0%		99.1%	100%	97%	98.3%	0%		97.4%	98.2%	97.2%	83%	0%		94.7%	-
Single-Unit Trucks	14	3	1	0		18	0	6	1	0		7	0	9	2	0		11	2	9	22	0		33	-
Single-Unit Trucks %	12.2%	1%	0.9%	0%		3.4%	0%	0.5%	1.4%	0%		0.6%	0%	1.6%	1.7%	0%		1.5%	1.8%	1.5%	12.9%	0%		3.7%	-
Buses	0	0	0	0		0	0	3	0	0		3	0	0	0	0		0	0	5	0	0		5	-
Buses %	0%	0%	0%	0%		0%	0%	0.3%	0%	0%		0.2%	0%	0%	0%	0%		0%	0%	0.8%	0%	0%		0.6%	-
Articulated Trucks	3	6	0	0		9	0	0	1	0		1	0	8	0	0		8	0	3	7	0		10	-
Articulated Trucks %	2.6%	2%	0%	0%		1.7%	0%	0%	1.4%	0%		0.1%	0%	1.4%	0%	0%		1.1%	0%	0.5%	4.1%	0%		1.1%	-

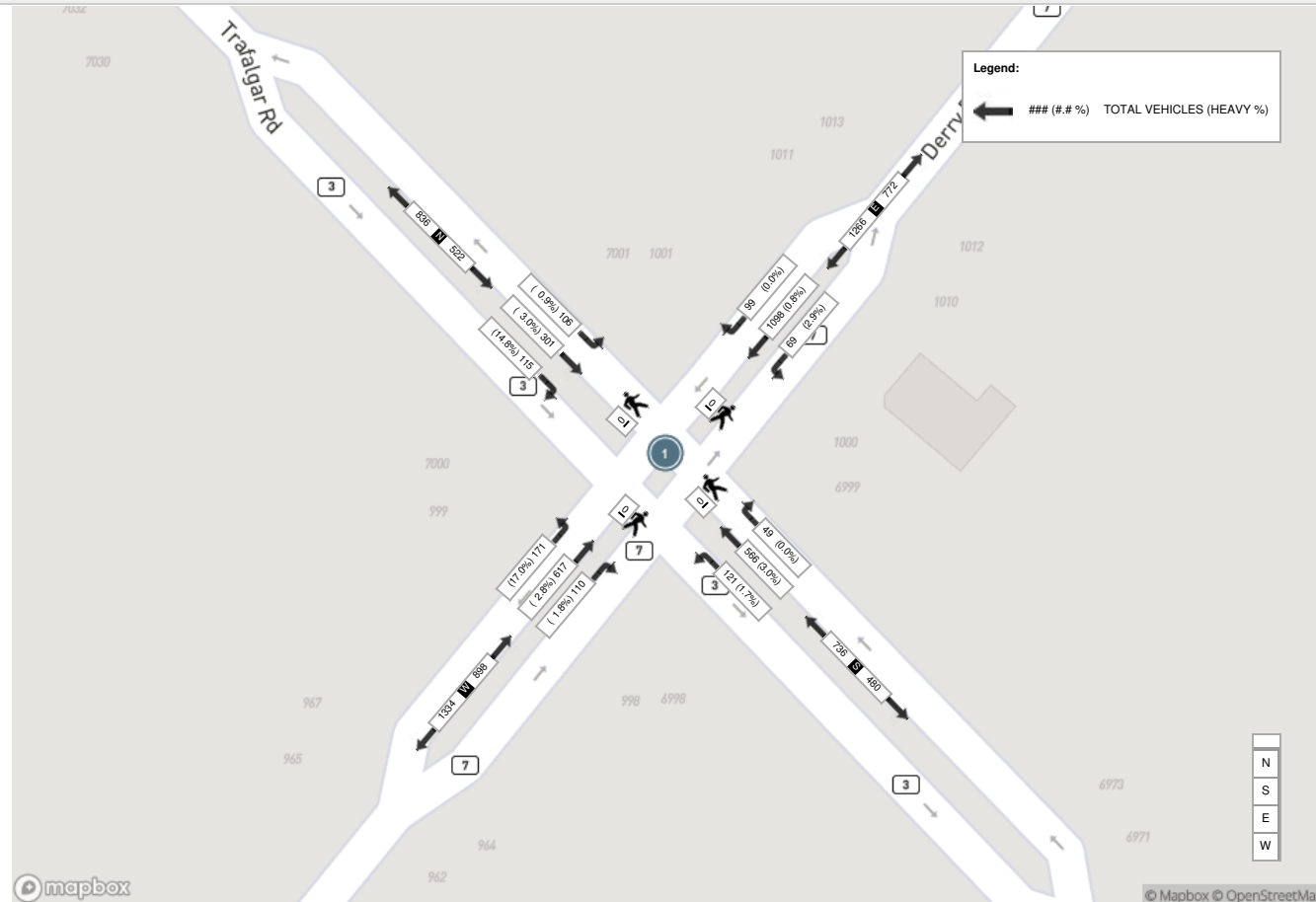
Peak Hour: 07:45 AM - 08:45 AM Weather: Overcast Clouds (3.3 °C)



Peak Hour: 11:15 AM - 12:15 PM Weather: Overcast Clouds (4.24 °C)



Peak Hour: 04:45 PM - 05:45 PM Weather: Overcast Clouds (4.09 °C)





Turning Movement Count (3 . BRITANNIA RD & TRAFALGAR RD)

Start Time	N Approach TRAFALGAR RD						E Approach BRITANNIA RD						S Approach TRAFALGAR RD						W Approach BRITANNIA RD						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
06:00:00	5	106	5	0	0	116	8	11	7	0	0	26	4	52	4	0	0	60	27	28	7	0	0	62	264	
06:15:00	5	133	8	0	0	146	11	23	9	0	0	43	2	61	7	0	0	70	41	35	14	0	0	90	349	
06:30:00	7	163	9	0	0	179	10	28	14	0	0	52	17	71	18	0	0	106	66	38	12	0	0	116	453	
06:45:00	6	151	10	0	0	167	13	43	22	0	0	78	9	79	17	0	0	105	59	46	9	0	0	114	464	1530
07:00:00	4	129	4	0	0	137	8	38	19	0	0	65	17	105	27	0	0	149	51	56	10	0	0	117	468	1734
07:15:00	6	161	12	0	0	179	13	53	26	0	0	92	17	155	25	0	0	197	71	96	9	0	0	176	644	2029
07:30:00	8	196	16	0	0	220	7	68	36	0	0	111	43	161	26	0	0	230	63	89	12	0	0	164	725	2301
07:45:00	2	159	21	0	0	182	15	63	26	0	0	104	42	123	38	0	0	203	72	120	8	0	0	200	689	2526
08:00:00	5	143	22	0	0	170	14	56	34	0	0	104	42	166	40	0	0	248	70	121	13	0	0	204	726	2784
08:15:00	6	178	11	0	0	195	18	62	29	0	0	109	33	114	27	0	0	174	52	98	8	0	0	158	636	2776
08:30:00	6	160	17	0	0	183	12	78	37	0	0	127	23	150	40	0	0	213	72	76	7	0	0	155	678	2729
08:45:00	7	137	3	0	0	147	13	68	36	0	0	117	30	159	46	0	0	235	52	81	10	0	0	143	642	2682
BREAK																										
16:00:00	15	129	16	0	0	160	31	134	32	0	0	197	25	164	49	0	0	238	50	72	13	0	0	135	730	
16:15:00	14	148	10	0	0	172	29	152	34	0	0	215	31	225	79	0	0	335	57	99	13	0	0	169	891	
16:30:00	8	132	14	0	0	154	19	141	28	0	0	188	30	183	65	0	0	278	39	74	10	0	0	123	743	
16:45:00	11	123	20	0	0	154	8	122	23	0	0	153	25	185	76	0	0	286	52	104	10	0	0	166	759	3123
17:00:00	11	110	14	0	0	135	21	124	29	0	0	174	38	245	84	1	0	368	43	99	17	0	0	159	836	3229
17:15:00	18	157	11	0	0	186	17	145	40	0	0	202	44	207	79	0	0	330	46	92	21	1	0	160	878	3216
17:30:00	7	132	22	0	0	161	17	145	26	0	0	188	49	190	77	0	0	316	53	92	15	0	0	160	825	3298
17:45:00	13	123	18	0	0	154	16	114	28	0	0	158	36	203	55	0	0	294	34	89	8	0	0	131	737	3276
18:00:00	13	133	18	0	0	164	16	94	24	0	0	134	34	167	81	0	0	282	44	72	11	0	0	127	707	3147
18:15:00	8	130	20	0	0	158	13	97	18	0	0	128	31	139	65	0	0	235	32	80	11	0	0	123	644	2913
18:30:00	6	146	20	0	0	172	18	94	21	0	0	133	30	147	57	0	0	234	36	58	9	0	0	103	642	2730
18:45:00	8	91	12	0	0	111	7	79	15	0	0	101	22	133	69	0	0	224	48	65	8	0	0	121	557	2550
Grand Total	199	3370	333	0	0	3902	354	2032	613	0	0	2999	674	3584	1151	1	0	5410	1230	1880	265	1	0	3376	15687	-
Approach%	5.1%	86.4%	8.5%	0%		-	11.8%	67.8%	20.4%	0%		-	12.5%	66.2%	21.3%	0%		-	36.4%	55.7%	7.8%	0%		-	-	-
Totals %	1.3%	21.5%	2.1%	0%		24.9%	2.3%	13%	3.9%	0%		19.1%	4.3%	22.8%	7.3%	0%		34.5%	7.8%	12%	1.7%	0%		21.5%	-	-
Heavy	30	251	7	0		-	6	77	3	0		-	10	230	45	0		-	50	58	29	0		-	-	-
Heavy %	15.1%	7.4%	2.1%	0%		-	1.7%	3.8%	0.5%	0%		-	1.5%	6.4%	3.9%	0%		-	4.1%	3.1%	10.9%	0%		-	-	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-



Peak Hour: 07:15 AM - 08:15 AM Weather: Overcast Clouds (12.27 °C)

Start Time	N Approach TRAFALGAR RD						E Approach BRITANNIA RD						S Approach TRAFALGAR RD						W Approach BRITANNIA RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
07:15:00	6	161	12	0	0	179	13	53	26	0	0	92	17	155	25	0	0	197	71	96	9	0	0	176	644
07:30:00	8	196	16	0	0	220	7	68	36	0	0	111	43	161	26	0	0	230	63	89	12	0	0	164	725
07:45:00	2	159	21	0	0	182	15	63	26	0	0	104	42	123	38	0	0	203	72	120	8	0	0	200	689
08:00:00	5	143	22	0	0	170	14	56	34	0	0	104	42	166	40	0	0	248	70	121	13	0	0	204	726
Grand Total	21	659	71	0	0	751	49	240	122	0	0	411	144	605	129	0	0	878	276	426	42	0	0	744	2784
Approach%	2.8%	87.7%	9.5%	0%		-	11.9%	58.4%	29.7%	0%		-	16.4%	68.9%	14.7%	0%		-	37.1%	57.3%	5.6%	0%		-	-
Totals %	0.8%	23.7%	2.6%	0%		27%	1.8%	8.6%	4.4%	0%		14.8%	5.2%	21.7%	4.6%	0%		31.5%	9.9%	15.3%	1.5%	0%		26.7%	-
PHF	0.66	0.84	0.81	0		0.85	0.82	0.88	0.85	0		0.93	0.84	0.91	0.81	0		0.89	0.96	0.88	0.81	0		0.91	-
Heavy	8	69	3	0		80	1	23	0	0		24	2	75	9	0		86	24	20	4	0		48	-
Heavy %	38.1%	10.5%	4.2%	0%		10.7%	2%	9.6%	0%	0%		5.8%	1.4%	12.4%	7%	0%		9.8%	8.7%	4.7%	9.5%	0%		6.5%	-
Lights	13	590	68	0		671	48	217	122	0		387	142	530	120	0		792	252	406	38	0		696	-
Lights %	61.9%	89.5%	95.8%	0%		89.3%	98%	90.4%	100%	0%		94.2%	98.6%	87.6%	93%	0%		90.2%	91.3%	95.3%	90.5%	0%		93.5%	-
Single-Unit Trucks	4	47	2	0		53	1	18	0	0		19	2	57	8	0		67	15	18	4	0		37	-
Single-Unit Trucks %	19%	7.1%	2.8%	0%		7.1%	2%	7.5%	0%	0%		4.6%	1.4%	9.4%	6.2%	0%		7.6%	5.4%	4.2%	9.5%	0%		5%	-
Buses	0	1	1	0		2	0	2	0	0		2	0	1	1	0		2	2	0	0	0		2	-
Buses %	0%	0.2%	1.4%	0%		0.3%	0%	0.8%	0%	0%		0.5%	0%	0.2%	0.8%	0%		0.2%	0.7%	0%	0%	0%		0.3%	-
Articulated Trucks	4	21	0	0		25	0	3	0	0		3	0	17	0	0		17	7	2	0	0		9	-
Articulated Trucks %	19%	3.2%	0%	0%		3.3%	0%	1.3%	0%	0%		0.7%	0%	2.8%	0%	0%		1.9%	2.5%	0.5%	0%	0%		1.2%	-
Bicycles on Road	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-

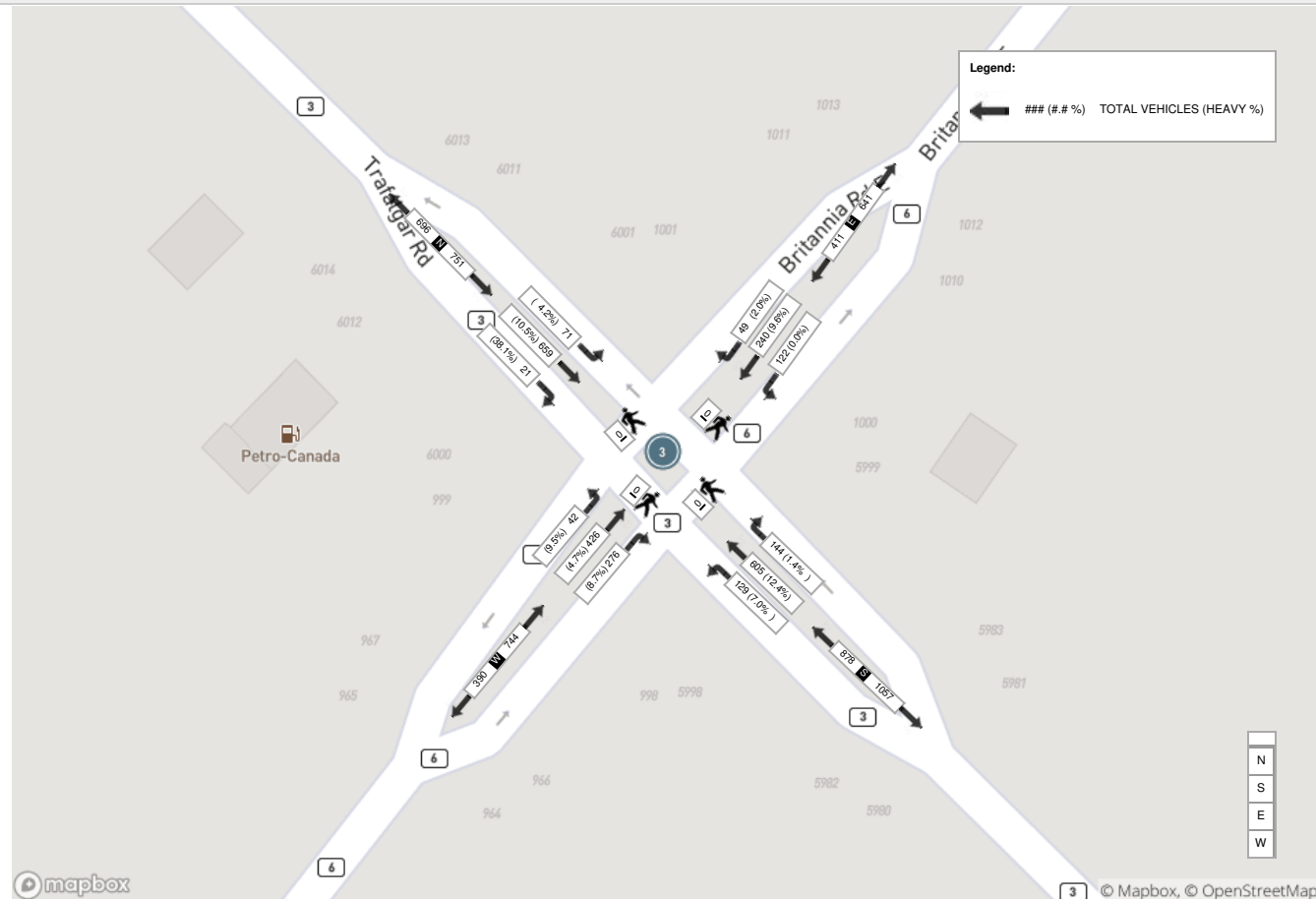
PHF = 0.96



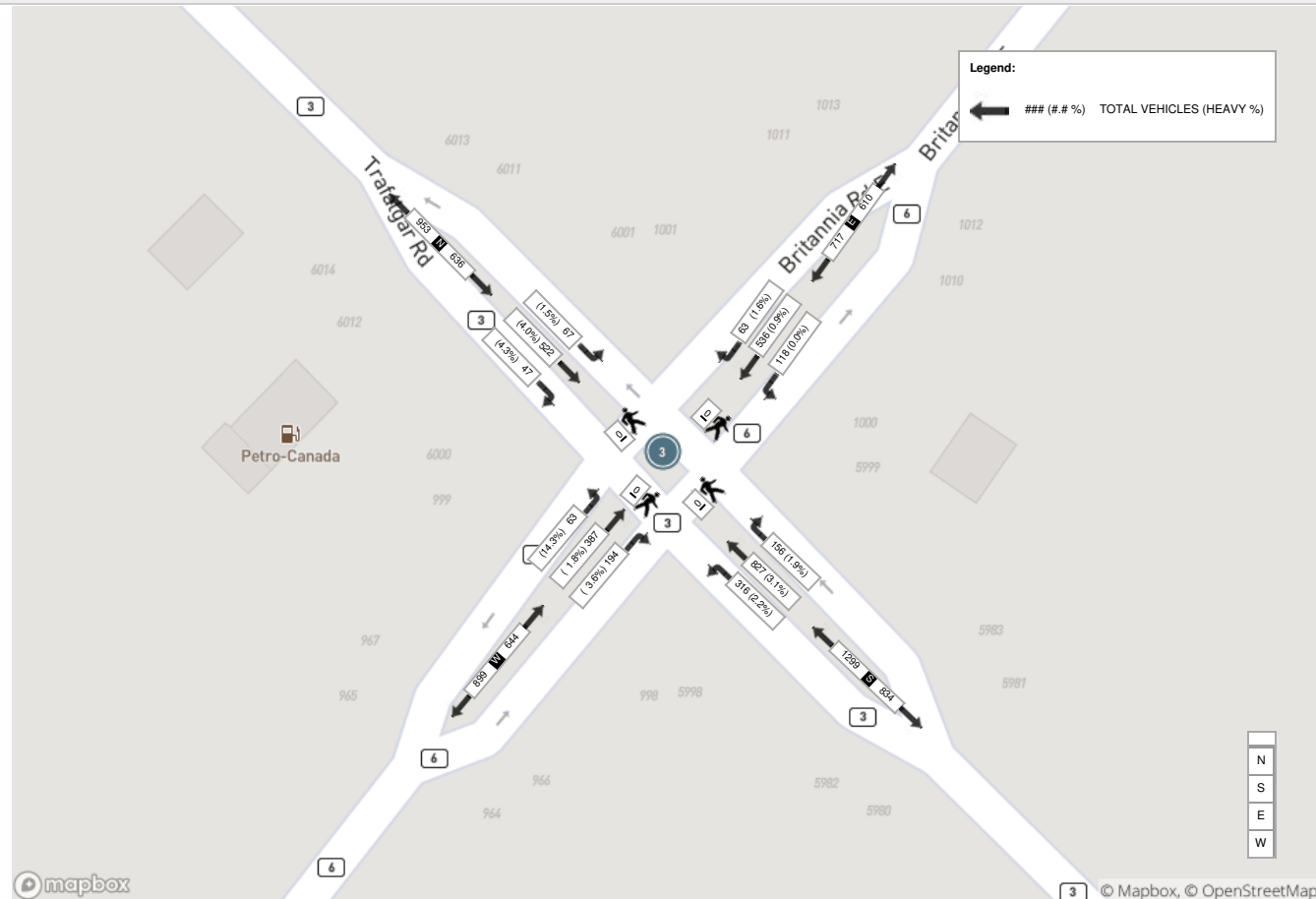
Peak Hour: 04:45 PM - 05:45 PM Weather: Scattered Clouds (16.94 °C)

Start Time	N Approach TRAFALGAR RD						E Approach BRITANNIA RD						S Approach TRAFALGAR RD						W Approach BRITANNIA RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:45:00	11	123	20	0	0	154	8	122	23	0	0	153	25	185	76	0	0	286	52	104	10	0	0	166	759
17:00:00	11	110	14	0	0	135	21	124	29	0	0	174	38	245	84	1	0	368	43	99	17	0	0	159	836
17:15:00	18	157	11	0	0	186	17	145	40	0	0	202	44	207	79	0	0	330	46	92	21	1	0	160	878
17:30:00	7	132	22	0	0	161	17	145	26	0	0	188	49	190	77	0	0	316	53	92	15	0	0	160	825
Grand Total	47	522	67	0	0	636	63	536	118	0	0	717	156	827	316	1	0	1300	194	387	63	1	0	645	3298
Approach%	7.4%	82.1%	10.5%	0%		-	8.8%	74.8%	16.5%	0%		-	12%	63.6%	24.3%	0.1%		-	30.1%	60%	9.8%	0.2%		-	-
Totals %	1.4%	15.8%	2%	0%		19.3%	1.9%	16.3%	3.6%	0%		21.7%	4.7%	25.1%	9.6%	0%		39.4%	5.9%	11.7%	1.9%	0%		19.6%	PHF = 0.94
PHF	0.65	0.83	0.76	0		0.85	0.75	0.92	0.74	0		0.89	0.8	0.84	0.94	0.25		0.88	0.92	0.93	0.75	0.25		0.97	-
Heavy	2	21	1	0		24	1	5	0	0		6	3	26	7	0		36	7	7	9	0		23	-
Heavy %	4.3%	4%	1.5%	0%		3.8%	1.6%	0.9%	0%	0%		0.8%	1.9%	3.1%	2.2%	0%		2.8%	3.6%	1.8%	14.3%	0%		3.6%	-
Lights	45	499	66	0		610	62	531	118	0		711	153	801	309	1		1264	187	380	54	1		622	-
Lights %	95.7%	95.6%	98.5%	0%		95.9%	98.4%	99.1%	100%	0%		99.2%	98.1%	96.9%	97.8%	100%		97.2%	96.4%	98.2%	85.7%	100%		96.4%	-
Single-Unit Trucks	0	15	1	0		16	0	3	0	0		3	2	21	5	0		28	4	6	4	0		14	-
Single-Unit Trucks %	0%	2.9%	1.5%	0%		2.5%	0%	0.6%	0%	0%		0.4%	1.3%	2.5%	1.6%	0%		2.2%	2.1%	1.6%	6.3%	0%		2.2%	-
Buses	0	2	0	0		2	0	1	0	0		1	1	0	1	0		2	2	0	0	0		2	-
Buses %	0%	0.4%	0%	0%		0.3%	0%	0.2%	0%	0%		0.1%	0.6%	0%	0.3%	0%		0.2%	1%	0%	0%	0%		0.3%	-
Articulated Trucks	2	4	0	0		6	1	1	0	0		2	0	5	1	0		6	1	1	5	0		7	-
Articulated Trucks %	4.3%	0.8%	0%	0%		0.9%	1.6%	0.2%	0%	0%		0.3%	0%	0.6%	0.3%	0%		0.5%	0.5%	0.3%	7.9%	0%		1.1%	-
Bicycles on Road	0	2	0	0		2	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Bicycles on Road %	0%	0.4%	0%	0%		0.3%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-

Peak Hour: 07:15 AM - 08:15 AM Weather: Overcast Clouds (12.27 °C)



Peak Hour: 04:45 PM - 05:45 PM Weather: Scattered Clouds (16.94 °C)





Appendix E

Excerpts from Halton Region Access Management Guideline and Halton TMP

Rural/Natural Heritage System (R)

Rural lands are designated areas for agriculture and protection of infrastructure that supports farming and Natural Heritage Areas (NHS) are lands designated for natural area conservation. In planning for new urban areas, the Region is seeking to minimize development of prime agricultural lands. Regional Roads in Rural/NHS lands should respect the rural character of the area.

Corridors (C)

Corridors are urban growth areas identified along major roads, arterials or higher order corridors that have the potential to provide a focus for higher density mixed-use development and employment use consistent with planned transit service levels. The design and physical appearance of corridors contribute directly to livability and economic success and therefore should offer a positive community environment and convenient access for residents and businesses to a variety of goods and services.

Corridors will generally vary in use along their length and their design needs to reflect the change in surroundings. Over time, corridors could include a mix of uses such as: sidewalk-fronting shops or businesses, offices, civic uses appropriately scaled and designed public spaces and a broad mix of residential forms and densities. Corridors that travel through employment lands are to provide for development of quality business environment and include a range of offices, industrial-type buildings and services supporting employment such as business related retail and restaurants located in buildings with doors and windows that front the street.

Node (N)

Nodes are defined as compact, transit-oriented, pedestrian/cyclist friendly and mixed use/residential neighbourhood centers that are areas of more intensive urban uses within a community. They provide area residents with a hub to meet a variety of daily needs (goods and services) and serve as a social focus for the community and as concentrations of office employment uses. Nodes are generally located at the intersections of major corridors within the identified intensification areas and extend approximately 200-400 metres from the intersection.

Halton Region's access spacing guidelines are further refined by providing spacing for cross-section type as identified in the Region's Right-of-Way guidelines. **Please see Appendix B for the individual cross-sections by Rural/NHS (R), Corridor (C) and Node (N).**

Table 1 outlines the minimum spacing requirements for access and road connections to Regional roads. As speed limits increase, greater minimum distance is required between access locations. Access spacing can be reduced to a minimum of 250 metres within the intensification areas (Node) identified within the Regional Official Plan that can be substantiated through the submission of a comprehensive corridor analysis and Transportation Impact Study analyzing all possible alternatives and taking into consideration land use and community factors. Access spacing is measured stop bar to stop bar.

Table 1 – Minimum Access Spacing

TYPE*	Full Movement Access (m)	Right in/out Access (m)
R1	400	115
R2	400	115
C1	400	115
C2	300	115
C3	300	115
C4	300	115
C5	300	115
N1	250	115
N2	250	115

3.4 SIGHT DISTANCE REQUIREMENTS

A safe sight distance is the distance needed by a driver on a Major Arterial, or a driver exiting a driveway or street to verify that the road is clear and to avoid conflicts with other vehicles.

Adequate sight distance must be provided for both movements into and out of an access with a minimum of hazard and disruption to traffic. Sight distance requirements must be considered both for vehicles approaching the access and departing from the stopped position at the access.

The sight distances should be designed to enable existing vehicles:

- Upon turning left or right, to accelerate to the operating speed of the street without causing approaching vehicles to reduce speed by more than 15km/h; and
- Upon turning left, to clear the near half of the street without conflicting with vehicles approaching from the left.

The operating characteristics (driver eye elevation, visibility of the vehicle, and vehicle acceleration characteristics) of both trucks and passenger vehicles should be considered if both vehicle types are anticipated to utilize the access.

3.5 DRIVEWAY AND SITE CONFIGURATION

Driveway location and design affects the ability of a driver to safely and easily enter and exit a site. Road classification, right-of-way, design speed, design hour volumes, and land use influence driveway location and design. For driveways to be permitted along major Regional roads, the design of the proposed driveways should be feasible to minimize interference with the mobility of the through traffic by designing the driveway to provide desirable:

- Driveway width – See Section 5.4 -Table 2
- Driveway radii – See Section 5.4 – Table 3
- Clear throat conditions



Appendix F

Background Development Trip Generation

Report for TAZ:

Mode Split Reduction:

31FB (RNA Assumption)

28%

Land Use	Parameter	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Single-Family Detached Housing ITE LUC 210 1322 Units	Trip Generation Equation or Average Rate	$T = 0.71(X) + 4.8$			$\ln(T) = 0.96\ln(X) + 0.2$		
	Directional Split	25%	75%	-	63%	37%	-
	Gross Trips	244	729	973	822	483	1,305
	Mode Split Reduction (28%)	-69	-204	-273	-229	-136	-365
	Net Trips	175	525	700	593	347	940
Multi-family Housing (Low-rise) ITE LUC 220 1048 Units	Trip Generation Equation or Average Rate	$\ln(T) = 0.95\ln(X) - 0.51$			$\ln(T) = 0.89\ln(X) - 0.02$		
	Directional Split	23%	77%	-	63%	37%	-
	Gross Trips	113	377	490	374	219	593
	Mode Split Reduction (28%)	-31	-106	-137	-105	-61	-166
	Net Trips	82	271	353	269	158	427
Multi-family Housing (Mid-rise) ITE LUC 221 402 Units	Trip Generation Equation or Average Rate	$\ln(T) = 0.98\ln(X) - 0.98$			$\ln(T) = 0.96\ln(X) - 0.63$		
	Directional Split	26%	74%	-	61%	39%	-
	Gross Trips	36	103	139	110	73	183
	Mode Split Reduction (28%)	-10	-28	-38	-31	-21	-52
	Net Trips	26	75	101	79	52	131
Multi-family Housing (High-rise) ITE LUC 222 5732 Units	Trip Generation Equation or Average Rate	$T = 0.28(X) + 12.86$			$T = 0.34(X) + 8.56$		
	Directional Split	24%	76%	-	61%	39%	-
	Gross Trips	414	1,314	1,728	1,238	794	2,032
	Mode Split Reduction (28%)	-116	-368	-483	-347	-222	-569
	Net Trips	299	946	1,245	891	572	1,463
Total Residential 8504 Units	Net Trips	582	1,817	2,399	1,832	1,129	2,961
Shopping Center ITE LUC 820 181000 sq.ft. GFA	Trip Generation Equation or Average Rate	0.94			$\ln(T) = 0.74\ln(X) + 2.89$		
	Directional Split	62%	38%	-	48%	52%	-
	Gross Trips	105	65	170	532	577	1,109
	Mode Split Reduction (28%)	-30	-19	-49	-148	-161	-309
	Pass-by (34% PM)	0	0	0	-140	-140	-279
	Net Trips	75	46	121	244	277	521
Elementary School ITE LUC 520 1450 Students	Trip Generation Equation or Average Rate	0.67			0.17		
	Directional Split	54%	46%	-	48%	52%	-
	Gross Trips	524	448	972	118	128	246
	Mode Split Reduction (28%)	-146	-126	-272	-34	-36	-70
	Net Trips	378	322	700	84	92	176
High School ITE LUC 530 1500 Students	Trip Generation Equation or Average Rate	0.52			0.14		
	Directional Split	67%	33%	-	48%	52%	-
	Gross Trips	523	257	780	101	109	210
	Mode Split Reduction (28%)	-146	-72	-218	-28	-31	-59
	Net Trips	377	185	562	73	78	151
District Park ITE LUC 411 15 Acres	Trip Generation Equation or Average Rate	0.02			$T = 0.06(X) + 22.6$		
	Directional Split	-	-	-	-	-	-
	Gross Trips	0	0	0	13	11	24
	Mode Split Reduction (28%)	0	0	0	0	0	0
	Net Trips	0	0	0	13	11	24
Total Non-Residential	Net Trips	830	553	1,383	414	458	872
Total Trips	Net Trips	1,411	2,371	3,782	2,246	1,587	3,833

Report for TAZ:

41FB (RNA Assumption)

Mode Split Reduction:

28%

Land Use	Parameter	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Single-Family Detached Housing ITE LUC 210 2558 Units	Trip Generation Equation or Average Rate	$T = 0.71(X) + 4.8$			$\ln(T) = 0.96\ln(X) + 0.2$		
	Directional Split	25%	75%	-	63%	37%	-
	Gross Trips	472	1,418	1,890	1,597	938	2,535
	Mode Split Reduction (28%)	-133	-396	-529	-445	-263	-708
	Net Trips	339	1,022	1,361	1,152	675	1,827
Multi-family Housing (Low-rise) ITE LUC 220 2741 Units	Trip Generation Equation or Average Rate	$\ln(T) = 0.95\ln(X) - 0.51$			$\ln(T) = 0.89\ln(X) - 0.02$		
	Directional Split	23%	77%	-	63%	37%	-
	Gross Trips	293	977	1,270	960	564	1,524
	Mode Split Reduction (28%)	-81	-273	-354	-270	-159	-429
	Net Trips	212	704	916	690	405	1,095
Multi-family Housing (Mid-rise) ITE LUC 221 893 Units	Trip Generation Equation or Average Rate	$\ln(T) = 0.98\ln(X) - 0.98$			$\ln(T) = 0.96\ln(X) - 0.63$		
	Directional Split	26%	74%	-	61%	39%	-
	Gross Trips	80	225	305	243	156	399
	Mode Split Reduction (28%)	-23	-63	-86	-68	-45	-113
	Net Trips	57	162	219	175	111	286
Multi-family Housing (High-rise) ITE LUC 222 10159 Units	Trip Generation Equation or Average Rate	$T = 0.28(X) + 12.86$			$T = 0.34(X) + 8.56$		
	Directional Split	24%	76%	-	61%	39%	-
	Gross Trips	727	2,303	3,030	2,182	1,399	3,581
	Mode Split Reduction (28%)	-203	-644	-846	-612	-391	-1,003
	Net Trips	525	1,659	2,184	1,570	1,008	2,578
Total Residential 16351 Units	Net Trips	1,133	3,547	4,680	3,587	2,199	5,786
Shopping Center ITE LUC 820 331000 sq.ft. GFA	Trip Generation Equation or Average Rate	0.94			$\ln(T) = 0.74\ln(X) + 2.89$		
	Directional Split	62%	38%	-	48%	52%	-
	Gross Trips	192	118	310	988	1,070	2,058
	Mode Split Reduction (28%)	-54	-33	-87	-277	-299	-576
	Pass-by (34% PM)	0	0	0	-258	-258	-515
	Net Trips	138	85	223	453	514	967
Elementary School ITE LUC 520 3625 Students	Trip Generation Equation or Average Rate	0.67			0.17		
	Directional Split	54%	46%	-	48%	52%	-
	Gross Trips	1,310	1,120	2,430	295	320	615
	Mode Split Reduction (28%)	-365	-315	-680	-85	-90	-175
	Net Trips	945	805	1,750	210	230	440
High School ITE LUC 530 1500 Students	Trip Generation Equation or Average Rate	0.52			0.14		
	Directional Split	67%	33%	-	48%	52%	-
	Gross Trips	523	257	780	101	109	210
	Mode Split Reduction (28%)	-146	-72	-218	-28	-31	-59
	Net Trips	377	185	562	73	78	151
District Park ITE LUC 411 30 Acres	Trip Generation Equation or Average Rate	0.02			$T = 0.06(X) + 22.6$		
	Directional Split	-	-	-	-	-	-
	Gross Trips	0	0	0	26	22	48
	Mode Split Reduction (28%)	0	0	0	0	0	0
	Net Trips	0	0	0	26	22	48
Total Non-Residential	Net Trips	1,460	1,075	2,535	762	844	1,606
Total Trips	Net Trips	2,592	4,623	7,215	4,349	3,043	7,392

Report for TAZ:
Mode Split Reduction:

Trinison - Frontenac

28%

Land Use	Parameter	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Single-Family Detached Housing ITE LUC 210 435 Units	Trip Generation Equation or Average Rate	$\text{Ln}(T) = 0.91\text{Ln}(X) + 0.12$			$\text{Ln}(T) = 0.94\text{Ln}(X) + 0.27$		
	Directional Split	25%	75%	-	63%	37%	-
	Gross Trips	82	244	326	271	161	432
	Mode Split Reduction (28%)	-23	-68	-91	-76	-46	-122
	Net Trips	59	176	235	195	115	310
Multi-family Housing (Low-rise) ITE LUC 220 855 Units	Trip Generation Equation or Average Rate	$T = 0.31(X) + 22.85$			$T = 0.43(X) + 20.55$		
	Directional Split	24%	76%	-	63%	37%	-
	Gross Trips	97	305	402	309	181	490
	Mode Split Reduction (28%)	-26	-86	-112	-87	-50	-137
	Net Trips	71	219	290	222	131	353
Multi-family Housing (Mid-rise) ITE LUC 221 356 Units	Trip Generation Equation or Average Rate	$T = 0.44(X) - 11.61$			$T = 0.39(X) + 0.34$		
	Directional Split	23%	77%	-	61%	39%	-
	Gross Trips	30	104	134	84	55	139
	Mode Split Reduction (28%)	-8	-29	-37	-24	-15	-39
	Net Trips	22	75	97	60	40	100
Multi-family Housing (High-rise) ITE LUC 222 701 Units	Trip Generation Equation or Average Rate	$T = 0.22(X) + 18.85$			$T = 0.26(X) + 23.12$		
	Directional Split	26%	74%	-	62%	38%	-
	Gross Trips	45	128	173	127	78	205
	Mode Split Reduction (28%)	-13	-36	-49	-36	-22	-58
	Net Trips	32	92	124	91	56	147
Total Residential 2,347 Units	Net Trips	184	562	746	568	342	910
Shopping Center ITE LUC 820 116,000 sq.ft. GFA	Trip Generation Equation or Average Rate	0.84			$\text{Ln}(T) = 0.72\text{Ln}(X) + 3.02$		
	Directional Split	62%	38%	-	48%	52%	-
	Gross Trips	125	77	202	301	327	628
	Mode Split Reduction (28%)	-35	-22	-57	-84	-92	-176
	Pass-by (34% PM)	0	0	0	-74	-74	-148
	Net Trips	90	55	145	143	161	304
Elementary School ITE LUC 520 725 Students	Trip Generation Equation or Average Rate	0.74			0.16		
	Directional Split	54%	46%	-	46%	54%	-
	Gross Trips	290	247	537	53	63	116
	Mode Split Reduction (28%)	-81	-69	-150	-15	-18	-33
	Net Trips	209	178	387	38	45	83
Total Non-Residential	Net Trips	299	233	532	181	206	387
Total Trips	Net Trips	483	795	1,278	749	548	1,297

Report for TAZ:

Mattamy - White Squadron

Mode Split Reduction:

28%

Land Use	Parameter	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Single-Family Detached Housing ITE LUC 210 397 Units	Trip Generation Equation or Average Rate	$\text{Ln}(T) = 0.91\text{Ln}(X) + 0.12$			$\text{Ln}(T) = 0.94\text{Ln}(X) + 0.27$		
	Directional Split	25%	75%	-	63%	37%	-
	Gross Trips	67	200	267	232	136	368
	Mode Split Reduction (28%)	-18	-56	-74	-64	-39	-103
	Net Trips	49	144	193	168	97	265
Multi-family Housing (Low-rise) ITE LUC 220 395 Units	Trip Generation Equation or Average Rate	$T = 0.31(X) + 22.85$			$T = 0.43(X) + 20.55$		
	Directional Split	24%	76%	-	63%	37%	-
	Gross Trips	57	179	236	171	101	272
	Mode Split Reduction (28%)	-17	-51	-68	-48	-29	-77
	Net Trips	40	128	168	123	72	195
Multi-family Housing (Mid-rise) ITE LUC 221 50 Units	Trip Generation Equation or Average Rate	$T = 0.44(X) - 11.61$			$T = 0.39(X) + 0.34$		
	Directional Split	23%	77%	-	61%	39%	-
	Gross Trips	2	8	10	12	8	20
	Mode Split Reduction (28%)	-1	-2	-3	-3	-2	-5
	Net Trips	1	6	7	9	6	15
Multi-family Housing (High-rise) ITE LUC 222 1371 Units	Trip Generation Equation or Average Rate	$T = 0.22(X) + 18.85$			$T = 0.26(X) + 23.12$		
	Directional Split	26%	74%	-	62%	38%	-
	Gross Trips	89	251	340	250	153	403
	Mode Split Reduction (28%)	-25	-71	-96	-70	-43	-113
	Net Trips	64	180	244	180	110	290
Total Residential 2,347 Units	Net Trips	154	458	612	480	285	765
Shopping Center ITE LUC 820 66,000 sq.ft. GFA	Trip Generation Equation or Average Rate	0.84			$\text{Ln}(T) = 0.72\text{Ln}(X) + 3.02$		
	Directional Split	62%	38%	-	48%	52%	-
	Gross Trips	34	21	55	272	295	567
	Mode Split Reduction (28%)	-10	-5	-15	-76	-82	-158
	Pass-by (34% PM)	0	0	0	-66	-66	-132
	Net Trips	24	16	40	130	147	277
Elementary School ITE LUC 520 725 Students	Trip Generation Equation or Average Rate	0.74			0.16		
	Directional Split	54%	46%	-	46%	54%	-
	Gross Trips	290	247	537	53	63	116
	Mode Split Reduction (28%)	-81	-69	-150	-15	-18	-33
	Net Trips	209	178	387	38	45	83
Total Non-Residential	Net Trips	233	194	427	168	192	360
Total Trips	Net Trips	387	652	1,039	648	477	1,125



Appendix G

Trip Distribution Calculation

4.2 Trip Distribution

Trip distribution for the Trafalgar Corridor development area for the 2031 horizon year was estimated using the origin-destination matrices from the Region's 2031 model run with the proposed densities outlined previously. Trip assignment was subsequently estimated for each TAZ based on potential access locations and the route providing the shortest travel time. The external trip distribution for the Trafalgar Corridor for Scenario A and Scenario B is summarized in **Table 4-7**.

Table 4-7: External Trip Distribution Summary

Location	Scenario A				Scenario B			
	AM Peak Period		PM Peak Period		AM Peak Period		PM Peak Period	
	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
Brampton-Caledon	2.80%	2.90%	2.90%	2.80%	2.60%	2.70%	2.70%	2.60%
York	3.50%	0.50%	0.50%	3.50%	3.70%	0.60%	0.60%	3.70%
Halton Hills	6.30%	13.20%	13.20%	6.30%	6.00%	13.40%	13.40%	6.00%
Oakville	5.90%	8.00%	8.00%	5.90%	6.30%	7.80%	7.80%	6.30%
Burlington South	3.90%	5.10%	5.10%	3.90%	3.70%	5.00%	5.00%	3.70%
Burlington North	0.90%	0.70%	0.70%	0.90%	0.70%	0.60%	0.60%	0.70%
Mississauga North-West	1.20%	1.70%	1.70%	1.20%	1.20%	1.60%	1.60%	1.20%
Mississauga Central-West	3.70%	2.90%	2.90%	3.70%	4.00%	2.80%	2.80%	4.00%
Mississauga South-West	0.80%	0.50%	0.50%	0.80%	0.80%	0.60%	0.60%	0.80%
Mississauga North-East	2.30%	2.20%	2.20%	2.30%	2.20%	2.30%	2.30%	2.20%
Mississauga Central-East	2.30%	1.40%	1.40%	2.30%	1.70%	1.60%	1.60%	1.70%
Mississauga South-East	0.20%	1.10%	1.10%	0.20%	0.00%	0.90%	0.90%	0.00%
Toronto South	1.60%	0.80%	0.80%	1.60%	1.40%	0.80%	0.80%	1.40%
Toronto North	1.00%	1.60%	1.60%	1.00%	0.80%	1.60%	1.60%	0.80%
Hamilton South	10.90%	1.60%	1.60%	10.90%	9.50%	1.60%	1.60%	9.50%
Hamilton North	4.30%	4.90%	4.90%	4.30%	3.60%	4.90%	4.90%	3.60%
Milton Downtown	17.00%	24.30%	24.30%	17.00%	18.50%	24.60%	24.60%	18.50%
Milton South	18.30%	14.60%	14.60%	18.30%	18.60%	14.50%	14.50%	18.60%
Milton North-West	13.10%	11.90%	11.90%	13.10%	14.80%	11.80%	11.80%	14.80%
Durham	0.00%	0.40%	0.40%	0.00%	0.00%	0.40%	0.40%	0.00%
Total	100%	100%	100%	100%	100%	100%	100%	100%

The external trip distribution obtained from the Region's EMME model illustrates that most of the trips inbound and outbound are contained within Milton, with the rest heavily destined to or originating from various municipalities within Halton Region.

The Region's EMME model was also used to extract the trip distribution between the zones within the Trafalgar Corridor. The interzonal and intrazonal trip distribution for the Trafalgar Corridor for Scenario A and Scenario B is summarized in **Table 4-8**.

Location	General Direction	Scenario A - Agerton Go Station			
		AM Peak Hour		PM Peak Hour	
		Inbound	Outbound	Inbound	Outbound
Brampton-Caledon	NE	2.80%	2.90%	2.90%	2.80%
York	E	3.50%	0.50%	0.50%	3.50%
Halton Hills	N	6.30%	13.20%	13.20%	6.30%
Oakville	S	5.90%	8.00%	8.00%	5.90%
Burlington South	SW	3.90%	5.10%	5.10%	3.90%
Burlington North	SW	0.90%	0.70%	0.70%	0.90%
Mississauga North-West	E	1.20%	1.70%	1.70%	1.20%
Mississauga Central-West	E	3.70%	2.90%	2.90%	3.70%
Mississauga South-West	SE	0.80%	0.50%	0.50%	0.80%
Mississauga North-East	E	2.30%	2.20%	2.20%	2.30%
Mississauga Central-East	E	2.30%	1.40%	1.40%	2.30%
Mississauga South-East	SE	0.20%	1.10%	1.10%	0.20%
Toronto South	SE	1.60%	0.80%	0.80%	1.60%
Toronto North	E	1.00%	1.60%	1.60%	1.00%
Hamilton South	SW	10.90%	1.60%	1.60%	10.90%
Hamilton North	SW	4.30%	4.90%	4.90%	4.30%
Milton Downtown	NW	17.00%	24.30%	24.30%	17.00%
Milton South	W	18.30%	14.60%	14.60%	18.30%
Milton North-West	NW	13.10%	11.90%	11.90%	13.10%
Durham	NE	0.00%	0.40%	0.40%	0.00%
Total		100.00%	100.30%	100.30%	100.00%

0.033% Modification to apply to all movements to account for rounding errors in TMP Summary table (100.30% total previously)

Direction		AM Peak Hour		PM Peak Hour	
		Inbound	Outbound	Inbound	Outbound
N	via Trafalgar NB	6.30%	13.17%	13.17%	6.30%
	via Hwy 401	15.44%	13.58%	13.58%	15.44%
S	via Trafalgar SB	15.28%	14.47%	14.47%	15.28%
E	via Derry EB	5.25%	4.12%	4.12%	5.25%
	via Britannia EB	8.45%	6.52%	6.52%	8.45%
	via LBL EB	5.39%	4.12%	4.12%	5.39%
W	via Derry WB	13.60%	15.26%	15.26%	13.60%
	via Britannia WB	28.53%	26.87%	26.87%	28.53%
	via LBL WB	1.77%	1.91%	1.91%	1.77%
Total		100%	100%	100%	100%

Overall Directional Distribution

	AM IN	AM OUT	PM IN	PM OUT
N	21.74%	26.74%	26.74%	21.74%
S	15.28%	14.47%	14.47%	15.28%
E	19.09%	14.75%	14.75%	19.09%
W	43.89%	44.04%	44.04%	43.89%
Total	100.00%	100.00%	100.00%	100.00%

			AM (IN)	AM (OUT)	PM (IN)	PM (OUT)
1	Trafalgar Road to/from north		21.74%	26.74%	26.74%	21.74%
2	Eighth Line to/from north		0.00%	0.00%	0.00%	0.00%
3	Derry Road to/from east		5.25%	4.12%	4.12%	5.25%
4	Britannia Road to/from east		8.45%	6.52%	6.52%	8.45%
5	Lower Baseline to/from east		5.39%	4.12%	4.12%	5.39%
6	Trafalgar Road to/from south		15.28%	14.47%	14.47%	15.28%
7	Lower Baseline to/from west		1.77%	1.91%	1.91%	1.77%
8	Britannia Road to/from west		28.53%	26.87%	26.87%	28.53%
9	Derry Road to/from west		13.60%	15.26%	15.26%	13.60%
		Total	100.00%	100.00%	100.00%	100.00%



Appendix H

Baseline SYNCHRO Capacity and Queuing Analysis Reports

Lanes, Volumes, Timings
1: Trafalgar Road & Derry Road

Baseline AM Peak Hour

07/10/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	514	1349	184	65	483	104	60	405	74	43	294	47
Future Volume (vph)	514	1349	184	65	483	104	60	405	74	43	294	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	110.0		85.0	100.0		0.0	100.0		0.0	85.0		85.0
Storage Lanes	1		1	1		0	1		0	1		1
Taper Length (m)	100.0			50.0			50.0			50.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.973			0.977				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1772	3579	1570	1825	3438	0	1706	3314	0	1825	3230	944
Flt Permitted	0.275			0.104			0.485			0.291		
Satd. Flow (perm)	513	3579	1570	200	3438	0	871	3314	0	559	3230	944
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			163		26			22				118
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		227.5			1340.7			2992.0			623.5	
Travel Time (s)		10.2			60.3			179.5			37.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	3%	2%	4%	0%	4%	0%	7%	9%	0%	0%	13%	73%
Adj. Flow (vph)	547	1435	196	69	514	111	64	431	79	46	313	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	547	1435	196	69	625	0	64	510	0	46	313	50
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)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2		1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5		6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	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	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8		6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	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	0.0
Detector 1 Queue (s)	0.0	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	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	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	

Lanes, Volumes, Timings
1: Trafalgar Road & Derry Road

Baseline AM Peak Hour
07/10/2025

	↖	→	↗	↖	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		2	6			8			4		4
Detector Phase	5	2	2	1	6		3	8		7	4	4
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0		6.0	20.0		6.0	20.0	20.0
Minimum Split (s)	10.0	37.9	37.9	10.0	37.9		10.0	36.8		10.0	36.8	36.8
Total Split (s)	10.0	45.0	45.0	10.0	45.0		10.0	45.0		10.0	45.0	45.0
Total Split (%)	9.1%	40.9%	40.9%	9.1%	40.9%		9.1%	40.9%		9.1%	40.9%	40.9%
Maximum Green (s)	6.0	38.1	38.1	6.0	38.1		6.0	38.2		6.0	38.2	38.2
Yellow Time (s)	3.0	4.6	4.6	3.0	4.6		3.0	4.2		3.0	4.2	4.2
All-Red Time (s)	1.0	2.3	2.3	1.0	2.3		1.0	2.6		1.0	2.6	2.6
Lost Time Adjust (s)	-1.0	-2.0	-2.0	-1.0	-2.0		-1.0	-2.0		-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	4.9	4.9	3.0	4.9		3.0	4.8		3.0	4.8	4.8
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	5.0
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None		None	None	None
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	7.0
Flash Dont Walk (s)		24.0	24.0		24.0			23.0			23.0	23.0
Pedestrian Calls (#/hr)		0	0		0			0			0	0
Act Effect Green (s)	66.8	54.2	54.2	52.3	40.1		34.5	27.1		34.5	27.1	27.1
Actuated g/C Ratio	0.61	0.49	0.49	0.48	0.36		0.31	0.25		0.31	0.25	0.25
v/c Ratio	0.97	0.81	0.23	0.28	0.49		0.20	0.61		0.18	0.39	0.16
Control Delay	51.3	31.3	5.9	14.4	27.5		24.1	38.0		23.7	35.4	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	51.3	31.3	5.9	14.4	27.5		24.1	38.0		23.7	35.4	1.0
LOS	D	C	A	B	C		C	D		C	D	A
Approach Delay		34.0			26.2			36.4			29.9	
Approach LOS		C			C			D			C	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 32.5

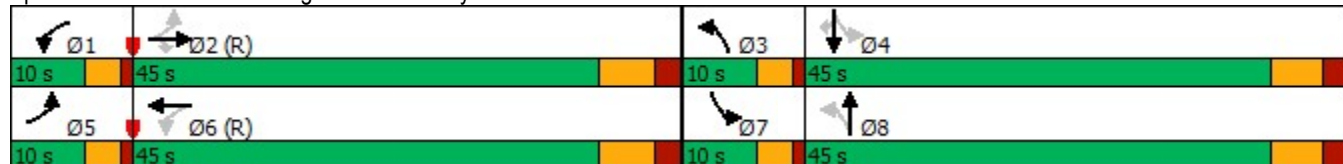
Intersection LOS: C

Intersection Capacity Utilization 81.6%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 1: Trafalgar Road & Derry Road

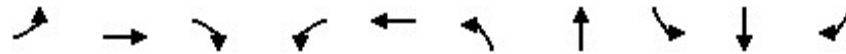


Queues

Baseline AM Peak Hour

1: Trafalgar Road & Derry Road

07/10/2025



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	547	1435	196	69	625	64	510	46	313	50
v/c Ratio	0.97	0.81	0.23	0.28	0.49	0.20	0.61	0.18	0.39	0.16
Control Delay	51.3	31.3	5.9	14.4	27.5	24.1	38.0	23.7	35.4	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.3	31.3	5.9	14.4	27.5	24.1	38.0	23.7	35.4	1.0
Queue Length 50th (m)	~76.8	143.7	3.9	5.9	51.7	9.1	49.1	6.5	29.6	0.0
Queue Length 95th (m)	#167.9	#220.0	19.0	13.5	68.3	16.8	61.4	13.1	39.1	0.0
Internal Link Dist (m)	203.5		1316.7			2968.0			599.5	
Turn Bay Length (m)	110.0	85.0		100.0	100.0			85.0	85.0	
Base Capacity (vph)	564	1762	855	247	1269	326	1225	256	1180	419
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.81	0.23	0.28	0.49	0.20	0.42	0.18	0.27	0.12

Intersection Summary

~ 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.

HCM Signalized Intersection Capacity Analysis

1: Trafalgar Road & Derry Road

Baseline AM Peak Hour

07/10/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	514	1349	184	65	483	104	60	405	74	43	294	47
Future Volume (vph)	514	1349	184	65	483	104	60	405	74	43	294	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9		3.0	4.8		3.0	4.8	4.8
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1772	3579	1570	1825	3440		1706	3313		1825	3230	944
Flt Permitted	0.28	1.00	1.00	0.10	1.00		0.49	1.00		0.29	1.00	1.00
Satd. Flow (perm)	513	3579	1570	201	3440		871	3313		559	3230	944
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	547	1435	196	69	514	111	64	431	79	46	313	50
RTOR Reduction (vph)	0	0	85	0	17	0	0	17	0	0	0	38
Lane Group Flow (vph)	547	1435	111	69	608	0	64	493	0	46	313	12
Heavy Vehicles (%)	3%	2%	4%	0%	4%	0%	7%	9%	0%	0%	13%	73%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6			8			4		4
Actuated Green, G (s)	62.4	50.6	50.6	45.1	37.3		29.9	25.1		29.9	25.1	25.1
Effective Green, g (s)	63.4	52.6	52.6	47.1	39.3		31.9	27.1		31.9	27.1	27.1
Actuated g/C Ratio	0.58	0.48	0.48	0.43	0.36		0.29	0.25		0.29	0.25	0.25
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9		4.0	6.8		4.0	6.8	6.8
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lane Grp Cap (vph)	548	1711	750	215	1229		296	816		228	795	232
v/s Ratio Prot	c0.20	0.40		0.03	0.18		c0.01	c0.15		0.01	0.10	
v/s Ratio Perm	c0.37		0.07	0.11			0.05			0.05		0.01
v/c Ratio	1.00	0.84	0.15	0.32	0.49		0.22	0.60		0.20	0.39	0.05
Uniform Delay, d1	18.8	25.0	16.1	21.5	27.6		28.9	36.7		28.9	34.6	31.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	37.8	5.1	0.4	1.8	1.4		0.8	1.9		0.9	0.7	0.2
Delay (s)	56.6	30.1	16.5	23.4	29.0		29.6	38.6		29.8	35.3	31.9
Level of Service	E	C	B	C	C		C	D		C	D	C
Approach Delay (s)		35.5			28.5			37.6			34.2	
Approach LOS		D			C			D			C	
Intersection Summary												
HCM 2000 Control Delay			34.4			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			110.0			Sum of lost time (s)				15.7		
Intersection Capacity Utilization			81.6%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings

3: Trafalgar Road & Britannia Road

Baseline AM Peak Hour

07/10/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	468	288	127	264	51	135	664	150	74	723	22
Future Volume (vph)	44	468	288	127	264	51	135	664	150	74	723	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0		0.0	215.0		0.0	100.0		0.0	100.0		0.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	30.0			30.0			50.0			50.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850			0.850		0.972			0.996	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1706	5142	1601	1825	4995	1633	1772	3382	0	1789	3435	0
Flt Permitted	0.574			0.350			0.261			0.235		
Satd. Flow (perm)	1031	5142	1601	672	4995	1633	487	3382	0	443	3435	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			274			84		28			3	
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		77.0			86.0			3180.7			2992.0	
Travel Time (s)		4.6			5.2			190.8			179.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	2%	2%	0%	5%	0%	3%	6%	0%	2%	6%	0%
Adj. Flow (vph)	46	493	303	134	278	54	142	699	158	78	761	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	46	493	303	134	278	54	142	857	0	78	784	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)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	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	0.0	
Detector 1 Position(m)	0.0	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	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	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	0.0	
Detector 1 Queue (s)	0.0	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	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	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	

Lanes, Volumes, Timings
3: Trafalgar Road & Britannia Road

Baseline AM Peak Hour

07/10/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8		8	2			6		
Detector Phase	4	4	4	3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	7.0	15.0	15.0	7.0	25.0		7.0	25.0	
Minimum Split (s)	42.0	42.0	42.0	11.0	42.0	42.0	11.0	40.0		11.0	40.0	
Total Split (s)	37.0	37.0	37.0	11.0	48.0	48.0	11.0	41.0		15.0	45.0	
Total Split (%)	35.6%	35.6%	35.6%	10.6%	46.2%	46.2%	10.6%	39.4%		14.4%	43.3%	
Maximum Green (s)	31.0	31.0	31.0	7.0	42.0	42.0	7.0	34.0		11.0	38.0	
Yellow Time (s)	4.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	4.0	6.0	6.0	4.0	7.0		4.0	7.0	
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0		3.0	5.0	
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	
Walk Time (s)	7.0	7.0	7.0		7.0	7.0		7.0			7.0	
Flash Dont Walk (s)	29.0	29.0	29.0		29.0	29.0		26.0			26.0	
Pedestrian Calls (#/hr)	0	0	0		0	0		0			0	
Act Effect Green (s)	21.8	21.8	21.8	34.9	32.9	32.9	48.2	39.6		49.1	38.1	
Actuated g/C Ratio	0.23	0.23	0.23	0.37	0.35	0.35	0.51	0.42		0.52	0.40	
v/c Ratio	0.19	0.42	0.52	0.40	0.16	0.09	0.42	0.60		0.23	0.57	
Control Delay	30.8	31.9	8.7	24.0	21.4	2.0	16.1	25.0		13.3	24.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	30.8	31.9	8.7	24.0	21.4	2.0	16.1	25.0		13.3	24.8	
LOS	C	C	A	C	C	A	B	C		B	C	
Approach Delay		23.5			19.9			23.8			23.8	
Approach LOS		C			B			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 104

Actuated Cycle Length: 95.1

Natural Cycle: 105

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 23.1

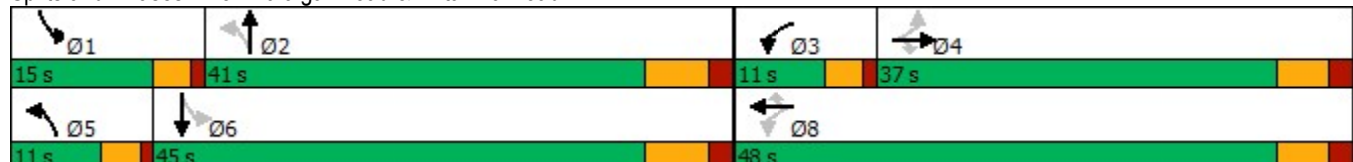
Intersection LOS: C

Intersection Capacity Utilization 73.1%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 3: Trafalgar Road & Britannia Road

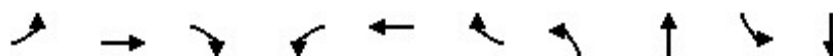


Queues

Baseline AM Peak Hour

3: Trafalgar Road & Britannia Road

07/10/2025



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	46	493	303	134	278	54	142	857	78	784
v/c Ratio	0.19	0.42	0.52	0.40	0.16	0.09	0.42	0.60	0.23	0.57
Control Delay	30.8	31.9	8.7	24.0	21.4	2.0	16.1	25.0	13.3	24.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.8	31.9	8.7	24.0	21.4	2.0	16.1	25.0	13.3	24.8
Queue Length 50th (m)	6.8	28.2	4.2	16.5	12.7	0.0	11.9	62.5	6.3	56.8
Queue Length 95th (m)	15.9	37.7	24.2	28.7	18.6	3.5	25.8	100.0	15.6	87.2
Internal Link Dist (m)		53.0			62.0			3156.7		2968.0
Turn Bay Length (m)	120.0			215.0			100.0		100.0	
Base Capacity (vph)	337	1681	708	331	2213	770	341	1425	399	1379
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.29	0.43	0.40	0.13	0.07	0.42	0.60	0.20	0.57

Intersection Summary

HCM Signalized Intersection Capacity Analysis

3: Trafalgar Road & Britannia Road

Baseline AM Peak Hour

07/10/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Traffic Volume (vph)	44	468	288	127	264	51	135	664	150	74	723	22
Future Volume (vph)	44	468	288	127	264	51	135	664	150	74	723	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	4.0	6.0	6.0	4.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1706	5142	1601	1825	4995	1633	1772	3384		1789	3434	
Flt Permitted	0.57	1.00	1.00	0.35	1.00	1.00	0.26	1.00		0.24	1.00	
Satd. Flow (perm)	1031	5142	1601	673	4995	1633	486	3384		443	3434	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	46	493	303	134	278	54	142	699	158	78	761	23
RTOR Reduction (vph)	0	0	211	0	0	35	0	16	0	0	2	0
Lane Group Flow (vph)	46	493	92	134	278	19	142	841	0	78	782	0
Heavy Vehicles (%)	7%	2%	2%	0%	5%	0%	3%	6%	0%	2%	6%	0%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	21.9	21.9	21.9	32.9	32.9	32.9	46.6	39.6		45.4	39.0	
Effective Green, g (s)	21.9	21.9	21.9	32.9	32.9	32.9	46.6	39.6		45.4	39.0	
Actuated g/C Ratio	0.23	0.23	0.23	0.34	0.34	0.34	0.49	0.41		0.47	0.41	
Clearance Time (s)	6.0	6.0	6.0	4.0	6.0	6.0	4.0	7.0		4.0	7.0	
Vehicle Extension (s)	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	235	1174	365	314	1713	560	330	1397		299	1396	
v/s Ratio Prot		0.10		c0.03	0.06		c0.03	c0.25		0.02	0.23	
v/s Ratio Perm	0.04		0.06	c0.11		0.01	0.18			0.11		
v/c Ratio	0.20	0.42	0.25	0.43	0.16	0.03	0.43	0.60		0.26	0.56	
Uniform Delay, d1	29.9	31.6	30.3	22.6	21.9	20.9	14.5	22.0		14.7	21.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.5	0.8	0.9	0.1	0.1	0.9	1.9		0.5	1.6	
Delay (s)	30.7	32.1	31.0	23.5	22.0	21.0	15.4	23.9		15.1	23.5	
Level of Service	C	C	C	C	C	C	B	C		B	C	
Approach Delay (s)		31.6			22.3			22.7			22.7	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			25.0			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			95.9			Sum of lost time (s)				21.0		
Intersection Capacity Utilization			73.1%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
1: Trafalgar Road & Derry Road

Baseline PM Peak Hour

07/10/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	651	110	69	1157	99	121	597	49	106	318	115
Future Volume (vph)	171	651	110	69	1157	99	121	597	49	106	318	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	110.0		85.0	100.0		0.0	100.0		0.0	85.0		85.0
Storage Lanes	1		1	1		0	1		0	1		1
Taper Length (m)	100.0			50.0			50.0			50.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.988			0.989				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1560	3544	1601	1772	3573	0	1789	3481	0	1807	3544	1420
Flt Permitted	0.080			0.320			0.426			0.204		
Satd. Flow (perm)	131	3544	1601	597	3573	0	802	3481	0	388	3544	1420
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			138		8			7				139
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		227.5			1340.7			2992.0			623.5	
Travel Time (s)		10.2			60.3			179.5			37.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	17%	3%	2%	3%	1%	0%	2%	4%	0%	1%	3%	15%
Adj. Flow (vph)	182	693	117	73	1231	105	129	635	52	113	338	122
Shared Lane Traffic (%)												
Lane Group Flow (vph)	182	693	117	73	1336	0	129	687	0	113	338	122
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)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2		1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5		6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	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	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8		6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	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	0.0
Detector 1 Queue (s)	0.0	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	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	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	

Lanes, Volumes, Timings
1: Trafalgar Road & Derry Road

Baseline PM Peak Hour
07/10/2025

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		2	6			8			4		4
Detector Phase	5	2	2	1	6		3	8		7	4	4
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0		7.0	20.0		7.0	20.0	20.0
Minimum Split (s)	11.0	37.9	37.9	11.0	37.9		11.0	36.8		11.0	36.8	36.8
Total Split (s)	15.0	50.0	50.0	15.0	50.0		20.0	45.0		15.0	40.0	40.0
Total Split (%)	12.0%	40.0%	40.0%	12.0%	40.0%		16.0%	36.0%		12.0%	32.0%	32.0%
Maximum Green (s)	11.0	43.1	43.1	11.0	43.1		16.0	38.2		11.0	33.2	33.2
Yellow Time (s)	3.0	4.6	4.6	3.0	4.6		3.0	4.2		3.0	4.2	4.2
All-Red Time (s)	1.0	2.3	2.3	1.0	2.3		1.0	2.6		1.0	2.6	2.6
Lost Time Adjust (s)	-1.0	-2.0	-2.0	-1.0	-2.0		-1.0	-2.0		-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	4.9	4.9	3.0	4.9		3.0	4.8		3.0	4.8	4.8
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	5.0
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None		None	None	None
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	7.0
Flash Dont Walk (s)		24.0	24.0		24.0			23.0			23.0	23.0
Pedestrian Calls (#/hr)		0	0		0			0			0	0
Act Effect Green (s)	66.1	53.7	53.7	60.4	47.7		50.9	35.5		46.6	33.1	33.1
Actuated g/C Ratio	0.53	0.43	0.43	0.48	0.38		0.41	0.28		0.37	0.26	0.26
v/c Ratio	0.78	0.46	0.15	0.19	0.98		0.30	0.69		0.41	0.36	0.26
Control Delay	51.8	28.3	3.2	16.7	57.8		23.9	43.1		26.5	38.2	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	51.8	28.3	3.2	16.7	57.8		23.9	43.1		26.5	38.2	5.3
LOS	D	C	A	B	E		C	D		C	D	A
Approach Delay		29.7			55.7			40.0			28.9	
Approach LOS		C			E			D			C	

Intersection Summary

Area Type: Other

Cycle Length: 125

Actuated Cycle Length: 125

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 41.5

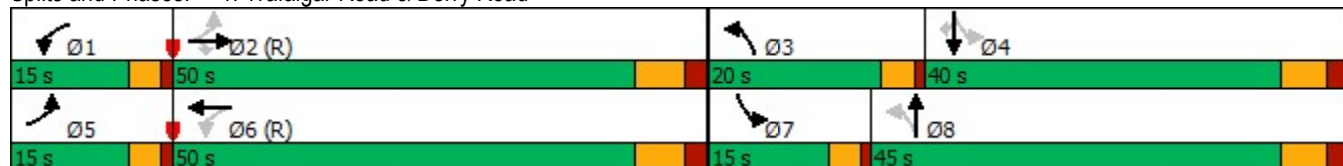
Intersection LOS: D

Intersection Capacity Utilization 83.3%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 1: Trafalgar Road & Derry Road



Queues
1: Trafalgar Road & Derry Road

Baseline PM Peak Hour
07/10/2025

										
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	182	693	117	73	1336	129	687	113	338	122
v/c Ratio	0.78	0.46	0.15	0.19	0.98	0.30	0.69	0.41	0.36	0.26
Control Delay	51.8	28.3	3.2	16.7	57.8	23.9	43.1	26.5	38.2	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.8	28.3	3.2	16.7	57.8	23.9	43.1	26.5	38.2	5.3
Queue Length 50th (m)	29.2	66.2	0.0	8.6	~184.7	19.3	77.7	16.7	35.1	0.0
Queue Length 95th (m)	#75.3	89.4	8.6	17.3	#227.6	30.5	94.0	27.2	48.0	10.9
Internal Link Dist (m)	203.5			1316.7			2968.0			599.5
Turn Bay Length (m)	110.0			85.0	100.0			100.0	85.0	85.0
Base Capacity (vph)	234	1523	767	406	1368	467	1124	281	998	499
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.46	0.15	0.18	0.98	0.28	0.61	0.40	0.34	0.24

Intersection Summary

~ 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.

HCM Signalized Intersection Capacity Analysis

1: Trafalgar Road & Derry Road

Baseline PM Peak Hour

07/10/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	651	110	69	1157	99	121	597	49	106	318	115
Future Volume (vph)	171	651	110	69	1157	99	121	597	49	106	318	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9		3.0	4.8		3.0	4.8	4.8
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1560	3544	1601	1772	3574		1789	3480		1807	3544	1420
Flt Permitted	0.08	1.00	1.00	0.32	1.00		0.43	1.00		0.20	1.00	1.00
Satd. Flow (perm)	132	3544	1601	596	3574		803	3480		389	3544	1420
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	182	693	117	73	1231	105	129	635	52	113	338	122
RTOR Reduction (vph)	0	0	67	0	5	0	0	5	0	0	0	90
Lane Group Flow (vph)	182	693	50	73	1331	0	129	682	0	113	338	32
Heavy Vehicles (%)	17%	3%	2%	3%	1%	0%	2%	4%	0%	1%	3%	15%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6			8			4		4
Actuated Green, G (s)	63.1	50.9	50.9	53.9	45.7		46.6	33.5		41.8	31.1	31.1
Effective Green, g (s)	64.1	52.9	52.9	55.9	47.7		48.6	35.5		43.8	33.1	33.1
Actuated g/C Ratio	0.51	0.42	0.42	0.45	0.38		0.39	0.28		0.35	0.26	0.26
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9		4.0	6.8		4.0	6.8	6.8
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lane Grp Cap (vph)	232	1499	677	353	1363		423	988		269	938	376
v/s Ratio Prot	c0.09	0.20		0.02	c0.37		c0.03	c0.20		c0.04	0.10	
v/s Ratio Perm	0.31		0.03	0.08			0.08			0.11		0.02
v/c Ratio	0.78	0.46	0.07	0.21	0.98		0.30	0.69		0.42	0.36	0.09
Uniform Delay, d1	33.7	25.9	21.5	20.2	38.1		25.4	39.9		29.2	37.3	34.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	18.1	1.0	0.2	0.6	19.4		0.9	2.7		2.2	0.5	0.2
Delay (s)	51.8	26.9	21.7	20.8	57.5		26.3	42.5		31.4	37.8	34.8
Level of Service	D	C	C	C	E		C	D		C	D	C
Approach Delay (s)		30.8			55.6			39.9			35.9	
Approach LOS		C			E			D			D	
Intersection Summary												
HCM 2000 Control Delay			42.8			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			125.0			Sum of lost time (s)				15.7		
Intersection Capacity Utilization			83.3%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings

3: Trafalgar Road & Britannia Road

Baseline PM Peak Hour

07/10/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Traffic Volume (vph)	66	425	202	123	588	66	329	907	163	70	573	49
Future Volume (vph)	66	425	202	123	588	66	329	907	163	70	573	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0		0.0	215.0		0.0	100.0		0.0	100.0		0.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	30.0			30.0			50.0			50.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850			0.850		0.977			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1755	5142	1617	1825	5193	1601	1772	3507	0	1772	3470	0
Flt Permitted	0.406			0.336			0.291			0.188		
Satd. Flow (perm)	750	5142	1617	645	5193	1601	543	3507	0	351	3470	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			213			101		21			8	
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		77.0			86.0			3180.7			2992.0	
Travel Time (s)		4.6			5.2			190.8			179.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	4%	2%	1%	0%	1%	2%	3%	2%	0%	3%	4%	3%
Adj. Flow (vph)	69	447	213	129	619	69	346	955	172	74	603	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	69	447	213	129	619	69	346	1127	0	74	655	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)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	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	0.0	
Detector 1 Position(m)	0.0	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	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	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	0.0	
Detector 1 Queue (s)	0.0	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	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	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	

Lanes, Volumes, Timings
3: Trafalgar Road & Britannia Road

Baseline PM Peak Hour
07/10/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8		8	2			6		
Detector Phase	4	4	4	3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	7.0	15.0	15.0	7.0	25.0		7.0	25.0	
Minimum Split (s)	42.0	42.0	42.0	11.0	42.0	42.0	11.0	40.0		11.0	40.0	
Total Split (s)	40.0	40.0	40.0	15.0	55.0	55.0	25.0	64.0		11.0	50.0	
Total Split (%)	30.8%	30.8%	30.8%	11.5%	42.3%	42.3%	19.2%	49.2%		8.5%	38.5%	
Maximum Green (s)	34.0	34.0	34.0	11.0	49.0	49.0	21.0	57.0		7.0	43.0	
Yellow Time (s)	4.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	-1.0	-2.0	0.0	-1.0	-2.0	0.0	-1.0	-2.0		-1.0	-2.0	
Total Lost Time (s)	5.0	4.0	6.0	3.0	4.0	6.0	3.0	5.0		3.0	5.0	
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0		3.0	5.0	
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	
Walk Time (s)	7.0	7.0	7.0		7.0	7.0		7.0			7.0	
Flash Dont Walk (s)	29.0	29.0	29.0		29.0	29.0		26.0			26.0	
Pedestrian Calls (#/hr)	0	0	0		0	0		0			0	
Act Effect Green (s)	23.8	24.8	22.8	39.9	38.9	36.9	70.3	59.8		58.1	48.0	
Actuated g/C Ratio	0.20	0.21	0.20	0.34	0.33	0.32	0.60	0.51		0.50	0.41	
v/c Ratio	0.45	0.41	0.44	0.39	0.36	0.12	0.68	0.62		0.27	0.46	
Control Delay	51.0	40.4	7.9	30.4	29.6	2.3	19.7	23.5		15.0	27.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	51.0	40.4	7.9	30.4	29.6	2.3	19.7	23.5		15.0	27.5	
LOS	D	D	A	C	C	A	B	C		B	C	
Approach Delay		31.9			27.5			22.6			26.3	
Approach LOS		C			C			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 116.3

Natural Cycle: 105

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 26.2

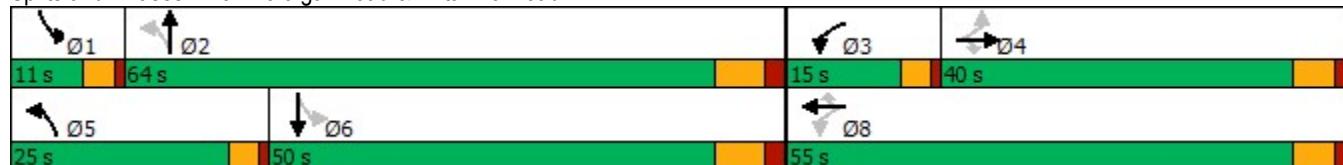
Intersection LOS: C

Intersection Capacity Utilization 78.2%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 3: Trafalgar Road & Britannia Road

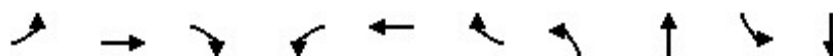


Queues

Baseline PM Peak Hour

3: Trafalgar Road & Britannia Road

07/10/2025



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	69	447	213	129	619	69	346	1127	74	655
v/c Ratio	0.45	0.41	0.44	0.39	0.36	0.12	0.68	0.62	0.27	0.46
Control Delay	51.0	40.4	7.9	30.4	29.6	2.3	19.7	23.5	15.0	27.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.0	40.4	7.9	30.4	29.6	2.3	19.7	23.5	15.0	27.5
Queue Length 50th (m)	14.3	33.2	0.0	21.1	39.6	0.0	35.8	94.7	6.4	54.8
Queue Length 95th (m)	28.7	43.3	18.5	35.0	49.5	4.2	67.3	142.3	15.8	88.7
Internal Link Dist (m)		53.0			62.0			3156.7		2968.0
Turn Bay Length (m)	120.0			215.0			100.0		100.0	
Base Capacity (vph)	227	1607	627	344	2299	739	563	1814	273	1436
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.28	0.34	0.38	0.27	0.09	0.61	0.62	0.27	0.46
Intersection Summary										

HCM Signalized Intersection Capacity Analysis

3: Trafalgar Road & Britannia Road

Baseline PM Peak Hour

07/10/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Traffic Volume (vph)	66	425	202	123	588	66	329	907	163	70	573	49
Future Volume (vph)	66	425	202	123	588	66	329	907	163	70	573	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	4.0	6.0	3.0	4.0	6.0	3.0	5.0		3.0	5.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1755	5142	1617	1825	5193	1601	1772	3507		1772	3471	
Flt Permitted	0.41	1.00	1.00	0.34	1.00	1.00	0.29	1.00		0.19	1.00	
Satd. Flow (perm)	751	5142	1617	646	5193	1601	542	3507		350	3471	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	69	447	213	129	619	69	346	955	172	74	603	52
RTOR Reduction (vph)	0	0	171	0	0	47	0	10	0	0	5	0
Lane Group Flow (vph)	69	447	42	129	619	22	346	1117	0	74	650	0
Heavy Vehicles (%)	4%	2%	1%	0%	1%	2%	3%	2%	0%	3%	4%	3%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	22.9	22.9	22.9	36.9	36.9	36.9	67.2	57.8		52.3	46.9	
Effective Green, g (s)	23.9	24.9	22.9	37.9	38.9	36.9	68.2	59.8		54.3	48.9	
Actuated g/C Ratio	0.20	0.21	0.20	0.32	0.33	0.32	0.58	0.51		0.46	0.42	
Clearance Time (s)	6.0	6.0	6.0	4.0	6.0	6.0	4.0	7.0		4.0	7.0	
Vehicle Extension (s)	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	153	1093	316	319	1725	504	497	1790		240	1449	
v/s Ratio Prot		0.09		c0.04	0.12		c0.10	0.32		0.02	0.19	
v/s Ratio Perm	c0.09		0.03	0.09		0.01	c0.30			0.13		
v/c Ratio	0.45	0.41	0.13	0.40	0.36	0.04	0.70	0.62		0.31	0.45	
Uniform Delay, d1	40.8	39.8	38.9	29.2	29.6	27.8	14.3	20.6		18.3	24.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.4	0.5	0.4	0.8	0.3	0.1	4.2	1.7		0.7	1.0	
Delay (s)	45.2	40.3	39.3	30.0	29.9	27.9	18.5	22.2		19.1	25.4	
Level of Service	D	D	D	C	C	C	B	C		B	C	
Approach Delay (s)		40.5			29.8			21.3			24.8	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			27.6			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			117.1			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			78.2%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												



Appendix I

Future Background SYNCHRO Capacity and Queuing Analysis Reports



2031 Future Background

Lanes, Volumes, Timings
1: Trafalgar Road & Derry Road

2031 FB AM Peak Hour

06/17/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	514	1660	223	65	741	414	198	893	74	110	501	47
Future Volume (vph)	514	1660	223	65	741	414	198	893	74	110	501	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	130.0		110.0	300.0		70.0	110.0		70.0	130.0		85.0
Storage Lanes	2		1	1		1	2		1	2		1
Taper Length (m)	50.0			50.0			50.0			50.0		
Lane Util. Factor	0.97	*0.80	1.00	1.00	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3437	4520	1570	1825	4433	1633	3309	4230	1633	3541	4080	944
Flt Permitted	0.950			0.083			0.950			0.950		
Satd. Flow (perm)	3437	4520	1570	159	4433	1633	3309	4230	1633	3541	4080	944
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			223			154			124			155
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		455.0			198.7			323.1			623.5	
Travel Time (s)		20.5			8.9			19.4			37.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	2%	4%	0%	4%	0%	7%	9%	0%	0%	13%	73%
Adj. Flow (vph)	514	1660	223	65	741	414	198	893	74	110	501	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	514	1660	223	65	741	414	198	893	74	110	501	47
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)		7.4			7.4			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	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	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	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	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	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	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	Prot	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	

Lanes, Volumes, Timings
1: Trafalgar Road & Derry Road

2031 FB AM Peak Hour

06/17/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			2	6		6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	7.0	10.0	10.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	37.9	37.9	11.0	37.9	37.9	11.0	36.8	36.8	11.0	36.8	36.8
Total Split (s)	32.0	70.0	70.0	11.0	49.0	49.0	19.0	48.0	48.0	11.0	40.0	40.0
Total Split (%)	22.9%	50.0%	50.0%	7.9%	35.0%	35.0%	13.6%	34.3%	34.3%	7.9%	28.6%	28.6%
Maximum Green (s)	28.0	63.1	63.1	7.0	42.1	42.1	15.0	41.2	41.2	7.0	33.2	33.2
Yellow Time (s)	3.0	4.6	4.6	3.0	4.6	4.6	3.0	4.2	4.2	3.0	4.2	4.2
All-Red Time (s)	1.0	2.3	2.3	1.0	2.3	2.3	1.0	2.6	2.6	1.0	2.6	2.6
Lost Time Adjust (s)	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.8	4.8	3.0	4.8	4.8
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	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)		24.0	24.0		24.0	24.0		23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	26.2	69.0	69.0	59.5	49.0	49.0	15.2	41.1	41.1	8.0	33.9	33.9
Actuated g/C Ratio	0.19	0.49	0.49	0.42	0.35	0.35	0.11	0.29	0.29	0.06	0.24	0.24
v/c Ratio	0.80	0.75	0.25	0.38	0.48	0.62	0.55	0.72	0.13	0.54	0.51	0.14
Control Delay	70.9	29.5	4.9	29.3	37.6	28.9	86.8	54.5	11.2	74.7	47.7	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.9	29.5	4.9	29.3	37.6	28.9	86.8	54.5	11.2	74.7	47.7	0.8
LOS	E	C	A	C	D	C	F	D	B	E	D	A
Approach Delay		36.1			34.2			57.3			48.8	
Approach LOS		D			C			E			D	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 41.7

Intersection LOS: D

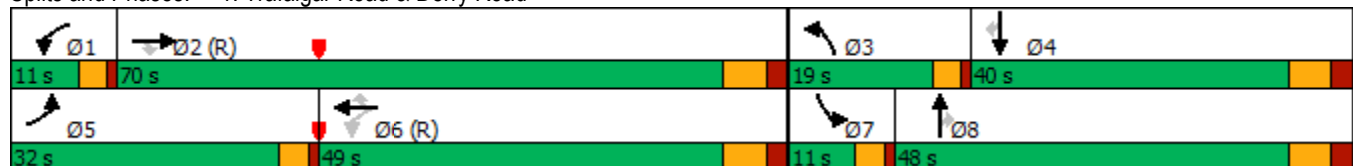
Intersection Capacity Utilization 75.7%

ICU Level of Service D

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 1: Trafalgar Road & Derry Road



Queues

2031 FB AM Peak Hour

1: Trafalgar Road & Derry Road

06/17/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	514	1660	223	65	741	414	198	893	74	110	501	47
v/c Ratio	0.80	0.75	0.25	0.38	0.48	0.62	0.55	0.72	0.13	0.54	0.51	0.14
Control Delay	70.9	29.5	4.9	29.3	37.6	28.9	86.8	54.5	11.2	74.7	47.7	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.9	29.5	4.9	29.3	37.6	28.9	86.8	54.5	11.2	74.7	47.7	0.8
Queue Length 50th (m)	78.2	107.2	0.0	8.3	74.1	69.7	30.1	55.8	3.0	15.5	49.6	0.0
Queue Length 95th (m)	96.4	133.9	21.3	17.6	94.5	51.1	42.8	94.0	15.6	25.5	63.4	0.0
Internal Link Dist (m)		431.0			174.7			299.1			599.5	
Turn Bay Length (m)	130.0		110.0	300.0		70.0	110.0		70.0	130.0		85.0
Base Capacity (vph)	711	2228	887	169	1552	671	378	1305	589	202	1025	353
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.75	0.25	0.38	0.48	0.62	0.52	0.68	0.13	0.54	0.49	0.13
Intersection Summary												

HCM Signalized Intersection Capacity Analysis

2031 FB AM Peak Hour

1: Trafalgar Road & Derry Road

06/17/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	514	1660	223	65	741	414	198	893	74	110	501	47
Future Volume (vph)	514	1660	223	65	741	414	198	893	74	110	501	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.8	4.8	3.0	4.8	4.8
Lane Util. Factor	0.97	*0.80	1.00	1.00	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3437	4520	1570	1825	4433	1633	3309	4230	1633	3541	4080	944
Flt Permitted	0.95	1.00	1.00	0.08	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3437	4520	1570	160	4433	1633	3309	4230	1633	3541	4080	944
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	514	1660	223	65	741	414	198	893	74	110	501	47
RTOR Reduction (vph)	0	0	114	0	0	100	0	0	52	0	0	36
Lane Group Flow (vph)	514	1660	109	65	741	314	198	893	22	110	501	11
Heavy Vehicles (%)	3%	2%	4%	0%	4%	0%	7%	9%	0%	0%	13%	73%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6			8			4
Actuated Green, G (s)	25.2	66.2	66.2	53.0	47.0	47.0	14.2	39.1	39.1	7.0	31.9	31.9
Effective Green, g (s)	26.2	68.2	68.2	55.0	49.0	49.0	15.2	41.1	41.1	8.0	33.9	33.9
Actuated g/C Ratio	0.19	0.49	0.49	0.39	0.35	0.35	0.11	0.29	0.29	0.06	0.24	0.24
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.8	6.8	4.0	6.8	6.8
Vehicle Extension (s)	3.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	643	2201	764	146	1551	571	359	1241	479	202	987	228
v/s Ratio Prot	c0.15	c0.37		0.02	0.17		c0.06	c0.21		0.03	0.12	
v/s Ratio Perm			0.07	0.15		0.19			0.01			0.01
v/c Ratio	0.80	0.75	0.14	0.45	0.48	0.55	0.55	0.72	0.05	0.54	0.51	0.05
Uniform Delay, d1	54.4	29.1	19.8	28.7	35.5	36.6	59.2	44.3	35.4	64.2	45.8	40.7
Progression Factor	1.17	0.94	1.70	1.15	1.00	1.02	1.37	1.16	19.82	1.00	1.00	1.00
Incremental Delay, d2	4.9	1.7	0.3	4.3	1.0	3.7	2.8	2.3	0.1	5.2	0.9	0.2
Delay (s)	68.7	29.0	34.0	37.3	36.5	40.9	84.1	53.6	701.9	69.4	46.7	40.9
Level of Service	E	C	C	D	D	D	F	D	F	E	D	D
Approach Delay (s)		38.0			38.0			100.0			50.1	
Approach LOS		D			D			F			D	
Intersection Summary												
HCM 2000 Control Delay			52.7		HCM 2000 Level of Service					D		
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			140.0		Sum of lost time (s)					15.7		
Intersection Capacity Utilization			75.7%		ICU Level of Service					D		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
3: Trafalgar Road & Britannia Road

2031 FB AM Peak Hour

06/17/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	164	713	301	173	699	188	159	967	169	120	1083	344
Future Volume (vph)	164	713	301	173	699	188	159	967	169	120	1083	344
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	125.0		85.0	90.0		70.0	165.0		70.0	140.0		140.0
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (m)	50.0			50.0			50.0			50.0		
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3309	4520	1601	3541	4391	1633	1772	4350	1633	1789	4350	1633
Flt Permitted	0.950			0.950			0.141			0.190		
Satd. Flow (perm)	3309	4520	1601	3541	4391	1633	263	4350	1633	358	4350	1633
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			153			173			169			341
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		503.1			219.2			264.1			430.6	
Travel Time (s)		30.2			13.2			15.8			25.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	7%	2%	2%	0%	5%	0%	3%	6%	0%	2%	6%	0%
Adj. Flow (vph)	164	713	301	173	699	188	159	967	169	120	1083	344
Shared Lane Traffic (%)												
Lane Group Flow (vph)	164	713	301	173	699	188	159	967	169	120	1083	344
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)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	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	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	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	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	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	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	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

Lanes, Volumes, Timings
3: Trafalgar Road & Britannia Road

2031 FB AM Peak Hour

06/17/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			4			8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0	15.0	7.0	25.0	25.0	7.0	25.0	25.0
Minimum Split (s)	11.0	40.0	40.0	11.0	40.0	40.0	11.0	41.0	41.0	11.0	41.0	41.0
Total Split (s)	20.0	44.0	44.0	20.0	44.0	44.0	14.0	65.0	65.0	11.0	62.0	62.0
Total Split (%)	14.3%	31.4%	31.4%	14.3%	31.4%	31.4%	10.0%	46.4%	46.4%	7.9%	44.3%	44.3%
Maximum Green (s)	16.0	38.0	38.0	16.0	38.0	38.0	10.0	58.0	58.0	7.0	55.0	55.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	13.3	37.0	37.0	13.2	36.9	36.9	78.8	65.9	65.9	74.9	63.9	63.9
Actuated g/C Ratio	0.10	0.26	0.26	0.09	0.26	0.26	0.56	0.47	0.47	0.54	0.46	0.46
v/c Ratio	0.52	0.60	0.56	0.52	0.60	0.34	0.60	0.47	0.20	0.42	0.55	0.37
Control Delay	66.1	46.8	24.8	80.3	39.4	9.1	36.1	12.1	0.7	26.2	37.0	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.1	46.8	24.8	80.3	39.4	9.1	36.1	12.1	0.7	26.2	37.0	11.4
LOS	E	D	C	F	D	A	D	B	A	C	D	B
Approach Delay		43.9			40.7			13.5			30.5	
Approach LOS		D			D			B			C	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 50 (36%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 31.4

Intersection LOS: C

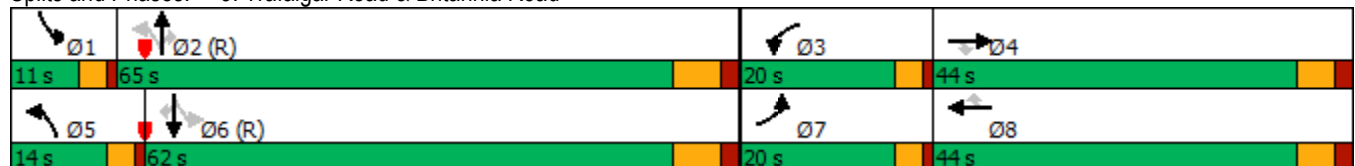
Intersection Capacity Utilization 63.5%

ICU Level of Service B

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 3: Trafalgar Road & Britannia Road



Queues
3: Trafalgar Road & Britannia Road

2031 FB AM Peak Hour
06/17/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	164	713	301	173	699	188	159	967	169	120	1083	344
v/c Ratio	0.52	0.60	0.56	0.52	0.60	0.34	0.60	0.47	0.20	0.42	0.55	0.37
Control Delay	66.1	46.8	24.8	80.3	39.4	9.1	36.1	12.1	0.7	26.2	37.0	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.1	46.8	24.8	80.3	39.4	9.1	36.1	12.1	0.7	26.2	37.0	11.4
Queue Length 50th (m)	22.6	71.2	34.4	25.1	65.6	3.2	10.4	50.5	0.1	13.7	112.1	9.5
Queue Length 95th (m)	33.6	85.0	62.7	m35.7	78.0	m14.9	41.2	38.1	0.3	37.5	144.2	47.4
Internal Link Dist (m)	479.1				195.2				240.1			
Turn Bay Length (m)	125.0		85.0	90.0		70.0	165.0		70.0	140.0		140.0
Base Capacity (vph)	401	1306	571	429	1266	594	272	2046	857	283	1986	931
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.55	0.53	0.40	0.55	0.32	0.58	0.47	0.20	0.42	0.55	0.37

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

3: Trafalgar Road & Britannia Road

2031 FB AM Peak Hour

06/17/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	164	713	301	173	699	188	159	967	169	120	1083	344
Future Volume (vph)	164	713	301	173	699	188	159	967	169	120	1083	344
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3309	4520	1601	3541	4391	1633	1772	4350	1633	1789	4350	1633
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.14	1.00	1.00	0.19	1.00	1.00
Satd. Flow (perm)	3309	4520	1601	3541	4391	1633	263	4350	1633	358	4350	1633
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	164	713	301	173	699	188	159	967	169	120	1083	344
RTOR Reduction (vph)	0	0	113	0	0	127	0	0	90	0	0	185
Lane Group Flow (vph)	164	713	188	173	699	61	159	967	79	120	1083	159
Heavy Vehicles (%)	7%	2%	2%	0%	5%	0%	3%	6%	0%	2%	6%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8	2		2	6		6
Actuated Green, G (s)	12.3	35.0	35.0	12.2	34.9	34.9	73.7	63.8	63.8	69.9	61.9	61.9
Effective Green, g (s)	13.3	37.0	37.0	13.2	36.9	36.9	75.7	65.8	65.8	71.9	63.9	63.9
Actuated g/C Ratio	0.10	0.26	0.26	0.09	0.26	0.26	0.54	0.47	0.47	0.51	0.46	0.46
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	314	1194	423	333	1157	430	259	2044	767	275	1985	745
v/s Ratio Prot	c0.05	0.16		0.05	c0.16		c0.05	0.22		0.03	0.25	
v/s Ratio Perm			0.12			0.04	c0.28		0.05	0.20		0.10
v/c Ratio	0.52	0.60	0.45	0.52	0.60	0.14	0.61	0.47	0.10	0.44	0.55	0.21
Uniform Delay, d1	60.3	45.0	42.9	60.4	45.2	39.4	19.2	25.3	20.7	18.8	27.5	22.9
Progression Factor	1.00	1.00	1.00	1.25	0.83	1.10	1.69	0.43	0.04	1.39	1.24	3.70
Incremental Delay, d2	1.6	1.2	1.6	1.3	1.3	0.3	4.2	0.8	0.3	1.1	1.1	0.6
Delay (s)	61.9	46.2	44.5	76.6	38.7	43.8	36.7	11.6	1.2	27.2	35.3	85.4
Level of Service	E	D	D	E	D	D	D	B	A	C	D	F
Approach Delay (s)		48.0			45.8			13.3			45.8	
Approach LOS		D			D			B			D	
Intersection Summary												
HCM 2000 Control Delay			38.0			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)				15.0		
Intersection Capacity Utilization			63.5%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
1: Trafalgar Road & Derry Road

2031 FB PM Peak Hour

06/17/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	992	231	69	1450	250	202	921	49	324	889	115
Future Volume (vph)	171	992	231	69	1450	250	202	921	49	324	889	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	130.0		110.0	300.0		70.0	110.0		70.0	130.0		85.0
Storage Lanes	2		1	1		1	2		1	2		1
Taper Length (m)	50.0			50.0			50.0			50.0		
Lane Util. Factor	0.97	*0.80	1.00	1.00	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3026	4476	1601	1772	4565	1633	3471	4433	1633	3506	4476	1420
Flt Permitted	0.950			0.186			0.950			0.950		
Satd. Flow (perm)	3026	4476	1601	347	4565	1633	3471	4433	1633	3506	4476	1420
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			231			179			124			124
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		455.0			198.7			323.1			623.5	
Travel Time (s)		20.5			8.9			19.4			37.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	17%	3%	2%	3%	1%	0%	2%	4%	0%	1%	3%	15%
Adj. Flow (vph)	171	992	231	69	1450	250	202	921	49	324	889	115
Shared Lane Traffic (%)												
Lane Group Flow (vph)	171	992	231	69	1450	250	202	921	49	324	889	115
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)		7.4			7.4			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	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	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	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	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	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	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	Prot	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	

Lanes, Volumes, Timings
1: Trafalgar Road & Derry Road

2031 FB PM Peak Hour

06/17/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			2	6		6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	7.0	10.0	10.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	37.9	37.9	11.0	37.9	37.9	11.0	36.8	36.8	11.0	36.8	36.8
Total Split (s)	16.0	65.0	65.0	11.0	60.0	60.0	17.0	43.0	43.0	21.0	47.0	47.0
Total Split (%)	11.4%	46.4%	46.4%	7.9%	42.9%	42.9%	12.1%	30.7%	30.7%	15.0%	33.6%	33.6%
Maximum Green (s)	12.0	58.1	58.1	7.0	53.1	53.1	13.0	36.2	36.2	17.0	40.2	40.2
Yellow Time (s)	3.0	4.6	4.6	3.0	4.6	4.6	3.0	4.2	4.2	3.0	4.2	4.2
All-Red Time (s)	1.0	2.3	2.3	1.0	2.3	2.3	1.0	2.6	2.6	1.0	2.6	2.6
Lost Time Adjust (s)	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.8	4.8	3.0	4.8	4.8
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	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)		24.0	24.0		24.0	24.0		23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	12.4	63.3	63.3	66.8	56.7	56.7	13.7	37.6	37.6	17.7	41.5	41.5
Actuated g/C Ratio	0.09	0.45	0.45	0.48	0.40	0.40	0.10	0.27	0.27	0.13	0.30	0.30
v/c Ratio	0.64	0.49	0.27	0.28	0.78	0.33	0.59	0.77	0.09	0.73	0.67	0.23
Control Delay	69.9	35.5	12.2	14.9	33.7	9.3	86.6	26.7	1.0	69.4	46.1	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.9	35.5	12.2	14.9	33.7	9.3	86.6	26.7	1.0	69.4	46.1	6.0
LOS	E	D	B	B	C	A	F	C	A	E	D	A
Approach Delay		35.8			29.5			35.9			48.3	
Approach LOS		D			C			D			D	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 40 (29%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 36.8

Intersection LOS: D

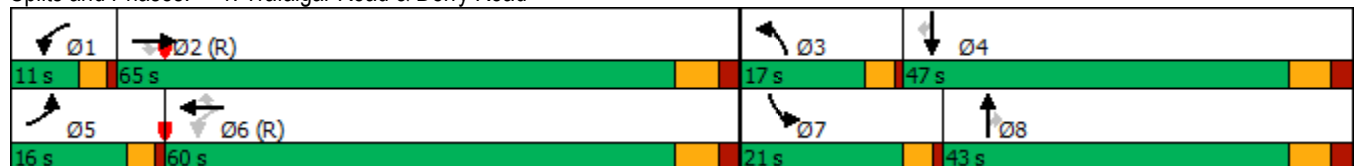
Intersection Capacity Utilization 74.7%

ICU Level of Service D

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 1: Trafalgar Road & Derry Road



Queues

2031 FB PM Peak Hour

1: Trafalgar Road & Derry Road

06/17/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	171	992	231	69	1450	250	202	921	49	324	889	115
v/c Ratio	0.64	0.49	0.27	0.28	0.78	0.33	0.59	0.77	0.09	0.73	0.67	0.23
Control Delay	69.9	35.5	12.2	14.9	33.7	9.3	86.6	26.7	1.0	69.4	46.1	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.9	35.5	12.2	14.9	33.7	9.3	86.6	26.7	1.0	69.4	46.1	6.0
Queue Length 50th (m)	23.8	97.9	10.5	6.6	153.9	18.0	23.2	112.8	0.8	45.1	89.5	0.0
Queue Length 95th (m)	36.1	116.2	32.9	11.9	167.2	34.3	41.0	53.7	1.4	61.3	107.2	12.1
Internal Link Dist (m)		431.0			174.7			299.1			599.5	
Turn Bay Length (m)	130.0		110.0	300.0		70.0	110.0		70.0	130.0		85.0
Base Capacity (vph)	280	2022	850	248	1848	767	347	1209	535	450	1349	514
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.49	0.27	0.28	0.78	0.33	0.58	0.76	0.09	0.72	0.66	0.22
Intersection Summary												

HCM Signalized Intersection Capacity Analysis

2031 FB PM Peak Hour

1: Trafalgar Road & Derry Road

06/17/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	992	231	69	1450	250	202	921	49	324	889	115
Future Volume (vph)	171	992	231	69	1450	250	202	921	49	324	889	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.8	4.8	3.0	4.8	4.8
Lane Util. Factor	0.97	*0.80	1.00	1.00	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3026	4476	1601	1772	4565	1633	3471	4433	1633	3506	4476	1420
Flt Permitted	0.95	1.00	1.00	0.19	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3026	4476	1601	347	4565	1633	3471	4433	1633	3506	4476	1420
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	171	992	231	69	1450	250	202	921	49	324	889	115
RTOR Reduction (vph)	0	0	128	0	0	107	0	0	36	0	0	81
Lane Group Flow (vph)	171	992	103	69	1450	143	202	921	13	324	889	34
Heavy Vehicles (%)	17%	3%	2%	3%	1%	0%	2%	4%	0%	1%	3%	15%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6			8			4
Actuated Green, G (s)	11.4	60.4	60.4	60.2	54.6	54.6	12.7	35.6	35.6	16.7	39.6	39.6
Effective Green, g (s)	12.4	62.4	62.4	62.2	56.6	56.6	13.7	37.6	37.6	17.7	41.6	41.6
Actuated g/C Ratio	0.09	0.45	0.45	0.44	0.40	0.40	0.10	0.27	0.27	0.13	0.30	0.30
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.8	6.8	4.0	6.8	6.8
Vehicle Extension (s)	3.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	268	1995	713	221	1845	660	339	1190	438	443	1330	421
v/s Ratio Prot	c0.06	0.22		0.01	c0.32		0.06	c0.21		c0.09	0.20	
v/s Ratio Perm			0.06	0.12		0.09			0.01			0.02
v/c Ratio	0.64	0.50	0.14	0.31	0.79	0.22	0.60	0.77	0.03	0.73	0.67	0.08
Uniform Delay, d1	61.6	27.6	23.0	23.1	36.4	27.2	60.5	47.3	37.8	58.9	43.2	35.4
Progression Factor	0.96	1.24	3.91	0.72	0.83	0.94	1.32	0.47	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.6	0.8	0.4	1.5	3.2	0.7	3.8	3.4	0.1	7.4	1.7	0.2
Delay (s)	63.8	35.1	90.3	18.3	33.2	26.3	83.4	25.4	37.8	66.3	44.9	35.6
Level of Service	E	D	F	B	C	C	F	C	D	E	D	D
Approach Delay (s)		47.8			31.7			36.0			49.3	
Approach LOS		D			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			40.7				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)			15.7		
Intersection Capacity Utilization			74.7%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
3: Trafalgar Road & Britannia Road

2031 FB PM Peak Hour

06/17/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	364	903	239	151	943	134	345	1290	211	190	892	271
Future Volume (vph)	364	903	239	151	943	134	345	1290	211	190	892	271
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	125.0		85.0	90.0		70.0	165.0		70.0	140.0		140.0
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (m)	50.0			50.0			50.0			50.0		
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3404	4520	1617	3541	4565	1601	1772	4520	1633	1772	4433	1585
Flt Permitted	0.950			0.950			0.120			0.100		
Satd. Flow (perm)	3404	4520	1617	3541	4565	1601	224	4520	1633	187	4433	1585
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			239			156			160			271
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		503.1			219.2			264.1			430.6	
Travel Time (s)		30.2			13.2			15.8			25.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	2%	1%	0%	1%	2%	3%	2%	0%	3%	4%	3%
Adj. Flow (vph)	364	903	239	151	943	134	345	1290	211	190	892	271
Shared Lane Traffic (%)												
Lane Group Flow (vph)	364	903	239	151	943	134	345	1290	211	190	892	271
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)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	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	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	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	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	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	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	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

Lanes, Volumes, Timings
3: Trafalgar Road & Britannia Road

2031 FB PM Peak Hour

06/17/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			4			8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0	15.0	7.0	25.0	25.0	7.0	25.0	25.0
Minimum Split (s)	11.0	40.0	40.0	11.0	40.0	40.0	11.0	41.0	41.0	11.0	41.0	41.0
Total Split (s)	28.0	54.0	54.0	14.0	40.0	40.0	30.0	55.0	55.0	17.0	42.0	42.0
Total Split (%)	20.0%	38.6%	38.6%	10.0%	28.6%	28.6%	21.4%	39.3%	39.3%	12.1%	30.0%	30.0%
Maximum Green (s)	24.0	48.0	48.0	10.0	34.0	34.0	26.0	48.0	48.0	13.0	35.0	35.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	20.9	48.4	48.4	10.6	38.1	38.1	71.0	52.4	52.4	56.5	40.9	40.9
Actuated g/C Ratio	0.15	0.35	0.35	0.08	0.27	0.27	0.51	0.37	0.37	0.40	0.29	0.29
v/c Ratio	0.72	0.58	0.33	0.56	0.76	0.24	0.88	0.76	0.30	0.83	0.69	0.41
Control Delay	64.7	39.0	4.9	93.9	33.4	1.8	63.7	24.7	2.1	67.8	47.5	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.7	39.0	4.9	93.9	33.4	1.8	63.7	24.7	2.1	67.8	47.5	12.0
LOS	E	D	A	F	C	A	E	C	A	E	D	B
Approach Delay		39.8			37.4			29.4			43.3	
Approach LOS		D			D			C			D	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 85 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 36.9

Intersection LOS: D

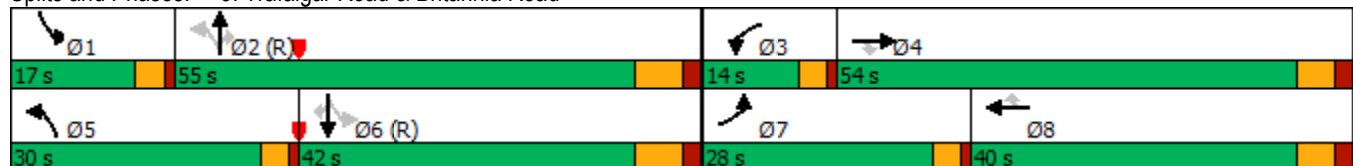
Intersection Capacity Utilization 82.7%

ICU Level of Service E

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 3: Trafalgar Road & Britannia Road



Queues
3: Trafalgar Road & Britannia Road

2031 FB PM Peak Hour

06/17/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	364	903	239	151	943	134	345	1290	211	190	892	271
v/c Ratio	0.72	0.58	0.33	0.56	0.76	0.24	0.88	0.76	0.30	0.83	0.69	0.41
Control Delay	64.7	39.0	4.9	93.9	33.4	1.8	63.7	24.7	2.1	67.8	47.5	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.7	39.0	4.9	93.9	33.4	1.8	63.7	24.7	2.1	67.8	47.5	12.0
Queue Length 50th (m)	50.0	83.3	0.0	22.8	109.8	0.0	49.0	137.5	2.2	40.4	84.0	5.5
Queue Length 95th (m)	64.7	99.6	17.3	34.1	127.3	3.0	#116.9	109.3	0.3	#78.8	92.9	27.3
Internal Link Dist (m)	479.1			195.2			240.1			406.6		
Turn Bay Length (m)	125.0		85.0	90.0		70.0	165.0		70.0	140.0		140.0
Base Capacity (vph)	607	1614	731	278	1243	549	411	1691	711	236	1295	655
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.56	0.33	0.54	0.76	0.24	0.84	0.76	0.30	0.81	0.69	0.41

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

3: Trafalgar Road & Britannia Road

2031 FB PM Peak Hour

06/17/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	364	903	239	151	943	134	345	1290	211	190	892	271
Future Volume (vph)	364	903	239	151	943	134	345	1290	211	190	892	271
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3404	4520	1617	3541	4565	1601	1772	4520	1633	1772	4433	1585
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.12	1.00	1.00	0.10	1.00	1.00
Satd. Flow (perm)	3404	4520	1617	3541	4565	1601	225	4520	1633	187	4433	1585
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	364	903	239	151	943	134	345	1290	211	190	892	271
RTOR Reduction (vph)	0	0	156	0	0	98	0	0	100	0	0	192
Lane Group Flow (vph)	364	903	83	151	943	36	345	1290	111	190	892	79
Heavy Vehicles (%)	4%	2%	1%	0%	1%	2%	3%	2%	0%	3%	4%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8	2		2	6		6
Actuated Green, G (s)	19.9	46.4	46.4	9.6	36.1	36.1	67.0	50.4	50.4	51.5	38.9	38.9
Effective Green, g (s)	20.9	48.4	48.4	10.6	38.1	38.1	68.0	52.4	52.4	53.5	40.9	40.9
Actuated g/C Ratio	0.15	0.35	0.35	0.08	0.27	0.27	0.49	0.37	0.37	0.38	0.29	0.29
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	508	1562	559	268	1242	435	386	1691	611	225	1295	463
v/s Ratio Prot	c0.11	0.20		0.04	c0.21		c0.16	0.29		0.08	0.20	
v/s Ratio Perm			0.05			0.02	c0.27		0.07	0.24		0.05
v/c Ratio	0.72	0.58	0.15	0.56	0.76	0.08	0.89	0.76	0.18	0.84	0.69	0.17
Uniform Delay, d1	56.7	37.5	31.6	62.5	46.7	38.0	37.4	38.4	29.4	33.4	43.9	36.9
Progression Factor	1.00	1.00	1.00	1.38	0.62	0.22	1.20	0.55	0.13	1.17	0.99	2.25
Incremental Delay, d2	4.8	0.8	0.3	2.5	3.0	0.2	21.5	3.2	0.6	23.1	2.9	0.8
Delay (s)	61.5	38.3	31.8	88.6	32.1	8.3	66.5	24.2	4.3	62.2	46.2	84.0
Level of Service	E	D	C	F	C	A	E	C	A	E	D	F
Approach Delay (s)		42.9			36.4			29.8			56.0	
Approach LOS		D			D			C			E	
Intersection Summary												
HCM 2000 Control Delay			40.5			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)				15.0		
Intersection Capacity Utilization			82.7%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												



2041 Future Background

Lanes, Volumes, Timings
1: Trafalgar Road & Derry Road

2041 FB AM Peak Hour

06/17/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	322	1989	220	25	866	356	308	1259	17	82	591	23
Future Volume (vph)	322	1989	220	25	866	356	308	1259	17	82	591	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	130.0		110.0	130.0		70.0	110.0		70.0	130.0		85.0
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (m)	50.0			50.0			50.0			50.0		
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			185			154			124			155
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		455.0			198.7			323.1			623.5	
Travel Time (s)		20.5			8.9			19.4			37.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	322	1989	220	25	866	356	308	1259	17	82	591	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	322	1989	220	25	866	356	308	1259	17	82	591	23
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)		7.4			7.4			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	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	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	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	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	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	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	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	

Lanes, Volumes, Timings
1: Trafalgar Road & Derry Road

2041 FB AM Peak Hour

06/17/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	10.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	37.9	37.9	11.0	37.9	37.9	11.0	36.8	36.8	11.0	36.8	36.8
Total Split (s)	23.0	65.0	65.0	11.0	53.0	53.0	23.0	53.0	53.0	11.0	41.0	41.0
Total Split (%)	16.4%	46.4%	46.4%	7.9%	37.9%	37.9%	16.4%	37.9%	37.9%	7.9%	29.3%	29.3%
Maximum Green (s)	19.0	58.1	58.1	7.0	46.1	46.1	19.0	46.2	46.2	7.0	34.2	34.2
Yellow Time (s)	3.0	4.6	4.6	3.0	4.6	4.6	3.0	4.2	4.2	3.0	4.2	4.2
All-Red Time (s)	1.0	2.3	2.3	1.0	2.3	2.3	1.0	2.6	2.6	1.0	2.6	2.6
Lost Time Adjust (s)	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.8	4.8	3.0	4.8	4.8
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	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)		24.0	24.0		24.0	24.0		23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	19.0	64.8	64.8	8.1	49.4	49.4	18.9	47.9	47.9	8.0	37.0	37.0
Actuated g/C Ratio	0.14	0.46	0.46	0.06	0.35	0.35	0.14	0.34	0.34	0.06	0.26	0.26
v/c Ratio	0.67	0.93	0.26	0.12	0.53	0.53	0.65	0.80	0.03	0.41	0.48	0.04
Control Delay	81.2	30.8	5.0	68.4	41.6	27.5	62.1	43.4	0.1	70.0	45.2	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.2	30.8	5.0	68.4	41.6	27.5	62.1	43.4	0.1	70.0	45.2	0.1
LOS	F	C	A	E	D	C	E	D	A	E	D	A
Approach Delay		35.0			38.1			46.5			46.6	
Approach LOS		C			D			D			D	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 40.0

Intersection LOS: D

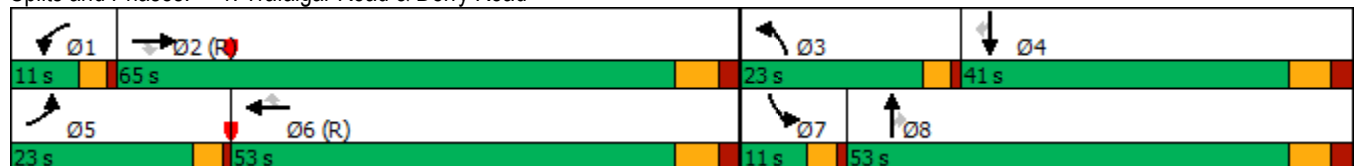
Intersection Capacity Utilization 89.2%

ICU Level of Service E

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 1: Trafalgar Road & Derry Road



Queues

2041 FB AM Peak Hour

1: Trafalgar Road & Derry Road

06/17/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	322	1989	220	25	866	356	308	1259	17	82	591	23
v/c Ratio	0.67	0.93	0.26	0.12	0.53	0.53	0.65	0.80	0.03	0.41	0.48	0.04
Control Delay	81.2	30.8	5.0	68.4	41.6	27.5	62.1	43.4	0.1	70.0	45.2	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.2	30.8	5.0	68.4	41.6	27.5	62.1	43.4	0.1	70.0	45.2	0.1
Queue Length 50th (m)	43.4	~192.5	4.3	3.6	67.5	36.2	35.1	144.0	0.0	11.5	58.2	0.0
Queue Length 95th (m)	m51.5	#268.4	m13.1	m7.9	80.4	58.4	55.7	164.6	m0.0	20.3	72.7	0.0
Internal Link Dist (m)	431.0				174.7		299.1				599.5	
Turn Bay Length (m)	130.0		110.0		130.0		70.0		110.0		70.0	
Base Capacity (vph)	505		2134		855		204		1625		675	
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	0.64	0.93	0.26	0.12	0.53	0.53	0.61	0.79	0.03	0.41	0.48	0.04

Intersection Summary

~ 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.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

2041 FB AM Peak Hour

1: Trafalgar Road & Derry Road

06/17/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	322	1989	220	25	866	356	308	1259	17	82	591	23
Future Volume (vph)	322	1989	220	25	866	356	308	1259	17	82	591	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.8	4.8	3.0	4.8	4.8
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	322	1989	220	25	866	356	308	1259	17	82	591	23
RTOR Reduction (vph)	0	0	101	0	0	100	0	0	11	0	0	17
Lane Group Flow (vph)	322	1989	119	25	866	256	308	1259	6	82	591	6
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	18.0	61.2	61.2	4.2	47.4	47.4	17.9	45.9	45.9	7.0	35.0	35.0
Effective Green, g (s)	19.0	63.2	63.2	5.2	49.4	49.4	18.9	47.9	47.9	8.0	37.0	37.0
Actuated g/C Ratio	0.14	0.45	0.45	0.04	0.35	0.35	0.13	0.34	0.34	0.06	0.26	0.26
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.8	6.8	4.0	6.8	6.8
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	480	2081	737	131	1627	576	478	1577	558	202	1218	431
v/s Ratio Prot	c0.09	c0.43		0.01	0.19		c0.09	c0.27		0.02	0.13	
v/s Ratio Perm			0.07			0.16			0.00			0.00
v/c Ratio	0.67	0.96	0.16	0.19	0.53	0.45	0.64	0.80	0.01	0.41	0.49	0.01
Uniform Delay, d1	57.5	37.1	22.7	65.4	36.1	34.8	57.4	41.7	30.4	63.7	43.5	38.0
Progression Factor	1.35	0.70	0.87	1.07	1.10	1.23	0.98	0.94	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	6.4	0.2	1.4	1.2	2.3	3.5	2.9	0.0	2.8	0.6	0.0
Delay (s)	80.0	32.5	19.9	71.3	41.0	44.9	59.8	42.3	30.4	66.5	44.1	38.1
Level of Service	E	C	B	E	D	D	E	D	C	E	D	D
Approach Delay (s)		37.4			42.7			45.6			46.5	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			41.7				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)			15.7		
Intersection Capacity Utilization			89.2%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
3: Trafalgar Road & Britannia Road

2041 FB AM Peak Hour

06/17/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	231	919	501	86	784	201	452	1434	158	125	1380	483
Future Volume (vph)	231	919	501	86	784	201	452	1434	158	125	1380	483
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	125.0		85.0	90.0		70.0	165.0		70.0	140.0		140.0
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (m)	50.0			50.0			50.0			50.0		
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			255			156			128			196
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		503.1			219.2			264.1			430.6	
Travel Time (s)		30.2			13.2			15.8			25.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	231	919	501	86	784	201	452	1434	158	125	1380	483
Shared Lane Traffic (%)												
Lane Group Flow (vph)	231	919	501	86	784	201	452	1434	158	125	1380	483
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)		7.4			7.4			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	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	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	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	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	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	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	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

Lanes, Volumes, Timings
3: Trafalgar Road & Britannia Road

2041 FB AM Peak Hour

06/17/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0	15.0	7.0	25.0	25.0	7.0	25.0	25.0
Minimum Split (s)	11.0	40.0	40.0	11.0	40.0	40.0	11.0	41.0	41.0	11.0	41.0	41.0
Total Split (s)	18.0	47.0	47.0	11.0	40.0	40.0	24.0	69.0	69.0	13.0	58.0	58.0
Total Split (%)	12.9%	33.6%	33.6%	7.9%	28.6%	28.6%	17.1%	49.3%	49.3%	9.3%	41.4%	41.4%
Maximum Green (s)	14.0	41.0	41.0	7.0	34.0	34.0	20.0	62.0	62.0	9.0	51.0	51.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	14.1	42.2	42.2	8.0	36.2	36.2	20.6	65.1	65.1	9.7	54.1	54.1
Actuated g/C Ratio	0.10	0.30	0.30	0.06	0.26	0.26	0.15	0.46	0.46	0.07	0.39	0.39
v/c Ratio	0.65	0.66	0.75	0.43	0.66	0.37	0.87	0.67	0.19	0.51	0.77	0.64
Control Delay	69.5	45.2	28.5	52.0	49.4	15.4	82.5	23.3	4.1	70.5	41.5	24.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.5	45.2	28.5	52.0	49.4	15.4	82.5	23.3	4.1	70.5	41.5	24.8
LOS	E	D	C	D	D	B	F	C	A	E	D	C
Approach Delay		43.5			43.2			34.9			39.3	
Approach LOS		D			D			C			D	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 90 (64%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 39.6

Intersection LOS: D

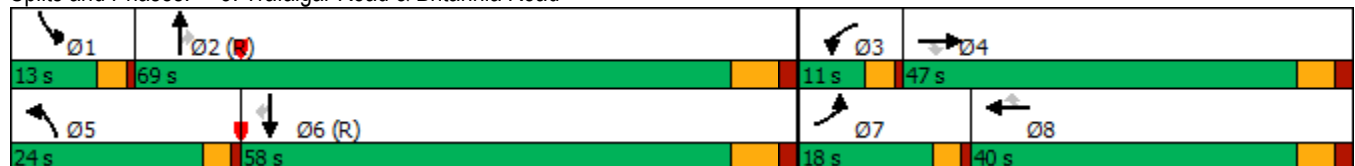
Intersection Capacity Utilization 77.3%

ICU Level of Service D

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 3: Trafalgar Road & Britannia Road



Queues
3: Trafalgar Road & Britannia Road

2041 FB AM Peak Hour
06/17/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	231	919	501	86	784	201	452	1434	158	125	1380	483
v/c Ratio	0.65	0.66	0.75	0.43	0.66	0.37	0.87	0.67	0.19	0.51	0.77	0.64
Control Delay	69.5	45.2	28.5	52.0	49.4	15.4	82.5	23.3	4.1	70.5	41.5	24.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.5	45.2	28.5	52.0	49.4	15.4	82.5	23.3	4.1	70.5	41.5	24.8
Queue Length 50th (m)	32.0	91.8	63.6	12.5	82.3	21.7	67.2	89.3	2.0	17.4	140.3	66.2
Queue Length 95th (m)	45.8	109.4	107.5	m17.1	99.9	41.4	#90.9	102.2	8.6	28.0	161.8	104.9
Internal Link Dist (m)	479.1				195.2				240.1			
Turn Bay Length (m)	125.0		85.0	90.0		70.0	165.0		70.0	140.0		140.0
Base Capacity (vph)	379	1416	678	202	1193	538	531	2142	827	252	1782	751
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.65	0.74	0.43	0.66	0.37	0.85	0.67	0.19	0.50	0.77	0.64

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

3: Trafalgar Road & Britannia Road

2041 FB AM Peak Hour

06/17/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	231	919	501	86	784	201	452	1434	158	125	1380	483
Future Volume (vph)	231	919	501	86	784	201	452	1434	158	125	1380	483
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	231	919	501	86	784	201	452	1434	158	125	1380	483
RTOR Reduction (vph)	0	0	178	0	0	116	0	0	69	0	0	120
Lane Group Flow (vph)	231	919	323	86	784	85	452	1434	89	125	1380	363
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	13.1	40.3	40.3	7.0	34.2	34.2	19.6	63.0	63.0	8.7	52.1	52.1
Effective Green, g (s)	14.1	42.3	42.3	8.0	36.2	36.2	20.6	65.0	65.0	9.7	54.1	54.1
Actuated g/C Ratio	0.10	0.30	0.30	0.06	0.26	0.26	0.15	0.46	0.46	0.07	0.39	0.39
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	356	1393	493	202	1192	422	521	2140	758	245	1781	631
v/s Ratio Prot	c0.07	c0.20		0.02	0.17		c0.13	0.31		0.04	c0.30	
v/s Ratio Perm			0.20			0.05			0.05			0.22
v/c Ratio	0.65	0.66	0.66	0.43	0.66	0.20	0.87	0.67	0.12	0.51	0.77	0.57
Uniform Delay, d1	60.6	42.6	42.5	63.8	46.4	40.6	58.4	29.2	21.3	62.9	37.6	33.9
Progression Factor	1.00	1.00	1.00	0.72	1.00	1.20	1.13	0.73	0.63	1.00	1.00	1.00
Incremental Delay, d2	4.0	1.5	4.2	1.4	1.7	0.5	13.6	1.6	0.3	1.8	3.4	3.8
Delay (s)	64.6	44.1	46.7	47.0	48.0	49.3	79.7	23.0	13.7	64.6	41.0	37.7
Level of Service	E	D	D	D	D	D	E	C	B	E	D	D
Approach Delay (s)		47.8			48.2			34.8			41.7	
Approach LOS		D			D			C			D	
Intersection Summary												
HCM 2000 Control Delay			42.1				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			77.3%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
1: Trafalgar Road & Derry Road

2041 FB PM Peak Hour

06/17/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	1262	353	36	1735	190	219	971	13	258	1325	51
Future Volume (vph)	102	1262	353	36	1735	190	219	971	13	258	1325	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	130.0		110.0	130.0		70.0	110.0		70.0	130.0		85.0
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (m)	50.0			50.0			50.0			50.0		
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			227			118			93			93
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		455.0			198.7			323.1			623.5	
Travel Time (s)		20.5			8.9			19.4			37.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	102	1262	353	36	1735	190	219	971	13	258	1325	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	102	1262	353	36	1735	190	219	971	13	258	1325	51
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)		7.4			7.4			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	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	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	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	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	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	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	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	

Lanes, Volumes, Timings
1: Trafalgar Road & Derry Road

2041 FB PM Peak Hour

06/17/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	10.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	37.9	37.9	11.0	37.9	37.9	11.0	36.8	36.8	11.0	36.8	36.8
Total Split (s)	11.0	63.0	63.0	11.0	63.0	63.0	13.0	50.0	50.0	16.0	53.0	53.0
Total Split (%)	7.9%	45.0%	45.0%	7.9%	45.0%	45.0%	9.3%	35.7%	35.7%	11.4%	37.9%	37.9%
Maximum Green (s)	7.0	56.1	56.1	7.0	56.1	56.1	9.0	43.2	43.2	12.0	46.2	46.2
Yellow Time (s)	3.0	4.6	4.6	3.0	4.6	4.6	3.0	4.2	4.2	3.0	4.2	4.2
All-Red Time (s)	1.0	2.3	2.3	1.0	2.3	2.3	1.0	2.6	2.6	1.0	2.6	2.6
Lost Time Adjust (s)	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.8	4.8	3.0	4.8	4.8
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	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)		24.0	24.0		24.0	24.0		23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	8.0	60.3	60.3	8.0	58.1	58.1	10.0	45.2	45.2	13.0	48.2	48.2
Actuated g/C Ratio	0.06	0.43	0.43	0.06	0.42	0.42	0.07	0.32	0.32	0.09	0.34	0.34
v/c Ratio	0.50	0.64	0.42	0.18	0.91	0.25	0.87	0.65	0.02	0.79	0.83	0.08
Control Delay	91.9	19.6	3.8	61.9	57.3	23.9	87.1	40.0	0.3	79.4	47.9	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.9	19.6	3.8	61.9	57.3	23.9	87.1	40.0	0.3	79.4	47.9	0.7
LOS	F	B	A	E	E	C	F	D	A	E	D	A
Approach Delay		20.6			54.1			48.1			51.4	
Approach LOS		C			D			D			D	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 43.5

Intersection LOS: D

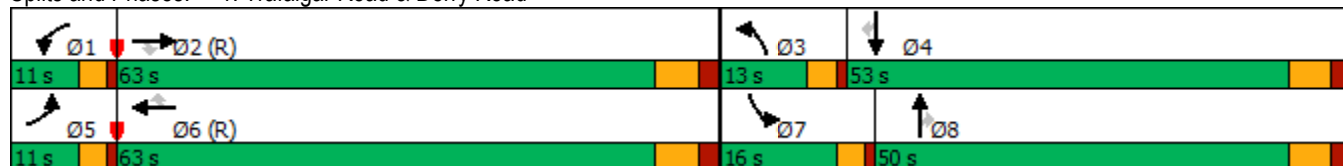
Intersection Capacity Utilization 86.0%

ICU Level of Service E

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 1: Trafalgar Road & Derry Road



Queues

2041 FB PM Peak Hour

1: Trafalgar Road & Derry Road

06/17/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	102	1262	353	36	1735	190	219	971	13	258	1325	51
v/c Ratio	0.50	0.64	0.42	0.18	0.91	0.25	0.87	0.65	0.02	0.79	0.83	0.08
Control Delay	91.9	19.6	3.8	61.9	57.3	23.9	87.1	40.0	0.3	79.4	47.9	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.9	19.6	3.8	61.9	57.3	23.9	87.1	40.0	0.3	79.4	47.9	0.7
Queue Length 50th (m)	15.3	47.5	6.9	5.3	169.5	20.9	27.9	115.9	0.0	36.6	140.3	0.0
Queue Length 95th (m)	m22.4	57.1	15.0	m9.0	189.8	39.3	#52.3	132.2	m0.4	#55.8	162.1	1.3
Internal Link Dist (m)	431.0				174.7				299.1			
Turn Bay Length (m)	130.0		110.0	130.0		70.0	110.0		70.0	130.0		85.0
Base Capacity (vph)	202	1985	832	202	1913	746	252	1488	590	328	1587	623
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.64	0.42	0.18	0.91	0.25	0.87	0.65	0.02	0.79	0.83	0.08

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

2041 FB PM Peak Hour

1: Trafalgar Road & Derry Road

06/17/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	1262	353	36	1735	190	219	971	13	258	1325	51
Future Volume (vph)	102	1262	353	36	1735	190	219	971	13	258	1325	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.8	4.8	3.0	4.8	4.8
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	102	1262	353	36	1735	190	219	971	13	258	1325	51
RTOR Reduction (vph)	0	0	131	0	0	69	0	0	9	0	0	33
Lane Group Flow (vph)	102	1262	222	36	1735	121	219	971	4	258	1325	18
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	7.0	57.5	57.5	5.6	56.1	56.1	9.0	43.2	43.2	12.0	46.2	46.2
Effective Green, g (s)	8.0	59.5	59.5	6.6	58.1	58.1	10.0	45.2	45.2	13.0	48.2	48.2
Actuated g/C Ratio	0.06	0.42	0.42	0.05	0.42	0.42	0.07	0.32	0.32	0.09	0.34	0.34
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.8	6.8	4.0	6.8	6.8
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	202	1959	694	166	1913	677	252	1488	527	328	1587	562
v/s Ratio Prot	c0.03	0.27		0.01	c0.38		c0.06	0.21		0.07	c0.29	
v/s Ratio Perm			0.14			0.07			0.00			0.01
v/c Ratio	0.50	0.64	0.32	0.22	0.91	0.18	0.87	0.65	0.01	0.79	0.83	0.03
Uniform Delay, d1	64.1	31.9	26.8	64.2	38.4	25.9	64.4	40.7	32.2	62.1	42.2	30.4
Progression Factor	1.33	0.58	0.27	0.95	1.31	2.25	0.88	0.92	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.0	1.2	0.9	1.2	6.7	0.5	26.6	1.3	0.0	13.5	4.4	0.0
Delay (s)	87.9	19.6	8.1	62.5	57.1	58.6	83.6	38.9	32.2	75.6	46.7	30.5
Level of Service	F	B	A	E	E	E	F	D	C	E	D	C
Approach Delay (s)		21.3			57.3			47.0			50.7	
Approach LOS		C			E			D			D	
Intersection Summary												
HCM 2000 Control Delay			44.3				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)			15.7		
Intersection Capacity Utilization			86.0%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
3: Trafalgar Road & Britannia Road

2041 FB PM Peak Hour

06/17/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	522	1140	600	127	1101	131	545	1587	213	200	1500	364
Future Volume (vph)	522	1140	600	127	1101	131	545	1587	213	200	1500	364
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	125.0		85.0	90.0		70.0	165.0		70.0	140.0		140.0
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (m)	50.0			50.0			50.0			50.0		
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			242			156			140			312
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		503.1			219.2			264.1			430.6	
Travel Time (s)		30.2			13.2			15.8			25.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	522	1140	600	127	1101	131	545	1587	213	200	1500	364
Shared Lane Traffic (%)												
Lane Group Flow (vph)	522	1140	600	127	1101	131	545	1587	213	200	1500	364
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)		7.4			7.4			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	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	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	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	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	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	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	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

Lanes, Volumes, Timings
3: Trafalgar Road & Britannia Road

2041 FB PM Peak Hour

06/17/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0	15.0	7.0	25.0	25.0	7.0	25.0	25.0
Minimum Split (s)	11.0	40.0	40.0	11.0	40.0	40.0	11.0	41.0	41.0	11.0	41.0	41.0
Total Split (s)	27.0	56.0	56.0	11.0	40.0	40.0	22.0	61.0	61.0	12.0	51.0	51.0
Total Split (%)	19.3%	40.0%	40.0%	7.9%	28.6%	28.6%	15.7%	43.6%	43.6%	8.6%	36.4%	36.4%
Maximum Green (s)	23.0	50.0	50.0	7.0	34.0	34.0	18.0	54.0	54.0	8.0	44.0	44.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	23.5	52.0	52.0	8.0	36.5	36.5	19.0	56.0	56.0	9.0	46.0	46.0
Actuated g/C Ratio	0.17	0.37	0.37	0.06	0.26	0.26	0.14	0.40	0.40	0.06	0.33	0.33
v/c Ratio	0.88	0.67	0.79	0.63	0.92	0.24	1.14	0.86	0.29	0.88	0.99	0.49
Control Delay	73.5	39.1	31.5	95.5	49.5	4.9	144.8	27.7	5.5	105.9	72.1	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.5	39.1	31.5	95.5	49.5	4.9	144.8	27.7	5.5	105.9	72.1	15.7
LOS	E	D	C	F	D	A	F	C	A	F	E	B
Approach Delay		45.0			49.5			52.9			65.4	
Approach LOS		D			D			D			E	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 90 (64%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 135

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.14

Intersection Signal Delay: 53.3

Intersection LOS: D

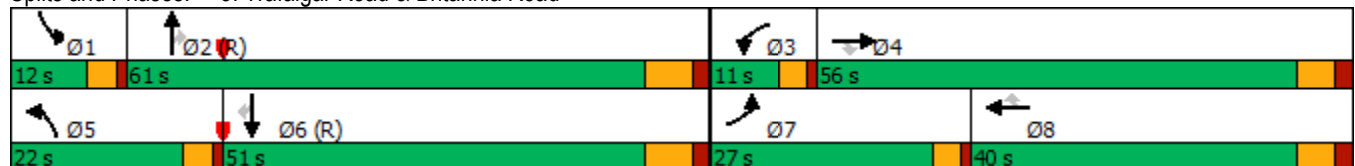
Intersection Capacity Utilization 94.9%

ICU Level of Service F

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 3: Trafalgar Road & Britannia Road



Queues
3: Trafalgar Road & Britannia Road

2041 FB PM Peak Hour
06/17/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	522	1140	600	127	1101	131	545	1587	213	200	1500	364
v/c Ratio	0.88	0.67	0.79	0.63	0.92	0.24	1.14	0.86	0.29	0.88	0.99	0.49
Control Delay	73.5	39.1	31.5	95.5	49.5	4.9	144.8	27.7	5.5	105.9	72.1	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.5	39.1	31.5	95.5	49.5	4.9	144.8	27.7	5.5	105.9	72.1	15.7
Queue Length 50th (m)	73.2	109.2	93.0	15.3	127.0	13.7	~90.0	116.5	0.0	28.1	164.0	14.2
Queue Length 95th (m)	#100.2	127.8	144.5	30.2	#157.0	9.0	#124.4	164.7	12.9	#51.9	#215.0	71.5
Internal Link Dist (m)	479.1			195.2			240.1			406.6		
Turn Bay Length (m)	125.0		85.0	90.0		70.0	165.0		70.0	140.0		140.0
Base Capacity (vph)	607	1712	758	202	1201	540	480	1844	737	227	1515	746
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.67	0.79	0.63	0.92	0.24	1.14	0.86	0.29	0.88	0.99	0.49

Intersection Summary

- ~ 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.

HCM Signalized Intersection Capacity Analysis

3: Trafalgar Road & Britannia Road

2041 FB PM Peak Hour

06/17/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	522	1140	600	127	1101	131	545	1587	213	200	1500	364
Future Volume (vph)	522	1140	600	127	1101	131	545	1587	213	200	1500	364
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	522	1140	600	127	1101	131	545	1587	213	200	1500	364
RTOR Reduction (vph)	0	0	152	0	0	97	0	0	84	0	0	209
Lane Group Flow (vph)	522	1140	448	127	1101	34	545	1587	129	200	1500	155
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	22.5	50.0	50.0	7.0	34.5	34.5	18.0	54.0	54.0	8.0	44.0	44.0
Effective Green, g (s)	23.5	52.0	52.0	8.0	36.5	36.5	19.0	56.0	56.0	9.0	46.0	46.0
Actuated g/C Ratio	0.17	0.37	0.37	0.06	0.26	0.26	0.14	0.40	0.40	0.06	0.33	0.33
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	594	1712	606	202	1202	425	480	1844	653	227	1515	536
v/s Ratio Prot	c0.15	0.25		0.04	c0.24		c0.15	0.34		0.06	c0.33	
v/s Ratio Perm			0.27			0.02			0.08			0.09
v/c Ratio	0.88	0.67	0.74	0.63	0.92	0.08	1.14	0.86	0.20	0.88	0.99	0.29
Uniform Delay, d1	56.9	36.7	38.1	64.5	50.3	39.1	60.5	38.4	27.4	65.0	46.8	34.9
Progression Factor	1.00	1.00	1.00	1.28	0.75	1.21	1.22	0.58	0.46	1.17	1.15	2.15
Incremental Delay, d2	13.9	1.3	5.7	5.3	10.3	0.2	81.9	5.0	0.6	26.8	19.1	1.1
Delay (s)	70.7	38.1	43.8	87.9	48.0	47.6	155.8	27.5	13.1	102.6	72.7	76.0
Level of Service	E	D	D	F	D	D	F	C	B	F	E	E
Approach Delay (s)		47.1			51.7			56.0			76.2	
Approach LOS		D			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			58.0				HCM 2000 Level of Service			E		
HCM 2000 Volume to Capacity ratio			0.97									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			94.9%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												



Appendix J

Future Total SYNCHRO Capacity and Queuing Analysis Reports



2031 Future Total

Lanes, Volumes, Timings
1: Trafalgar Road & Derry Road

2031 FT AM Peak Hour

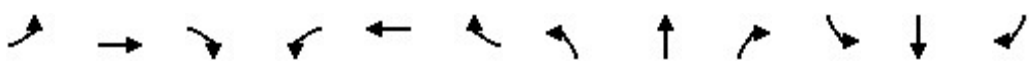
07/10/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	514	1678	223	65	762	439	226	969	75	114	530	47
Future Volume (vph)	514	1678	223	65	762	439	226	969	75	114	530	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	130.0		110.0	300.0		70.0	110.0		70.0	130.0		85.0
Storage Lanes	2		1	1		1	2		1	2		1
Taper Length (m)	50.0			50.0			50.0			50.0		
Lane Util. Factor	0.97	*0.80	1.00	1.00	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3437	4520	1570	1825	4433	1633	3309	4230	1633	3541	4080	944
Flt Permitted	0.950			0.085			0.950			0.950		
Satd. Flow (perm)	3437	4520	1570	163	4433	1633	3309	4230	1633	3541	4080	944
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			223			154			124			155
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		455.0			198.7			323.1			623.5	
Travel Time (s)		20.5			8.9			19.4			37.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	2%	4%	0%	4%	0%	7%	9%	0%	0%	13%	73%
Adj. Flow (vph)	514	1678	223	65	762	439	226	969	75	114	530	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	514	1678	223	65	762	439	226	969	75	114	530	47
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)		7.4			7.4			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	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	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	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	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	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	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	Prot	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	

Lanes, Volumes, Timings
1: Trafalgar Road & Derry Road

2031 FT AM Peak Hour

07/10/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			2	6		6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	7.0	10.0	10.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	37.9	37.9	11.0	37.9	37.9	11.0	36.8	36.8	11.0	36.8	36.8
Total Split (s)	32.0	70.0	70.0	11.0	49.0	49.0	19.0	48.0	48.0	11.0	40.0	40.0
Total Split (%)	22.9%	50.0%	50.0%	7.9%	35.0%	35.0%	13.6%	34.3%	34.3%	7.9%	28.6%	28.6%
Maximum Green (s)	28.0	63.1	63.1	7.0	42.1	42.1	15.0	41.2	41.2	7.0	33.2	33.2
Yellow Time (s)	3.0	4.6	4.6	3.0	4.6	4.6	3.0	4.2	4.2	3.0	4.2	4.2
All-Red Time (s)	1.0	2.3	2.3	1.0	2.3	2.3	1.0	2.6	2.6	1.0	2.6	2.6
Lost Time Adjust (s)	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.8	4.8	3.0	4.8	4.8
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	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)		24.0	24.0		24.0	24.0		23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effect Green (s)	26.2	68.3	68.3	58.0	47.9	47.9	15.5	42.2	42.2	8.0	34.7	34.7
Actuated g/C Ratio	0.19	0.49	0.49	0.41	0.34	0.34	0.11	0.30	0.30	0.06	0.25	0.25
v/c Ratio	0.80	0.76	0.25	0.40	0.50	0.67	0.62	0.76	0.13	0.56	0.52	0.13
Control Delay	71.2	30.6	5.4	29.0	37.2	30.1	88.6	55.0	12.2	75.6	47.6	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.2	30.6	5.4	29.0	37.2	30.1	88.6	55.0	12.2	75.6	47.6	0.8
LOS	E	C	A	C	D	C	F	D	B	E	D	A
Approach Delay		36.9			34.3			58.4			49.0	
Approach LOS		D			C			E			D	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 42.7

Intersection LOS: D

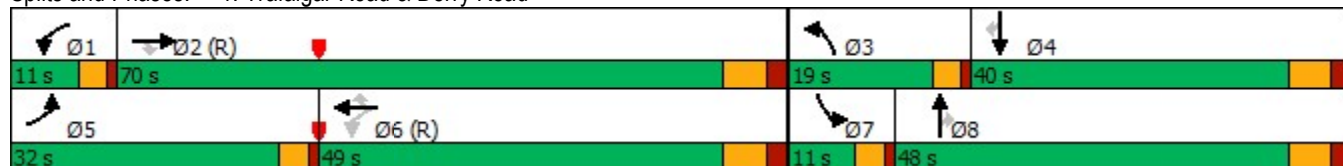
Intersection Capacity Utilization 77.6%

ICU Level of Service D

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 1: Trafalgar Road & Derry Road



Queues

2031 FT AM Peak Hour

1: Trafalgar Road & Derry Road

07/10/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	514	1678	223	65	762	439	226	969	75	114	530	47
v/c Ratio	0.80	0.76	0.25	0.40	0.50	0.67	0.62	0.76	0.13	0.56	0.52	0.13
Control Delay	71.2	30.6	5.4	29.0	37.2	30.1	88.6	55.0	12.2	75.6	47.6	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.2	30.6	5.4	29.0	37.2	30.1	88.6	55.0	12.2	75.6	47.6	0.8
Queue Length 50th (m)	78.2	108.4	0.0	8.0	77.1	52.3	34.3	67.1	3.4	16.1	52.9	0.0
Queue Length 95th (m)	96.4	138.1	22.5	17.3	83.3	56.4	47.9	106.6	16.4	26.4	67.2	0.0
Internal Link Dist (m)		431.0			174.7			299.1			599.5	
Turn Bay Length (m)	130.0		110.0	300.0		70.0	110.0		70.0	130.0		85.0
Base Capacity (vph)	711	2204	880	164	1516	660	378	1305	589	202	1025	353
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.76	0.25	0.40	0.50	0.67	0.60	0.74	0.13	0.56	0.52	0.13
Intersection Summary												

HCM Signalized Intersection Capacity Analysis

2031 FT AM Peak Hour

1: Trafalgar Road & Derry Road

07/10/2025

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	514	1678	223	65	762	439	226	969	75	114	530	47	
Future Volume (vph)	514	1678	223	65	762	439	226	969	75	114	530	47	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.8	4.8	3.0	4.8	4.8	
Lane Util. Factor	0.97	*0.80	1.00	1.00	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3437	4520	1570	1825	4433	1633	3309	4230	1633	3541	4080	944	
Flt Permitted	0.95	1.00	1.00	0.09	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	3437	4520	1570	164	4433	1633	3309	4230	1633	3541	4080	944	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	514	1678	223	65	762	439	226	969	75	114	530	47	
RTOR Reduction (vph)	0	0	115	0	0	101	0	0	52	0	0	35	
Lane Group Flow (vph)	514	1678	108	65	762	338	226	969	23	114	530	12	
Heavy Vehicles (%)	3%	2%	4%	0%	4%	0%	7%	9%	0%	0%	13%	73%	
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	
Protected Phases	5	2		1	6		3	8		7	4		
Permitted Phases			2	6		6			8			4	
Actuated Green, G (s)	25.2	65.5	65.5	51.5	45.9	45.9	14.5	40.2	40.2	7.0	32.7	32.7	
Effective Green, g (s)	26.2	67.5	67.5	53.5	47.9	47.9	15.5	42.2	42.2	8.0	34.7	34.7	
Actuated g/C Ratio	0.19	0.48	0.48	0.38	0.34	0.34	0.11	0.30	0.30	0.06	0.25	0.25	
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.8	6.8	4.0	6.8	6.8	
Vehicle Extension (s)	3.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lane Grp Cap (vph)	643	2179	756	140	1516	558	366	1275	492	202	1011	233	
v/s Ratio Prot	c0.15	c0.37		0.02	0.17		c0.07	c0.23		0.03	0.13		
v/s Ratio Perm			0.07	0.15		0.21			0.01			0.01	
v/c Ratio	0.80	0.77	0.14	0.46	0.50	0.61	0.62	0.76	0.05	0.56	0.52	0.05	
Uniform Delay, d1	54.4	29.9	20.2	29.8	36.6	38.2	59.4	44.3	34.6	64.3	45.5	40.1	
Progression Factor	1.18	0.95	1.86	1.12	0.96	0.96	1.38	1.15	18.77	1.00	1.00	1.00	
Incremental Delay, d2	4.9	1.9	0.3	4.8	1.1	4.6	4.0	2.9	0.1	5.8	0.9	0.2	
Delay (s)	69.1	30.2	37.8	38.3	36.3	41.3	85.7	53.9	650.2	70.1	46.5	40.3	
Level of Service	E	C	D	D	D	D	F	D	F	E	D	D	
Approach Delay (s)		39.2			38.1			94.8			49.9		
Approach LOS		D			D			F			D		
Intersection Summary													
HCM 2000 Control Delay			52.8									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.79										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	15.7
Intersection Capacity Utilization			77.6%									ICU Level of Service	D
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
3: Trafalgar Road & Britannia Road

2031 FT AM Peak Hour

07/10/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	207	713	301	173	699	191	159	991	169	128	1150	445
Future Volume (vph)	207	713	301	173	699	191	159	991	169	128	1150	445
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	125.0		85.0	90.0		70.0	165.0		70.0	140.0		140.0
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (m)	50.0			50.0			50.0			50.0		
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3309	4520	1601	3541	4391	1633	1772	4350	1633	1789	4350	1633
Flt Permitted	0.950			0.950			0.123			0.182		
Satd. Flow (perm)	3309	4520	1601	3541	4391	1633	229	4350	1633	343	4350	1633
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			149			156			169			338
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		503.1			219.2			264.1			430.6	
Travel Time (s)		30.2			13.2			15.8			25.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	7%	2%	2%	0%	5%	0%	3%	6%	0%	2%	6%	0%
Adj. Flow (vph)	207	713	301	173	699	191	159	991	169	128	1150	445
Shared Lane Traffic (%)												
Lane Group Flow (vph)	207	713	301	173	699	191	159	991	169	128	1150	445
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)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	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	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	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	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	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	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	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

Lanes, Volumes, Timings
3: Trafalgar Road & Britannia Road

2031 FT AM Peak Hour

07/10/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			4			8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0	15.0	7.0	25.0	25.0	7.0	25.0	25.0
Minimum Split (s)	11.0	40.0	40.0	11.0	40.0	40.0	11.0	41.0	41.0	11.0	41.0	41.0
Total Split (s)	20.0	44.0	44.0	20.0	44.0	44.0	14.0	65.0	65.0	11.0	62.0	62.0
Total Split (%)	14.3%	31.4%	31.4%	14.3%	31.4%	31.4%	10.0%	46.4%	46.4%	7.9%	44.3%	44.3%
Maximum Green (s)	16.0	38.0	38.0	16.0	38.0	38.0	10.0	58.0	58.0	7.0	55.0	55.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effect Green (s)	14.6	37.1	37.1	13.2	35.6	35.6	78.7	65.6	65.6	74.7	63.6	63.6
Actuated g/C Ratio	0.10	0.26	0.26	0.09	0.25	0.25	0.56	0.47	0.47	0.53	0.45	0.45
v/c Ratio	0.60	0.60	0.56	0.52	0.63	0.36	0.63	0.49	0.20	0.46	0.58	0.48
Control Delay	67.1	46.7	25.4	79.9	40.6	11.5	43.9	12.1	0.7	27.6	37.4	15.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.1	46.7	25.4	79.9	40.6	11.5	43.9	12.1	0.7	27.6	37.4	15.6
LOS	E	D	C	E	D	B	D	B	A	C	D	B
Approach Delay		44.9			41.8			14.5			31.0	
Approach LOS		D			D			B			C	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 50 (36%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 32.3

Intersection LOS: C

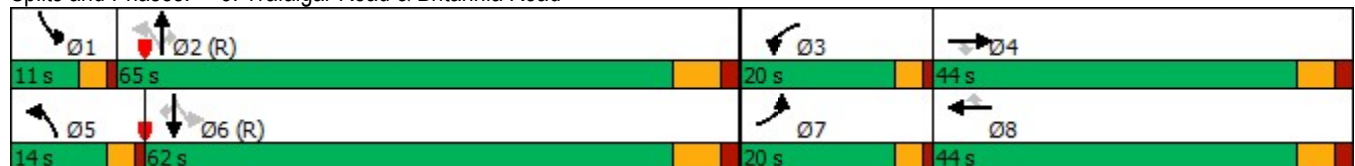
Intersection Capacity Utilization 64.8%

ICU Level of Service C

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 3: Trafalgar Road & Britannia Road



Queues

2031 FT AM Peak Hour

3: Trafalgar Road & Britannia Road

07/10/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	207	713	301	173	699	191	159	991	169	128	1150	445
v/c Ratio	0.60	0.60	0.56	0.52	0.63	0.36	0.63	0.49	0.20	0.46	0.58	0.48
Control Delay	67.1	46.7	25.4	79.9	40.6	11.5	43.9	12.1	0.7	27.6	37.4	15.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.1	46.7	25.4	79.9	40.6	11.5	43.9	12.1	0.7	27.6	37.4	15.6
Queue Length 50th (m)	28.6	71.2	35.4	25.2	65.6	3.9	14.0	60.5	0.1	15.4	122.3	33.3
Queue Length 95th (m)	41.0	85.0	63.8	m35.7	78.0	m19.3	45.0	38.6	0.4	36.4	153.4	58.7
Internal Link Dist (m)	479.1				195.2				240.1			
Turn Bay Length (m)	125.0		85.0	90.0		70.0	165.0		70.0	140.0		140.0
Base Capacity (vph)	401	1306	568	429	1254	578	256	2038	855	277	1976	926
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.55	0.53	0.40	0.56	0.33	0.62	0.49	0.20	0.46	0.58	0.48

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

3: Trafalgar Road & Britannia Road

2031 FT AM Peak Hour

07/10/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	207	713	301	173	699	191	159	991	169	128	1150	445
Future Volume (vph)	207	713	301	173	699	191	159	991	169	128	1150	445
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3309	4520	1601	3541	4391	1633	1772	4350	1633	1789	4350	1633
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.12	1.00	1.00	0.18	1.00	1.00
Satd. Flow (perm)	3309	4520	1601	3541	4391	1633	229	4350	1633	343	4350	1633
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	207	713	301	173	699	191	159	991	169	128	1150	445
RTOR Reduction (vph)	0	0	110	0	0	116	0	0	90	0	0	184
Lane Group Flow (vph)	207	713	191	173	699	75	159	991	79	128	1150	261
Heavy Vehicles (%)	7%	2%	2%	0%	5%	0%	3%	6%	0%	2%	6%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8	2		2	6		6
Actuated Green, G (s)	13.6	35.1	35.1	12.2	33.7	33.7	73.7	63.6	63.6	69.7	61.6	61.6
Effective Green, g (s)	14.6	37.1	37.1	13.2	35.7	35.7	75.7	65.6	65.6	71.7	63.6	63.6
Actuated g/C Ratio	0.10	0.27	0.27	0.09	0.26	0.26	0.54	0.47	0.47	0.51	0.45	0.45
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	345	1197	424	333	1119	416	246	2038	765	269	1976	741
v/s Ratio Prot	c0.06	0.16		0.05	c0.16		c0.05	0.23		0.03	0.26	
v/s Ratio Perm			0.12			0.05	c0.30		0.05	0.21		0.16
v/c Ratio	0.60	0.60	0.45	0.52	0.62	0.18	0.65	0.49	0.10	0.48	0.58	0.35
Uniform Delay, d1	59.9	44.9	43.0	60.4	46.2	40.7	20.0	25.6	20.8	19.1	28.3	24.8
Progression Factor	1.00	1.00	1.00	1.24	0.83	1.03	1.97	0.42	0.04	1.41	1.22	1.98
Incremental Delay, d2	2.8	1.2	1.6	1.3	1.5	0.4	5.7	0.8	0.3	1.3	1.2	1.3
Delay (s)	62.7	46.1	44.6	76.2	39.8	42.3	45.3	11.7	1.2	28.2	35.7	50.3
Level of Service	E	D	D	E	D	D	D	B	A	C	D	D
Approach Delay (s)		48.5			46.2			14.4			38.9	
Approach LOS		D			D			B			D	
Intersection Summary												
HCM 2000 Control Delay			36.5			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			64.8%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
106: Trafalgar Road & Collector L

2031 FT AM Peak Hour
07/10/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			  			  
Traffic Volume (vph)	317	110	1447	145	60	994
Future Volume (vph)	317	110	1447	145	60	994
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	110.0	0.0		50.0	100.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	20.0				50.0	
Lane Util. Factor	1.00	1.00	*0.80	1.00	1.00	*0.80
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1601	4520	1601	1789	4520
Flt Permitted	0.950				0.101	
Satd. Flow (perm)	1789	1601	4520	1601	190	4520
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		110		75		
Link Speed (k/h)	48		60			60
Link Distance (m)	184.6		368.2			870.6
Travel Time (s)	13.8		22.1			52.2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	317	110	1447	145	60	994
Shared Lane Traffic (%)						
Lane Group Flow (vph)	317	110	1447	145	60	994
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	6.1	6.1	30.5	6.1	6.1	30.5
Trailing Detector (m)	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
Detector 1 Size(m)	6.1	6.1	1.8	6.1	6.1	1.8
Detector 1 Type	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
Detector 1 Queue (s)	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
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	3		2	6	

Lanes, Volumes, Timings
106: Trafalgar Road & Collector L

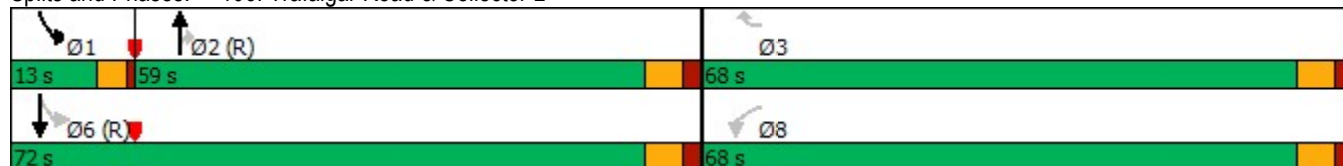
2031 FT AM Peak Hour
07/10/2025

	↖	↗	↑	↘	↙	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	8	3	2	2	1	6
Switch Phase						
Minimum Initial (s)	10.0	5.0	20.0	20.0	7.0	20.0
Minimum Split (s)	40.0	11.0	26.0	26.0	13.0	26.0
Total Split (s)	68.0	68.0	59.0	59.0	13.0	72.0
Total Split (%)	48.6%	48.6%	42.1%	42.1%	9.3%	51.4%
Maximum Green (s)	62.0	62.0	53.0	53.0	9.0	66.0
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	4.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	7.0		7.0	7.0		7.0
Flash Dont Walk (s)	27.0		9.0	9.0		9.0
Pedestrian Calls (#/hr)	0		0	0		0
Act Effect Green (s)	31.2	31.2	87.5	87.5	98.8	96.8
Actuated g/C Ratio	0.22	0.22	0.62	0.62	0.71	0.69
v/c Ratio	0.80	0.25	0.51	0.14	0.27	0.32
Control Delay	65.6	7.9	19.6	11.2	9.6	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.6	7.9	19.6	11.2	9.6	4.1
LOS	E	A	B	B	A	A
Approach Delay	50.7		18.8			4.4
Approach LOS	D		B			A

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 18.3
 Intersection LOS: B
 Intersection Capacity Utilization 64.7%
 ICU Level of Service C
 Analysis Period (min) 15
 * User Entered Value

Splits and Phases: 106: Trafalgar Road & Collector L



Queues

2031 FT AM Peak Hour

106: Trafalgar Road & Collector L

07/10/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	317	110	1447	145	60	994
v/c Ratio	0.80	0.25	0.51	0.14	0.27	0.32
Control Delay	65.6	7.9	19.6	11.2	9.6	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.6	7.9	19.6	11.2	9.6	4.1
Queue Length 50th (m)	83.6	0.0	46.5	6.5	3.1	22.5
Queue Length 95th (m)	107.4	13.7	164.2	24.6	6.5	30.6
Internal Link Dist (m)	160.6		344.2			846.6
Turn Bay Length (m)	110.0			50.0	100.0	
Base Capacity (vph)	792	770	2823	1028	236	3124
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	0.40	0.14	0.51	0.14	0.25	0.32
Intersection Summary						

HCM Signalized Intersection Capacity Analysis

106: Trafalgar Road & Collector L

2031 FT AM Peak Hour

07/10/2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	317	110	1447	145	60	994
Future Volume (vph)	317	110	1447	145	60	994
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	4.0	6.0
Lane Util. Factor	1.00	1.00	*0.80	1.00	1.00	*0.80
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1789	1601	4520	1601	1789	4520
Flt Permitted	0.95	1.00	1.00	1.00	0.10	1.00
Satd. Flow (perm)	1789	1601	4520	1601	190	4520
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	317	110	1447	145	60	994
RTOR Reduction (vph)	0	85	0	29	0	0
Lane Group Flow (vph)	317	25	1447	116	60	994
Turn Type	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	3		2	6	
Actuated Green, G (s)	31.2	31.2	86.7	86.7	96.8	96.8
Effective Green, g (s)	31.2	31.2	86.7	86.7	96.8	96.8
Actuated g/C Ratio	0.22	0.22	0.62	0.62	0.69	0.69
Clearance Time (s)	6.0	6.0	6.0	6.0	4.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	398	356	2799	991	201	3125
v/s Ratio Prot			c0.32		0.01	c0.22
v/s Ratio Perm	c0.18	0.02		0.07	0.19	
v/c Ratio	0.80	0.07	0.52	0.12	0.30	0.32
Uniform Delay, d1	51.4	42.9	14.9	10.9	9.8	8.5
Progression Factor	1.00	1.00	1.17	1.58	0.86	0.42
Incremental Delay, d2	10.6	0.1	0.6	0.2	0.8	0.3
Delay (s)	62.0	43.0	18.1	17.5	9.2	3.8
Level of Service	E	D	B	B	A	A
Approach Delay (s)	57.1		18.1			4.1
Approach LOS	E		B			A
Intersection Summary						
HCM 2000 Control Delay			18.7		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.58			
Actuated Cycle Length (s)			140.0		Sum of lost time (s)	16.0
Intersection Capacity Utilization			64.7%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings
107: Trafalgar Road & Collector H

2031 FT AM Peak Hour
07/10/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	211	47	1545	107	26	1285
Future Volume (vph)	211	47	1545	107	26	1285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	90.0	0.0		50.0	50.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	20.0				50.0	
Lane Util. Factor	1.00	1.00	*0.80	0.91	1.00	*0.80
Frt		0.850	0.990			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1601	4475	0	1789	4520
Flt Permitted	0.950				0.093	
Satd. Flow (perm)	1789	1601	4475	0	175	4520
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		47	14			
Link Speed (k/h)	48		60			60
Link Distance (m)	180.1		999.8			368.2
Travel Time (s)	13.5		60.0			22.1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	211	47	1545	107	26	1285
Shared Lane Traffic (%)						
Lane Group Flow (vph)	211	47	1652	0	26	1285
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	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
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	3		2			6
Permitted Phases		3			6	

Lanes, Volumes, Timings
107: Trafalgar Road & Collector H

2031 FT AM Peak Hour
07/10/2025

	↖	↗	↑	↘	↙	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	3	3	2		6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0		20.0	20.0
Minimum Split (s)	40.0	40.0	26.0		26.0	26.0
Total Split (s)	41.0	41.0	99.0		99.0	99.0
Total Split (%)	29.3%	29.3%	70.7%		70.7%	70.7%
Maximum Green (s)	35.0	35.0	93.0		93.0	93.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		C-Max	C-Max
Walk Time (s)	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	27.0	27.0	9.0		9.0	9.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	21.8	21.8	106.2		106.2	106.2
Actuated g/C Ratio	0.16	0.16	0.76		0.76	0.76
v/c Ratio	0.76	0.16	0.49		0.20	0.37
Control Delay	73.1	13.5	7.8		6.4	3.0
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	73.1	13.5	7.8		6.4	3.0
LOS	E	B	A		A	A
Approach Delay	62.3		7.8			3.0
Approach LOS	E		A			A

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 105 (75%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 10.2

Intersection LOS: B

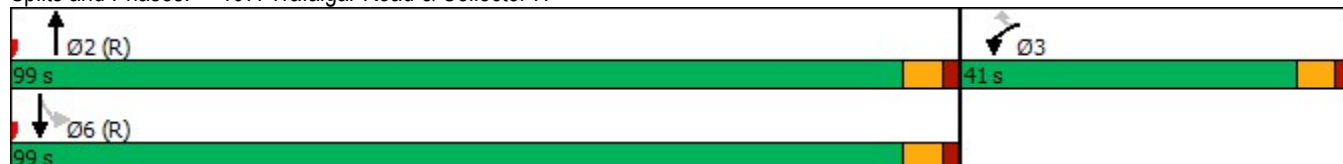
Intersection Capacity Utilization 53.9%

ICU Level of Service A

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 107: Trafalgar Road & Collector H



Queues
107: Trafalgar Road & Collector H

2031 FT AM Peak Hour
07/10/2025

					
Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	211	47	1652	26	1285
v/c Ratio	0.76	0.16	0.49	0.20	0.37
Control Delay	73.1	13.5	7.8	6.4	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	73.1	13.5	7.8	6.4	3.0
Queue Length 50th (m)	56.6	0.0	44.0	0.9	22.7
Queue Length 95th (m)	79.5	10.7	66.3	4.0	36.5
Internal Link Dist (m)	156.1		975.8		344.2
Turn Bay Length (m)	90.0			50.0	
Base Capacity (vph)	447	435	3396	132	3427
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.47	0.11	0.49	0.20	0.37
Intersection Summary					

HCM Signalized Intersection Capacity Analysis

107: Trafalgar Road & Collector H

2031 FT AM Peak Hour

07/10/2025

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	211	47	1545	107	26	1285
Future Volume (vph)	211	47	1545	107	26	1285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	*0.80		1.00	*0.80
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1789	1601	4476		1789	4520
Flt Permitted	0.95	1.00	1.00		0.09	1.00
Satd. Flow (perm)	1789	1601	4476		175	4520
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	211	47	1545	107	26	1285
RTOR Reduction (vph)	0	40	3	0	0	0
Lane Group Flow (vph)	211	7	1649	0	26	1285
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	3		2			6
Permitted Phases		3			6	
Actuated Green, G (s)	21.8	21.8	106.2		106.2	106.2
Effective Green, g (s)	21.8	21.8	106.2		106.2	106.2
Actuated g/C Ratio	0.16	0.16	0.76		0.76	0.76
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	278	249	3395		132	3428
v/s Ratio Prot	c0.12		c0.37			0.28
v/s Ratio Perm		0.00			0.15	
v/c Ratio	0.76	0.03	0.49		0.20	0.37
Uniform Delay, d1	56.6	50.1	6.5		4.8	5.7
Progression Factor	1.00	1.00	1.06		0.46	0.43
Incremental Delay, d2	11.3	0.0	0.5		3.2	0.3
Delay (s)	67.9	50.2	7.3		5.4	2.8
Level of Service	E	D	A		A	A
Approach Delay (s)	64.6		7.3			2.8
Approach LOS	E		A			A
Intersection Summary						
HCM 2000 Control Delay			10.1		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.53			
Actuated Cycle Length (s)			140.0		Sum of lost time (s)	12.0
Intersection Capacity Utilization			53.9%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings
207: Collector G & Collector L

2031 FT AM Peak Hour
07/10/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	181	10	38	259	58	53	47	53	103	65	115
Future Volume (vph)	38	181	10	38	259	58	53	47	53	103	65	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	25.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	10.0			25.0			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992			0.973			0.953			0.945	
Flt Protected	0.950			0.950				0.983			0.982	
Satd. Flow (prot)	1789	1868	0	1789	1833	0	0	1764	0	0	1748	0
Flt Permitted	0.950			0.950				0.983			0.982	
Satd. Flow (perm)	1789	1868	0	1789	1833	0	0	1764	0	0	1748	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		184.6			422.4			376.5			875.5	
Travel Time (s)		13.8			31.7			28.2			65.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	38	181	10	38	259	58	53	47	53	103	65	115
Shared Lane Traffic (%)												
Lane Group Flow (vph)	38	191	0	38	317	0	0	153	0	0	283	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)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	52.0%						ICU Level of Service A					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
207: Collector G & Collector L

2031 FT AM Peak Hour
07/10/2025

																		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR						
Lane Configurations																		
Sign Control	Stop			Stop				Stop			Stop							
Traffic Volume (vph)	38	181	10	38	259	58	53	47	53	103	65	115						
Future Volume (vph)	38	181	10	38	259	58	53	47	53	103	65	115						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00						
Hourly flow rate (vph)	38	181	10	38	259	58	53	47	53	103	65	115						
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1												
Volume Total (vph)	38	191	38	317	153	283												
Volume Left (vph)	38	0	38	0	53	103												
Volume Right (vph)	0	10	0	58	53	115												
Hadj (s)	0.53	0.00	0.53	-0.09	-0.10	-0.14												
Departure Headway (s)	7.0	6.4	6.8	6.1	6.0	5.7												
Degree Utilization, x	0.07	0.34	0.07	0.54	0.26	0.45												
Capacity (veh/h)	475	507	500	550	523	580												
Control Delay (s)	9.3	11.5	9.1	14.9	11.1	13.4												
Approach Delay (s)	11.1		14.3		11.1	13.4												
Approach LOS	B		B		B	B												
Intersection Summary																		
Delay			12.8															
Level of Service			B															
Intersection Capacity Utilization			52.0%		ICU Level of Service		A											
Analysis Period (min)			15															

Lanes, Volumes, Timings
208: Collector H & Collector L

2031 FT AM Peak Hour
07/10/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	187	45	26	225	59	31	87	39	53	76	78
Future Volume (vph)	155	187	45	26	225	59	31	87	39	53	76	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	25.0		0.0	25.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	2.5			2.5			25.0			25.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.984			0.974			0.954			0.924	
Flt Protected		0.980			0.996		0.950			0.950		
Satd. Flow (prot)	0	1816	0	0	1827	0	1789	1797	0	1789	1740	0
Flt Permitted		0.980			0.996		0.950			0.950		
Satd. Flow (perm)	0	1816	0	0	1827	0	1789	1797	0	1789	1740	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		422.4			514.0			400.7			911.3	
Travel Time (s)		31.7			38.6			30.1			68.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	155	187	45	26	225	59	31	87	39	53	76	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	387	0	0	310	0	31	126	0	53	154	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)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	63.5%						ICU Level of Service B					
Analysis Period (min)	15											

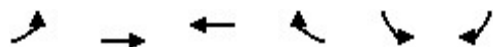
HCM Unsignalized Intersection Capacity Analysis 208: Collector H & Collector L

2031 FT AM Peak Hour
07/10/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	187	45	26	225	59	31	87	39	53	76	78
Future Volume (Veh/h)	155	187	45	26	225	59	31	87	39	53	76	78
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	155	187	45	26	225	59	31	87	39	53	76	78
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	284			232			942	856	210	908	848	254
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	284			232			942	856	210	908	848	254
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	88			98			80	66	95	67	70	90
cM capacity (veh/h)	1278			1336			152	254	831	161	257	784
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	387	310	31	126	53	154						
Volume Left	155	26	31	0	53	0						
Volume Right	45	59	0	39	0	78						
cSH	1278	1336	152	324	161	390						
Volume to Capacity	0.12	0.02	0.20	0.39	0.33	0.40						
Queue Length 95th (m)	3.1	0.5	5.6	13.5	10.1	14.0						
Control Delay (s)	4.0	0.8	34.7	23.0	37.8	20.2						
Lane LOS	A	A	D	C	E	C						
Approach Delay (s)	4.0	0.8	25.3		24.7							
Approach LOS			D		C							
Intersection Summary												
Average Delay			10.3									
Intersection Capacity Utilization			63.5%		ICU Level of Service			B				
Analysis Period (min)			15									

Lanes, Volumes, Timings
211: Collector H & Collector G

2031 FT AM Peak Hour
07/10/2025



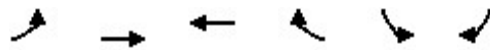
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	25	108	164	85	80	94
Future Volume (vph)	25	108	164	85	80	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.954		0.927	
Flt Protected		0.991			0.978	
Satd. Flow (prot)	0	1866	1797	0	1708	0
Flt Permitted		0.991			0.978	
Satd. Flow (perm)	0	1866	1797	0	1708	0
Link Speed (k/h)		48	48		48	
Link Distance (m)		180.1	459.0		376.5	
Travel Time (s)		13.5	34.4		28.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	108	164	85	80	94
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	133	249	0	174	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	41.1%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

211: Collector H & Collector G

2031 FT AM Peak Hour

07/10/2025



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	108	164	85	80	94
Future Volume (Veh/h)	25	108	164	85	80	94
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	108	164	85	80	94
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)		180				
pX, platoon unblocked						
vC, conflicting volume	249				364	206
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	249				364	206
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				87	89
cM capacity (veh/h)	1317				623	834
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	133	249	174			
Volume Left	25	0	80			
Volume Right	0	85	94			
cSH	1317	1700	722			
Volume to Capacity	0.02	0.15	0.24			
Queue Length 95th (m)	0.4	0.0	7.1			
Control Delay (s)	1.6	0.0	11.6			
Lane LOS	A		B			
Approach Delay (s)	1.6	0.0	11.6			
Approach LOS			B			
Intersection Summary						
Average Delay			4.0			
Intersection Capacity Utilization			41.1%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
1: Trafalgar Road & Derry Road

2031 FT PM Peak Hour

07/10/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	1040	233	69	1461	262	216	957	50	340	969	115
Future Volume (vph)	171	1040	233	69	1461	262	216	957	50	340	969	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	130.0		110.0	300.0		70.0	110.0		70.0	130.0		85.0
Storage Lanes	2		1	1		1	2		1	2		1
Taper Length (m)	50.0			50.0			50.0			50.0		
Lane Util. Factor	0.97	*0.80	1.00	1.00	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3026	4476	1601	1772	4565	1633	3471	4433	1633	3506	4476	1420
Flt Permitted	0.950			0.169			0.950			0.950		
Satd. Flow (perm)	3026	4476	1601	315	4565	1633	3471	4433	1633	3506	4476	1420
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			233			186			124			124
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		455.0			198.7			323.1			623.5	
Travel Time (s)		20.5			8.9			19.4			37.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	17%	3%	2%	3%	1%	0%	2%	4%	0%	1%	3%	15%
Adj. Flow (vph)	171	1040	233	69	1461	262	216	957	50	340	969	115
Shared Lane Traffic (%)												
Lane Group Flow (vph)	171	1040	233	69	1461	262	216	957	50	340	969	115
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)		7.4			7.4			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	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	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	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	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	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	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	Prot	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	

Lanes, Volumes, Timings
1: Trafalgar Road & Derry Road

2031 FT PM Peak Hour
07/10/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			2	6		6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	7.0	10.0	10.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	37.9	37.9	11.0	37.9	37.9	11.0	36.8	36.8	11.0	36.8	36.8
Total Split (s)	16.0	65.0	65.0	11.0	60.0	60.0	17.0	43.0	43.0	21.0	47.0	47.0
Total Split (%)	11.4%	46.4%	46.4%	7.9%	42.9%	42.9%	12.1%	30.7%	30.7%	15.0%	33.6%	33.6%
Maximum Green (s)	12.0	58.1	58.1	7.0	53.1	53.1	13.0	36.2	36.2	17.0	40.2	40.2
Yellow Time (s)	3.0	4.6	4.6	3.0	4.6	4.6	3.0	4.2	4.2	3.0	4.2	4.2
All-Red Time (s)	1.0	2.3	2.3	1.0	2.3	2.3	1.0	2.6	2.6	1.0	2.6	2.6
Lost Time Adjust (s)	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.8	4.8	3.0	4.8	4.8
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	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)		24.0	24.0		24.0	24.0		23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effect Green (s)	12.4	63.0	63.0	66.5	56.4	56.4	13.8	37.7	37.7	17.8	41.7	41.7
Actuated g/C Ratio	0.09	0.45	0.45	0.48	0.40	0.40	0.10	0.27	0.27	0.13	0.30	0.30
v/c Ratio	0.64	0.52	0.27	0.29	0.79	0.34	0.63	0.80	0.09	0.76	0.73	0.23
Control Delay	69.7	36.1	12.2	15.3	34.5	9.4	91.3	25.8	0.9	71.1	47.7	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.7	36.1	12.2	15.3	34.5	9.4	91.3	25.8	0.9	71.1	47.7	6.0
LOS	E	D	B	B	C	A	F	C	A	E	D	A
Approach Delay		36.2			30.1			36.4			49.9	
Approach LOS		D			C			D			D	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 40 (29%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 37.7

Intersection LOS: D

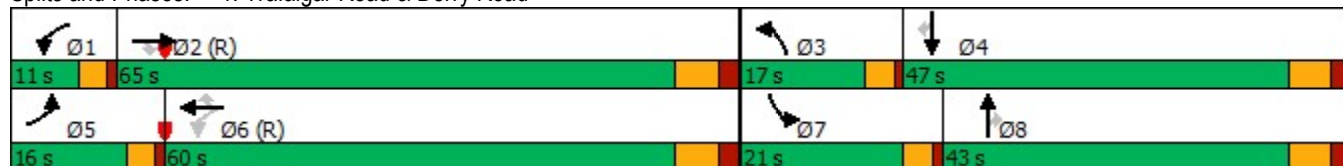
Intersection Capacity Utilization 76.0%

ICU Level of Service D

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 1: Trafalgar Road & Derry Road



Queues

2031 FT PM Peak Hour

1: Trafalgar Road & Derry Road

07/10/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	171	1040	233	69	1461	262	216	957	50	340	969	115
v/c Ratio	0.64	0.52	0.27	0.29	0.79	0.34	0.63	0.80	0.09	0.76	0.73	0.23
Control Delay	69.7	36.1	12.2	15.3	34.5	9.4	91.3	25.8	0.9	71.1	47.7	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.7	36.1	12.2	15.3	34.5	9.4	91.3	25.8	0.9	71.1	47.7	6.0
Queue Length 50th (m)	23.8	104.2	10.8	6.8	155.9	20.2	25.5	107.4	0.7	47.5	99.8	0.0
Queue Length 95th (m)	36.1	122.9	33.3	12.2	172.7	37.2	43.9	65.9	1.2	64.3	118.6	12.1
Internal Link Dist (m)		431.0			174.7			299.1			599.5	
Turn Bay Length (m)	130.0		110.0	300.0		70.0	110.0		70.0	130.0		85.0
Base Capacity (vph)	280	2012	848	234	1838	768	347	1209	535	450	1349	514
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.52	0.27	0.29	0.79	0.34	0.62	0.79	0.09	0.76	0.72	0.22
Intersection Summary												

HCM Signalized Intersection Capacity Analysis

1: Trafalgar Road & Derry Road

2031 FT PM Peak Hour

07/10/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	1040	233	69	1461	262	216	957	50	340	969	115
Future Volume (vph)	171	1040	233	69	1461	262	216	957	50	340	969	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.8	4.8	3.0	4.8	4.8
Lane Util. Factor	0.97	*0.80	1.00	1.00	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3026	4476	1601	1772	4565	1633	3471	4433	1633	3506	4476	1420
Flt Permitted	0.95	1.00	1.00	0.17	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3026	4476	1601	316	4565	1633	3471	4433	1633	3506	4476	1420
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	171	1040	233	69	1461	262	216	957	50	340	969	115
RTOR Reduction (vph)	0	0	129	0	0	111	0	0	37	0	0	81
Lane Group Flow (vph)	171	1040	104	69	1461	151	216	957	13	340	969	34
Heavy Vehicles (%)	17%	3%	2%	3%	1%	0%	2%	4%	0%	1%	3%	15%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6			8			4
Actuated Green, G (s)	11.4	60.2	60.2	60.0	54.4	54.4	12.8	35.7	35.7	16.8	39.7	39.7
Effective Green, g (s)	12.4	62.2	62.2	62.0	56.4	56.4	13.8	37.7	37.7	17.8	41.7	41.7
Actuated g/C Ratio	0.09	0.44	0.44	0.44	0.40	0.40	0.10	0.27	0.27	0.13	0.30	0.30
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.8	6.8	4.0	6.8	6.8
Vehicle Extension (s)	3.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	268	1988	711	208	1839	657	342	1193	439	445	1333	422
v/s Ratio Prot	c0.06	0.23		0.02	c0.32		0.06	c0.22		c0.10	0.22	
v/s Ratio Perm			0.06	0.13		0.09			0.01			0.02
v/c Ratio	0.64	0.52	0.15	0.33	0.79	0.23	0.63	0.80	0.03	0.76	0.73	0.08
Uniform Delay, d1	61.6	28.2	23.1	23.4	36.7	27.5	60.7	47.7	37.7	59.1	44.0	35.4
Progression Factor	0.96	1.24	3.92	0.73	0.84	0.93	1.37	0.43	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.6	0.9	0.4	1.8	3.3	0.7	4.7	4.1	0.1	8.9	2.5	0.2
Delay (s)	63.6	35.8	90.9	18.8	34.0	26.5	88.0	24.7	37.7	68.0	46.5	35.5
Level of Service	E	D	F	B	C	C	F	C	D	E	D	D
Approach Delay (s)		48.0			32.3			36.4			50.8	
Approach LOS		D			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			41.5				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)			15.7		
Intersection Capacity Utilization			76.0%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
3: Trafalgar Road & Britannia Road

2031 FT PM Peak Hour

07/10/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	460	903	239	151	943	138	345	1342	211	196	931	335
Future Volume (vph)	460	903	239	151	943	138	345	1342	211	196	931	335
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	125.0		85.0	90.0		70.0	165.0		70.0	140.0		140.0
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (m)	50.0			50.0			50.0			50.0		
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3404	4520	1617	3541	4565	1601	1772	4520	1633	1772	4433	1585
Flt Permitted	0.950			0.950			0.102			0.103		
Satd. Flow (perm)	3404	4520	1617	3541	4565	1601	190	4520	1633	192	4433	1585
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			239			156			154			332
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		503.1			219.2			264.1			430.6	
Travel Time (s)		30.2			13.2			15.8			25.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	2%	1%	0%	1%	2%	3%	2%	0%	3%	4%	3%
Adj. Flow (vph)	460	903	239	151	943	138	345	1342	211	196	931	335
Shared Lane Traffic (%)												
Lane Group Flow (vph)	460	903	239	151	943	138	345	1342	211	196	931	335
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)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	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	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	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	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	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	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	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

Lanes, Volumes, Timings
3: Trafalgar Road & Britannia Road

2031 FT PM Peak Hour

07/10/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			4			8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0	15.0	7.0	25.0	25.0	7.0	25.0	25.0
Minimum Split (s)	11.0	40.0	40.0	11.0	40.0	40.0	11.0	41.0	41.0	11.0	41.0	41.0
Total Split (s)	28.0	54.0	54.0	14.0	40.0	40.0	30.0	55.0	55.0	17.0	42.0	42.0
Total Split (%)	20.0%	38.6%	38.6%	10.0%	28.6%	28.6%	21.4%	39.3%	39.3%	12.1%	30.0%	30.0%
Maximum Green (s)	24.0	48.0	48.0	10.0	34.0	34.0	26.0	48.0	48.0	13.0	35.0	35.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	23.4	49.2	49.2	10.6	36.4	36.4	70.2	51.6	51.6	55.6	40.0	40.0
Actuated g/C Ratio	0.17	0.35	0.35	0.08	0.26	0.26	0.50	0.37	0.37	0.40	0.29	0.29
v/c Ratio	0.81	0.57	0.33	0.56	0.80	0.26	0.91	0.81	0.30	0.86	0.73	0.49
Control Delay	67.9	38.4	4.9	94.0	36.6	2.2	71.0	26.1	2.2	71.3	50.3	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.9	38.4	4.9	94.0	36.6	2.2	71.0	26.1	2.2	71.3	50.3	14.3
LOS	E	D	A	F	D	A	E	C	A	E	D	B
Approach Delay		41.9			39.7			31.6			44.9	
Approach LOS		D			D			C			D	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 85 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 115

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 39.0

Intersection LOS: D

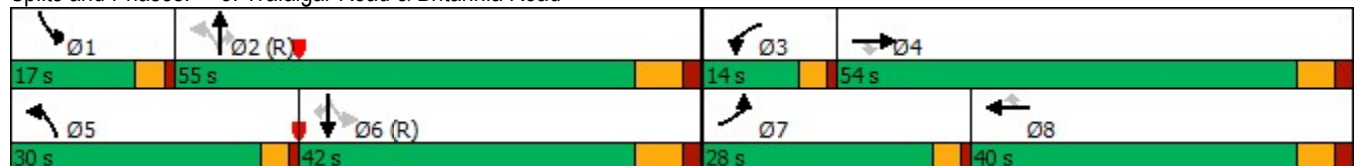
Intersection Capacity Utilization 85.5%

ICU Level of Service E

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 3: Trafalgar Road & Britannia Road



Queues

2031 FT PM Peak Hour

3: Trafalgar Road & Britannia Road

07/10/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	460	903	239	151	943	138	345	1342	211	196	931	335
v/c Ratio	0.81	0.57	0.33	0.56	0.80	0.26	0.91	0.81	0.30	0.86	0.73	0.49
Control Delay	67.9	38.4	4.9	94.0	36.6	2.2	71.0	26.1	2.2	71.3	50.3	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.9	38.4	4.9	94.0	36.6	2.2	71.0	26.1	2.2	71.3	50.3	14.3
Queue Length 50th (m)	63.0	83.3	0.0	22.8	112.1	2.1	53.0	144.8	2.2	41.6	86.2	6.8
Queue Length 95th (m)	82.0	99.6	17.3	34.1	126.5	3.0	#123.7	110.8	0.3	#81.5	112.0	45.0
Internal Link Dist (m)	479.1				195.2				240.1			
Turn Bay Length (m)	125.0		85.0	90.0		70.0	165.0		70.0	140.0		140.0
Base Capacity (vph)	607	1614	731	278	1188	532	400	1666	699	234	1267	690
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.56	0.33	0.54	0.79	0.26	0.86	0.81	0.30	0.84	0.73	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

3: Trafalgar Road & Britannia Road

2031 FT PM Peak Hour

07/10/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	460	903	239	151	943	138	345	1342	211	196	931	335
Future Volume (vph)	460	903	239	151	943	138	345	1342	211	196	931	335
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3404	4520	1617	3541	4565	1601	1772	4520	1633	1772	4433	1585
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.10	1.00	1.00	0.10	1.00	1.00
Satd. Flow (perm)	3404	4520	1617	3541	4565	1601	189	4520	1633	191	4433	1585
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	460	903	239	151	943	138	345	1342	211	196	931	335
RTOR Reduction (vph)	0	0	155	0	0	102	0	0	97	0	0	237
Lane Group Flow (vph)	460	903	84	151	943	36	345	1342	114	196	931	98
Heavy Vehicles (%)	4%	2%	1%	0%	1%	2%	3%	2%	0%	3%	4%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8	2		2	6		6
Actuated Green, G (s)	22.4	47.2	47.2	9.6	34.4	34.4	66.2	49.6	49.6	50.6	38.0	38.0
Effective Green, g (s)	23.4	49.2	49.2	10.6	36.4	36.4	67.2	51.6	51.6	52.6	40.0	40.0
Actuated g/C Ratio	0.17	0.35	0.35	0.08	0.26	0.26	0.48	0.37	0.37	0.38	0.29	0.29
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	568	1588	568	268	1186	416	375	1665	601	225	1266	452
v/s Ratio Prot	c0.14	0.20		0.04	c0.21		c0.17	0.30		0.08	0.21	
v/s Ratio Perm			0.05			0.02	c0.27		0.07	0.24		0.06
v/c Ratio	0.81	0.57	0.15	0.56	0.80	0.09	0.92	0.81	0.19	0.87	0.74	0.22
Uniform Delay, d1	56.2	36.8	31.1	62.5	48.3	39.2	41.0	39.7	30.0	34.6	45.2	38.1
Progression Factor	1.00	1.00	1.00	1.38	0.64	0.27	1.17	0.54	0.12	1.17	1.01	2.76
Incremental Delay, d2	8.4	0.8	0.3	2.5	4.1	0.2	26.6	4.1	0.7	27.3	3.6	1.0
Delay (s)	64.5	37.6	31.3	88.6	35.2	10.9	74.5	25.7	4.3	67.9	49.2	106.3
Level of Service	E	D	C	F	D	B	E	C	A	E	D	F
Approach Delay (s)		44.4			39.0			32.2			64.8	
Approach LOS		D			D			C			E	
Intersection Summary												
HCM 2000 Control Delay		44.4			HCM 2000 Level of Service			D				
HCM 2000 Volume to Capacity ratio		0.87										
Actuated Cycle Length (s)		140.0			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		85.5%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

Lanes, Volumes, Timings
106: Trafalgar Road & Collector L

2031 FT PM Peak Hour
07/10/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			  			  
Traffic Volume (vph)	249	60	1361	285	215	1368
Future Volume (vph)	249	60	1361	285	215	1368
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	110.0	0.0		50.0	100.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	20.0				50.0	
Lane Util. Factor	1.00	1.00	*0.80	1.00	1.00	*0.80
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1601	4520	1601	1789	4520
Flt Permitted	0.950				0.111	
Satd. Flow (perm)	1789	1601	4520	1601	209	4520
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		60		161		
Link Speed (k/h)	48		60			60
Link Distance (m)	184.6		368.2			870.6
Travel Time (s)	13.8		22.1			52.2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	249	60	1361	285	215	1368
Shared Lane Traffic (%)						
Lane Group Flow (vph)	249	60	1361	285	215	1368
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	6.1	6.1	30.5	6.1	6.1	30.5
Trailing Detector (m)	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
Detector 1 Size(m)	6.1	6.1	1.8	6.1	6.1	1.8
Detector 1 Type	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
Detector 1 Queue (s)	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
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	3		2	6	

Lanes, Volumes, Timings
106: Trafalgar Road & Collector L

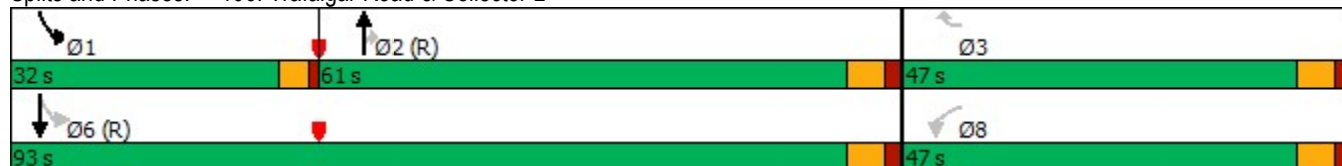
2031 FT PM Peak Hour
07/10/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	8	3	2	2	1	6
Switch Phase						
Minimum Initial (s)	10.0	5.0	20.0	20.0	7.0	20.0
Minimum Split (s)	40.0	11.0	26.0	26.0	13.0	26.0
Total Split (s)	47.0	47.0	61.0	61.0	32.0	93.0
Total Split (%)	33.6%	33.6%	43.6%	43.6%	22.9%	66.4%
Maximum Green (s)	41.0	41.0	55.0	55.0	28.0	87.0
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	4.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	7.0		7.0	7.0		7.0
Flash Dont Walk (s)	27.0		9.0	9.0		9.0
Pedestrian Calls (#/hr)	0		0	0		0
Act Effect Green (s)	24.9	22.6	83.2	83.2	105.1	103.1
Actuated g/C Ratio	0.18	0.16	0.59	0.59	0.75	0.74
v/c Ratio	0.78	0.19	0.51	0.28	0.64	0.41
Control Delay	71.6	11.6	14.1	5.2	34.6	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.6	11.6	14.1	5.2	34.6	11.2
LOS	E	B	B	A	C	B
Approach Delay	60.0		12.5			14.4
Approach LOS	E		B			B

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 13 (9%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 17.5
 Intersection Capacity Utilization 65.3%
 Analysis Period (min) 15
 * User Entered Value

Splits and Phases: 106: Trafalgar Road & Collector L



Queues
106: Trafalgar Road & Collector L

2031 FT PM Peak Hour
07/10/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	249	60	1361	285	215	1368
v/c Ratio	0.78	0.19	0.51	0.28	0.64	0.41
Control Delay	71.6	11.6	14.1	5.2	34.6	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.6	11.6	14.1	5.2	34.6	11.2
Queue Length 50th (m)	66.6	0.0	90.0	6.1	36.5	55.3
Queue Length 95th (m)	90.6	11.7	130.3	34.3	61.8	79.3
Internal Link Dist (m)	160.6		344.2			846.6
Turn Bay Length (m)	110.0			50.0	100.0	
Base Capacity (vph)	523	511	2686	1016	472	3329
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	0.48	0.12	0.51	0.28	0.46	0.41
Intersection Summary						

HCM Signalized Intersection Capacity Analysis

106: Trafalgar Road & Collector L

2031 FT PM Peak Hour
07/10/2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	249	60	1361	285	215	1368
Future Volume (vph)	249	60	1361	285	215	1368
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	4.0	6.0
Lane Util. Factor	1.00	1.00	*0.80	1.00	1.00	*0.80
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1789	1601	4520	1601	1789	4520
Flt Permitted	0.95	1.00	1.00	1.00	0.11	1.00
Satd. Flow (perm)	1789	1601	4520	1601	210	4520
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	249	60	1361	285	215	1368
RTOR Reduction (vph)	0	49	0	65	0	0
Lane Group Flow (vph)	249	11	1361	220	215	1368
Turn Type	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	3		2	6	
Actuated Green, G (s)	24.9	24.9	83.2	83.2	103.1	103.1
Effective Green, g (s)	24.9	24.9	83.2	83.2	103.1	103.1
Actuated g/C Ratio	0.18	0.18	0.59	0.59	0.74	0.74
Clearance Time (s)	6.0	6.0	6.0	6.0	4.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	318	284	2686	951	333	3328
v/s Ratio Prot			0.30		c0.07	0.30
v/s Ratio Perm	c0.14	0.01		0.14	c0.40	
v/c Ratio	0.78	0.04	0.51	0.23	0.65	0.41
Uniform Delay, d1	55.0	47.6	16.5	13.4	14.1	7.0
Progression Factor	1.00	1.00	0.73	0.63	2.08	1.45
Incremental Delay, d2	11.9	0.1	0.6	0.5	3.9	0.3
Delay (s)	66.8	47.7	12.7	8.9	33.4	10.4
Level of Service	E	D	B	A	C	B
Approach Delay (s)	63.1		12.1			13.6
Approach LOS	E		B			B
Intersection Summary						
HCM 2000 Control Delay			17.2		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.69			
Actuated Cycle Length (s)			140.0		Sum of lost time (s)	16.0
Intersection Capacity Utilization			65.3%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings
107: Trafalgar Road & Collector H

2031 FT PM Peak Hour
07/10/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	127	22	1624	131	41	1576
Future Volume (vph)	127	22	1624	131	41	1576
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	90.0	0.0		50.0	50.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	20.0				50.0	
Lane Util. Factor	1.00	1.00	*0.80	0.91	1.00	*0.80
Frt		0.850	0.989			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1601	4471	0	1789	4520
Flt Permitted	0.950				0.084	
Satd. Flow (perm)	1789	1601	4471	0	158	4520
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		22	14			
Link Speed (k/h)	48		60			60
Link Distance (m)	180.1		999.8			368.2
Travel Time (s)	13.5		60.0			22.1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	127	22	1624	131	41	1576
Shared Lane Traffic (%)						
Lane Group Flow (vph)	127	22	1755	0	41	1576
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	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
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	3		2			6
Permitted Phases		3			6	

Lanes, Volumes, Timings
107: Trafalgar Road & Collector H

2031 FT PM Peak Hour
07/10/2025

	↖	↗	↑	↘	↙	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	3	3	2		6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0		20.0	20.0
Minimum Split (s)	40.0	40.0	26.0		26.0	26.0
Total Split (s)	50.0	50.0	90.0		90.0	90.0
Total Split (%)	35.7%	35.7%	64.3%		64.3%	64.3%
Maximum Green (s)	44.0	44.0	84.0		84.0	84.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		C-Max	C-Max
Walk Time (s)	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	27.0	27.0	9.0		9.0	9.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effect Green (s)	15.4	15.4	112.6		112.6	112.6
Actuated g/C Ratio	0.11	0.11	0.80		0.80	0.80
v/c Ratio	0.64	0.11	0.49		0.32	0.43
Control Delay	74.2	19.7	3.7		17.1	7.8
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	74.2	19.7	3.7		17.1	7.8
LOS	E	B	A		B	A
Approach Delay	66.1		3.7			8.0
Approach LOS	E		A			A

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 50 (36%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 8.3

Intersection LOS: A

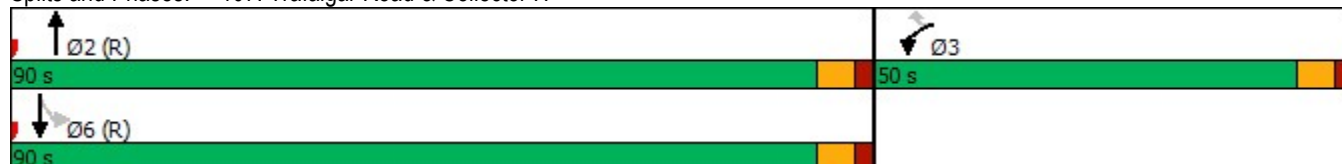
Intersection Capacity Utilization 52.6%

ICU Level of Service A

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 107: Trafalgar Road & Collector H



Queues
107: Trafalgar Road & Collector H

2031 FT PM Peak Hour
07/10/2025

					
Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	127	22	1755	41	1576
v/c Ratio	0.64	0.11	0.49	0.32	0.43
Control Delay	74.2	19.7	3.7	17.1	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	74.2	19.7	3.7	17.1	7.8
Queue Length 50th (m)	34.3	0.0	4.0	2.6	41.4
Queue Length 95th (m)	53.4	8.0	115.1	13.8	112.8
Internal Link Dist (m)	156.1		975.8		344.2
Turn Bay Length (m)	90.0			50.0	
Base Capacity (vph)	562	518	3598	127	3634
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.23	0.04	0.49	0.32	0.43
Intersection Summary					

HCM Signalized Intersection Capacity Analysis

107: Trafalgar Road & Collector H

2031 FT PM Peak Hour

07/10/2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	127	22	1624	131	41	1576
Future Volume (vph)	127	22	1624	131	41	1576
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	*0.80		1.00	*0.80
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1789	1601	4470		1789	4520
Flt Permitted	0.95	1.00	1.00		0.08	1.00
Satd. Flow (perm)	1789	1601	4470		159	4520
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	127	22	1624	131	41	1576
RTOR Reduction (vph)	0	20	3	0	0	0
Lane Group Flow (vph)	127	2	1752	0	41	1576
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	3		2			6
Permitted Phases		3			6	
Actuated Green, G (s)	15.4	15.4	112.6		112.6	112.6
Effective Green, g (s)	15.4	15.4	112.6		112.6	112.6
Actuated g/C Ratio	0.11	0.11	0.80		0.80	0.80
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	196	176	3595		127	3635
v/s Ratio Prot	c0.07		c0.39			0.35
v/s Ratio Perm		0.00			0.26	
v/c Ratio	0.65	0.01	0.49		0.32	0.43
Uniform Delay, d1	59.7	55.5	4.4		3.6	4.1
Progression Factor	1.00	1.00	0.69		1.90	1.67
Incremental Delay, d2	7.2	0.0	0.4		6.1	0.3
Delay (s)	66.9	55.6	3.5		13.0	7.2
Level of Service	E	E	A		B	A
Approach Delay (s)	65.2		3.5			7.4
Approach LOS	E		A			A
Intersection Summary						
HCM 2000 Control Delay			7.9		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.51			
Actuated Cycle Length (s)			140.0		Sum of lost time (s)	12.0
Intersection Capacity Utilization			52.6%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings
207: Collector G & Collector L

2031 FT PM Peak Hour
07/10/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	327	52	62	162	77	50	30	48	83	79	97
Future Volume (vph)	125	327	52	62	162	77	50	30	48	83	79	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	25.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	10.0			25.0			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.979			0.952			0.949			0.949	
Flt Protected	0.950			0.950				0.981			0.984	
Satd. Flow (prot)	1789	1844	0	1789	1793	0	0	1753	0	0	1759	0
Flt Permitted	0.950			0.950				0.981			0.984	
Satd. Flow (perm)	1789	1844	0	1789	1793	0	0	1753	0	0	1759	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		184.6			422.4			376.5			875.5	
Travel Time (s)		13.8			31.7			28.2			65.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	125	327	52	62	162	77	50	30	48	83	79	97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	125	379	0	62	239	0	0	128	0	0	259	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)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	51.6%						ICU Level of Service A					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
207: Collector G & Collector L

2031 FT PM Peak Hour
07/10/2025

																		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR						
Lane Configurations																		
Sign Control	Stop			Stop				Stop			Stop							
Traffic Volume (vph)	125	327	52	62	162	77	50	30	48	83	79	97						
Future Volume (vph)	125	327	52	62	162	77	50	30	48	83	79	97						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00						
Hourly flow rate (vph)	125	327	52	62	162	77	50	30	48	83	79	97						
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1												
Volume Total (vph)	125	379	62	239	128	259												
Volume Left (vph)	125	0	62	0	50	83												
Volume Right (vph)	0	52	0	77	48	97												
Hadj (s)	0.53	-0.06	0.53	-0.19	-0.11	-0.13												
Departure Headway (s)	6.9	6.2	7.2	6.4	6.6	6.2												
Degree Utilization, x	0.24	0.66	0.12	0.43	0.23	0.45												
Capacity (veh/h)	503	552	471	518	477	535												
Control Delay (s)	10.8	19.2	10.0	12.9	11.6	14.1												
Approach Delay (s)	17.1		12.3		11.6	14.1												
Approach LOS	C		B		B	B												
Intersection Summary																		
Delay			14.7															
Level of Service			B															
Intersection Capacity Utilization			51.6%		ICU Level of Service		A											
Analysis Period (min)			15															

Lanes, Volumes, Timings
208: Collector H & Collector L

2031 FT PM Peak Hour
07/10/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	306	8	28	233	43	8	29	16	34	47	68
Future Volume (vph)	106	306	8	28	233	43	8	29	16	34	47	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	25.0		0.0	25.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	2.5			2.5			25.0			25.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.981			0.947			0.911	
Flt Protected		0.988			0.995		0.950			0.950		
Satd. Flow (prot)	0	1855	0	0	1838	0	1789	1784	0	1789	1716	0
Flt Permitted		0.988			0.995		0.950			0.950		
Satd. Flow (perm)	0	1855	0	0	1838	0	1789	1784	0	1789	1716	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		422.4			514.0			400.7			911.3	
Travel Time (s)		31.7			38.6			30.1			68.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	106	306	8	28	233	43	8	29	16	34	47	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	420	0	0	304	0	8	45	0	34	115	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)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 57.4%	ICU Level of Service B											
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis 208: Collector H & Collector L

2031 FT PM Peak Hour
07/10/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	306	8	28	233	43	8	29	16	34	47	68
Future Volume (Veh/h)	106	306	8	28	233	43	8	29	16	34	47	68
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	106	306	8	28	233	43	8	29	16	34	47	68
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	276			314			924	854	310	863	836	254
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	276			314			924	854	310	863	836	254
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			98			96	89	98	85	83	91
cM capacity (veh/h)	1287			1246			183	265	730	227	272	784
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	420	304	8	45	34	115						
Volume Left	106	28	8	0	34	0						
Volume Right	8	43	0	16	0	68						
cSH	1287	1246	183	343	227	443						
Volume to Capacity	0.08	0.02	0.04	0.13	0.15	0.26						
Queue Length 95th (m)	2.0	0.5	1.0	3.4	3.9	7.8						
Control Delay (s)	2.6	0.9	25.6	17.1	23.6	16.0						
Lane LOS	A	A	D	C	C	C						
Approach Delay (s)	2.6	0.9	18.4		17.7							
Approach LOS			C		C							
Intersection Summary												
Average Delay			5.4									
Intersection Capacity Utilization			57.4%		ICU Level of Service				B			
Analysis Period (min)			15									

Lanes, Volumes, Timings
211: Collector H & Collector G

2031 FT PM Peak Hour
07/10/2025



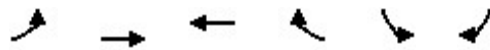
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	68	104	90	30	40	59
Future Volume (vph)	68	104	90	30	40	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.966		0.920	
Flt Protected		0.981			0.980	
Satd. Flow (prot)	0	1848	1819	0	1698	0
Flt Permitted		0.981			0.980	
Satd. Flow (perm)	0	1848	1819	0	1698	0
Link Speed (k/h)		48	48		48	
Link Distance (m)		180.1	459.0		376.5	
Travel Time (s)		13.5	34.4		28.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	68	104	90	30	40	59
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	172	120	0	99	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 28.4%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis

211: Collector H & Collector G

2031 FT PM Peak Hour

07/10/2025



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	68	104	90	30	40	59
Future Volume (Veh/h)	68	104	90	30	40	59
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	68	104	90	30	40	59
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)		180				
pX, platoon unblocked						
vC, conflicting volume	120				345	105
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	120				345	105
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				94	94
cM capacity (veh/h)	1468				621	949
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	172	120	99			
Volume Left	68	0	40			
Volume Right	0	30	59			
cSH	1468	1700	783			
Volume to Capacity	0.05	0.07	0.13			
Queue Length 95th (m)	1.1	0.0	3.3			
Control Delay (s)	3.2	0.0	10.3			
Lane LOS	A		B			
Approach Delay (s)	3.2	0.0	10.3			
Approach LOS			B			
Intersection Summary						
Average Delay			4.0			
Intersection Capacity Utilization		28.4%		ICU Level of Service		A
Analysis Period (min)		15				



2041 Future Total

Lanes, Volumes, Timings
1: Trafalgar Road & Derry Road

2041 FT AM Peak Hour

06/25/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	322	2007	220	25	887	381	336	1335	18	86	620	23
Future Volume (vph)	322	2007	220	25	887	381	336	1335	18	86	620	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	130.0		110.0	130.0		70.0	110.0		70.0	130.0		85.0
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (m)	50.0			50.0			50.0			50.0		
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			183			154			124			155
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		455.0			198.7			323.1			623.5	
Travel Time (s)		20.5			8.9			19.4			37.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	322	2007	220	25	887	381	336	1335	18	86	620	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	322	2007	220	25	887	381	336	1335	18	86	620	23
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)		7.4			7.4			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	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	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	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	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	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	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	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	

Lanes, Volumes, Timings
1: Trafalgar Road & Derry Road

2041 FT AM Peak Hour
06/25/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6			8			4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	10.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	37.9	37.9	11.0	37.9	37.9	11.0	36.8	36.8	11.0	36.8	36.8
Total Split (s)	23.0	65.0	65.0	11.0	53.0	53.0	23.0	53.0	53.0	11.0	41.0	41.0
Total Split (%)	16.4%	46.4%	46.4%	7.9%	37.9%	37.9%	16.4%	37.9%	37.9%	7.9%	29.3%	29.3%
Maximum Green (s)	19.0	58.1	58.1	7.0	46.1	46.1	19.0	46.2	46.2	7.0	34.2	34.2
Yellow Time (s)	3.0	4.6	4.6	3.0	4.6	4.6	3.0	4.2	4.2	3.0	4.2	4.2
All-Red Time (s)	1.0	2.3	2.3	1.0	2.3	2.3	1.0	2.6	2.6	1.0	2.6	2.6
Lost Time Adjust (s)	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.8	4.8	3.0	4.8	4.8
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	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)		24.0	24.0		24.0	24.0		23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	19.0	64.5	64.5	8.0	49.1	49.1	19.2	48.2	48.2	8.0	37.0	37.0
Actuated g/C Ratio	0.14	0.46	0.46	0.06	0.35	0.35	0.14	0.34	0.34	0.06	0.26	0.26
v/c Ratio	0.67	0.94	0.26	0.12	0.55	0.57	0.69	0.84	0.03	0.43	0.51	0.04
Control Delay	80.9	32.0	5.1	69.5	40.9	28.1	61.4	48.4	0.1	70.6	45.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.9	32.0	5.1	69.5	40.9	28.1	61.4	48.4	0.1	70.6	45.7	0.1
LOS	F	C	A	E	D	C	E	D	A	E	D	A
Approach Delay	35.9			37.7			50.5			47.2		
Approach LOS	D			D			D			D		

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 41.5

Intersection LOS: D

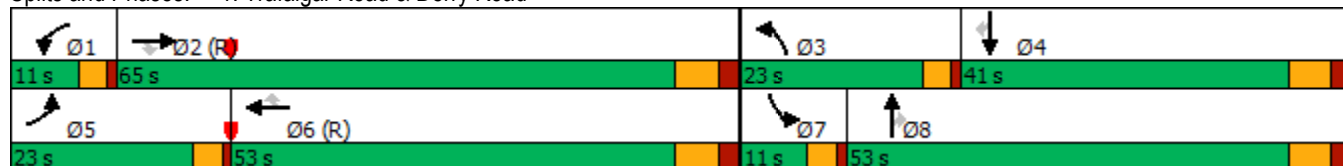
Intersection Capacity Utilization 91.0%

ICU Level of Service E

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 1: Trafalgar Road & Derry Road



Queues

2041 FT AM Peak Hour

1: Trafalgar Road & Derry Road

06/25/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	322	2007	220	25	887	381	336	1335	18	86	620	23
v/c Ratio	0.67	0.94	0.26	0.12	0.55	0.57	0.69	0.84	0.03	0.43	0.51	0.04
Control Delay	80.9	32.0	5.1	69.5	40.9	28.1	61.4	48.4	0.1	70.6	45.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.9	32.0	5.1	69.5	40.9	28.1	61.4	48.4	0.1	70.6	45.7	0.1
Queue Length 50th (m)	43.4	~207.5	4.8	3.6	70.4	41.9	39.5	155.0	0.0	12.0	61.6	0.0
Queue Length 95th (m)	m51.1	#272.7	m13.0	m7.8	81.8	63.0	63.9	175.6	m0.0	21.0	76.5	0.0
Internal Link Dist (m)		431.0			174.7			299.1			599.5	
Turn Bay Length (m)	130.0		110.0	130.0		70.0	110.0		70.0	130.0		85.0
Base Capacity (vph)	505	2124	851	202	1616	672	505	1587	643	202	1218	545
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.94	0.26	0.12	0.55	0.57	0.67	0.84	0.03	0.43	0.51	0.04

Intersection Summary

~ 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.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

2041 FT AM Peak Hour

1: Trafalgar Road & Derry Road

06/25/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	322	2007	220	25	887	381	336	1335	18	86	620	23
Future Volume (vph)	322	2007	220	25	887	381	336	1335	18	86	620	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.8	4.8	3.0	4.8	4.8
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	322	2007	220	25	887	381	336	1335	18	86	620	23
RTOR Reduction (vph)	0	0	101	0	0	100	0	0	12	0	0	17
Lane Group Flow (vph)	322	2007	119	25	887	281	336	1335	6	86	620	6
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	18.0	60.9	60.9	4.2	47.1	47.1	18.2	46.2	46.2	7.0	35.0	35.0
Effective Green, g (s)	19.0	62.9	62.9	5.2	49.1	49.1	19.2	48.2	48.2	8.0	37.0	37.0
Actuated g/C Ratio	0.14	0.45	0.45	0.04	0.35	0.35	0.14	0.34	0.34	0.06	0.26	0.26
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.8	6.8	4.0	6.8	6.8
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	480	2071	733	131	1617	572	485	1587	562	202	1218	431
v/s Ratio Prot	c0.09	c0.44		0.01	0.19		c0.09	c0.29		0.02	0.13	
v/s Ratio Perm			0.07			0.17			0.00			0.00
v/c Ratio	0.67	0.97	0.16	0.19	0.55	0.49	0.69	0.84	0.01	0.43	0.51	0.01
Uniform Delay, d1	57.5	37.6	22.9	65.4	36.5	35.7	57.6	42.4	30.2	63.8	43.8	38.0
Progression Factor	1.35	0.71	0.88	1.09	1.07	1.15	0.95	1.02	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	7.7	0.2	1.4	1.2	2.7	4.5	3.9	0.0	3.0	0.7	0.0
Delay (s)	79.8	34.3	20.3	72.4	40.5	43.7	59.2	47.3	30.2	66.8	44.5	38.1
Level of Service	E	C	C	E	D	D	E	D	C	E	D	D
Approach Delay (s)		38.9			42.0			49.5			46.9	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			43.3				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)			15.7		
Intersection Capacity Utilization			91.0%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
3: Trafalgar Road & Britannia Road

2041 FT AM Peak Hour

06/25/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	274	919	501	86	784	204	452	1458	158	133	1447	584
Future Volume (vph)	274	919	501	86	784	204	452	1458	158	133	1447	584
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	125.0		85.0	90.0		70.0	165.0		70.0	140.0		140.0
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (m)	50.0			50.0			50.0			50.0		
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			254			156			126			196
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		503.1			219.2			264.1			430.6	
Travel Time (s)		30.2			13.2			15.8			25.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	274	919	501	86	784	204	452	1458	158	133	1447	584
Shared Lane Traffic (%)												
Lane Group Flow (vph)	274	919	501	86	784	204	452	1458	158	133	1447	584
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)		7.4			7.4			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	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	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	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	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	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	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	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

Lanes, Volumes, Timings
3: Trafalgar Road & Britannia Road

2041 FT AM Peak Hour

06/25/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0	15.0	7.0	25.0	25.0	7.0	25.0	25.0
Minimum Split (s)	11.0	40.0	40.0	11.0	40.0	40.0	11.0	41.0	41.0	11.0	41.0	41.0
Total Split (s)	18.0	47.0	47.0	11.0	40.0	40.0	24.0	69.0	69.0	13.0	58.0	58.0
Total Split (%)	12.9%	33.6%	33.6%	7.9%	28.6%	28.6%	17.1%	49.3%	49.3%	9.3%	41.4%	41.4%
Maximum Green (s)	14.0	41.0	41.0	7.0	34.0	34.0	20.0	62.0	62.0	9.0	51.0	51.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	14.6	42.2	42.2	8.0	35.7	35.7	20.6	65.0	65.0	9.7	54.1	54.1
Actuated g/C Ratio	0.10	0.30	0.30	0.06	0.26	0.26	0.15	0.46	0.46	0.07	0.39	0.39
v/c Ratio	0.74	0.66	0.75	0.43	0.67	0.38	0.87	0.68	0.19	0.54	0.81	0.78
Control Delay	73.8	45.2	28.7	52.0	49.7	15.7	82.7	23.2	4.1	71.5	43.1	33.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.8	45.2	28.7	52.0	49.7	15.7	82.7	23.2	4.1	71.5	43.1	33.0
LOS	E	D	C	D	D	B	F	C	A	E	D	C
Approach Delay		44.9			43.4			34.8			42.1	
Approach LOS		D			D			C			D	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 90 (64%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 40.8

Intersection LOS: D

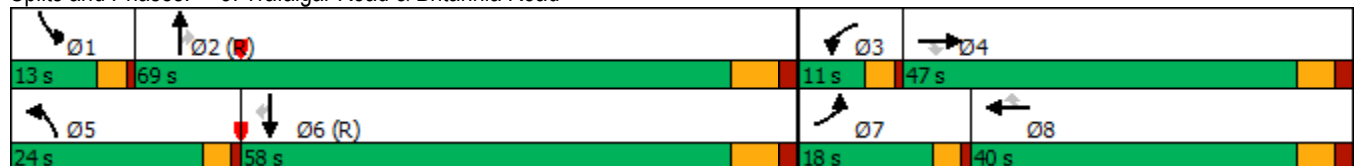
Intersection Capacity Utilization 78.6%

ICU Level of Service D

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 3: Trafalgar Road & Britannia Road



Queues
3: Trafalgar Road & Britannia Road

2041 FT AM Peak Hour
06/25/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	274	919	501	86	784	204	452	1458	158	133	1447	584
v/c Ratio	0.74	0.66	0.75	0.43	0.67	0.38	0.87	0.68	0.19	0.54	0.81	0.78
Control Delay	73.8	45.2	28.7	52.0	49.7	15.7	82.7	23.2	4.1	71.5	43.1	33.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.8	45.2	28.7	52.0	49.7	15.7	82.7	23.2	4.1	71.5	43.1	33.0
Queue Length 50th (m)	38.4	91.8	63.9	12.5	82.4	22.1	67.2	90.0	2.0	18.6	150.2	99.4
Queue Length 95th (m)	53.6	109.4	107.9	m17.1	99.8	42.2	#91.1	103.1	8.7	29.5	172.7	149.9
Internal Link Dist (m)	479.1				195.2				240.1			
Turn Bay Length (m)	125.0		85.0	90.0		70.0	165.0		70.0	140.0		140.0
Base Capacity (vph)	379	1416	677	202	1185	535	531	2141	825	252	1782	751
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.65	0.74	0.43	0.66	0.38	0.85	0.68	0.19	0.53	0.81	0.78

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

3: Trafalgar Road & Britannia Road

2041 FT AM Peak Hour

06/25/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	274	919	501	86	784	204	452	1458	158	133	1447	584
Future Volume (vph)	274	919	501	86	784	204	452	1458	158	133	1447	584
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	274	919	501	86	784	204	452	1458	158	133	1447	584
RTOR Reduction (vph)	0	0	177	0	0	116	0	0	68	0	0	120
Lane Group Flow (vph)	274	919	324	86	784	88	452	1458	91	133	1447	464
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	13.6	40.3	40.3	7.0	33.7	33.7	19.6	63.0	63.0	8.7	52.1	52.1
Effective Green, g (s)	14.6	42.3	42.3	8.0	35.7	35.7	20.6	65.0	65.0	9.7	54.1	54.1
Actuated g/C Ratio	0.10	0.30	0.30	0.06	0.26	0.26	0.15	0.46	0.46	0.07	0.39	0.39
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	369	1393	493	202	1175	416	521	2140	758	245	1781	631
v/s Ratio Prot	c0.08	c0.20		0.02	0.17		c0.13	0.32		0.04	c0.31	
v/s Ratio Perm			0.20			0.05			0.06			0.28
v/c Ratio	0.74	0.66	0.66	0.43	0.67	0.21	0.87	0.68	0.12	0.54	0.81	0.73
Uniform Delay, d1	60.9	42.6	42.5	63.8	46.8	41.1	58.4	29.4	21.3	63.0	38.4	36.8
Progression Factor	1.00	1.00	1.00	0.71	1.00	1.18	1.14	0.72	0.61	1.00	1.00	1.00
Incremental Delay, d2	7.9	1.5	4.2	1.4	1.8	0.5	13.6	1.7	0.3	2.4	4.2	7.4
Delay (s)	68.7	44.1	46.7	47.0	48.4	49.0	79.9	22.9	13.3	65.5	42.6	44.3
Level of Service	E	D	D	D	D	D	E	C	B	E	D	D
Approach Delay (s)		48.9			48.4			34.6			44.4	
Approach LOS		D			D			C			D	
Intersection Summary												
HCM 2000 Control Delay			43.2				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			78.6%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
106: Trafalgar Road & Collector L

2041 FT AM Peak Hour

06/25/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  			  	
Traffic Volume (vph)	55	20	39	336	8	110	14	1983	176	62	1189	23
Future Volume (vph)	55	20	39	336	8	110	14	1983	176	62	1189	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	130.0		0.0	50.0		50.0	100.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	15.0			15.0			50.0			50.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt		0.901			0.860				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	1731	0	1825	1652	0	1825	4611	1633	1825	4611	1633
Flt Permitted	0.665			0.719			0.158			0.050		
Satd. Flow (perm)	1278	1731	0	1381	1652	0	304	4611	1633	96	4611	1633
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		39			110				73			55
Link Speed (k/h)		48			48			60			60	
Link Distance (m)		441.2			184.6			368.2			870.6	
Travel Time (s)		33.1			13.8			22.1			52.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	55	20	39	336	8	110	14	1983	176	62	1189	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	55	59	0	336	118	0	14	1983	176	62	1189	23
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)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	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	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	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	0.0
Detector 1 Queue (s)	0.0	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	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	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1		6

Lanes, Volumes, Timings
106: Trafalgar Road & Collector L

2041 FT AM Peak Hour
06/25/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	40.0	40.0		40.0	40.0		11.0	26.0	26.0	13.0	26.0	26.0
Total Split (s)	61.0	61.0		61.0	61.0		11.0	66.0	66.0	13.0	68.0	68.0
Total Split (%)	43.6%	43.6%		43.6%	43.6%		7.9%	47.1%	47.1%	9.3%	48.6%	48.6%
Maximum Green (s)	55.0	55.0		55.0	55.0		7.0	60.0	60.0	9.0	62.0	62.0
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	27.0	27.0		27.0	27.0			9.0	9.0		9.0	9.0
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	0
Act Effct Green (s)	40.5	40.5		40.5	40.5		85.5	77.9	77.9	88.6	83.1	83.1
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.61	0.56	0.56	0.63	0.59	0.59
v/c Ratio	0.15	0.11		0.84	0.21		0.05	0.77	0.19	0.40	0.43	0.02
Control Delay	34.7	14.0		64.6	7.2		13.9	23.3	11.5	35.5	14.8	3.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.7	14.0		64.6	7.2		13.9	23.3	11.5	35.5	14.8	3.7
LOS	C	B		E	A		B	C	B	D	B	A
Approach Delay		24.0			49.7			22.3			15.6	
Approach LOS		C			D			C			B	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 23.3

Intersection LOS: C

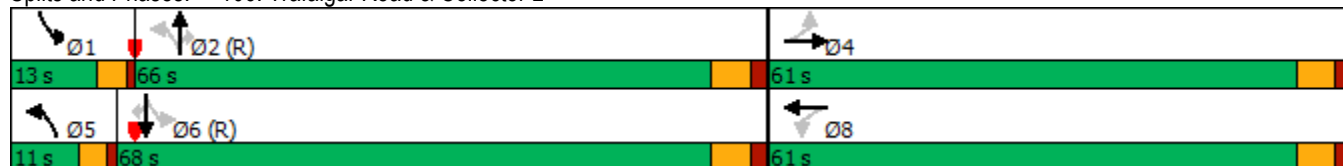
Intersection Capacity Utilization 82.8%

ICU Level of Service E

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 106: Trafalgar Road & Collector L



Queues
106: Trafalgar Road & Collector L

2041 FT AM Peak Hour

06/25/2025



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	55	59	336	118	14	1983	176	62	1189	23
v/c Ratio	0.15	0.11	0.84	0.21	0.05	0.77	0.19	0.40	0.43	0.02
Control Delay	34.7	14.0	64.6	7.2	13.9	23.3	11.5	35.5	14.8	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.7	14.0	64.6	7.2	13.9	23.3	11.5	35.5	14.8	3.7
Queue Length 50th (m)	11.3	4.0	87.7	1.6	1.3	98.9	11.0	7.2	27.5	0.0
Queue Length 95th (m)	19.7	12.9	110.9	14.1	m2.8	#258.8	25.8	m21.8	115.9	m2.4
Internal Link Dist (m)		417.2		160.6		344.2			846.6	
Turn Bay Length (m)	50.0		130.0		50.0		50.0	100.0		50.0
Base Capacity (vph)	502	703	542	715	261	2565	941	173	2736	991
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.08	0.62	0.17	0.05	0.77	0.19	0.36	0.43	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

106: Trafalgar Road & Collector L

2041 FT AM Peak Hour

06/25/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	20	39	336	8	110	14	1983	176	62	1189	23
Future Volume (vph)	55	20	39	336	8	110	14	1983	176	62	1189	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	0.90		1.00	0.86		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	1731		1825	1652		1825	4611	1633	1825	4611	1633
Flt Permitted	0.66	1.00		0.72	1.00		0.16	1.00	1.00	0.05	1.00	1.00
Satd. Flow (perm)	1277	1731		1380	1652		303	4611	1633	95	4611	1633
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	55	20	39	336	8	110	14	1983	176	62	1189	23
RTOR Reduction (vph)	0	28	0	0	78	0	0	0	33	0	0	10
Lane Group Flow (vph)	55	31	0	336	40	0	14	1983	143	62	1189	13
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	40.5	40.5		40.5	40.5		79.9	77.1	77.1	87.1	80.7	80.7
Effective Green, g (s)	40.5	40.5		40.5	40.5		79.9	77.1	77.1	87.1	80.7	80.7
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.57	0.55	0.55	0.62	0.58	0.58
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	369	500		399	477		203	2539	899	138	2657	941
v/s Ratio Prot		0.02			0.02		0.00	c0.43		c0.02	0.26	
v/s Ratio Perm	0.04			c0.24			0.04		0.09	0.26		0.01
v/c Ratio	0.15	0.06		0.84	0.08		0.07	0.78	0.16	0.45	0.45	0.01
Uniform Delay, d1	37.0	36.0		46.7	36.2		13.6	24.8	15.5	22.6	16.9	12.7
Progression Factor	1.00	1.00		1.00	1.00		1.11	0.79	0.99	1.92	0.80	1.00
Incremental Delay, d2	0.2	0.1		14.8	0.1		0.1	1.9	0.3	2.2	0.5	0.0
Delay (s)	37.1	36.1		61.6	36.3		15.2	21.5	15.6	45.6	14.1	12.7
Level of Service	D	D		E	D		B	C	B	D	B	B
Approach Delay (s)		36.6			55.0			21.0			15.6	
Approach LOS		D			D			C			B	
Intersection Summary												
HCM 2000 Control Delay			23.6			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			82.8%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
107: Trafalgar Road & Collector H

2041 FT AM Peak Hour

06/25/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	230	47	2126	129	26	1538
Future Volume (vph)	230	47	2126	129	26	1538
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	90.0	0.0		50.0	50.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	20.0				50.0	
Lane Util. Factor	1.00	1.00	*0.80	0.91	1.00	*0.80
Frt		0.850	0.991			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	4569	0	1825	4611
Flt Permitted	0.950				0.038	
Satd. Flow (perm)	1825	1633	4569	0	73	4611
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		14	12			
Link Speed (k/h)	48		60			60
Link Distance (m)	180.1		999.8			368.2
Travel Time (s)	13.5		60.0			22.1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	230	47	2126	129	26	1538
Shared Lane Traffic (%)						
Lane Group Flow (vph)	230	47	2255	0	26	1538
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	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
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	3		2			6

Lanes, Volumes, Timings
107: Trafalgar Road & Collector H

2041 FT AM Peak Hour
06/25/2025

	↖	↗	↑	↘	↙	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases		3			6	
Detector Phase	3	3	2		6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0		20.0	20.0
Minimum Split (s)	40.0	40.0	26.0		26.0	26.0
Total Split (s)	41.0	41.0	99.0		99.0	99.0
Total Split (%)	29.3%	29.3%	70.7%		70.7%	70.7%
Maximum Green (s)	35.0	35.0	93.0		93.0	93.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		C-Max	C-Max
Walk Time (s)	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	27.0	27.0	9.0		9.0	9.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	22.9	22.9	105.1		105.1	105.1
Actuated g/C Ratio	0.16	0.16	0.75		0.75	0.75
v/c Ratio	0.77	0.17	0.66		0.48	0.44
Control Delay	72.6	37.0	10.3		38.9	5.4
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	72.6	37.0	10.3		38.9	5.4
LOS	E	D	B		D	A
Approach Delay	66.6		10.3			5.9
Approach LOS	E		B			A

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 12.5

Intersection LOS: B

Intersection Capacity Utilization 66.7%

ICU Level of Service C

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 107: Trafalgar Road & Collector H



Queues
107: Trafalgar Road & Collector H

2041 FT AM Peak Hour
06/25/2025



Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	230	47	2255	26	1538
v/c Ratio	0.77	0.17	0.66	0.48	0.44
Control Delay	72.6	37.0	10.3	38.9	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	72.6	37.0	10.3	38.9	5.4
Queue Length 50th (m)	61.7	7.9	113.0	1.5	36.1
Queue Length 95th (m)	85.2	18.4	159.1	m#17.8	41.0
Internal Link Dist (m)	156.1		975.8		344.2
Turn Bay Length (m)	90.0			50.0	
Base Capacity (vph)	456	418	3431	54	3460
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.50	0.11	0.66	0.48	0.44

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
107: Trafalgar Road & Collector H

2041 FT AM Peak Hour
06/25/2025

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	230	47	2126	129	26	1538
Future Volume (vph)	230	47	2126	129	26	1538
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	*0.80		1.00	*0.80
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1825	1633	4571		1825	4611
Flt Permitted	0.95	1.00	1.00		0.04	1.00
Satd. Flow (perm)	1825	1633	4571		73	4611
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	230	47	2126	129	26	1538
RTOR Reduction (vph)	0	12	3	0	0	0
Lane Group Flow (vph)	230	35	2252	0	26	1538
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	3		2			6
Permitted Phases		3			6	
Actuated Green, G (s)	22.9	22.9	105.1		105.1	105.1
Effective Green, g (s)	22.9	22.9	105.1		105.1	105.1
Actuated g/C Ratio	0.16	0.16	0.75		0.75	0.75
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	298	267	3431		54	3461
v/s Ratio Prot	c0.13		c0.49			0.33
v/s Ratio Perm		0.02			0.36	
v/c Ratio	0.77	0.13	0.66		0.48	0.44
Uniform Delay, d1	56.0	50.1	8.6		6.8	6.5
Progression Factor	1.00	1.00	1.00		0.80	0.71
Incremental Delay, d2	11.7	0.2	1.0		25.1	0.4
Delay (s)	67.8	50.3	9.6		30.6	5.0
Level of Service	E	D	A		C	A
Approach Delay (s)	64.8		9.6			5.4
Approach LOS	E		A			A
Intersection Summary						
HCM 2000 Control Delay			11.7		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.68			
Actuated Cycle Length (s)			140.0		Sum of lost time (s)	12.0
Intersection Capacity Utilization			66.7%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings
207: Collector G & Collector L

2041 FT AM Peak Hour
06/25/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	223	11	30	285	52	53	48	46	89	75	116
Future Volume (vph)	40	223	11	30	285	52	53	48	46	89	75	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	25.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	10.0			25.0			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993			0.977			0.958			0.944	
Flt Protected	0.950			0.950				0.982			0.984	
Satd. Flow (prot)	1772	1869	0	1825	1816	0	0	1714	0	0	1334	0
Flt Permitted	0.950			0.950				0.982			0.984	
Satd. Flow (perm)	1772	1869	0	1825	1816	0	0	1714	0	0	1334	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		184.6			422.4			376.5			875.5	
Travel Time (s)		13.8			31.7			28.2			65.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	2%	4%	0%	4%	0%	7%	9%	0%	0%	13%	73%
Adj. Flow (vph)	40	223	11	30	285	52	53	48	46	89	75	116
Shared Lane Traffic (%)												
Lane Group Flow (vph)	40	234	0	30	337	0	0	147	0	0	280	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)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 51.5%	ICU Level of Service A											
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis 207: Collector G & Collector L

2041 FT AM Peak Hour
06/25/2025

																		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR						
Lane Configurations																		
Sign Control	Stop			Stop				Stop			Stop							
Traffic Volume (vph)	40	223	11	30	285	52	53	48	46	89	75	116						
Future Volume (vph)	40	223	11	30	285	52	53	48	46	89	75	116						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00						
Hourly flow rate (vph)	40	223	11	30	285	52	53	48	46	89	75	116						
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1												
Volume Total (vph)	40	234	30	337	147	280												
Volume Left (vph)	40	0	30	0	53	89												
Volume Right (vph)	0	11	0	52	46	116												
Hadj (s)	0.55	0.00	0.50	-0.05	-0.02	0.39												
Departure Headway (s)	7.2	6.6	7.0	6.4	6.5	6.5												
Degree Utilization, x	0.08	0.43	0.06	0.60	0.27	0.51												
Capacity (veh/h)	464	499	487	530	484	513												
Control Delay (s)	9.6	13.4	9.2	17.4	11.8	16.1												
Approach Delay (s)	12.8		16.8		11.8	16.1												
Approach LOS	B		C		B	C												
Intersection Summary																		
Delay			14.9															
Level of Service			B															
Intersection Capacity Utilization			51.5%		ICU Level of Service		A											
Analysis Period (min)			15															

Lanes, Volumes, Timings
208: Collector H & Collector L

2041 FT AM Peak Hour
06/25/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	152	207	45	30	238	56	31	99	47	53	79	76
Future Volume (vph)	152	207	45	30	238	56	31	99	47	53	79	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	25.0		0.0	25.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	2.5			2.5			25.0			25.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.985			0.977			0.952			0.926	
Flt Protected		0.982			0.995		0.950			0.950		
Satd. Flow (prot)	0	1822	0	0	1841	0	1825	1804	0	1825	1744	0
Flt Permitted		0.982			0.995		0.950			0.950		
Satd. Flow (perm)	0	1822	0	0	1841	0	1825	1804	0	1825	1744	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		422.4			514.0			400.7			911.3	
Travel Time (s)		31.7			38.6			30.1			68.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	0%	2%	0%	0%	2%	2%
Adj. Flow (vph)	152	207	45	30	238	56	31	99	47	53	79	76
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	404	0	0	324	0	31	146	0	53	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)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	65.1%						ICU Level of Service C					
Analysis Period (min)	15											

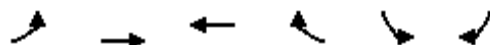
HCM Unsignalized Intersection Capacity Analysis
208: Collector H & Collector L

2041 FT AM Peak Hour
06/25/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	152	207	45	30	238	56	31	99	47	53	79	76
Future Volume (Veh/h)	152	207	45	30	238	56	31	99	47	53	79	76
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	152	207	45	30	238	56	31	99	47	53	79	76
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	294			252			975	888	230	956	882	266
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	294			252			975	888	230	956	882	266
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	88			98			78	59	94	62	68	90
cM capacity (veh/h)	1268			1325			141	243	815	139	245	773
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	404	324	31	146	53	155						
Volume Left	152	30	31	0	53	0						
Volume Right	45	56	0	47	0	76						
cSH	1268	1325	141	314	139	369						
Volume to Capacity	0.12	0.02	0.22	0.46	0.38	0.42						
Queue Length 95th (m)	3.1	0.5	6.0	17.8	12.2	15.4						
Control Delay (s)	3.8	0.9	37.4	26.0	46.1	21.7						
Lane LOS	A	A	E	D	E	C						
Approach Delay (s)	3.8	0.9	28.0		27.9							
Approach LOS			D		D							
Intersection Summary												
Average Delay			11.3									
Intersection Capacity Utilization			65.1%		ICU Level of Service				C			
Analysis Period (min)			15									

Lanes, Volumes, Timings
211: Collector H & Collector G

2041 FT AM Peak Hour
06/25/2025

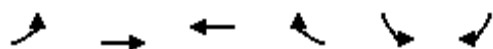


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	25	130	172	85	80	105
Future Volume (vph)	25	130	172	85	80	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.955		0.923	
Flt Protected		0.992			0.979	
Satd. Flow (prot)	0	1890	1726	0	1699	0
Flt Permitted		0.992			0.979	
Satd. Flow (perm)	0	1890	1726	0	1699	0
Link Speed (k/h)		48	48		48	
Link Distance (m)		180.1	459.0		376.5	
Travel Time (s)		13.5	34.4		28.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	3%	13%	5%	0%
Adj. Flow (vph)	25	130	172	85	80	105
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	155	257	0	185	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type: Other						
Control Type: Unsignalized						
Intersection Capacity Utilization 43.3%						
ICU Level of Service A						
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis

211: Collector H & Collector G

2041 FT AM Peak Hour
06/25/2025



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	130	172	85	80	105
Future Volume (Veh/h)	25	130	172	85	80	105
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	130	172	85	80	105
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		180				
pX, platoon unblocked						
vC, conflicting volume	257				394	214
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	257				394	214
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				87	87
cM capacity (veh/h)	1320				593	831
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	155	257	185			
Volume Left	25	0	80			
Volume Right	0	85	105			
cSH	1320	1700	708			
Volume to Capacity	0.02	0.15	0.26			
Queue Length 95th (m)	0.4	0.0	7.9			
Control Delay (s)	1.4	0.0	11.9			
Lane LOS	A		B			
Approach Delay (s)	1.4	0.0	11.9			
Approach LOS			B			
Intersection Summary						
Average Delay			4.0			
Intersection Capacity Utilization			43.3%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
1: Trafalgar Road & Derry Road

2041 FT PM Peak Hour

06/25/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	1310	355	36	1746	202	233	1007	14	274	1405	51
Future Volume (vph)	102	1310	355	36	1746	202	233	1007	14	274	1405	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	130.0		110.0	130.0		70.0	110.0		70.0	130.0		85.0
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (m)	50.0			50.0			50.0			50.0		
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			226			125			93			93
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		455.0			198.7			323.1			623.5	
Travel Time (s)		20.5			8.9			19.4			37.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	102	1310	355	36	1746	202	233	1007	14	274	1405	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	102	1310	355	36	1746	202	233	1007	14	274	1405	51
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)		7.4			7.4			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	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	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	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	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	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	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	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	

Lanes, Volumes, Timings
1: Trafalgar Road & Derry Road

2041 FT PM Peak Hour

06/25/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	10.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	37.9	37.9	11.0	37.9	37.9	11.0	36.8	36.8	11.0	36.8	36.8
Total Split (s)	11.0	63.0	63.0	11.0	63.0	63.0	13.0	50.0	50.0	16.0	53.0	53.0
Total Split (%)	7.9%	45.0%	45.0%	7.9%	45.0%	45.0%	9.3%	35.7%	35.7%	11.4%	37.9%	37.9%
Maximum Green (s)	7.0	56.1	56.1	7.0	56.1	56.1	9.0	43.2	43.2	12.0	46.2	46.2
Yellow Time (s)	3.0	4.6	4.6	3.0	4.6	4.6	3.0	4.2	4.2	3.0	4.2	4.2
All-Red Time (s)	1.0	2.3	2.3	1.0	2.3	2.3	1.0	2.6	2.6	1.0	2.6	2.6
Lost Time Adjust (s)	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.8	4.8	3.0	4.8	4.8
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	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)		24.0	24.0		24.0	24.0		23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effect Green (s)	8.0	60.3	60.3	8.0	58.1	58.1	10.0	45.2	45.2	13.0	48.2	48.2
Actuated g/C Ratio	0.06	0.43	0.43	0.06	0.42	0.42	0.07	0.32	0.32	0.09	0.34	0.34
v/c Ratio	0.50	0.66	0.43	0.18	0.91	0.27	0.92	0.68	0.02	0.84	0.89	0.08
Control Delay	91.4	20.2	4.2	62.0	57.5	23.7	100.4	42.2	0.5	84.0	51.2	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.4	20.2	4.2	62.0	57.5	23.7	100.4	42.2	0.5	84.0	51.2	0.7
LOS	F	C	A	E	E	C	F	D	A	F	D	A
Approach Delay		21.1			54.1			52.6			54.9	
Approach LOS		C			D			D			D	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 45.4

Intersection LOS: D

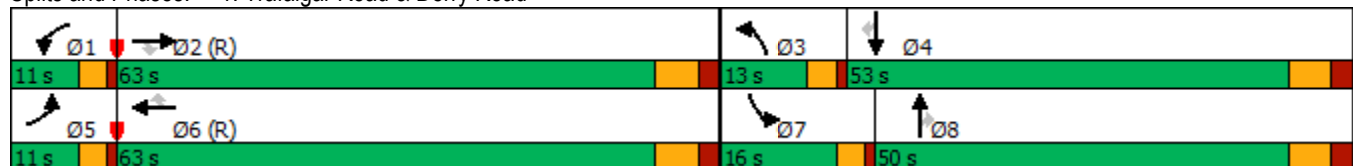
Intersection Capacity Utilization 88.1%

ICU Level of Service E

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 1: Trafalgar Road & Derry Road



Queues

2041 FT PM Peak Hour

1: Trafalgar Road & Derry Road

06/25/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	102	1310	355	36	1746	202	233	1007	14	274	1405	51
v/c Ratio	0.50	0.66	0.43	0.18	0.91	0.27	0.92	0.68	0.02	0.84	0.89	0.08
Control Delay	91.4	20.2	4.2	62.0	57.5	23.7	100.4	42.2	0.5	84.0	51.2	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.4	20.2	4.2	62.0	57.5	23.7	100.4	42.2	0.5	84.0	51.2	0.7
Queue Length 50th (m)	15.4	49.0	7.1	5.3	171.2	21.9	30.2	121.6	0.0	39.1	152.5	0.0
Queue Length 95th (m)	m21.8	68.2	18.0	m8.9	191.5	40.8	#57.1	137.5	m0.7	#61.1	175.6	1.3
Internal Link Dist (m)	431.0				174.7				299.1			
Turn Bay Length (m)	130.0		110.0	130.0		70.0	110.0		70.0	130.0		85.0
Base Capacity (vph)	202	1985	831	202	1913	750	252	1488	590	328	1587	623
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.66	0.43	0.18	0.91	0.27	0.92	0.68	0.02	0.84	0.89	0.08

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

2041 FT PM Peak Hour

1: Trafalgar Road & Derry Road

06/25/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	1310	355	36	1746	202	233	1007	14	274	1405	51
Future Volume (vph)	102	1310	355	36	1746	202	233	1007	14	274	1405	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.8	4.8	3.0	4.8	4.8
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	102	1310	355	36	1746	202	233	1007	14	274	1405	51
RTOR Reduction (vph)	0	0	130	0	0	73	0	0	9	0	0	33
Lane Group Flow (vph)	102	1310	225	36	1746	129	233	1007	5	274	1405	18
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	7.0	57.5	57.5	5.6	56.1	56.1	9.0	43.2	43.2	12.0	46.2	46.2
Effective Green, g (s)	8.0	59.5	59.5	6.6	58.1	58.1	10.0	45.2	45.2	13.0	48.2	48.2
Actuated g/C Ratio	0.06	0.42	0.42	0.05	0.42	0.42	0.07	0.32	0.32	0.09	0.34	0.34
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.8	6.8	4.0	6.8	6.8
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	202	1959	694	166	1913	677	252	1488	527	328	1587	562
v/s Ratio Prot	c0.03	0.28		0.01	c0.38		c0.07	0.22		0.08	c0.30	
v/s Ratio Perm			0.14			0.08			0.00			0.01
v/c Ratio	0.50	0.67	0.32	0.22	0.91	0.19	0.92	0.68	0.01	0.84	0.89	0.03
Uniform Delay, d1	64.1	32.3	26.8	64.2	38.6	26.0	64.6	41.1	32.2	62.4	43.3	30.4
Progression Factor	1.32	0.58	0.31	0.96	1.31	2.22	0.96	0.96	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.0	1.3	0.9	1.2	7.0	0.5	36.8	1.5	0.0	18.2	6.8	0.0
Delay (s)	87.6	20.2	9.2	62.5	57.3	58.3	98.7	41.1	32.2	80.7	50.1	30.5
Level of Service	F	C	A	E	E	E	F	D	C	F	D	C
Approach Delay (s)		21.9			57.5			51.7			54.3	
Approach LOS		C			E			D			D	
Intersection Summary												
HCM 2000 Control Delay			46.3		HCM 2000 Level of Service					D		
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			140.0		Sum of lost time (s)					15.7		
Intersection Capacity Utilization			88.1%		ICU Level of Service					E		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
3: Trafalgar Road & Britannia Road

2041 FT PM Peak Hour

06/25/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	618	1140	600	127	1101	135	545	1639	213	206	1539	428
Future Volume (vph)	618	1140	600	127	1101	135	545	1639	213	206	1539	428
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	125.0		85.0	90.0		70.0	165.0		70.0	140.0		140.0
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (m)	50.0			50.0			50.0			50.0		
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			242			156			136			312
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		503.1			219.2			264.1			430.6	
Travel Time (s)		30.2			13.2			15.8			25.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	618	1140	600	127	1101	135	545	1639	213	206	1539	428
Shared Lane Traffic (%)												
Lane Group Flow (vph)	618	1140	600	127	1101	135	545	1639	213	206	1539	428
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)		7.4			7.4			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	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	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	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	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	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	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	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

Lanes, Volumes, Timings
3: Trafalgar Road & Britannia Road

2041 FT PM Peak Hour

06/25/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0	15.0	7.0	25.0	25.0	7.0	25.0	25.0
Minimum Split (s)	11.0	40.0	40.0	11.0	40.0	40.0	11.0	41.0	41.0	11.0	41.0	41.0
Total Split (s)	27.0	56.0	56.0	11.0	40.0	40.0	22.0	61.0	61.0	12.0	51.0	51.0
Total Split (%)	19.3%	40.0%	40.0%	7.9%	28.6%	28.6%	15.7%	43.6%	43.6%	8.6%	36.4%	36.4%
Maximum Green (s)	23.0	50.0	50.0	7.0	34.0	34.0	18.0	54.0	54.0	8.0	44.0	44.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	24.0	52.0	52.0	8.0	36.0	36.0	19.0	56.0	56.0	9.0	46.0	46.0
Actuated g/C Ratio	0.17	0.37	0.37	0.06	0.26	0.26	0.14	0.40	0.40	0.06	0.33	0.33
v/c Ratio	1.02	0.67	0.79	0.63	0.93	0.25	1.14	0.89	0.29	0.91	1.02	0.57
Control Delay	97.7	39.1	31.5	95.7	51.1	5.1	144.8	29.6	5.8	110.1	76.3	19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.7	39.1	31.5	95.7	51.1	5.1	144.8	29.6	5.8	110.1	76.3	19.6
LOS	F	D	C	F	D	A	F	C	A	F	E	B
Approach Delay		52.5			50.7			53.7			68.3	
Approach LOS		D			D			D			E	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 90 (64%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.14

Intersection Signal Delay: 56.7

Intersection LOS: E

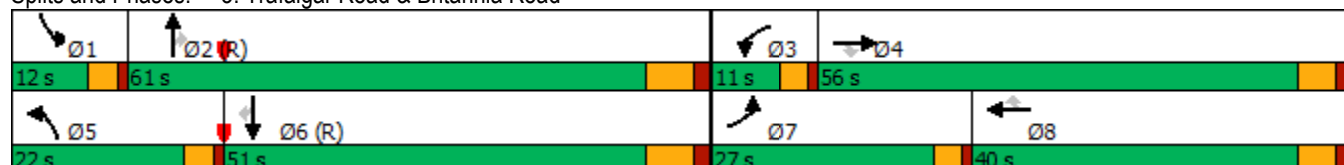
Intersection Capacity Utilization 98.4%

ICU Level of Service F

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 3: Trafalgar Road & Britannia Road



Queues
3: Trafalgar Road & Britannia Road

2041 FT PM Peak Hour
06/25/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	618	1140	600	127	1101	135	545	1639	213	206	1539	428
v/c Ratio	1.02	0.67	0.79	0.63	0.93	0.25	1.14	0.89	0.29	0.91	1.02	0.57
Control Delay	97.7	39.1	31.5	95.7	51.1	5.1	144.8	29.6	5.8	110.1	76.3	19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.7	39.1	31.5	95.7	51.1	5.1	144.8	29.6	5.8	110.1	76.3	19.6
Queue Length 50th (m)	~93.1	109.2	93.0	15.4	127.2	14.5	~90.2	129.4	0.8	29.7	~172.3	23.9
Queue Length 95th (m)	#130.1	127.8	144.5	30.3	#156.9	9.4	#124.8	177.0	12.9	#52.8	#225.1	79.2
Internal Link Dist (m)	479.1			195.2			240.1			406.6		
Turn Bay Length (m)	125.0		85.0	90.0		70.0	165.0		70.0	140.0		140.0
Base Capacity (vph)	607	1712	758	202	1185	535	480	1844	734	227	1515	746
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.67	0.79	0.63	0.93	0.25	1.14	0.89	0.29	0.91	1.02	0.57

Intersection Summary

- ~ 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.

HCM Signalized Intersection Capacity Analysis

3: Trafalgar Road & Britannia Road

2041 FT PM Peak Hour

06/25/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	618	1140	600	127	1101	135	545	1639	213	206	1539	428
Future Volume (vph)	618	1140	600	127	1101	135	545	1639	213	206	1539	428
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3541	4611	1633	3541	4611	1633	3541	4611	1633	3541	4611	1633
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	618	1140	600	127	1101	135	545	1639	213	206	1539	428
RTOR Reduction (vph)	0	0	152	0	0	100	0	0	82	0	0	209
Lane Group Flow (vph)	618	1140	448	127	1101	35	545	1639	131	206	1539	219
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	23.0	50.0	50.0	7.0	34.0	34.0	18.0	54.0	54.0	8.0	44.0	44.0
Effective Green, g (s)	24.0	52.0	52.0	8.0	36.0	36.0	19.0	56.0	56.0	9.0	46.0	46.0
Actuated g/C Ratio	0.17	0.37	0.37	0.06	0.26	0.26	0.14	0.40	0.40	0.06	0.33	0.33
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	607	1712	606	202	1185	419	480	1844	653	227	1515	536
v/s Ratio Prot	c0.17	0.25		0.04	c0.24		c0.15	0.36		0.06	c0.33	
v/s Ratio Perm			0.27			0.02			0.08			0.13
v/c Ratio	1.02	0.67	0.74	0.63	0.93	0.08	1.14	0.89	0.20	0.91	1.02	0.41
Uniform Delay, d1	58.0	36.7	38.1	64.5	50.8	39.5	60.5	39.1	27.4	65.1	47.0	36.4
Progression Factor	1.00	1.00	1.00	1.28	0.75	1.06	1.22	0.59	0.47	1.18	1.12	1.66
Incremental Delay, d2	41.2	1.3	5.7	5.3	11.8	0.2	81.7	6.2	0.6	30.9	25.0	1.9
Delay (s)	99.2	38.1	43.8	88.2	50.0	42.0	155.8	29.2	13.5	107.7	77.5	62.2
Level of Service	F	D	D	F	D	D	F	C	B	F	E	E
Approach Delay (s)		55.5			52.7			56.6			77.4	
Approach LOS		E			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			61.1		HCM 2000 Level of Service					E		
HCM 2000 Volume to Capacity ratio			1.01									
Actuated Cycle Length (s)			140.0		Sum of lost time (s)					15.0		
Intersection Capacity Utilization			98.4%		ICU Level of Service					F		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
106: Trafalgar Road & Collector L

2041 FT PM Peak Hour

06/25/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	18	28	279	19	60	46	1586	298	219	1930	49
Future Volume (vph)	24	18	28	279	19	60	46	1586	298	219	1930	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	130.0		0.0	50.0		50.0	100.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	15.0			15.0			50.0			50.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt		0.909			0.886				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	1746	0	1825	1702	0	1825	4611	1633	1825	4611	1633
Flt Permitted	0.706			0.420			0.058			0.055		
Satd. Flow (perm)	1356	1746	0	807	1702	0	111	4611	1633	106	4611	1633
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		28			60				126			101
Link Speed (k/h)		48			48			60			60	
Link Distance (m)		441.2			184.6			368.2			870.6	
Travel Time (s)		33.1			13.8			22.1			52.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	24	18	28	279	19	60	46	1586	298	219	1930	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	46	0	279	79	0	46	1586	298	219	1930	49
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)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	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	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	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	0.0
Detector 1 Queue (s)	0.0	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	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	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		3	8		5	2		1	6	

Lanes, Volumes, Timings
106: Trafalgar Road & Collector L

2041 FT PM Peak Hour

06/25/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	40.0	40.0		11.0	40.0		11.0	26.0	26.0	13.0	26.0	26.0
Total Split (s)	40.0	40.0		31.0	71.0		18.0	48.0	48.0	21.0	51.0	51.0
Total Split (%)	28.6%	28.6%		22.1%	50.7%		12.9%	34.3%	34.3%	15.0%	36.4%	36.4%
Maximum Green (s)	34.0	34.0		25.0	65.0		14.0	42.0	42.0	17.0	45.0	45.0
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0
Lead/Lag	Lag	Lag		Lead			Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	27.0	27.0			27.0			9.0	9.0		9.0	9.0
Pedestrian Calls (#/hr)	0	0			0			0	0		0	0
Act Effct Green (s)	10.2	10.2		35.9	35.9		79.4	70.1	70.1	94.1	83.0	83.0
Actuated g/C Ratio	0.07	0.07		0.26	0.26		0.57	0.50	0.50	0.67	0.59	0.59
v/c Ratio	0.24	0.30		0.75	0.16		0.30	0.69	0.34	0.75	0.71	0.05
Control Delay	67.5	36.0		57.6	13.4		16.3	20.3	11.4	33.9	46.5	5.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.5	36.0		57.6	13.4		16.3	20.3	11.4	33.9	46.5	5.8
LOS	E	D		E	B		B	C	B	C	D	A
Approach Delay		46.8			47.8			18.9			44.4	
Approach LOS		D			D			B			D	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 33.9

Intersection LOS: C

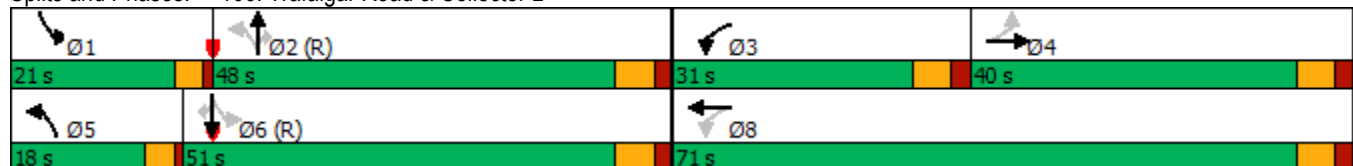
Intersection Capacity Utilization 78.6%

ICU Level of Service D

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 106: Trafalgar Road & Collector L



Queues
106: Trafalgar Road & Collector L

2041 FT PM Peak Hour
06/25/2025

										
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	24	46	279	79	46	1586	298	219	1930	49
v/c Ratio	0.24	0.30	0.75	0.16	0.30	0.69	0.34	0.75	0.71	0.05
Control Delay	67.5	36.0	57.6	13.4	16.3	20.3	11.4	33.9	46.5	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.5	36.0	57.6	13.4	16.3	20.3	11.4	33.9	46.5	5.8
Queue Length 50th (m)	6.4	4.8	65.1	3.8	2.9	120.3	42.4	52.9	234.0	0.6
Queue Length 95th (m)	16.0	17.5	91.8	15.8	m8.4	113.1	43.6	m67.3	252.4	m3.9
Internal Link Dist (m)		417.2		160.6		344.2			846.6	
Turn Bay Length (m)	50.0		130.0		50.0		50.0	100.0		50.0
Base Capacity (vph)	329	445	396	822	239	2310	880	311	2734	1009
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.10	0.70	0.10	0.19	0.69	0.34	0.70	0.71	0.05
Intersection Summary										
m Volume for 95th percentile queue is metered by upstream signal.										

HCM Signalized Intersection Capacity Analysis

106: Trafalgar Road & Collector L

2041 FT PM Peak Hour

06/25/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	18	28	279	19	60	46	1586	298	219	1930	49
Future Volume (vph)	24	18	28	279	19	60	46	1586	298	219	1930	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	0.91		1.00	0.89		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	1746		1825	1702		1825	4611	1633	1825	4611	1633
Flt Permitted	0.71	1.00		0.42	1.00		0.06	1.00	1.00	0.05	1.00	1.00
Satd. Flow (perm)	1356	1746		807	1702		111	4611	1633	105	4611	1633
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	24	18	28	279	19	60	46	1586	298	219	1930	49
RTOR Reduction (vph)	0	26	0	0	44	0	0	0	64	0	0	21
Lane Group Flow (vph)	24	20	0	279	35	0	46	1586	234	219	1930	28
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	8.2	8.2		37.0	37.0		74.9	69.0	69.0	91.0	81.1	81.1
Effective Green, g (s)	8.2	8.2		37.0	37.0		74.9	69.0	69.0	91.0	81.1	81.1
Actuated g/C Ratio	0.06	0.06		0.26	0.26		0.54	0.49	0.49	0.65	0.58	0.58
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	79	102		379	449		131	2272	804	289	2671	945
v/s Ratio Prot		0.01		c0.12	0.02		0.01	0.34		c0.10	0.42	
v/s Ratio Perm	0.02			c0.07			0.17		0.14	c0.39		0.02
v/c Ratio	0.30	0.19		0.74	0.08		0.35	0.70	0.29	0.76	0.72	0.03
Uniform Delay, d1	63.2	62.7		44.9	38.7		19.6	27.4	21.0	40.3	21.3	12.6
Progression Factor	1.00	1.00		1.00	1.00		0.83	0.65	0.76	0.63	2.02	1.00
Incremental Delay, d2	2.2	0.9		7.3	0.1		1.4	1.5	0.8	8.1	1.3	0.0
Delay (s)	65.3	63.7		52.2	38.8		17.7	19.3	16.8	33.6	44.4	12.7
Level of Service	E	E		D	D		B	B	B	C	D	B
Approach Delay (s)		64.2			49.2			18.9			42.6	
Approach LOS		E			D			B			D	
Intersection Summary												
HCM 2000 Control Delay			33.4									
HCM 2000 Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			140.0									
Intersection Capacity Utilization			78.6%									
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
107: Trafalgar Road & Collector H

2041 FT PM Peak Hour

06/25/2025

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	131	22	1908	135	41	2301
Future Volume (vph)	131	22	1908	135	41	2301
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	90.0	0.0		50.0	50.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	20.0				50.0	
Lane Util. Factor	1.00	1.00	*0.80	0.91	1.00	*0.80
Frt		0.850	0.990			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	4565	0	1825	4611
Flt Permitted	0.950				0.055	
Satd. Flow (perm)	1825	1633	4565	0	106	4611
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		22	14			
Link Speed (k/h)	48		60			60
Link Distance (m)	180.1		999.8			368.2
Travel Time (s)	13.5		60.0			22.1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	131	22	1908	135	41	2301
Shared Lane Traffic (%)						
Lane Group Flow (vph)	131	22	2043	0	41	2301
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	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
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	3		2			6

Lanes, Volumes, Timings
107: Trafalgar Road & Collector H

2041 FT PM Peak Hour
06/25/2025

	←	↙	↑	↘	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases		3			6	
Detector Phase	3	3	2		6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0		20.0	20.0
Minimum Split (s)	40.0	40.0	26.0		26.0	26.0
Total Split (s)	41.0	41.0	99.0		99.0	99.0
Total Split (%)	29.3%	29.3%	70.7%		70.7%	70.7%
Maximum Green (s)	35.0	35.0	93.0		93.0	93.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		C-Max	C-Max
Walk Time (s)	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	27.0	27.0	9.0		9.0	9.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	15.5	15.5	112.5		112.5	112.5
Actuated g/C Ratio	0.11	0.11	0.80		0.80	0.80
v/c Ratio	0.65	0.11	0.56		0.48	0.62
Control Delay	74.2	19.7	11.8		20.1	3.6
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	74.2	19.7	11.8		20.1	3.6
LOS	E	B	B		C	A
Approach Delay	66.4		11.8			3.9
Approach LOS	E		B			A

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 9.6

Intersection LOS: A

Intersection Capacity Utilization 62.8%

ICU Level of Service B

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 107: Trafalgar Road & Collector H



Queues
107: Trafalgar Road & Collector H

2041 FT PM Peak Hour
06/25/2025



Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	131	22	2043	41	2301
v/c Ratio	0.65	0.11	0.56	0.48	0.62
Control Delay	74.2	19.7	11.8	20.1	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	74.2	19.7	11.8	20.1	3.6
Queue Length 50th (m)	35.3	0.0	90.2	0.4	8.0
Queue Length 95th (m)	54.5	8.0	143.2	m0.8	13.8
Internal Link Dist (m)	156.1		975.8		344.2
Turn Bay Length (m)	90.0			50.0	
Base Capacity (vph)	456	424	3672	85	3706
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.29	0.05	0.56	0.48	0.62

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

107: Trafalgar Road & Collector H

2041 FT PM Peak Hour
06/25/2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			  			  
Traffic Volume (vph)	131	22	1908	135	41	2301
Future Volume (vph)	131	22	1908	135	41	2301
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	*0.80		1.00	*0.80
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1825	1633	4565		1825	4611
Flt Permitted	0.95	1.00	1.00		0.06	1.00
Satd. Flow (perm)	1825	1633	4565		107	4611
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	131	22	1908	135	41	2301
RTOR Reduction (vph)	0	20	3	0	0	0
Lane Group Flow (vph)	131	2	2040	0	41	2301
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	3		2			6
Permitted Phases		3			6	
Actuated Green, G (s)	15.5	15.5	112.5		112.5	112.5
Effective Green, g (s)	15.5	15.5	112.5		112.5	112.5
Actuated g/C Ratio	0.11	0.11	0.80		0.80	0.80
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	202	180	3668		85	3705
v/s Ratio Prot	c0.07		0.45			c0.50
v/s Ratio Perm		0.00			0.38	
v/c Ratio	0.65	0.01	0.56		0.48	0.62
Uniform Delay, d1	59.6	55.4	4.9		4.4	5.4
Progression Factor	1.00	1.00	2.18		0.59	0.52
Incremental Delay, d2	7.0	0.0	0.4		13.7	0.6
Delay (s)	66.6	55.5	11.0		16.4	3.4
Level of Service	E	E	B		B	A
Approach Delay (s)	65.0		11.0			3.6
Approach LOS	E		B			A
Intersection Summary						
HCM 2000 Control Delay			9.0		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.62			
Actuated Cycle Length (s)			140.0		Sum of lost time (s)	12.0
Intersection Capacity Utilization			62.8%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings
207: Collector G & Collector L

2041 FT PM Peak Hour
06/25/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	149	352	37	52	206	77	33	29	39	84	75	119
Future Volume (vph)	149	352	37	52	206	77	33	29	39	84	75	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	25.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	10.0			25.0			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.986			0.959			0.948			0.942	
Flt Protected	0.950			0.950				0.984			0.985	
Satd. Flow (prot)	1560	1841	0	1772	1829	0	0	1760	0	0	1658	0
Flt Permitted	0.950			0.950				0.984			0.985	
Satd. Flow (perm)	1560	1841	0	1772	1829	0	0	1760	0	0	1658	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		184.6			422.4			376.5			875.5	
Travel Time (s)		13.8			31.7			28.2			65.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	17%	3%	2%	3%	1%	0%	2%	4%	0%	1%	3%	15%
Adj. Flow (vph)	149	352	37	52	206	77	33	29	39	84	75	119
Shared Lane Traffic (%)												
Lane Group Flow (vph)	149	389	0	52	283	0	0	101	0	0	278	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)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 54.4%	ICU Level of Service A											
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis 207: Collector G & Collector L

2041 FT PM Peak Hour
06/25/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop			Stop				Stop			Stop	
Traffic Volume (vph)	149	352	37	52	206	77	33	29	39	84	75	119
Future Volume (vph)	149	352	37	52	206	77	33	29	39	84	75	119
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	149	352	37	52	206	77	33	29	39	84	75	119
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total (vph)	149	389	52	283	101	278						
Volume Left (vph)	149	0	52	0	33	84						
Volume Right (vph)	0	37	0	77	39	119						
Hadj (s)	0.79	-0.02	0.55	-0.18	-0.14	-0.07						
Departure Headway (s)	7.2	6.4	7.3	6.5	6.8	6.4						
Degree Utilization, x	0.30	0.69	0.11	0.51	0.19	0.49						
Capacity (veh/h)	481	544	468	517	449	525						
Control Delay (s)	12.0	21.1	9.9	15.0	11.5	15.4						
Approach Delay (s)	18.6		14.2		11.5	15.4						
Approach LOS	C		B		B	C						
Intersection Summary												
Delay			16.1									
Level of Service			C									
Intersection Capacity Utilization			54.4%	ICU Level of Service				A				
Analysis Period (min)			15									

Lanes, Volumes, Timings
208: Collector H & Collector L

2041 FT PM Peak Hour
06/25/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	322	8	30	267	42	8	32	17	33	49	67
Future Volume (vph)	106	322	8	30	267	42	8	32	17	33	49	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	25.0		0.0	25.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	2.5			2.5			25.0			25.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.983			0.948			0.913	
Flt Protected		0.988			0.996		0.950			0.950		
Satd. Flow (prot)	0	1844	0	0	1862	0	1825	1786	0	1825	1739	0
Flt Permitted		0.988			0.996		0.950			0.950		
Satd. Flow (perm)	0	1844	0	0	1862	0	1825	1786	0	1825	1739	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		422.4			514.0			400.7			911.3	
Travel Time (s)		31.7			38.6			30.1			68.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	3%	0%	0%	1%	2%	0%	2%	2%	0%	2%	0%
Adj. Flow (vph)	106	322	8	30	267	42	8	32	17	33	49	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	436	0	0	339	0	8	49	0	33	116	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)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	60.0%						ICU Level of Service B					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

208: Collector H & Collector L

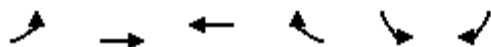
2041 FT PM Peak Hour

06/25/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	322	8	30	267	42	8	32	17	33	49	67
Future Volume (Veh/h)	106	322	8	30	267	42	8	32	17	33	49	67
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	106	322	8	30	267	42	8	32	17	33	49	67
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	309			330			978	907	326	919	890	288
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	309			330			978	907	326	919	890	288
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			98			95	87	98	84	81	91
cM capacity (veh/h)	1252			1241			165	246	715	205	252	756
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	436	339	8	49	33	116						
Volume Left	106	30	8	0	33	0						
Volume Right	8	42	0	17	0	67						
cSH	1252	1241	165	319	205	410						
Volume to Capacity	0.08	0.02	0.05	0.15	0.16	0.28						
Queue Length 95th (m)	2.1	0.6	1.1	4.1	4.3	8.7						
Control Delay (s)	2.6	0.9	27.9	18.3	25.9	17.2						
Lane LOS	A	A	D	C	D	C						
Approach Delay (s)	2.6	0.9	19.7		19.1							
Approach LOS			C		C							
Intersection Summary												
Average Delay			5.5									
Intersection Capacity Utilization			60.0%		ICU Level of Service		B					
Analysis Period (min)			15									

Lanes, Volumes, Timings
211: Collector H & Collector G

2041 FT PM Peak Hour
06/25/2025



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	68	108	94	30	39	59
Future Volume (vph)	68	108	94	30	39	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.967		0.919	
Flt Protected		0.981			0.980	
Satd. Flow (prot)	0	1873	1839	0	1710	0
Flt Permitted		0.981			0.980	
Satd. Flow (perm)	0	1873	1839	0	1710	0
Link Speed (k/h)		48	48		48	
Link Distance (m)		180.1	459.0		376.5	
Travel Time (s)		13.5	34.4		28.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	1%	1%	3%	0%
Adj. Flow (vph)	68	108	94	30	39	59
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	176	124	0	98	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type: Other						
Control Type: Unsignalized						
Intersection Capacity Utilization 32.0% ICU Level of Service A						
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis

211: Collector H & Collector G

2041 FT PM Peak Hour
06/25/2025



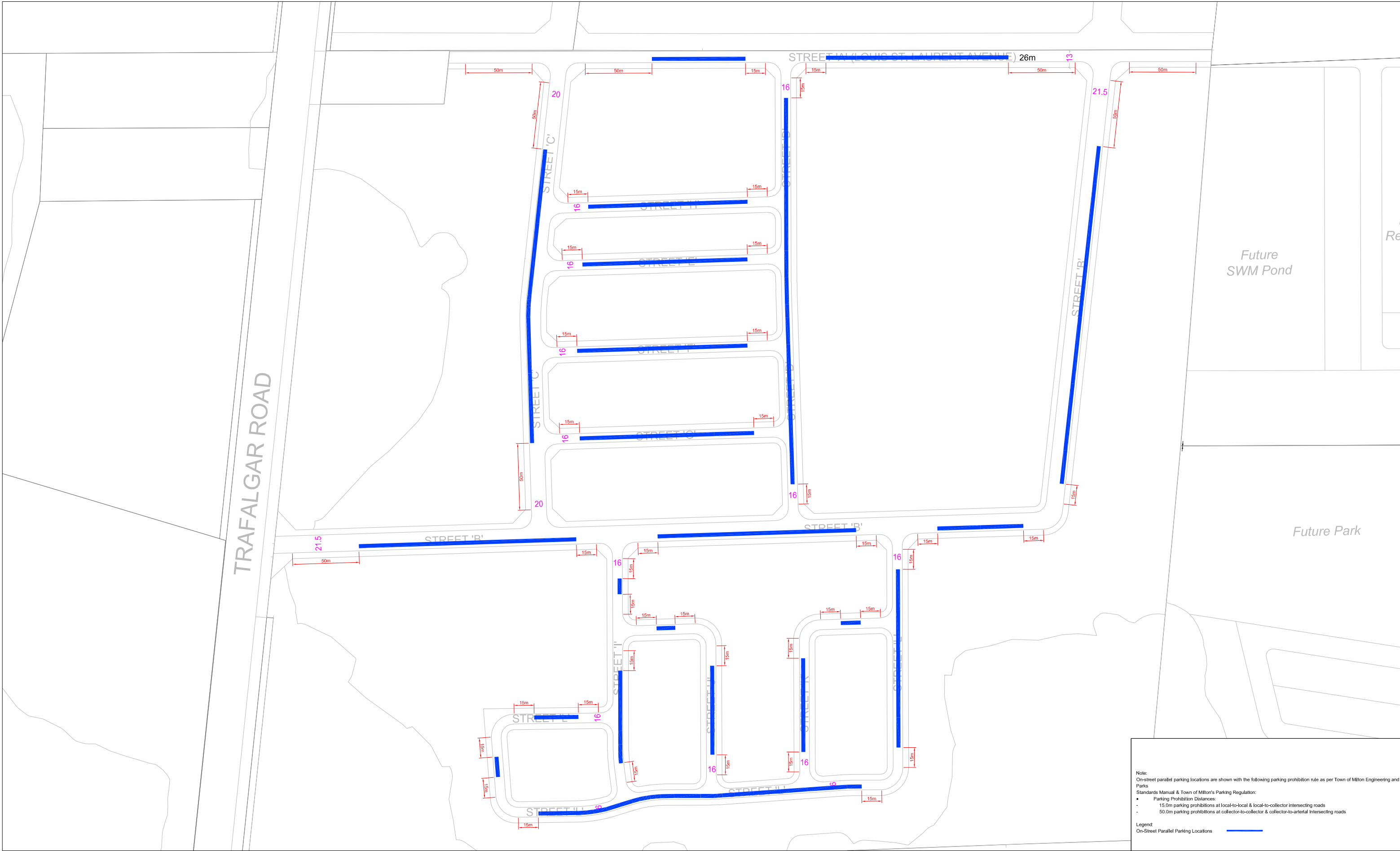
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	68	108	94	30	39	59
Future Volume (Veh/h)	68	108	94	30	39	59
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	68	108	94	30	39	59
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)		180				
pX, platoon unblocked						
vC, conflicting volume	124				353	109
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	124				353	109
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				94	94
cM capacity (veh/h)	1475				613	950
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	176	124	98			
Volume Left	68	0	39			
Volume Right	0	30	59			
cSH	1475	1700	780			
Volume to Capacity	0.05	0.07	0.13			
Queue Length 95th (m)	1.1	0.0	3.3			
Control Delay (s)	3.1	0.0	10.3			
Lane LOS	A		B			
Approach Delay (s)	3.1	0.0	10.3			
Approach LOS			B			
Intersection Summary						
Average Delay			3.9			
Intersection Capacity Utilization			32.0%	ICU Level of Service		A
Analysis Period (min)			15			



Appendix K

On-street Parking Plan

G:\Projects\2025\10494 - Remington - MP4 Trafalgar Block Plan\03 Analysis\05 Parking Plan



Note:
On-street parallel parking locations are shown with the following parking prohibition rule as per Town of Milton Engineering and Parks Standards Manual & Town of Milton's Parking Regulation:

- Parking Prohibition Distances:
 - 15.0m parking prohibitions at local-to-local & local-to-collector intersecting roads
 - 50.0m parking prohibitions at collector-to-collector & collector-to-arterial intersecting roads

Legend:
On-Street Parallel Parking Locations —



3381 STEELES AVE E,
Suite 315
Toronto, ON
M2H 3S8
P: 905.738.5700

REMINGTON TRAFALGAR DRAFT PLAN STUDY
CONCEPTUAL ON-STREET PARKING LOCATION PLAN



N.T.S

DRAWING No.	01
DATE	JUN 2025