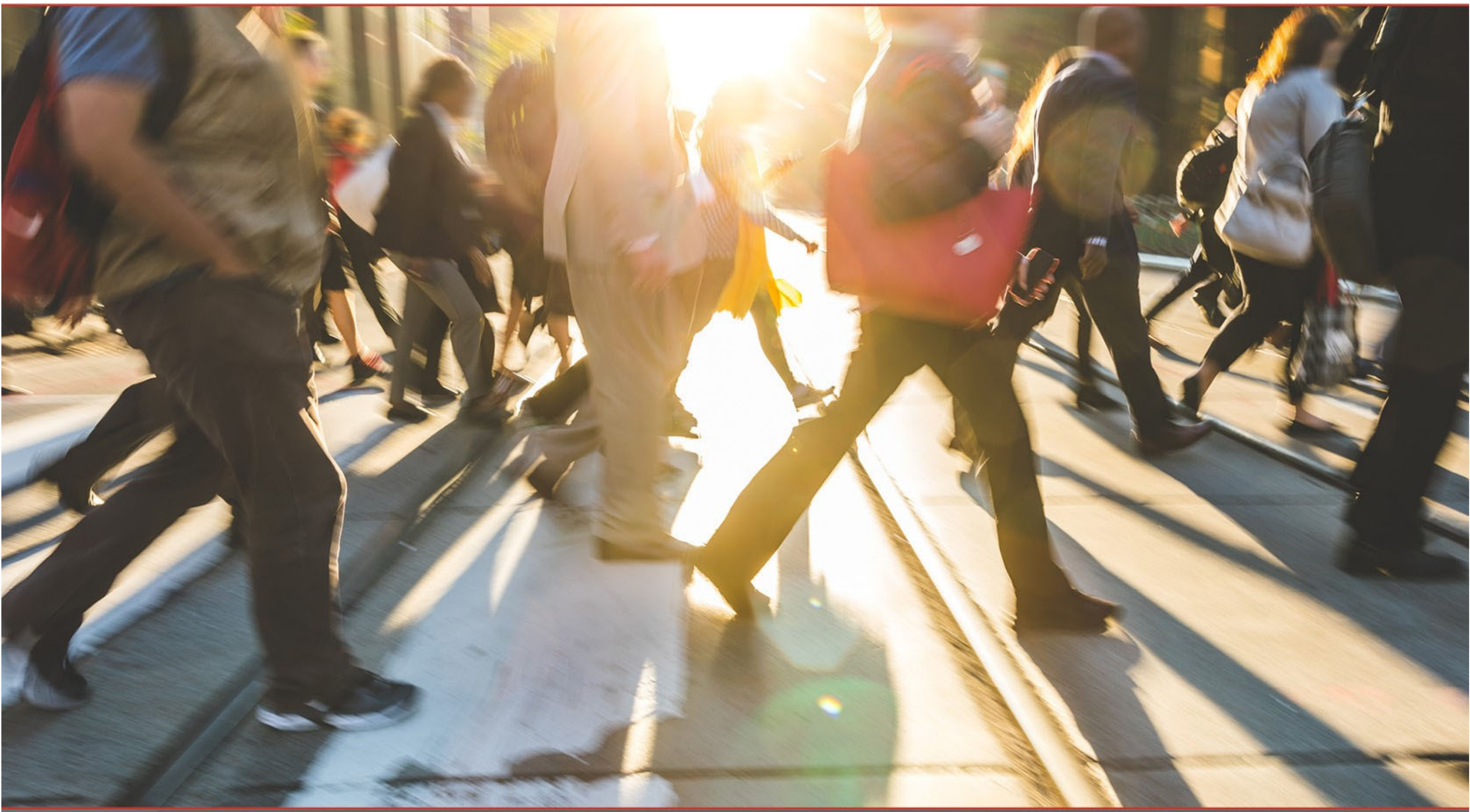
420 - 468 SOUTH SERVICE ROAD EAST PROPOSED MIXED USE DEVELOPMENT

Urban Transportation Considerations
Town of Oakville



Prepared For: South Service Holding Corp.

November 2024

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

TABLE OF APPENDICES

1.0 INTRODUCTION

BA Group has been retained by the South Service Holding Corp. (the "**Applicant**") to provide transportation consulting services for an Official Plan Amendment (OPA) to permit the redevelopment of the former GE Lands municipally known as 420-468 South Service Road East in the Town of Oakville (the "**Site**"). The Site location is illustrated in **Figure 1**.

1.1 Existing Site Context

The Site is located in Midtown Oakville, on the east side of Trafalgar Road, between the Queen Elizabeth Way (QEW) / Highway 403 corridor (referred to herein as the "**QEW corridor**") and the Metrolinx / CN rail corridor, and west of the existing Royal Windsor interchange with the QEW corridor.

The Site is bounded by South Service Road East to the north, the Metrolinx / CN rail corridor to the south, and other industrial parcels to the west and east. Vehicular access is currently provided via South Service Road to the north and Davis Road to the west. The Site has an approximate area of 11 ha (110,889 m^2) with an approximate frontage of 374 metres along South Service Road East. The Site was formerly occupied by the GE Lighting Lamp Plant, which was closed in 2010. It remained vacant until earlier in 2024 when temporary land use approvals were granted for an outdoor storage use. A concept plan for the temporary outdoor storage use is attached in **Appendix A**. The outdoor storage is segregated into three areas:

- An area dedicated to the deployment of prefabricated metal shipping containers (2.5 m wide by 6.1 m long) placed side-by-side and back-to-back to form individual outdoor storage units, forming double-sided rows;
- An area that would accommodate the outdoor storage of passenger-sized vehicles; and
- An area that would accommodate the outdoor storage of larger vehicles such as Recreational Vehicles (RV's), single unit trucks, personal trailers such as boats trailers or general-purpose trailers.

Access to the Site for the temporary uses is provided via three driveways:

- Two (2) driveways along South Service Road at existing driveway locations, generally located to the west and east of the planned temporary uses.
- An Emergency Access driveway that would be shut during normal operations at the east end of Davis Road, where Davis Road terminates at the western Site boundary. This will not change the existing conditions on Davis Road.

There will also be a small passenger vehicle parking area (15 customer parking spaces that meet the Town of Oakville's Zoning Bylaw dimensions) available upon entry via the western Site access driveway on South Service Road.

All areas for the temporary uses that will accommodate vehicle manoeuvering will be appropriately "hardscaped" per the Town of Oakville Zoning Bylaw requirements. The general storage area is an existing hard surfaced area. Access to the Site will be provided 24 hours a day via the gate-controlled entry points.

The Site is currently surrounded by a range of uses, including existing small scale industrial uses, existing hotel use, and two relatively new office buildings. The temporary uses, as noted above, take access from an existing public street system that relies upon:

- South Service Road East as its primary point of access to / from Trafalgar Road to the west and Royal Windsor Drive to the east; and
- Chartwell Road to the east that provides an at-grade crossing of the Metrolinx/CN rail corridor and connects to Cornwall Road to the south.

Aside from the connections to Trafalgar Road, there are also circuitous connections to the QEW corridor via Royal Windsor Drive and other public streets that encircle the Ford Assembly Plant to the northeast, that would link the Site to the QEW corridor.

1.1.1 Midtown Oakville

The Site is located in an area that has been identified for intensification by the Town of Oakville through the Midtown Oakville Growth Area Review. The plan includes a series of new, proposed public streets and multi-modal transportation infrastructure that connect Midtown Oakville to / from the north of the QEW corridor, to / from south of the rail corridor, east-west across Trafalgar Road, and east to / from an improved Royal Windsor interchange with the QEW corridor. The Town of Oakville has outlined a number of transportation goals and policies as part of the Midtown Oakville plan. The Midtown Oakville plan is further discussed in **Section 3.2**.

The Site location and Midtown Oakville are illustrated in **Figure 2**.

1.2 Proposed Development

The proposed mixed-use development is for four development blocks containing a total of 6,954 residential units within 16 residential towers and 5,849 m^2 of retail space. The development also includes an approximately 18,687 m^2 public park, occupying the entirety of one of the blocks (Block 3).

A new public street network is proposed through and around the Site, providing multi-modal access to all uses on the Site. One minor change is proposed to the north-south minor street grid contained in the latest Town of Oakville Midtown Draft Official Plan Amendment (Draft Midtown OPA) to better align with the Site's western property boundaries and to enable more logical development blocks. The change is minor and does not affect the functionality of the street network. The new major street network remains consistent with the Draft Midtown OPA, including the extension of Davis Road and Cross Avenue through the Site, and the creation of a new north-south grade separated arterial street across the QEW corridor to the north (road-over-highway overpass) and across the Metrolinx / CN rail corridor to the south (rail-over-road underpass).

Pedestrian access and circulation is afforded from all sides of all four development blocks. This ensures direct and convenient access to and from all new public streets that abut the development blocks as well as to planned transit routings that will permeate the Midtown Oakville area and link to the Oakville GO Transit hub. The four development blocks, inclusive of the public park block, will also exhibit private pedestrian linkages through each block and to each residential building and non-residential retail space within the podiums of the residential buildings. Retail spaces will line the frontages of the residential podiums along the east-west Collector Street through the centre of the mixed-use development. This is consistent with the uses anticipated along "Primary" and "Secondary" main streets in the Midtown area.

Cycling infrastructure is also planned in the form of dedicated bicycle parking rooms for long-term bicycle uses (i.e., resident bike parking and employee bike parking) and a mix of internal and external bike parking for short term bicycle uses (i.e., residential visitor bike parking and non-residential customer and visitor bike parking). The provision of convenient and direct connections between private bike infrastructure and public cycling infrastructure planned within the new public streets in Midtown will link the development blocks to the multi-modal transportation network emerging within Midtown Oakville and the broader Town of Oakville itself.

Vehicular parking is to be provided within below-grade parking facilities within each residential Block. A series of at-grade vehicular contact points (pick-up and drop-off facilities, service vehicle loading areas, and emergency vehicle access conditions) are also planned to ensure that all aspects of the mixed-use intensification will be appropriately served and connected to the planned public transportation systems within Midtown Oakville.

Redevelopment statistics are summarized in **Table 1**.

The development proposal for the Site is illustrated in **Figure 3**. Reduced scale architectural ground floor and parking level plans are provided in **Appendix B**.

Table 1 Development Proposal

Land Use / Type		Block 1	Block 2	Block 3	Block 4	Total
Description		**6 Residential Towers** A – 40 stories B – 45 stories C – 35 stories D – 42 stories E – 48 stories F – 45 stories	**6 Residential Towers** G – 48 stories H – 45 stories I – 40 stories J – 35 stories K – 42 stories L – 35 stories	**Public Park**	**6 Residential Towers** M – 40 stories N – 35 stories O – 35 stories P – 30 stories	-
Residential (units)		2,7462	2,584	-	1,624	**6,954 units**
Retail • **GCA** • **NFA**		 2,175 m² 2,001 m²	 1,362 m² 1,253 m²	 - -	 2,331 m² 2,127 m²	 **5,849 m²** **5,381 m²**
Public Park Space				18,687 m²		**18,687 m²**
Vehicle Parking (spaces)	Resident	1,373	1,292		812	**3,477**
	Non-Residential	527	436	-	267	**1,230**
	Total	**1,900**	**1,728**	**-**	**1,079**	**4,707 spaces**
Bicycle Parking (spaces)	Long-Term (Resident)	2,060	1,938	-	1,218	**5,216 spaces**
	Short-Term (Visitor)	684	646	-	406	**1,739 spaces**
	Non-Res.	3	2	-	3	**8 spaces**
	Total	**2,750**	**2,588**	**-**	**1,627**	**6,963 spaces**
Loading Facilities		6	6	-	6	**18 spaces**

Notes:

1. Site statistics based on site plans prepared by Graziani + Corazza Architects, dated November 1, 2024.

1.3 Master Plan Mobility Goals and Principles

The proposed development plan is premised upon the fundamental mobility goal of establishing a major component of the Davis Residential Precinct within the Midtown Oakville area that exceeds the travel characteristics of the rest of the Town of Oakville. To achieve that goal, key mobility principles were established that have guided the Master Plan development process. These key mobility principles include:

Establish a mixed-use development with a sustainable mix of supportive uses that will help to ensure that travel demands are internalized (to Midtown Oakville) to the extent possible, that they make efficient use of available transportation infrastructure, and that efficiencies can be gained in aspects of parking and goods movement.

A "Transit First" Master Plan, focusing on providing sustainable and effective transit options from "opening day" of new development through the development of the Master Plan. The development will incorporate easy access between different modes of transit – particularly direct, safe, and convenient access to public transit – and provide attractive connections between public transit and the public realm. The Master Plan encourages transit use for "opening day" travel demands.

A comprehensive plan to provide Mobility Choice, which includes complementary built form, transit provision, and appropriate infrastructure to support, encourage, and make convenient active transportation alternatives. The plan includes delivering complete streets consistent with the Livable Oakville Official Plan, Midtown Oakville, to achieve an attractive public realm and ensure that streets prioritize pedestrian and transit use while facilitating necessary vehicular access and movement. Furthermore, mobility choice will include providing flexibility in the Master Plan streets and access arrangements to facilitate potential changes in the use / application of automobiles.

A plan supporting the Transportation Demand Management (TDM) Plan strategy, which will focus on discouraging auto dependence and the effective rate of auto-driver trips by dis-incentivizing auto use through parking management / provisions and incentivizing alternative transportation options. Incentive / disincentive measures are advanced through appropriate application, monitoring, and mitigating strategies.

Integration with the larger planning framework, including infrastructure investments and area-wide planning initiatives being led by the Town of Oakville and other public agencies (Province / Metrolinx, Region of Halton). This wider planning framework and associated transportation network planning has informed the Master Plan street network, transit service provisions, and active transportation infrastructure. This ensures that the impact of the planned proposed development is fully integrated in area-wide planning initiatives.

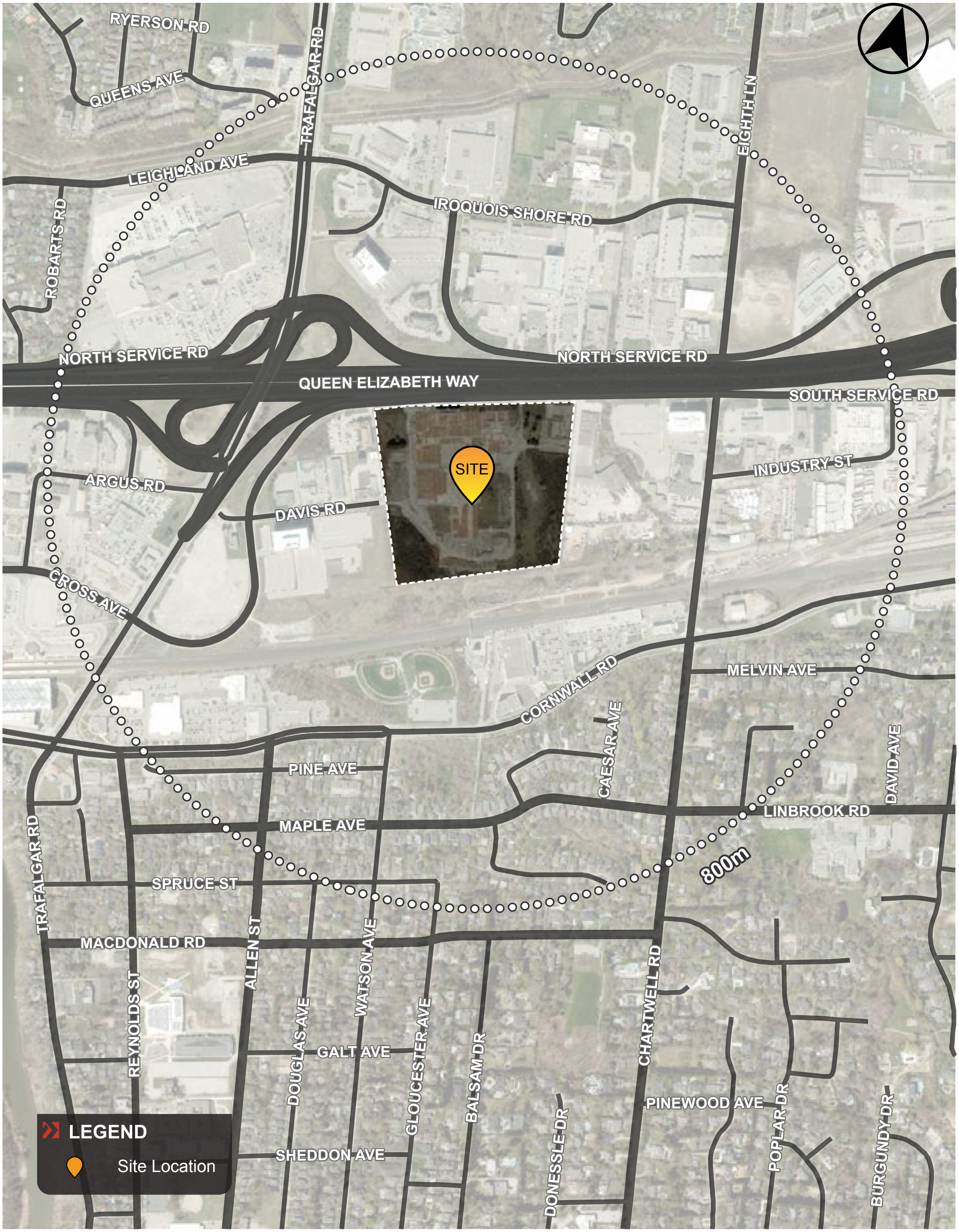

FIGURE 1 SITE LOCATION

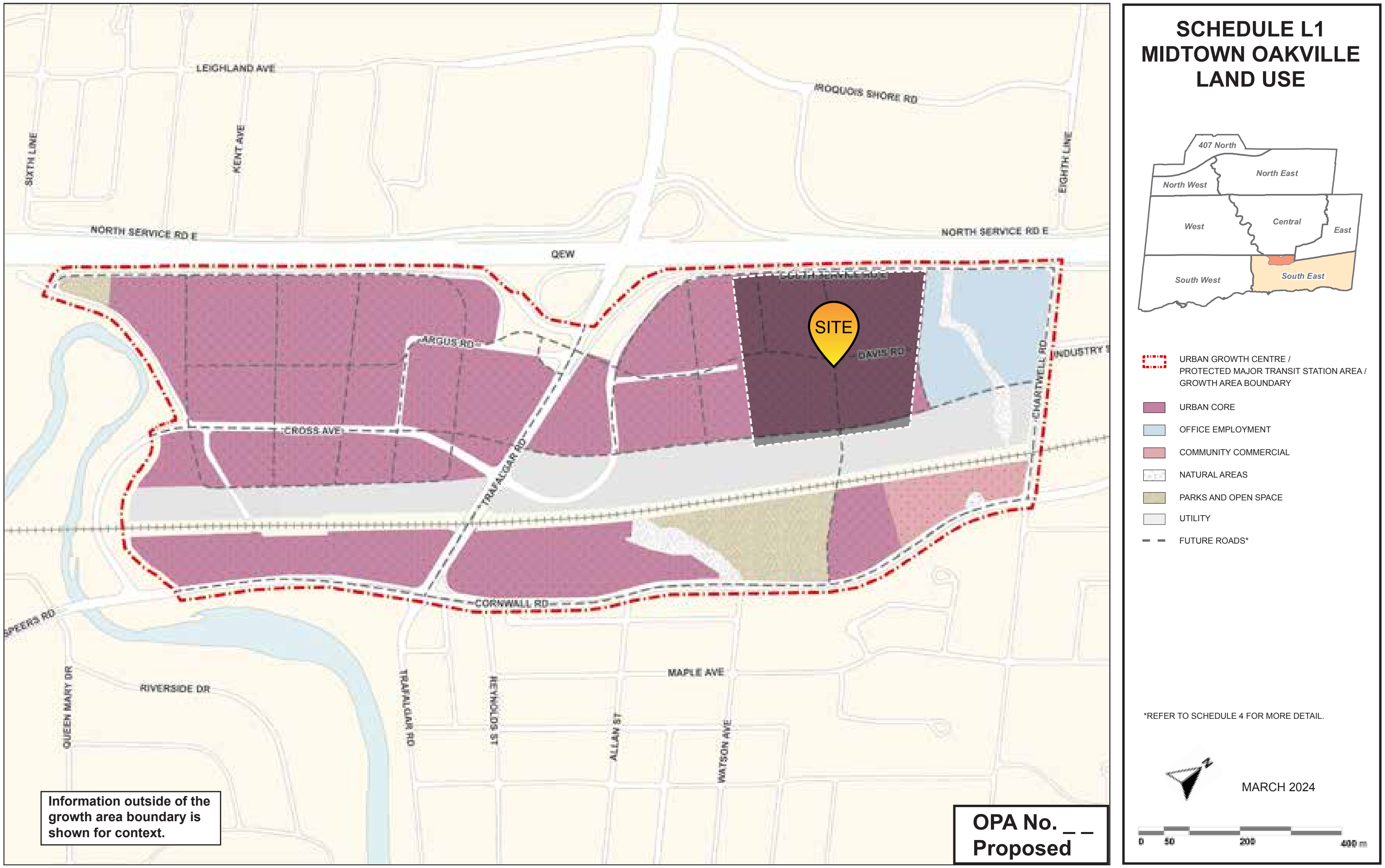

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FIGURE 2 MIDTOWN OAKVILLE CONTEXT

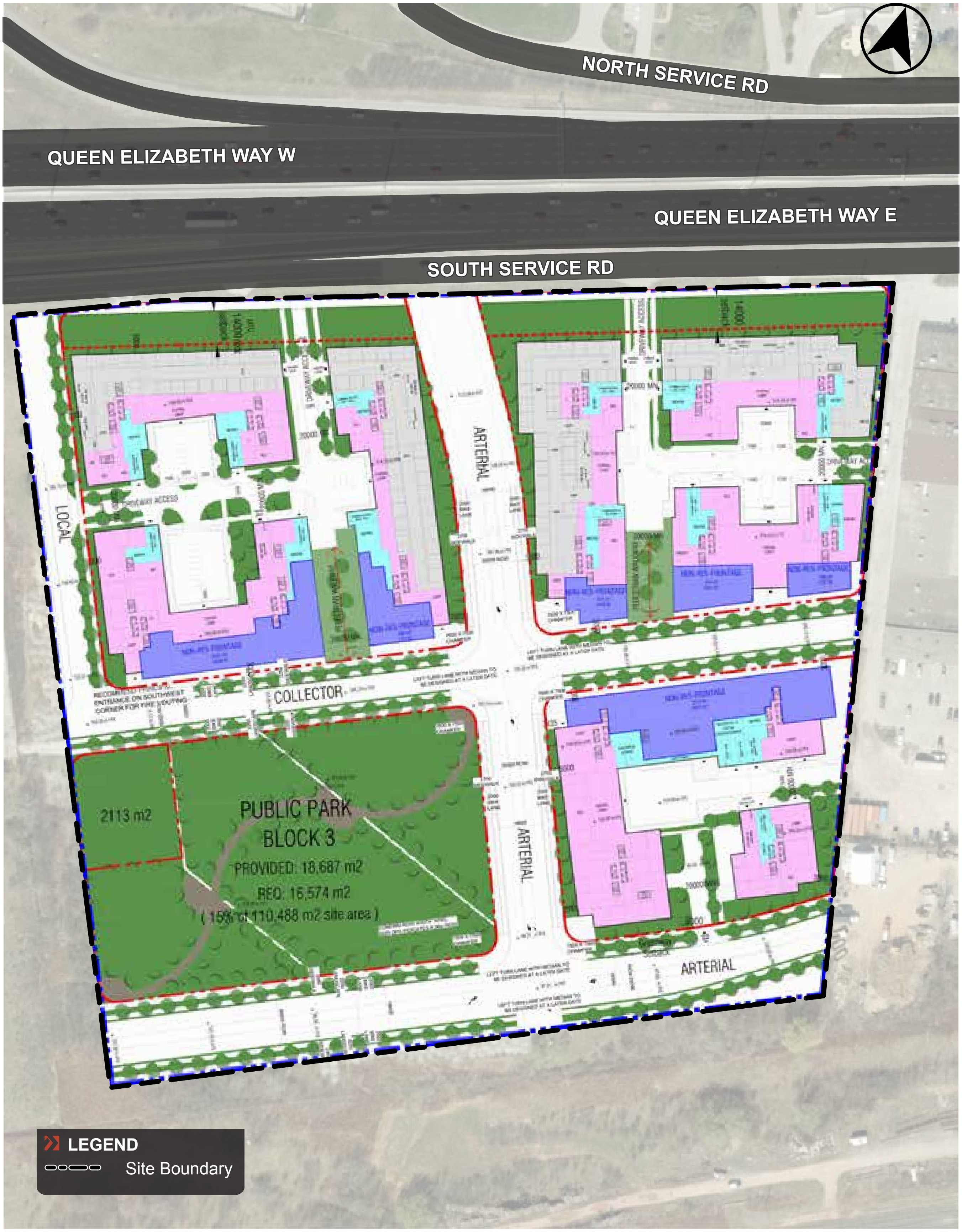

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FIGURE 3 MASTER PLAN

1.4 Study Scope

The study scope includes the following:

Transportation Context

- A description of the existing transportation context with consideration for the area road network, transit system and active transportation facilities.
- A description of any future transportation changes and/or improvements to the area context such as transit improvements and other non-automobile dependent travel options.

Development Proposal

- A summary of the proposed development.
- An overview of the Site and the area-wide transportation system that facilitates a shift towards non-automobile travel for prospective residents and visitors, while still being able to meet the practical and operational needs of the proposed development plan.
- A review of the transportation elements of the proposed development plan that includes vehicle access and circulation, loading and parking facilities.

Transportation Demand Management Framework

- An overview of potential Transportation Demand Management (TDM) measures and initiatives that are being considered to encourage prospective residents and visitors to use more active and sustainable modes of transportation.

Site Plan

- A review of the adequacy of the vehicle and bicycle parking supply.
- A review of the adequacy of the loading space provisions.
- A review of the functionality and appropriateness of the proposed vehicle, pedestrian and cycling facilities incorporated into the Site plan, including loading/garbage collection facility arrangements.

Multimodal Travel Demand Forecasting

- An assessment of the existing vehicular travel patterns and traffic volumes in the study area, during the key weekday morning and afternoon peak hours.
- A comprehensive review of future traffic growth that may occur in the area, including corridor growth and consideration for a number of other area development projects.
- An assessment of the multi-modal trip generation impacts of the proposed development.

Traffic Operations Review

- A review of traffic operations at intersections in the area, under existing and future conditions, including an assessment of the operational impacts of the proposed development.
- An assessment of any mitigative measures to accommodate the development traffic.

The findings of this review are summarized in the following sections.

2.0 SUMMARY & CONCLUSIONS

BA Group has been retained by the South Service Holding Corp. (the "**Applicant**") to provide transportation consulting services in support of an Official Plan Amendment (OPA) to permit the redevelopment of the GE Lands municipally known as 420-468 South Service Road East in the Town of Oakville.

The Site is situated in the Town of Oakville, in the Midtown area. The Site is located on the east side of Trafalgar Road, between the QEW / Highway 403 corridor and the Metrolinx / CN rail corridor, and west of the existing Royal Windsor interchange with the QEW/Highway 403 corridor.

The master plan development proposal includes the construction of 4 blocks, consisting of a total of 6,954 residential units within 16 residential towers and 5,849 m^2 of retail space. The development also includes the addition of a public park of approximately 18,687 m^2, located within Block 3.

A total of 4,707 parking spaces, 6,963 bicycle parking spaces and 18 loading spaces are proposed to support the transportation-related aspects of the proposed development.

Key findings are summarized as follows:

Planning Context

1. The Site development incorporates the policy direction of the following provincial and regional policy documents: Ontario's Five Year Climate Change Action Plan (2016), Provincial Policy Statement (2020), A Place to Grow: Growth Plan for the Greater Golden Horseshoe (2020), *Connecting the GGH: A Transportation Plan for the GGH (2022), 2041 Metrolinx Regional Transportation Plan (2018),* and *Ontario Bill 185 (2024).*

2. The Site development incorporates the policy direction of the following local area policy documents: *Livable Oakville – Growth Areas – Midtown Oakville, Trafalgar Environmental Assessment (2015), Midtown Oakville Environmental Assessment (2015),* and *Midtown Oakville Draft (2024) Official Plan Assessment*.

3. The Site is situated within an area that has been identified for intensification by the Town of Oakville with their Midtown plan and includes a series of new, proposed public streets and multi-modal transportation infrastructure.

4. The Site is located in the Midtown Oakville Protected Major Transit Station Area as outlined in the Oakville Official Plan.

Area Context

5. The Site is well served today by Oakville Transit and regional rail services through GO Transit and VIA. The Site is located within the Midtown Oakville Growth Area, one of the most transit-accessible locations within the Town of Oakville. Under future conditions, the subject Site is adjacent to the planned Trafalgar Road Rapid Transit (BRT) which will connect Uptown Oakville and Midtown Oakville to the Oakville GO Station.

6. Through the Midtown Oakville Environmental Assessment Study (Midtown EA), and further through the Draft Midtown (2024) Oakville process, the Town of Oakville has established a proposed street system to support intensification within the Midtown area of the Town. This proposed street system includes several future arterials, collectors, and local roads to support the transportation needs within the Midtown Oakville Urban Growth Centre.

7. Several additional active transportation connections within and beyond Midtown Oakville are proposed as part of the Midtown Oakville EA and the Midtown Draft (2024) OPA which will assist in improving connectively within and beyond Midtown and have the added benefit of improving active transportation linkages to the Oakville GO Transit hub and all of its transit opportunities.

Vehicle Parking Considerations

8. The prevailing Zoning By-law for the Site for parking supply requirements is the Town of Oakville's Zoning By-law 2014-014, of which the Site is subject to the "Mixed Use Zones" parking standards. Application of the parking standards results in a minimum parking requirement of 8,996 spaces, inclusive of 7,303 resident spaces and 1,693 visitor spaces.
9. The Province of Ontario recently passed (June 6, 2024) Bill 185, which amends the Planning Act of Ontario. Application of Bill 185 and the provisions which amend the Planning Act result in vehicular parking requirements **of zero parking spaces per unit (i.e., 0 parking spaces / unit)** for both the resident parking and visitor parking components as well as the non-residential land use components of the development proposal.
10. The current proposal includes a total of 4,707 parking spaces for the Site, including 3,477 residential spaces and 1,230 non-residential parking spaces between visitors and retail uses.

Bicycle Parking Considerations

11. Application of Zoning By-law 2014-014 minimum bicycle parking requirements results in a total of 6,903 bicycle parking spaces, including 5,216 spaces for residents, 1,739 spaces for residential visitors and 8 spaces for retail use.
12. The proposed development includes the provision of a minimum of 5,216 spaces for residents, 1,739 spaces for residential visitors and 8 spaces for retail use , consistent with the requirements set out in Zoning By-law 2014-014.

Loading Considerations

13. The Town of Oakville's Zoning By-law 2014-014 does not include a requirement for a minimum number of loading spaces.
14. The current proposal incorporates a total of 18 residential loading spaces for the proposed development. Six (6) loading spaces are provided in each Block. The proposed loading spaces will meet the dimensional requirements of Zoning By-law 2014-014.
15. The proposed loading supply strategy has been evaluated against the practical, functional, and policy requirements associated with the various types of loading operations that would be experienced on a daily basis.
16. The functional design of loading areas have been tested, at a high level of functional review – given the Master Plan level of detail – with appropriate design vehicles and manoeuvering requirements to ensure that the resulting loading space is capable of accommodating the needs – based upon land uses, scale of development, and physical opportunities / constraints – of each individual development building and or Block.
17. This ensures an efficient and compact development and safe Master Plan concept.

Transportation Demand Management

18. A TDM strategy has been developed to ensure that the proposed development sets a sustainable precedent in urban development (e.g. increase vehicle occupancy; and reduce vehicle kilometres travelled) and encourages the use of alternative travel modes (transit, cycling, walking).
19. TDM measures proposed as part of the development include, but are not limited to:

- Provision of a reduced resident parking supply;
- Provision unbundled parking from unit cost;

- Provision of convenient pick-up and drop-off facilities within and around the development blocks to facilitate passenger pick-up and drop-off via shared use mobility services, short-term small scale residential deliveries (substituting for vehicular shopping trips);
- Consideration of internal residential building facilities to facilitate the secure drop-off of small parcels, packages, and potentially food deliveries;
- Consideration to provide car share spaces on Site;
- Provision of the required long-term bicycle parking supply, meeting the Zoning By-law standards;
- Consideration to provide bike share stations located in the new public streets and parks being created on the Site;
- Consideration of a range of bike parking facilities for long term resident needs, such as cargo bike parking;
- Provision of bicycle repair stations;
- Consideration to provide private or shared micromobility devices; and;
- Provision of direct pedestrian and cycling connections to building entrances, bicycle parking facilities, nearby transit stops, and the external / public network.

Transportation Impact Assessment

20. Under future conditions, with the full buildout of the Midtown Oakville area, the road network will continue to operate under very busy conditions, with some intersections operating at, or above, their theoretical capacity. This is reflective of a busy urban centre where the majority of mobility needs will be met by non-auto means including transit (particularly GO, BRT and other bus transit) and active modes (walking and cycling and other micro-mobility), while a smaller proportion of travel needs will continue to be met via private automobile.

21. The Site's mobility choice strategy seeks to encourage and enable travel by non-auto means, while accommodating the smaller proportion of people that own and use a private automobile. Mobility choice strategies that will encourage non-auto travel include limiting the Site's parking supply (Section 6.0), provision of high quality bicycle parking (Section 7.0) a full suite of TDM measures (Section 9.0), and the creation of a dense, mixed-use and walkable community within the Site and Midtown Oakville (Section 5.0). Most importantly, the Site's proximity to frequent higher-order transit – including GO, the future Trafalgar BRT, and other bus services operated by Oakville Transit – will allow residents, employees and visitors of the Site to access local and regional destinations without use of a car.

22. A number of trends will shape future mobility in and around the Site and in the Town of Oakville more broadly, including:

- **Many residents who choose to live in Midtown Oakville will do so because of its proximity to transit and the ability to live and work without the daily use of a car. Midtown Oakville is intentionally planned to be a transit-oriented community that is characterized by higher density than the rest of Oakville.** Options to travel to / from Midtown Oakville by car will be limited, given that the existing and future road network will operate under very busy conditions and on-site parking supply will be limited. As a result, future residents who choose to live in Midtown Oakville will do so because the other mobility connections that will be available to them – in particular the GO line, the Trafalgar BRT and other bus services – will enable them to meet their day-to-day needs without needing to use a car.

  Consequently, future residents will have different travel characteristics from elsewhere in Oakville today. Importantly, future residents will make significantly more use of transit, supplemented by walking and cycling for shorter journeys – including within the Midtown Oakville neighbourhood – to meet their day-to-day needs.

- **At the same time, travel modes in Halton Region and the rest of the GTAH are evolving, and auto use is decreasing over time. This is particularly true for peak period travel**. This change is partly occurring in response to increasing congestion caused by population and employment growth in the GTAH. At the same time, the change is being supported by ongoing municipal and provincial efforts to promote non-auto travel modes, including improvements to transit service, the expansion of safe cycling and walking infrastructure, the creation of more mixed-use communities that allow people to meet their daily needs locally, and the increased availability of first and last mile travel options, including e-bikes and bike share (in some municipalities; currently not in Oakville).

  This decrease in auto use, particularly in the peak periods, is taking place faster in intensification areas and transit-oriented urban nodes like Midtown Oakville, but is also occurring in car-centric areas of the Region as well. This is borne out through data collected by the 5-yearly TTS, the latest available of which is the 2016 TTS[1]. A more recent TTS was conducted in 2022/2023, but this data has not yet been released.

- **Work commute habits are also changing, as a result of increased work-from-home following the COVID-19 pandemic**. An increased proportion of the population now works remotely for some or all of their employment since the COVID-19 pandemic. This results in the reduced need to travel during peak periods, reducing overall trip rates for all modes and reducing the relative peak period impact of new development.

- **An increasing number of daily needs are being met through e-commerce**. This includes online shopping, grocery online shopping, food / restaurant deliveries, app-based shopping and delivery services, etc. This decreases the need to travel but increases delivery vehicle trips. This results in the need to provide appropriately sized and well-designed pick-up / drop-off and temporary layby areas for delivery services. The proposed pick-up / drop-off and layby areas for the Site are discussed in Section 5.9).

- **Midtown Oakville is a designated Urban Growth Centre and is intended to be a focus of population and employment growth in the Town of Oakville**. Midtown Oakville is identified in Provincial, Regional and Town policy as a place for intensification. A significant portion of the population and employment growth that is designated for Oakville is intended to be accommodated in Midtown Oakville. The area has some of the best transit access in Oakville, and underutilized or vacant land available for redevelopment. The area is a designated Protected Major Transit Station Area (PMTSA), and a designated Primary Growth Area and Urban Growth Centre[2] that is expected to accommodate the highest level of intensification in the Town. As a result, the traffic impact of growth in the Town will be more concentrated in and around Midtown Oakville. At the same time, growth in the MTSA will have a relatively lesser traffic impact, on a per-unit basis, than growth in other less transit-accessible areas of the Town.

- **The proposed development will have minor traffic impact on at-capacity movements on the future area road network.** Rather, the intersections that will operate at, or above, their theoretical capacity will be as a result of background development traffic and general corridor growth elsewhere in Midtown and the rest of Oakville.

- **The planned introduction of significant new road infrastructure in Midtown Oakville, including through the Site, will help support increased traffic volumes to / from Midtown** and help to better distribute traffic to / from the surrounding road network. New infrastructure includes a new overpass over the QEW corridor, a new underpass under the Metrolinx / CN rail corridor, QEW interchange improvements, and a new network of major and minor streets throughout Midtown. Notably for the Site, this includes a new north-south major street connection from Iroquois Shore Road to Cornwall Road that will distribute traffic around the busy Trafalgar Road corridor, and a

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[1] "*Transportation Tomorrow Survey 2016, TTS 2016: 2016, 2011, 2006, 1996 and 1986. Travel Summaries for the TTS Area*". Prepared by R.A. Malatest & Associates Ltd., for the Transportation Information Steering Committee (TISC). March 2018. https://dmg.utoronto.ca/wp-content/uploads/2022/06/2016TTS_Summaries_TTSarea.pdf

[2] "*Livable Oakville Plan (2009 Town of Oakville Official Plan)*". Town of Oakville. Latest consolidated dated August 31, 2021. https://www.oakville.ca/business-development/planning-development/official-plan/livable-oakville-plan/

new network of north-south and east-west streets including an east-west street that will carry the future Trafalgar BRT.

Based on the foregoing, the proposed development is appropriate from a transportation perspective given the transit oriented nature of Midtown Oakville, the significant investment in transit and road network infrastructure that are planned in the area, and the transit and active oriented nature of the proposed mobility strategy.

3.0 PLANNING CONTEXT

3.1 Provincial and Regional Policy Framework and Directives

There are several provincial and regional policy documents related to transportation that pertain to the Site. The key transportation details of these policy documents are summarized below. The Site development incorporates the policy direction of these documents by incorporating a mix of uses, greater density and reduced parking standards based on the Site's proximity to existing and planned transit corridors and the implementation of transportation demand management ('TDM') strategies as part of the development.

3.1.1 Ontario's Five-Year Climate Change Action Plan (2016)

Ontario's Five-Year Climate Change Action Plan was announced in June 2016 (herein referred to as "Ontario CC Action Plan"). The Ontario CC Action Plan emphasizes the importance of addressing climate change at the municipal level. Some of the key transportation and land-use planning actions outlined in the Ontario CC Action Plan are as follows:

- *Reduce single-passenger vehicle trips*: Ontario will provide grants to municipalities and large private employers to implement Transportation Demand Management (TDM) Plans. The plans will be designed to help increase walking, cycling, carpooling, telecommuting and flex-work schedules, thereby reducing overall fossil fuel consumption, traffic congestion and transportation emissions.
- *Support cycling and walking*: Commuter cycling networks will be established across Ontario, targeting routes with high-commuting volume such as between residential communities, major transit stations and employment areas. There will be more cycling facilities in urban areas, including grade-separated routes and cycling signals. There will be more bicycle parking at transit stations and provincially owned, publicly accessible facilities. Ontario will revise provincial road and highway standards to require commuter cycling infrastructure be considered for all road and highway construction projects where it is safe and feasible. Ontario will do the same for major transit corridors.
- *Eliminate minimum parking requirements*: Minimum parking requirements will be eliminated over the next five years for municipal zoning by-laws, especially in transit corridors and other high-density, highly walkable communities. Minimum parking requirements are a barrier to creating complete, compact and mixed-use communities. Instead, by-laws will encourage bike lanes, larger sidewalks, and enhanced tree canopies.

3.1.2 Provincial Policy Statement (2024)

The *2024 Provincial Policy Statement* (the "PPS") (replacing the PPS 2020 and the Places to Grow: Growth Plan for the GGH 2020) promotes efficient development patterns optimizing the use of land, resources, and public investment in infrastructure and public service facilities for up to the next 25 years. According to the PPS, efficient development patterns promote a mix of housing, including affordable housing, employment, recreation, parks and open spaces, and safe and efficient transportation choices that maximizes the use of existing and planned infrastructure and increase the use and connectivity of multi-modal transportation system elements.

There are a number of important transportation-related directives relevant to the Site including:

- Provide a density and mix of land uses to minimize the length and number of vehicle trips and encourage the use of transit and active transportation. (Policy 2.2 c), d))
- Make efficient use of existing and planned infrastructure, including through the use of TDM strategies. (Policy 3.2 (2))
- Improve the connectivity of transportation systems for all modes of travel. (Policy 3.2 (3))
- Providing transportation systems appropriate for projected needs which are safe, energy efficient, and facilitate the movement of people and goods. (Policy 3.2 (1))
- Support the development of viable choices and plans for public transit and other alternative transportation modes, including commuter rail and bus.
- Prioritizing growth in strategic growth areas.
- Promote development and intensification in Major transit station areas ("MTSAs") for which the Site is located in within the Midtown Oakville MTSA.
- Developments within MTSAs will be transit supportive, often referred to as a compact mixed-use development with a high level of residential and employment density in proximity to transit stations and corridors.
- Developments within MTSAs will be supported, where appropriate, by providing alternative development standards, such as the elimination of parking requirements (per Bill 185).

The location of the proposed development demonstrates the characteristics of an area within a Major Transit Station Area (MTSA). The PPS 2024 defines the MTSAs that are within a 500 to 800-metre radius of a transit station (i.e. a 10-minute walking distance). The proposed development is within the Midtown Oakville MTSA.

3.1.3 Connecting the GGH: A Transportation Plan for the GGH (2022)

Connecting the GGH: A Transportation Plan for the Greater Golden Horseshoe, February 2022 (the "GGH Transportation Plan"), provides a 30-year vision for mobility across the GGH region. It identifies several actions, organized under seven goals:

- Fighting gridlock;
- Improving transit connectivity;
- Giving users more choice;
- Keep goods moving;
- Safe and inclusive transportation system;
- To be future ready; and
- Address connections beyond the GGH.

3.1.4 2041 Metrolinx Regional Transportation Plan (2018)

The *Metrolinx 2041 Regional Transportation Plan* (the "2041 RTP") – adopted in 2018 as an update to The Big Move (2008) – provides a framework to create an integrated, multi-modal, and regional transportation system to support the growth of healthy, complete, and sustainable communities.

The 2041 RTP contains strategies that integrate land use and transportation planning to identify areas for investment and build new connections. Strategy 4.8 specifically addresses parking management, encouraging the province to adopt a region-wide policy that "provides guidelines and encourages best practice in parking management." The strategy states that "zoning standards should be reviewed, with the expectation that minimum parking requirements will be reduced, particularly in transit-supportive neighbourhoods", such as the Site area. The 2041 RTP also speaks to embedding TDM strategies in land use planning and development to prioritize cycling, walking and transit use.

Additionally, the 2041 RTP identifies Midtown Oakville as a Mobility Hub, for which an additional framework was developed to help guide development in these areas.

3.1.4.1 METROLINX MOBILITY HUB GUIDELINES

Per the 2041 RTP, Mobility Hubs are Major Transit Station Areas (MTSAs) at key intersection points on the Frequent Rapid Transit Network, which are intended to create strong transit connections and integrate multiple modes of transportation. The *2011 Metrolinx Mobility Hub Guidelines*, currently under review to reflect updated Provincial policy and the 2041 RTP, build upon the strategies presented by Metrolinx to provide a framework that helps plan development at Mobility Hubs across the GTHA.

This framework is intended to ensure these areas surrounding key transit stations support more intense development and accommodate strong pedestrian, cycling, and transit facilities and connections. In conjunction with improving non-vehicular transportation infrastructure, the guidelines recommend minimizing auto-use through the implementation of parking maximums to limit excess parking supply and suggests reviewing and possibly removing minimum parking standards in areas that have high accessibility to rapid transit stations.

3.1.5 Ontario Bill 185 (2024)

On April 10, 2024, the Province of Ontario government introduced "Bill 185: Cutting Red Tape to Build More Homes Act, 2024". This provincial Bill introduced a number of changes to Province of Ontario Acts, including the Planning Act. Included among these changes were changes to prohibit and/or limit the ability for municipal official plans and zoning by-laws to require that an owner provide parking facilities (other than for bicycle parking) in Protected Major Transit Station Areas (PMTSA) and areas around transit stations. It is our understanding that any minimum parking requirements (except for bicycle parking) within Zoning By-laws are no longer in effect and are therefore no longer applicable to lands located within identified MTSAs or PMTSAs.

Bill 185 received Royal Assent on June 6, 2024 and is now in force and effect.

The subject Site is located in the Midtown Oakville Protected Major Transit Station Area as outlined in the Oakville Official Plan. The delineated MTSAs and PMTSAs have been approved by Region of Halton. As such, we understand that minimum vehicle parking requirements will no longer be applicable to the area immediately surrounding the subject Site.

3.2 Local Area Policy Framework and Directives

There are a number of local area policies and strategic framework pertaining to the Site. The key transportation details of these policy documents are summarized below.

3.2.1 Livable Oakville – Growth Areas – Midtown Oakville (2009 – Office Consolidation Aug 2021)

The Mid-Town Oakville District is envisioned as a higher density, transit-supportive, mixed-use area and as a strategic location to accommodate both population and employment growth. This district will include gateway features, urban park with pedestrian midblock connections and establish a mix of commercial and residential uses.

Livable Oakville describes the Mid-Town and its attributes as follows… *"The Oakville GO/VIA Station is the Town's primary hub for current and planned transit and is a major transit station. Rail and bus connections currently service the area and major improvements to the local and inter-regional transit network are planned. In addition to improvements to the local bus network, there will be express commuter rail service and bus rapid transit corridors along Trafalgar Road and Highway 403. The bus rapid transit systems will originate in Midtown Oakville and connect with the broader Greater Toronto and Hamilton Area transportation network."*

Within Livable Oakville, Part E – Growth Areas, Mid-Town Oakville, there are a number of relevant policies that support the intensification of the Mid-Town area and that speak directly to the mobility needs and requirements, supporting land use policies (internalization of trip making), and phasing necessary to fulfill those goals and objectives. These characteristics are consistent with the objective of reducing the reliance on the private automobile to support that intensification.

Policy 20.1 states that:

- *Midtown Oakville will be a vibrant, transit-supportive, mixed use urban community and employment area.*

Policy 20.2.1 states that:

- *To create transit-supportive development by*
  - *a) ensuring the entire area is developed as a pedestrian-oriented environment focused on access to, and from, transit;*
  - *b) improving internal road circulation and connections to, and through, Midtown Oakville for public transit, pedestrians, cyclists and vehicles; and,*
  - *c) promoting a compact urban form with higher density and higher intensity land uses.*

Policy 20.4.1 states that:

- *Development shall promote safe, convenient and attractive pedestrian access to transit stops or stations. Barriers, such as boundary fences, shall be discouraged.*

3.2.2 Trafalgar Environmental Assessment (2015)

The Trafalgar Road (Regional Road 3) Improvements Class Environmental Assessment Study ("Trafalgar EA") from Cornwall Road to Highway 407 was completed in May 2015. The study recommended widening Trafalgar Road from four (4) to six (6) lane and planned to convert the curb lanes into high-occupancy vehicle (HOV) or bus rapid transit (BRT) lanes after the road widening is completed by 2032.

Trafalgar Road currently has a six-lane configuration plus dedicated left-turn lanes within the study area. The only planned modification to the road network for future evaluations is the removal of the eastbound channelized right-turn at the intersection of Trafalgar Road and Cornwall Road to align with the preferred design.

3.2.3 Midtown Oakville Environmental Assessment (2015)

The Town of Oakville completed a Class Environmental Assessment ("Oakville EA") for Midtown Oakville to guide the development of the transportation and municipal stormwater infrastructure necessary to support the planned growth in the area. The Midtown Oakville EA identified key modifications to the existing and future road network needed to accommodate this growth.

In addition, other master plans have been updated and technical studies completed, including the Halton Region Transportation Master Plan, the Town of Oakville Transportation Master Plan – Switching Gears, the Midtown Parking Strategy, and Designing Midtown Oakville. As a result, the Town has proposed an Official Plan Amendment (OPA) to incorporate the findings of these studies into the Official Plan and ensure that policies and schedules are aligned with the most current source documents.

3.2.4 Midtown Oakville Draft (2024) Official Plan Amendment

The April 2024 draft of the transportation network for the Midtown Oakville OPA (with the relevant Schedules dated March 2024) illustrates changes to the Midtown-related transportation network include modifications to the broader area network (consistent with Midtown EA) and changes to the local road network within Midtown Oakville. To accommodate traffic to and from Midtown Oakville and to provide an alternative to Trafalgar Road, several improvements are provided, including new ramps to/from the QEW at Royal Windsor Drive and to streets within the Midtown area that better link the east and west sides of Trafalgar Road, including:

- A direct connection between the west and east "sides" of Midtown is proposed beneath Trafalgar Road by extending Argus Road under the Trafalgar Road corridor and connect it to Davis Road at South Service Road, forming a four-way intersection. This reduces the impacts of future traffic demand on the existing constrained intersections along Trafalgar Road at Cross Avenue as well as at the Trafalgar Road / Interchange ramps by allowing traffic to access the Royal Windsor interchange without having to physically cross Trafalgar Road. The underpass of Trafalgar Road also provides the opportunity for improved active transportation connections within Midtown Oakville.
- A direct route from eastbound QEW to Midtown Oakville is provided via a new off-ramp to Cross Avenue at the Royal Windsor Drive interchange. A direct route from Midtown Oakville to eastbound QEW is provided via a new on-ramp at Royal Windsor Drive opposite Cross Avenue. A new westbound QEW off-ramp at Royal Windsor Drive will offer an alternative route to Midtown Oakville and surrounding areas.
- Cross Avenue extends from Trafalgar Road to Royal Windsor Drive, connecting with the enhanced QEW interchange. Cross Avenue will provide accessible facilities for pedestrians and cyclists to travel safely, on-street parking where appropriate, and four vehicular travel lanes.
- For access and circulation within Midtown Oakville, a revised local road network for Midtown Oakville is designed to support and align with the broader transportation network determined through the Oakville EA. As part of the modified road network:
    - Lyons Lane at Cross Avenue is proposed to be realigned to form a four-way signalized intersection.
    - New north-south local streets connecting South Service Road (east and west of Trafalgar Road) to Cross Avenue;
    - New east-west street connecting Argus Road with Davis Road (mentioned above) and extending to the east side of the subject Site and connecting to a new north-south Local street;
    - A new north-south arterial street, east of Trafalgar Road, linking Midtown Oakville with the existing (and modified) street network north of the QEW corridor. This new north-south arterial will serve as the Trafalgar Road BRT route across the QEW corridor while also serving as an important new vehicular route into, out of, and through, the Midtown Oakville area connecting it to the rest of Oakville surrounding the area;
    - The new north-south Arterial street is also planned to extend south to Cornwall Road, linking Midtown Oakville with the Cornwall / Speers corridor through Oakville. The north-south Arterial street is planned to extend beneath the CN/GO Rail corridor and will also facilitate pedestrian and cycling infrastructure.
- Several additional active transportation connections within and beyond Midtown are proposed as part of the Midtown Oakville EA and the Midtown Draft 2024 OPA. These will assist in improving connectively within and

beyond Midtown and have the added benefit of improving active transportation linkages to the Oakville GO Transit hub and all of its transit opportunities.

The new ramps at Royal Windsor Drive and Trafalgar Road will accommodate the additional travel demand from Midtown Oakville's planned intensification, offering relief to the existing Trafalgar Road interchange.

Given the long-term perspective of this OPA approval review, the ramp network improvements are assumed to be in place. Similarly, the planned full local, collector, and arterial street network is assumed to be in place in order to assess the long-term impacts for the area. **Figure 7** illustrates the proposed transportation network for Midtown Oakville.

The Midtown Oakville EA recognized that the roadway improvements identified herein would provide relief to existing operational issues within the overall vehicle transportation network.

4.0 AREA TRANSPORTATION CONTEXT

4.1 Area Road Network

4.1.1 Existing Road Network

An overview of the surrounding public area road network is summarized below. The existing area road network is illustrated in **Figure 4.** The existing lane configuration and traffic control is illustrated in **Figure 5.**

Table 2 Existing Area Street Network

Roadway	Direction	Cross-Section	Speed Limit	Description
Highways				
Queen Elizabeth Way	East-West	8-lane	110 km/h	The Queen Elizabeth Way (QEW / Highway 403) is a 400-series highway linking Toronto and Fort Erie. In the site vicinity, the QEW has a six-lane cross section including a High occupancy vehicle (HOV) in each direction. The nearest on/off ramp is located at Trafalgar Road.
Arterial				
Trafalgar Road (Halton Region Road 3)	North-South	6-lane	50 km/h	Trafalgar Road (Halton Region Road 3) is an urban major arterial road from Cornwall Road northwards and an urban minor arterial road southward from Cornwall Road. The roadway consists of a six-lane cross-section from Cornwall Road northwards and tapers down to a two-lane cross-section southward. Pedestrian facilities are provided along both sides of the road in the study area.
Cornwall Road	East-West	4-lane	60 km/h	Cornwall Road is a multi-purpose arterial road and consists of a six-lane cross-section at the intersection of Trafalgar Road and tapers down to a four-lane cross-section eastward and westward. It provides access to the Oakville GO station and surrounding retail plazas. Pedestrian facilities are provided along both sides of the road in the study area.
Chartwell Road	North-South	2-lane	50 km/h	Chartwell Road is a two-lane north-south local street north of Cornwall Road that provides additional access to the existing built lands in Midtown Oakville and connects South Service Road East to Cornwall Road. There are no existing pedestrian facilities along Chartwell Road.

Roadway	Direction	Cross-Section	Speed Limit	Description
Local				
South Service Road East	East-West	2-lane	50 km/h	South Service Road East is the extension of Cross Avenue, east of Trafalgar Road. It reflects a four lane cross section (five lanes at Trafalgar Road) and extends as a four lane street east and north to just north of Davis Road, where it narrows to a two lane street. It continues as a two lane street easterly, to where South Service Road intersects with Royal Windsor Drive. It continues north of Royal Windsor Drive as The Canadian Road where it runs adjacent to the Ford Assembly Plant and intersects with Ford Drive. South Service Road West exists on the west side of Trafalgar Road and provides a load street function, configured as a two lane street. South Service Road is discontinuous across the Trafalgar Road corridor. There are no pedestrian facilities along South Service Road, except for the west/north side of South Service Road, from Davis Road to Trafalgar Road.
Davis Road	East-West	2-lane	50 km/h	Davis Road is a two-lane east-west local street that intersects with South Service Road East. Davis Road terminates as a cul-de-sac west of its intersection with South Service Road East. Davis Road currently terminates at the fence line that demarks the west limit of the Site. It does not have a typical cul-de-sac terminus. There are pedestrian facilities along the southern side of the segment of Davis Road east of South Service Road East.

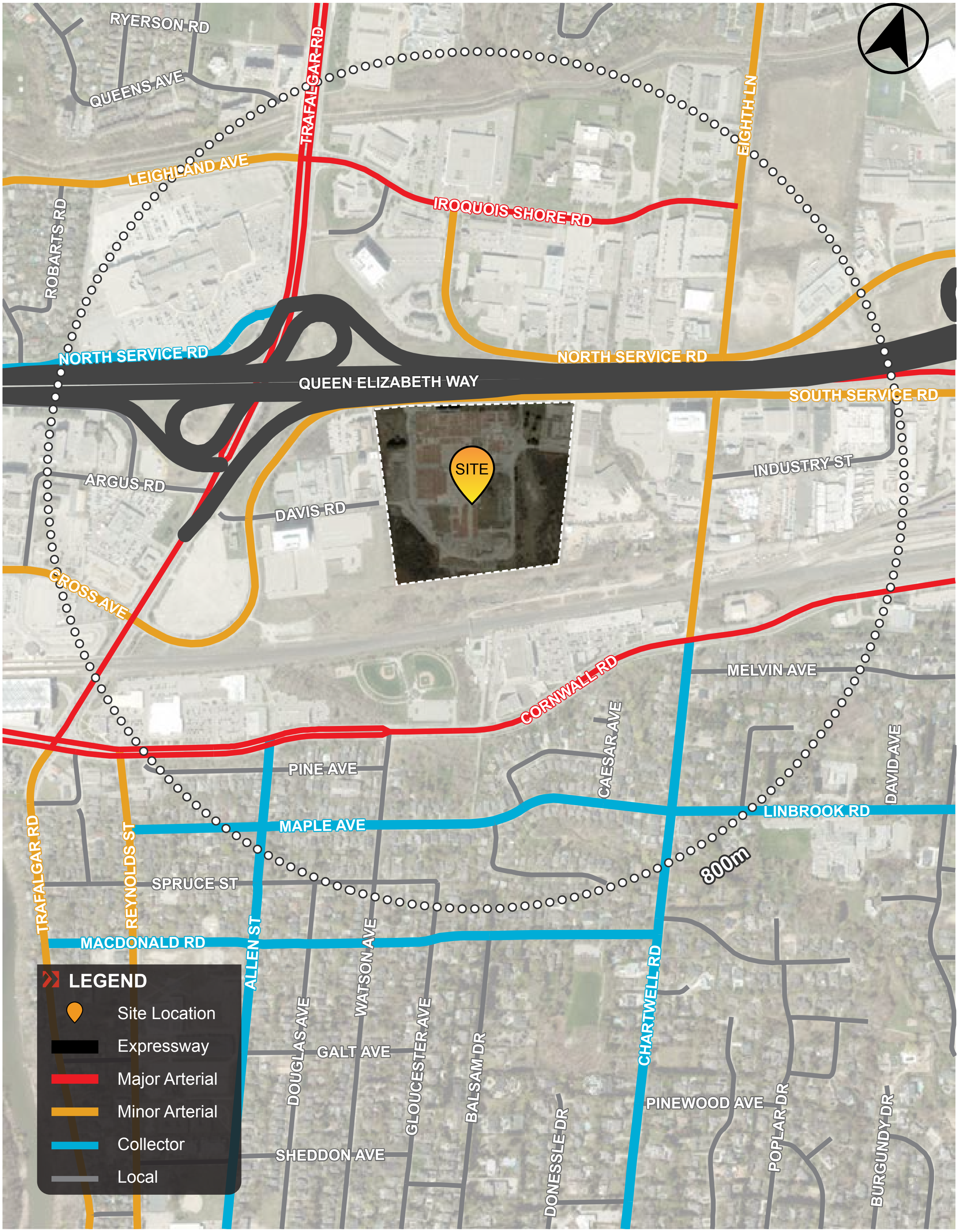

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FIGURE 4 EXISTING STREET NETWORK

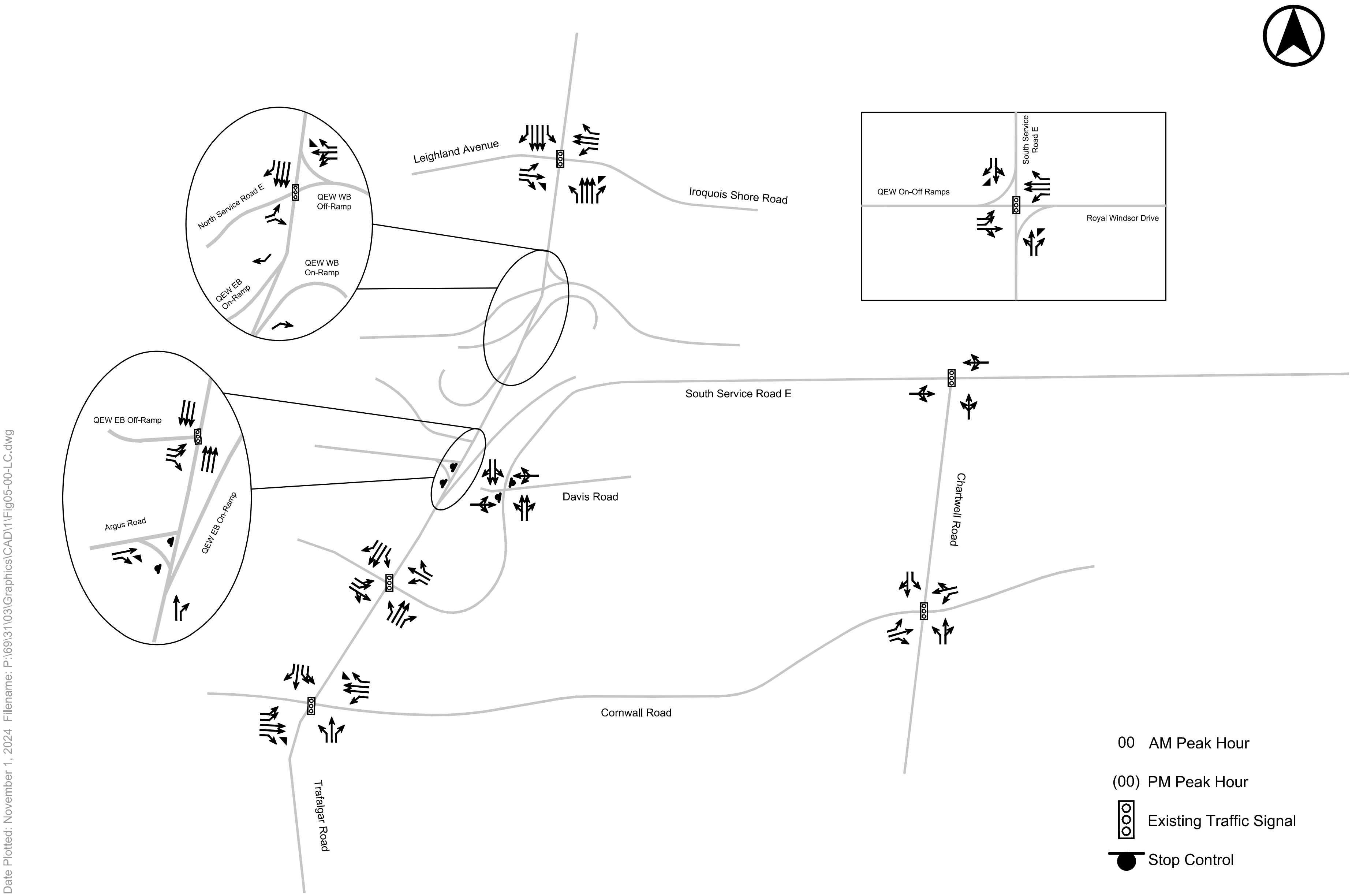

FIGURE 5 EXISTING LANE CONFIGURATION AND TRAFFIC CONTROL

4.1.2 Future Road Network

4.1.2.1 TRAFALGAR ENVIRONMENTAL ASSESSMENT

As discussed in **Section 3.2.2**, the Trafalgar Road (Regional Road 3) Improvements Class Environmental Assessment Study was completed in May 2015, and recommended that Trafalgar Road be widened from four (4) to six (6) lanes and convert the curb lanes to high occupancy vehicle (HOV) or bus rapid transit (BRT) lanes after completion of the road widening by 2032.

The only modification to the road network for future analyses is removing the eastbound channelized right-turn at Trafalgar Road and Cornwall Road to be consistent with the preferred design.

4.1.2.2 MIDTOWN OAKVILLE STREET NETWORK MODIFICATIONS

Through the Midtown Oakville Environmental Assessment Study (Midtown EA), and further through the Draft Midtown (April 2024) Oakville process, the Town of Oakville has established a proposed street system to support intensification within the Midtown area of the Town. Central to this proposed street system, east of Trafalgar Road, are the following key components of the future Midtown street network illustrated in **Figure 7** (consistent with the Draft Proposed Midtown OPA Schedule L4):

- The realigned Cross Avenue as it crosses Trafalgar Road and extends eastwards to connect with Chartwell Road, and beyond (according to the Midtown EA);
- The realigned South Service Road - facilitating the introduction of a new active transportation crossing of the QEW corridor and the connection to the realigned Cross Avenue extension;
- The extension of Argus Road, from west of Trafalgar Road, beneath the Trafalgar Road corridor to connect with Davis Road, at South Service Road, forming a four-way intersection;
- The easterly extension of Davis Road (mentioned above) to the east side of the Site and connecting to a new north-south Local street;
- New north-south local streets connecting South Service Road (both east and west of Trafalgar Road) to Cross Avenue; and,
- A new north-south arterial street, east of Trafalgar Road, linking Midtown Oakville with the existing (and modified) street network north of the QEW corridor. This new north-south arterial street will serve as the Trafalgar Road BRT route across the QEW corridor while also serving as an important new vehicular route into, out of, and through, the Midtown Oakville area connecting it to the rest of Oakville surrounding the area.

Providing these Midtown streets is essential to support transportation needs within the Midtown Oakville Urban Growth Centre. This area would accommodate the densest development planned within the Town of Oakville by creating:

- A structure of development blocks;
- Opportunities for direct vehicular access; and
- Opportunities to substantially improve the multi-modal network afforded the planned intensification within Midtown.

The routing options provided by the planned Midtown Oakville street system is also essential for all modes to appropriately navigate between future development blocks, external point of access and egress associated with Midtown Oakville, and the key mobility element within the Protected Major Transit Station Area (PMTSA), namely the Oakville GO Station Hub – housing Metrolinx's GO Rail and GO Bus stations and the Oakville Transit Terminal.

4.1.2.3 REVIEW OF SELECTED MIDTOWN AREA STREET SEGMENTS

The following section discusses the functional street design characteristics of the street network immediately adjacent to or within the development area. The functional street design of these street elements will be consistent with the design guidelines outlined in the Midtown EA and Midtown Oakville Draft (April 2024) OPA.

An overview of the surrounding proposed public area road network is summarized in **Table 3**.

Table 3 Future Area Road Network – Town of Oakville Draft OPA (April 2024)

Roadway	To-From	Type	Right-of-Way	Direction
Cross Avenue Extension	Lyons Ln to Chartwell Rd	Arterial	30 to 36-metres[1]	East-West
Future “N-S Road”	Iroquois Shore Rd to Cornwall Rd	Minor Arterial	30-metres	North-South
Argus Road - Davis Road Extension	Argus Rd / Davis Road to Future “East Road”	Collector	26-metres	East-West
Chartwell Road	Cornwall Rd to South Service Rd E	Collector	26-metres	North-South
South Service Road East	Cross Ave to Chartwell Rd	Local	20-metres	East-West
Future “East Road”	South Service Rd E to Cross Ave	Local	20-metres	North-South
Future “West Road”	South Service Rd E to Cross Ave	Local	20-metres	North-South

Notes:

1. ROW dimensions at Trafalgar Road would increase to account for planned turning lanes and to retain key pedestrian/cycling/landscaping elements.

Cross Avenue Extension

The Midtown EA Street network configuration contemplates the realignment and extension of Cross Avenue between Argus Road and Chartwell Road, and points east, per the Midtown EA. The realigned Cross Avenue is planned to cross Trafalgar Road and run parallel to the existing rail line and connect with Chartwell Road (and beyond) on the eastern border of the Midtown Oakville boundary. The Cross Avenue Extension is contemplated to be an arterial street and with a 36 m right-of-way (ROW) west of Trafalgar Road and east of Trafalgar Road, to the N-S Minor Arterial Street, where it would transition to a 30 m ROW, east of the N-S Minor Arterial Street. Cross Avenue would be built with future bicycle facilities along its entire length. Cross Avenue will serve as a portion of the Trafalgar BRT Route connecting the eastern area of Midtown Oakville to the Oakville GO Station. The BRT lanes will require a transition section where buses would move to an anticipated centre BRT lane arrangement along Cross Avenue from a curb-lane arrangement on the N-S Minor Arterial Street.

Within the Site vicinity, Cross Avenue is located along the southern edge of the Site, south of Block 3 and Block 4. Cross Avenue will intersect the future N-S Minor Arterial Street and future “East” local street. One site driveway is proposed from Cross Avenue to Block 4.

Appendix D illustrates cross-sections of the proposed public streets in Midtown Oakville (east of Trafalgar Road) adjacent to the Site. The Cross Avenue mid-block cross-sections are divided into the 36 m segment west of the proposed N-S Minor Arterial Street and the 30 m segment east of the N-S Minor Arterial Street.

It is contemplated that the vehicular portion of the 36 m and the 30 m ROW’s would be off-set within their respective ROW’s to ensure that that boulevards which abut the Park Block and Block 4 within the proposed Master Plan area are afforded a generous set of dimensions to accommodate the pedestrian, cycling, and landscape realms.

Cross Avenue West of the N-S Minor Arterial Street – 36 m mid-block ROW:

The north boulevard of the 36 m segment is envisioned to be approximately 9.5 m in width and would accommodate the following components:

- 0.5 m offset between the ROW limit and the public sidewalk (this could be hardscaped or softscaped depending on the adjacent use or surface treatment);
- 2.5 m public sidewalk (3.0 m when offset to ROW is included);
- 0.3 m buffer between the sidewalk and the two-way cycle track;
- 3.5 m two-way cycle track (ensures that cyclists travelling in both directions are situated near park space as well as the development blocks within Midtown Oakville);
- 2.5 m landscaping area(which could be "interrupted" to accommodate strategically located layby parking) ; and,
- 0.2 m top of curb.

The vehicular portion of the 36 m Cross Avenue ROW would be made up of 7-lanes, arranged as follows:

- Four 3 m wide lanes forming the outer two lanes in either direction;
- Two 3.5 m BRT lanes adjacent to the median; and
- One 4.8 m median lane which would accommodate a centre left turn lane and median island adjacent to the turn lane.

It is envisioned that the BRT lanes would be positioned adjacent to the median to facilitate buses use of the centre left turn lane to either turn eastbound at the N-S Minor Arterial Street or to turn westbound into the Oakville GO Rail station (east and/or west of Trafalgar Road – depending on whether a future protected transit station area identified in the April 2024 Draft OPA is realized or not.

The south boulevard along Cross Avenue, given its location adjacent to the existing rail corridor lands and future extension of the N-S Minor Arterial Street, beneath the rail corridor, was minimized in order to maximize the utility of the north boulevard condition. The south boulevard is envisioned to be a total of 2.7 m in width and would consist of a 2.5 m landscaped area and a 0.2 m top of curb.

At key intersections, transition segments of the cross-section would be finalized as more detail is advanced around the Midtown Oakville overall street network in general, specifically around key intersections, and with respect to the operational characteristics of the Trafalgar Road BRT corridor and its relationship with the Oakville GO Station facilities.

Cross Avenue East of the N-S Minor Arterial Street – 30 m mid-block ROW:

The north boulevard of the 30 m segment is envisioned to be approximately 9.9 metres in width and would accommodate the following components:

- 0.5 m offset between the ROW limit and the public sidewalk (this would likely be hardscaped given the planned development on Block 4 of the proposed Master Plan);
- 2.5 m public sidewalk (3.0 m when offset to ROW is included);
- 0.3 m buffer between the sidewalk and the two-way cycle track;
- 3.5 m two-way cycle track (ensures that cyclists travelling in both directions are situated near park space as well as the development blocks within Midtown Oakville);

- 2.9 m landscaping area (which could be “interrupted to accommodate strategically located layby parking); and,
- 0.2 m top of curb.

The vehicular portion of the 30 m Cross Avenue ROW would be made up of 5-lanes, arranged as follows:

- Four lanes, two curb lanes being 3.3 m wide and two lanes adjacent to the median being 3.0 m wide, in either direction; and,
- One 4.8 m median lane which would accommodate a centre left turn lane and median island adjacent to the turn lane.

There would be no BRT lanes in this segment of the Cross Avenue alignment.

The south boulevard along Cross Avenue, given its location adjacent to the existing rail corridor lands and future extension of the N-S Minor Arterial Street, beneath the rail corridor, was minimized in order to maximize the utility of the north boulevard condition. The south boulevard is envisioned to be a total of 2.7 m in width and would consist of a 2.5 m landscaped area and a 0.2 m top of curb.

Future “N-S” Minor Arterial Street

A new north-south minor arterial street (“N-S Minor Arterial Street”) located east of Trafalgar Road, linking Midtown Oakville with the existing (and modified) street network north of the QEW corridor is proposed. The future N-S Minor Arterial Street connects Iroquois Shore Road to Cornwall Road. The cross section of the future north-south minor arterial street is envisioned to be a 30m right-of-way with four lanes of traffic – two of which would be BRT lanes – and future bicycle lanes within the boulevard. The new N-S Minor Arterial Street will serve as the Trafalgar Road BRT Route across the QEW corridor.

The new north-south minor arterial street will bisect the Site between Blocks 1 & 4 and Blocks 2 & 3. The street will also intersect with the future Davis Road extension (Collector) at the center of the Site and with Cross Avenue (Arterial). There are no site driveways connections to this future minor-arterial road.

Appendix D illustrates the typical mid-block cross-section of the proposed N-S Minor Arterial Street. The vehicular portion of the cross-section would be centered within the 30 m ROW.

Boulevards along the N-S Minor Arterial Street are envisioned to be approximately 6.1 m in width and would consist of the following elements:

- 0.5 m offset between the ROW limit and the public sidewalk (this could be hardscaped or softscaped depending on the adjacent use or surface treatment);
- 2.70 m wide public sidewalks (3.2 m when offset to ROW is included);
- 0.3 m buffer between the sidewalk and the uni-directional cycle track;
- 2.0 m two-way uni-directional cycle track on each side of the ROW;
- 0.6 m buffer (including the 0.2 m top of curb allowance) between the face of curb and cycle track.

The vehicular portion of the 30 m N-S Minor Arterial Street ROW would be made up of 5-lanes, arranged as follows:

- Four lanes, two curb lanes being 3.5m wide which would accommodate the BRT operations and two lanes adjacent to the median being 3.0 m wide, in either direction; and,
- One 4.8 m median lane which would accommodate a centre left turn lane and median island adjacent to the turn lane.

Davis Road Extension

The Midtown EA Street network configuration contemplates the extension of Davis Road eastward connecting to the Future "West" street and terminating at Future "East" street (the east limits of the Site). To the west of the Site, Davis Road will become Argus Road at its intersection with South Service Road, forming a four-way intersection. Argus Road will extend further west, beneath the Trafalgar Road corridor, and link the 'east' and 'west' sides of Midtown Oakville. The Davis Road Extension is contemplated to be a collector road and have a 26 m right-of-way with future cycling infrastructure included.

Davis Road will bisect the Site between Blocks 1 & 2 and Blocks 3 & 4. Davis Road will intersect with two future local streets and the N-S Minor Arterial Street at the center of the Site. There are no site driveway connections to this future collector road.

Davis Road will serve as a Primary Main Street ("West" street to N-S Minor Arterial Street) and a Secondary Main Street (N-S Minor Arterial Street to "East" street) where the non-residential (retail) land uses would be located, consistent with the policies of the Midtown Oakville Draft (April 2024) OPA.

Appendix D illustrates the typical mid-block cross-section for Davis Road 26 m ROW. The vehicular portion of the cross-section will be centred within the ROW.

Boulevards along Davis Road are envisioned to be approximately 8.0 m in width and would consist of the following elements:

- 0.5 m offset between the ROW limit and the public sidewalk (this could be hardscaped or softscaped depending on the adjacent use or surface treatment);
- 2.00 m wide public sidewalks (2.5 m when offset to ROW is included);
- 0.3 m buffer between the sidewalk and the uni-directional cycle track;
- 2.0 m two-way uni-directional cycle track on each side of the ROW;
- 3.0 m landscaped area (which could be "interrupted" to accommodate strategically located layby parking); and
- 0.2 m top of curb allowance.

The vehicular portion of the 26 m Cross Avenue ROW would be made up of 3-lanes, arranged as follows:

- Two travel lanes being 3.5 m wide; and,
- One 3.0 m centre left turn lane to accommodate left turns at N-S Local and Minor Arterial streets.

South Service Road East Realignment (east of Trafalgar Road)

The Midtown EA Street network configuration contemplates the minor realignment of South Service Road East in selected locations to accommodate the broader [planned street network within the Midtown. A small segment, just east of Trafalgar Road, will be eliminated and replaced by the Cross Avenue Extension, east of Trafalgar Road. South Service Road East will form a "T" intersection (with a possible south leg for access to an extended Oakville GO Station) with Cross Avenue and follow an alignment north from Cross Avenue very close to the existing South Service Road alignment, save for a small realignment segment where South Service Road / Davis Road / Argus Road are planned to intersect, forming a four-way intersection. From the proposed South Service Road / Davis Road / Argus Road intersection, South Service Road essentially retains its current alignment with the planned 20 m ROW.

The cross section of the realigned South Service Road E is envisioned to have a 20 m right-of-way with future bicycle lanes.

The realigned South Service Road E will have two (2) new intersections on the segment parallel to the QEW across the frontage of the Site. The realigned South Service Road E will intersect with two new local streets; the Future "East Road" and Future “West Road” The proposed N-S Minor Arterial Street will travel over the existing South Service Road East alignment as a grade-separated overpass. South Service Road East will be subject to a potential Ministry of Transportation, Ontario (MTO) typical 14 metre setback requirement, should the MTO need to expand the QEW corridor for any future corridor expansion requirements.

In addition, South Service Road East is proposed to have two (2) site accesses (one for Block 1 and one for Block 2) on the northern edge of the Site boundary.

Appendix D illustrates the typical mid-block cross-section for South Service Road 20 m ROW. The vehicular portion of the cross-section could be centred within the ROW or it could be offset within the 20 m ROW to favour the boulevard adjacent to planned development with a greater width and cycling facilities.

Boulevards along the South Service Road East are envisioned to be approximately 5.75 m in width if the vehicular portion of the ROW is centred within the ROW, and would consist of the following elements:

- 0.5 m offset between the ROW limit and the public sidewalk (this could be hardscaped or softscaped depending on the adjacent use or surface treatment);
- 2.00 m wide public sidewalks (2.5 m when offset to ROW is included);
- 3.25 m landscaped area inclusive of the 0.2 m top of curb allowance (which could be “interrupted” on the south side of the street to accommodate strategically located layby parking).

If the vehicular portion of the ROW were offset within the ROW, a similar condition to Cross Avenue (South Side) could be achieved. A 2.7 m north boulevard (consisting of a 2.5 m landscaped area and a 0.2 m top of curb) could be proposed with the balance of the ROW dimension being added to the south boulevard resulting in a boulevard of 8.8 m . This wider south boulevard could be configured to include:

- 0.5 m offset between the ROW limit and the public sidewalk (this could be hardscaped or softscaped depending on the adjacent use or surface treatment);
- 2.00 m wide public sidewalks (2.5 m when offset to ROW is included);
- 0.3 m buffer between the sidewalk and a two-way cycle track;
- 3.5 m two-way cycle track on each side of the ROW;
- 2.3 m landscaped area (which could be “interrupted” to accommodate strategically located layby parking); and,
- 0.2 m top of curb allowance.

The vehicular portion of the 26 m South Service Road ROW would be made up of 2-lanes, arranged as follows:

- Two travel lanes being 3.25 m wide.

Future “East” Local Street

A new future north-south local road, connecting South Service Road East to the future Cross Avenue extension (Arterial) will be implemented. The cross section of this Future “East” local road is envisioned to have a 20 m right-of-way without formal bicycle lanes. The Future “East” local street ROW is located outside of the Site, on the eastern boundary of Block 2 while the alignment of the Future “East” Local Street veers away (to the east) from the eastern boundary of Block 4. The Future “East” Local Street will accommodate one (1) driveway to each of Block 2 and Block 4. This Future “East” local street intersects with the future Davis Road extension (Collector) as a “T” intersection and Cross Avenue at a T-intersection.

Appendix D illustrates the typical mid-block cross-section for the East Local Street 20 m ROW. The vehicular portion of the cross-section would be centred within the ROW.

Boulevards along the East Local Street are envisioned to be approximately 5.75 m in width, and would consist of the following elements:

- 0.5 m offset between the ROW limit and the public sidewalk (this could be hardscaped or softscaped depending on the adjacent use or surface treatment);
- 2.00 m wide public sidewalks (2.5 m when offset to ROW is included);
- 3.25 m landscaped area inclusive of the 0.2 m top of curb allowance (which could be “interrupted” on the west side of the street to accommodate strategically located layby parking).

The vehicular portion of the 20 m East Local Street ROW would be made up of 2-lanes, arranged as follows:

- Two travel lanes being 3.25 m wide.

Future “West” Local Street

A future north-south local street with a 20 m right of way without formal cycling facilities connecting South Service Road East to the future Davis Road extension (Collector) will also be provided. This Future “West” local street is located within the Site on the western boundary of Block 1 and includes one (1) driveway access to Block 1.

Appendix D illustrates the typical mid-block cross-section for the West Local Street 20 m ROW. The vehicular portion of the cross-section would be centred within the ROW.

Boulevards along the West Local Street are envisioned to be approximately 5.75 m in width, and would consist of the following elements:

- 0.5 m offset between the ROW limit and the public sidewalk (this could be hardscaped or softscaped depending on the adjacent use or surface treatment);
- 2.00 m wide public sidewalks (2.5 m when offset to ROW is included);
- 3.25 m landscaped area inclusive of the 0.2 m top of curb allowance (which could be “interrupted” on the east side of the street to accommodate strategically located layby parking).

The vehicular portion of the 20 m West Local Street ROW would be made up of 2-lanes, arranged as follows:

- Two travel lanes being 3.25 m wide.

4.1.2.4 PROPOSED MIDTOWN OAKVILLE STREET NETWORK *VERSUS* "IN-FORCE" LIVABLE OAKVILLE OFFICIAL PLAN – MIDTOWN OAKVILLE STREET NETWORK

The proposed Midtown Oakville street network through the Site (**Figure 6**) and the Draft OPA street network (Schedule L4, April 2024 Draft OPA – See **Figure 7**) differ from the "in-force" Livable Oakville Official Plan (Midtown Oakville) street network (Schedule L3, 2021 Office Consolidated, Livable Oakville Plan – See **Figure 8**).

The principal differences between the plans, east of Trafalgar Road, include:

- The proposed Master Plan street network and the Draft OPA street network (Schedule L4, April 2024 Draft OPA) differ in the following ways, both of which only affect segments of the Midtown Oakville street network within the limits of the Site:
  - Shifting the north-south local street on the west side of the subject Site slightly further west to align it with the west property limits of the subject Site (i.e., the proposed north-south Local street is provided within the Site boundaries); and,
  - The east-west Collector Street (Davis Road) in the proposed Master Plan, adjacent to the proposed Block 1 within the Master Plan, adopts a tangent alignment versus the "curved" alignment in the April 2024 Draft OPA Schedule L4. This tangent alignment produces a more uniform development block on the north side of Davis Road that also provides a more regular shape upon which to lay out buildings and interior open space. It also produces a more regular Park Block on the south side of Davis Road
- The Draft OPA street network (Schedule L4, April 2024 Draft OPA differs from the "in-force" Livable Oakville Official Plan (Midtown Oakville) street network (Schedule L3, 2021 Office Consolidated, Livable Oakville Plan in the following ways (east of Trafalgar Road):
  - The alignment of Cross Avenue – in the April 2024 Draft OPA, Cross Avenue assumes a straighter east-west alignment through Midtown Oakville along the southern limit of the developable area within Midtown, east of Trafalgar Road;
  - The alignment and connectivity of Davis Road and Argus Road – the April 2024 Draft OPA links these two collector streets beneath the Trafalgar Road corridor and connects the east and west side of Midtown Oakville;
  - Davis Road forms a central east-west Collector Street through Midtown (where the In-force OP has Cross Avenue running through the central portion of Midtown);
  - The April 2024 Draft OPA eliminates a proposed off-ramp from the eastbound QEW that would have passed beneath Trafalgar Road and connect to South Service Road East and to Cross Avenue.
  - The April 2024 Draft OPA includes a finer grained collector and local street system producing a better framework for development blocks.

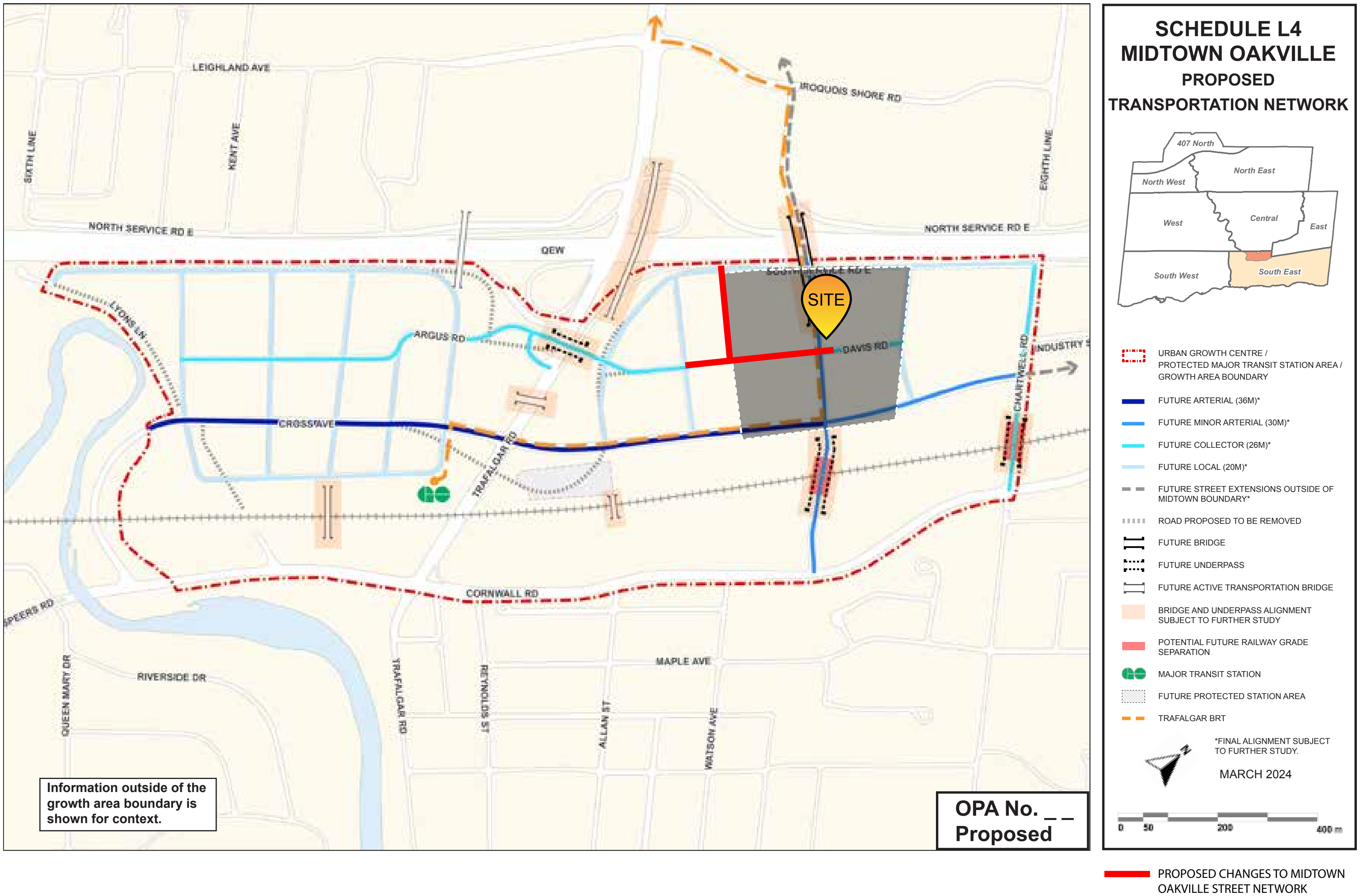

FIGURE 6 PROPOSED STREET NETWORK

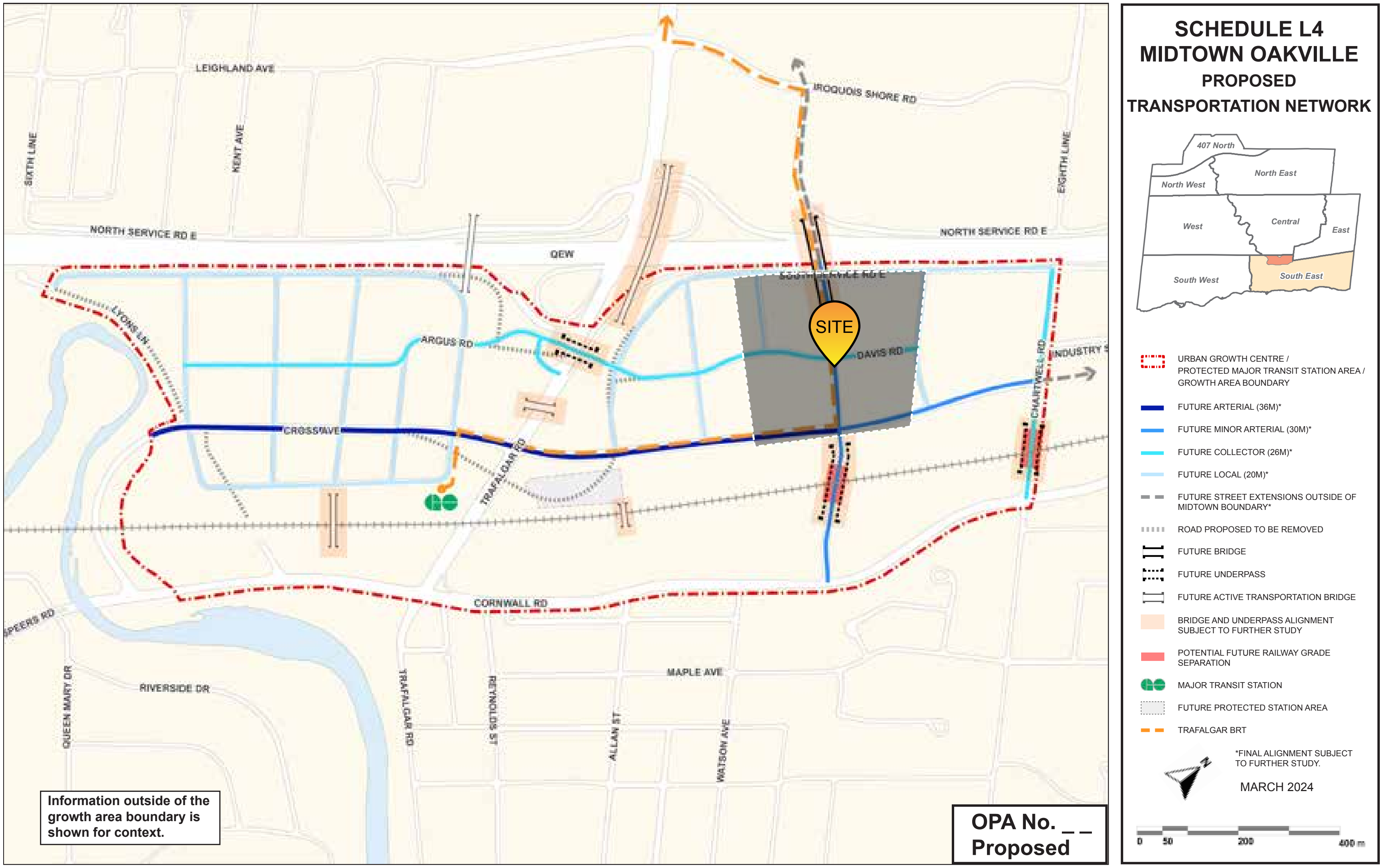

FIGURE 7 SCHEDULE L4, APRIL 2024 DRAFT MIDTOWN OFFICIAL PLAN AMENDMENT

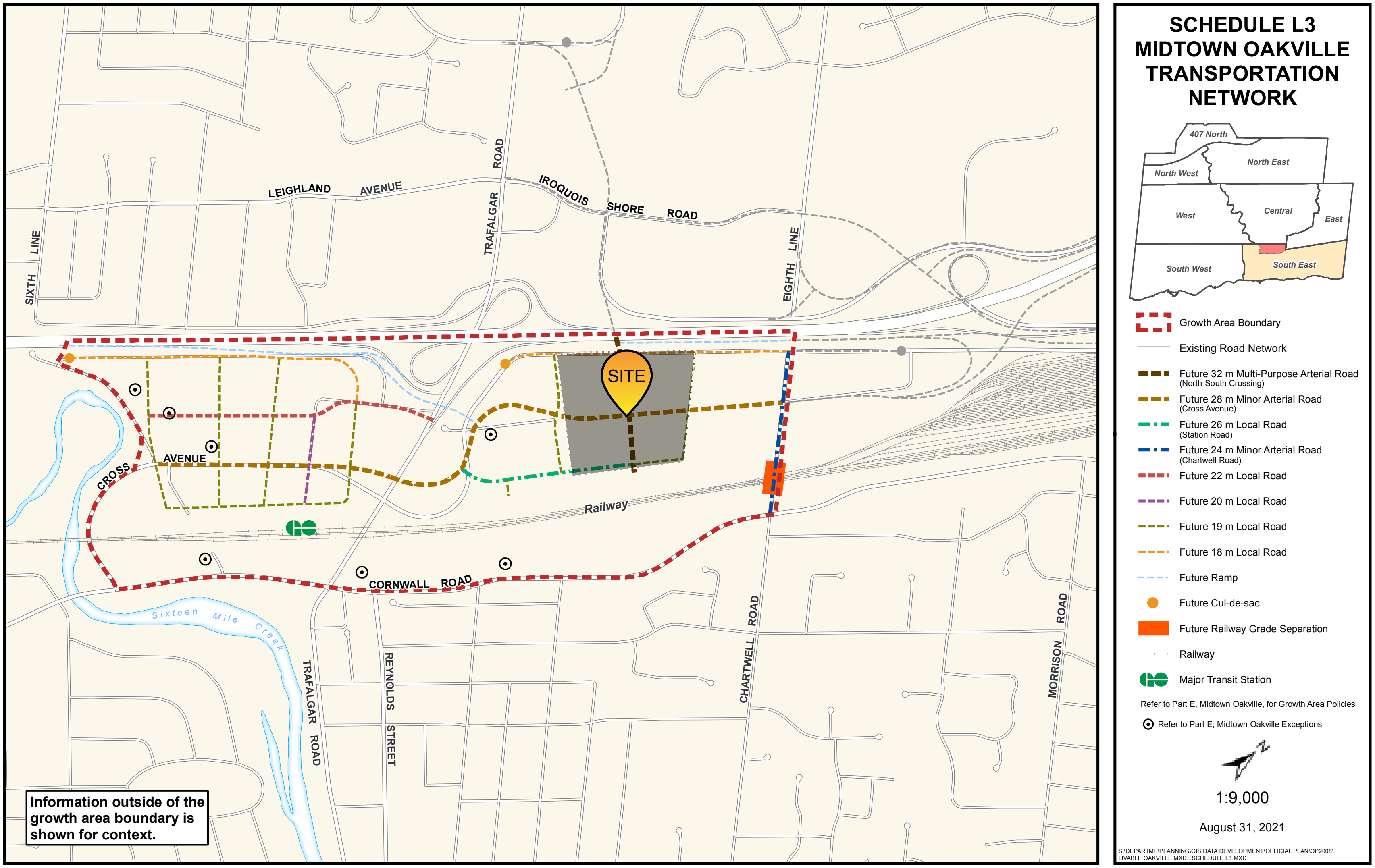

FIGURE 8 IN-FORCE SCHEDULE L3 - LIVABLE OAKVILLE OFFICIAL PLAN (OFFICE CONSOLIDATION, AUGUST 2018)

4.2 Area Transit Network

4.2.1 Existing Transit Context

The Site is well served today by Oakville Transit and regional rail services through GO Transit and VIA, in the vicinity of the site, including the Lakeshore West GO Rail line and 16 local bus services. The Site is located within the Midtown Oakville Growth Area, one of the most transit-accessible locations within the Town of Oakville. The nearby Oakville GO Station, and the adjacent Oakville GO Bus Terminal are located at the intersection of Cross Avenue and Argus Road. The existing area transit context is illustrated in **Figure 9.**

A summary of the transit routes operating within the vicinity of the Site, including transit lines, service frequencies and a brief description of each route is provided in **Table 4**.

Table 4 Existing Transit Services

Route	Headways (Peak Period)	Closest Stop Location	Route Description
GO Regional Rail & Bus			
Lakeshore West GO Rail Line	6 – 15 min.	Oakville GO Station (1.3 km / 18 min. walk)	The rail line operates east-west, with its eastern terminus at Union Station and its western terminus in Oakville, Burlington, or Hamilton, depending on the time of day. It runs generally parallel with the Gardiner Expressway, Lake Shore Boulevard West and the QEW.
GO Bus Route 22 – Milton/Oakville	60 – 62 min.	Oakville GO Bus Terminal (1.1 km / 15 min. walk)	The bus route operates generally north-south, connecting Milton GO Station to Oakville GO Station. It runs along Trafalgar Road, with stops at Sheridan College and Highway 407 between the terminals. The route only operates Monday to Friday.
GO Bus Route 56/56B – Oshawa/Oakville	25 – 35 min.	Oakville GO Bus Terminal (1.1 km / 15 min. walk)	The bus route operates generally east-west, with its eastern terminus at Durham College Oshawa GO and its western terminus at Oakville GO. The route runs north-south on Trafalgar Road, then east-west along the 403 and 407. The route only operates Monday to Friday.
Oakville Transit			
Route 1 – Trafalgar	60 min.	Trafalgar Road / South Service Road E (950 m / 13 min. walk)	The bus route operates north-south along Trafalgar Road, with its northern terminus at Trafalgar/407 GO Carpool and its southern terminus at Oakville GO. Major stops include Sheridan College and the Uptown Core. This route operates on weekdays.
Route 4 – Speers/Cornwall	18 – 23 min.	Cornwall Road / Chartwell Road (850 m / 10 min. walk)	The bus route operates east-west, generally along Cornwall Road, Speers Road, and Royal Windsor Drive, connecting the eastern terminus Clarkson GO, Oakville GO, and the western terminus Bronte GO. This route provides a direct connection to MiWay routes via Clarkson GO.
Route 5 – Dundas	14 -15 min.	Trafalgar Road / South Service Road E (950 m / 13 min. walk)	The bus route operates north-south on Trafalgar Road, and east-west on Dundas St West. The route connects the Dundas @ Highway 407 Park & Ride to Oakville GO, with key stops along the route including Sheridan College and Uptown Core.

Route	Headways (Peak Period)	Closest Stop Location	Route Description
Route 10 – West Industrial	30 min.	Oakville GO Bus Terminal (1.1 km / 15 min. walk)	Route 10 only operates in peak directions during rush hour on weekdays. The bus route operates circuitously, heading west towards Bronte GO via South Service Road West and Speers Road before heading back east towards Oakville GO via North Service Road West.
Route 11 – Linbrook	60 min.	Oakville GO Bus Terminal (1.1 km / 15 min. walk)	The bus route operates east-west, with the western terminus at Oakville GO and the eastern terminus at Clarkson GO. The route services the communities south of Cornwall Road, operating along Linbrook Road and Davis Road before arriving at Clarkson GO. The route provides a direct connection to MiWay routes via Clarkson GO, and only runs during the weekdays.
Route 13 – Westoak Trails	25 – 30 min.	Trafalgar Road / South Service Road E (950 m / 13 min. walk)	The bus route connects the western terminus Bronte GO with the eastern terminus Oakville GO through the communities along Upper Middle Road West.
Route 14/14A – Lakeshore West	15 min. (including both 14 and 14A departures)	Oakville GO Bus Terminal (1.1 km / 15 min. walk)	The bus route runs generally east-west, generally along Rebecca Street, Lakeshore Road East, and Burloak Drive. The route connects the western terminus Appleby GO, South Oakville Centre, and the eastern terminus Oakville GO.
Route 15 – Bridge	30 – 40 min.	Oakville GO Bus Terminal (1.1 km / 15 min. walk)	The route operates east-west, generally via Wildwood Drive and Bridge Road, connecting the western terminus at South Oakville Centre to the eastern terminus at Oakville GO.
Route 18 – Glen Abbey South	30 min.	Oakville GO Bus Terminal (1.1 km / 15 min. walk)	The route operates east-west, generally via Kerr Street, North Service Road West, and through the neighbourhood of Glen Abbey, connecting the western terminus of South Oakville Centre to the eastern terminus of Oakville GO.
Route 19 – River Oaks	30 min.	Oakville GO Bus Terminal (1.1 km / 15 min. walk)	The route operates north-south, initially via Trafalgar Road before servicing River Oaks, the community directly west of Trafalgar Road. The northern terminus is Uptown Core, and its southern terminus is Oakville GO.
Route 20 – Northridge	30 min.	Trafalgar Road / South Service Road E (950 m / 13 min. walk)	The route operates north-south, initially via Trafalgar Road before servicing Northridge, the community directly east of Trafalgar Road. The northern terminus is Uptown Core, and its southern terminus is Oakville GO.
Route 24 – South Common	20 min.	Trafalgar Road / South Service Road E (950 m / 13 min. walk)	The route operates north-south on Trafalgar Road and east-west on Dundas Street East, connecting the eastern terminus of Oakville GO to the western terminus of South Common. Key stops include Sheridan College and Uptown Core.
Route 28 – Glen Abbey North	30 min.	Oakville GO Bus Terminal (1.1 km / 15 min. walk)	The route operates east-west between Oakville GO and Bronte GO, servicing the community of Glen Abbey, south of the intersection of Third Line and Upper Middle Road West.

Route	Headways (Peak Period)	Closest Stop Location	Route Description
Route 120 – East Industrial	30 min.	Trafalgar Road / South Service Road E (950 m / 13 min. walk)	The route operates east-west, connecting the western terminus of Oakville GO to the eastern terminus, Laird & Ridgeway in Mississauga. The route majorly runs along North Service Road East, Upper Middle Road East, and Winston Park Drive between the terminals. Laird & Ridgeway provides connections to GO Regional Bus Service, as well as MiWay. The route only operates during weekday peak-hours.
Route 190 – River Oaks Express	30 min.	Trafalgar Road / South Service Road E (950 m / 13 min. walk)	The route operates north-south, serving the community of River Oaks to Oakville GO. The route only operates in peak direction and during weekday peak-hours.

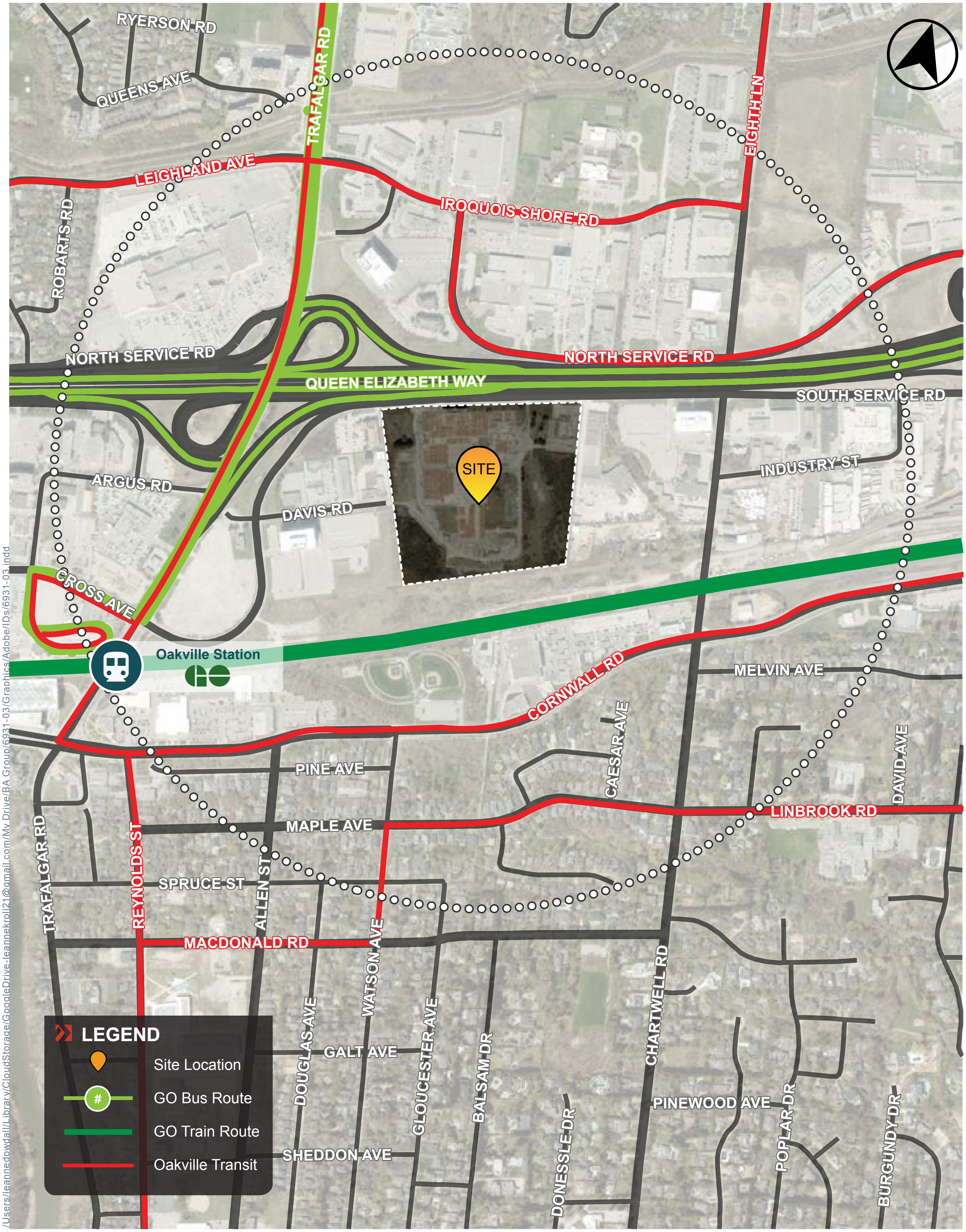

FIGURE 9 EXISTING TRANSIT NETWORK

4.2.2 Future Transit Context

Lakeshore West GO Line Service Expansion

The Lakeshore West line is an existing GO Rail line that currently provides two-way, all-day service 7 days a week between Toronto and Aldershot. It also provides weekday rush-hour service from Hamilton to Toronto in the morning and back in the afternoon. Limited service is also provided along this line to Niagara Falls and stops between Hamilton and Niagara Falls. Metrolinx has proposed expanded service to include 15-minute service or better frequencies, both-ways, throughout the day between Toronto and Aldershot, in addition to a 7-day a week, hourly service between Toronto and Hamilton. Oakville Transit will look to expand the hours of service and increase frequency of service to facilitate efficient and reliable connectivity with the rail line.

Trafalgar Road Rapid Transit – BRT

In both Halton Region's and Metrolinx's Transportation Master Plans, Trafalgar Road has been identified as a rapid transit corridor to feature an exclusive BRT service between Midtown Oakville and Highway 407. The idea behind BRT is to provide a dedicated lane for buses, allowing for faster, more reliable and more frequent transit service. The Trafalgar Road BRT will form a critical link for businesses and residents along the Trafalgar corridor. The system also includes a major connection at the existing Uptown Oakville transit hub and will provide connections with the future Dundas Street BRT, as well as the future Highway 407 Transitway, and improved GO Rail services.

The Draft Official Plan Amendment for Midtown Oakville proposes a BRT stop at the future intersection of Davis Road and Future north-south minor arterial road, which is currently within the project limits. This would give residents of the Site and visitors to the Site direct access to the proposed BRT, creating seamless access to Oakville GO as well as rapid transit service to the rest of the Town of Oakville.

Dundas Street Rapid Transit – BRT

Dundas Street is a major east-west corridor in the GTHA, linking Toronto, Mississauga, and Halton Region. A 48-kilometre exclusive BRT service has been proposed on Dundas Street from Highway 6 in the City of Hamilton to Kipling Transit Hub in Toronto. Rapid transit connections will be provided at the Bloor-Danforth Subway in Toronto, the Milton GO Rail line, and the proposed Hurontario LRT in Brampton/Mississauga. Within the Town of Oakville, access to the Dundas Street BRT will be provided along various stops within the Town, as well as a major connection at the Uptown Oakville Transit Hub (Trafalgar Road / Dundas Street – Upper Middle Road intersection) including to the Trafalgar Road BRT service.

Oakville Mobility Hub

With the Big Move, Metrolinx established goals to implement Transit Mobility Hubs throughout the GTHA. Metrolinx defines a mobility hub as a place with significant amounts/connections to existing and/or planned transit. Through the Big Move, Midtown Oakville was identified as a major mobility hub which will act as a node for many incoming transit projects. Oakville Mobility Hun is defined as a Protected Major Transit Station Area (PMTSA).

Relevant Literature Review – Commuter Rail Station / Network

Density

Historically, North American commuter networks have experienced low population density within the station catchment areas. Given that heavy rail often has large catchment areas, it should be acknowledged that the feasibility of access via active transportation may be limited for riders on the periphery. The intensification of the station area with increased density mitigates this problem by increasing the share of riders who live within a distance reachable by active transportation.

Access Trips to Higher Order Transit Stations

From a transportation perspective, trips made via higher-order transit typically consist of three distinct trip legs,

1). The initial trip from origin to station;

2). The station to station trip; and

3). The station to destination trip.

Throughout the GO network, this typically involves an initial private automobile trip to a GO station, a GO Train trip to the CBD, and a final trip from the CBD station to the destination typically made via active or feeder transportation. Unlike the final CBD station to destination to trip which is well served by feeder connections the initial origin to home station generally has fewer feeder transit options and active transport can be limited by access distance.

For the above reasons, there is a heavy reliance on private auto as the access mode to GO stations. However, as stated above, the expansion of parking facilities on the GO network is financially unsustainable and many station areas are land constrained. This operational problem has been well documented and has been studied by academics, transit authorities, and NGOs. Notable studies include [Chan & Farber], [Graystone & Mitra], [Shantz & Casello], and [Skidmore]. These studies have highlighted a variety of different aspects to mitigate auto dependency on the first mile. Frequently discussed factors include:

- Enhancing active transportation facilities
- Enhancing feeder transportation connectivity
- Reducing free parking and expanding paid parking (Metrolinx's long-term vision is to reduce overall parking and increase the paid / carpool parking component of the future parking supply)
- Promoting density around the station area

The above strategies aim to enhance the urban environment such that sustainable modes of travel become more attractive, and the dependency on auto ownership is reduced. The lands in PMTSA are positioned to benefit from the implementation of these strategies.

4.2.3 Transit Reach Assessment

4.2.3.1 EXISTING TRANSIT TRAVEL REACH

In order to understand the changing transportation context, transit service area analyses for the existing and future transit network was conducted using Geographic Information Systems (GIS). These analyses look at the service area of a transit network that a visitor of the TOC Development area has access to in a given time range. This type of analysis is useful in understanding the transit accessibility and can also be used to quantify the impact of transit service changes.

A 15, 30, and 45 minute transit reach from the TOC Development area during the weekday morning travel period was analysed for existing conditions as is illustrated in **Figure 10** and **Figure 11**. Transit travel times include walking time to and from transit stops, as well as the transit schedules during peak hour (i.e. service frequency and wait times), all of which are based upon existing transit service.

4.2.3.2 FUTURE TRANSIT TRAVEL REACH

A review of projected transit travel times assumed the various public transit network improvements included in Section 4.2.1 and Section 4.2.3 is illustrated in **Figure 12** and **Figure 13**. A comparison of areas that are reachable is provided in **Table 5** below.

Table 5 Existing and Future Transit Service Area Analysis Comparisons

Transit Scenario	15 minute reach	30 minute reach	45 minute reach
Existing Conditions (Travel Away From Site)	• North along Trafalgar Rd to before Upper Middle Rd; • South along Trafalgar Rd, and Kerr St to before Rebecca St / Randall St (north of Lakeshore Rd W); • East along Cornwall Rd to before Eighth Line / Chartwell Rd; and • West along Cornwall Rd / Speers Rd to just past Dorval Dr.	• North along Trafalgar Rd just past Dundas St E up to Threshing Mill Blvd, and north past Upper Middle Rd between Third Line and Joshua Creek Dr; • South along Trafalgar Rd, Reynolds St, and Kerr St to the waterfront; • East along Upper Middle Rd to before Ninth Line / Ford Dr, and east along Lakeshore West GO Line to Port Credit GO Station; and • West along Upper Middle Rd W to past Third Line, and west along Speers Rd and Wyecroft Rd to Bronte Rd.	• North along Trafalgar Rd to beyond Hwy 407 before Lower Baseline E; • South along Trafalgar Rd, Third Line, Reynolds St, and Kerr St to the waterfront; • East along Dundas St E to Winston Churchill Blvd, and east along Lakeshore West GO Line to Mimico GO Station; and • West along Dundas St W to Bronte Rd, west along Lakeshore Rd to Burloak Dr, and west along Lakeshore West GO Line to Burlington GO Station.
Existing Conditions (Travel Towards Site)	• North along Trafalgar Rd to before Upper Middle Rd; • South along Trafalgar Rd, and Kerr St to before Rebecca St / Randall St (north of Lakeshore Rd W); • East along Cornwall Rd to before Eighth Line / Chartwell Rd; and West along Cornwall Rd / Speers Rd to past Morden Rd (west of Dorval Dr).	• North along Trafalgar Rd just past Dundas St E up to Threshing Mill Blvd; • South along Trafalgar Rd, Reynolds St, and Kerr St to the waterfront; • East along Upper Middle Rd E to Hwy 403, and east along Lakeshore West GO Line to Clarkson GO Station; and West along Upper Middle Rd W to past Third Line, and along Lakeshore West GO Line to Walkers Line (halfway to Burlington GO Station).	• North along Trafalgar Rd to beyond Hwy 407 before Lower Base Line E; • South along Trafalgar, Third Line, Reynolds St, and Kerr St to the waterfront; • East along Dundas St E to Winston Churchill Blvd, and east along Lakeshore West GO Line to Long Branch GO Station; and West along Dundas St W to Bronte Rd, and west along Lakeshore West GO Line to Aldershot GO Station
Future Conditions (Travel Away From Site) *with the addition of GO Expansion /RER, Trafalgar BRT, Dundas BRT, etc.*	• North along Trafalgar Rd to before Oak Park Blvd / Postridge Dr (south of Dundas St E) via future Trafalgar BRT; • South along Trafalgar Rd, and Kerr St to before Rebecca St / Randall St (north of Lakeshore Rd W); • East along Lakeshore West GO Line to Clarkson GO Station; and West along Lakeshore West GO Line to Bronte GO Station.	• North along Trafalgar Rd to Hwy 407 (via future Trafalgar BRT), and north along Erin Mills Pkwy to past Dundas St W; • South along Trafalgar Rd, Reynolds St, Kerr St, and Appleby Line to the waterfront, and south along Southdown Rd to Lakeshore Rd W; • East along Dundas St W Pkwy (via future Dundas BRT) to beyond Erin Mills, and east along Lakeshore West GO Line to Mimico Go Station; and West along Upper Middle Rd W to past Third Line, and along Lakeshore West Go Line to Burlington GO Station.	• North along Trafalgar Rd to Lower Baseline E (via future Trafalgar BRT), north along Erin Mills Pkwy and Mississauga Rd to past Eglinton Ave W, and north along Hurontario St (via future Hazel McCallion LRT) to Hwy 403; • South along Trafalgar Rd, Reynolds St, Kerr St, and Appleby Line to the waterfront; • East along Dundas St E to past Dixie Rd (via future Dundas BRT), and east along Lakeshore West GO Line (and via Waterfront Reset LRT from Long Branch GO) to Union Station; and West along Dundas St to Walkers Line (via future Dundas BRT), and along Lakeshore West Go Line to past Aldershot GO Station.

Transit Scenario	15 minute reach	30 minute reach	45 minute reach
Future Conditions (Travel Towards Site) *with the addition of GO Expansion /RER, Trafalgar BRT, Dundas BRT, etc.*	• North along Trafalgar Rd to before Oak Park Blvd / Postridge Dr (south of Dundas St E) via future Trafalgar BRT; • South along Trafalgar Rd, and Kerr St to before Rebecca St / Randall St (north of Lakeshore Rd W); • East along Lakeshore West GO Line to Clarkson GO Station; and West along Lakeshore West GO Line to Bronte GO Station.	• North along Trafalgar Rd to beyond Hwy 407 (via future Trafalgar BRT), and north along Erin Mills Pkwy to past Dundas St W; • South along Trafalgar Rd, Reynolds St, and Kerr St to the waterfront; • East along Dundas St W Pkwy (via future Dundas BRT) to beyond Erin Mills, and east along Lakeshore West GO Line to Mimico GO Station; and West along Upper Middle Rd W to Bronte Rd, and along Lakeshore West GO Line to Burlington GO Station.	• North along Trafalgar Rd to Lower Baseline E (via future Trafalgar BRT), north along Winston Churchill Blvd and Erin Mills Pkwy to just before Eglinton Ave W, and north along Hurontario St (via future Hazel McCallion LRT) to Hwy 403; • South along Trafalgar Rd, Reynolds St, Kerr St, and Appleby Line to the waterfront; • East along Dundas St E to Hurontario St (via future Dundas BRT), and east along Lakeshore West GO Line (and via Waterfront Reset LRT from Long Branch GO) to Union Station; and West along Dundas St to Cedar Springs Rd / Brant St (via future Dundas BRT), and along Lakeshore West Go Line to Hwy 6 (past Aldershot GO Station).

Notable findings include:

- Within 15 minutes, under existing conditions, a small area is accessible for travel towards and away midtown Oakville, primarily along Trafalgar Rd and Kerr St (for southbound travel). Under future conditions, namely the implementation of the Trafalgar BRT, travel northwards along Trafalgar Rd extends to just short of Dundas St E. Future GO improvements also greatly increase access east-west from midtown Oakville along the Lakeshore West GO Line.

- Within 30 minutes, north-south travel away and towards midtown Oakville reaches northwards just past Dundas St E and southwards to the waterfront via Trafalgar Rd. East-west travel is centralized along Upper Middle Rd. Travel away from the site eastward along the Lakeshore West GO Line reaches Port Credit GO Station, whereas travel towards the site westward extends from Appleby GO Station. Under future conditions, with the implementation of the Trafalgar BRT, access northbound along Trafalgar Rd reaches to past Highway 407 for both travel directions. In addition, the Trafalgar BRT provides improved access to other transit services. In combination with the future Dundas BRT, improved access along Dundas further increases north-south reach along Winston Churchill Blvd and Erin Mills Pkwy. Future GO infrastructure and electrification projects improve east travel to Mimico GO Station (travel away) and west travel to Burlington GO Station (both directions).

- Wwithin 45 minutes, northbound travel reaches Lower Baseline E along Trafalgar Rd. Southbound travel extends to the waterfront across Oakville via existing local bus routes. Eastward travel away from midtown Oakville reaches Mimico GO Station, and westward travel towards midtown Oakville extends from Aldershot GO Station. Under future conditions, 45 minute reach spreads deep into surrounding municipalities of Burlington, Mississauga, and Toronto. The future Dundas BRT greatly increases east-west reach along Dundas; now reaching past Winston Churchill Blvd to Dixie Rd and past Bronte Rd to Walkers Line, respectively. Improved access to other transit operations along Dundas also increases north reach along Winston Churchill Blvd and Erin Mills Pkwy just shy of Eglinton Ave W. The implementation of Hurontario LRT also improves northwards reach up to Highway 403 along Hurontario St. Implementation of GO expansion extends travel along the Lakeshore West GO Line, spanning between Union Station and Aldershot GO Sation.

In summary, under present conditions the site of midtown Oakville is bound by the QEW corridor, limiting northwards travel to Trafalgar Rd. The nearby Oakville GO Station serves as the primary east-west route. In the future, the inclusion of Trafalgar BRT, Dundas BRT and GO Expansion greatly improves overall reach, opening greater opportunities for travel in all directions. The effect of future implementations is especially noticeable in longer travel reaches, as future 45 minute travel provides access to central Burlington, Mississauga City Center, and downtown Toronto.

The evolving transportation context visualized in this analysis indicates that, at either local or intercity scales, there are suitable alternatives to driving or requiring a parking space for daily travel. The proposed development area is in a prime location that enables future site users to shift away from auto use and utilize the major transit investments being afforded within the area.

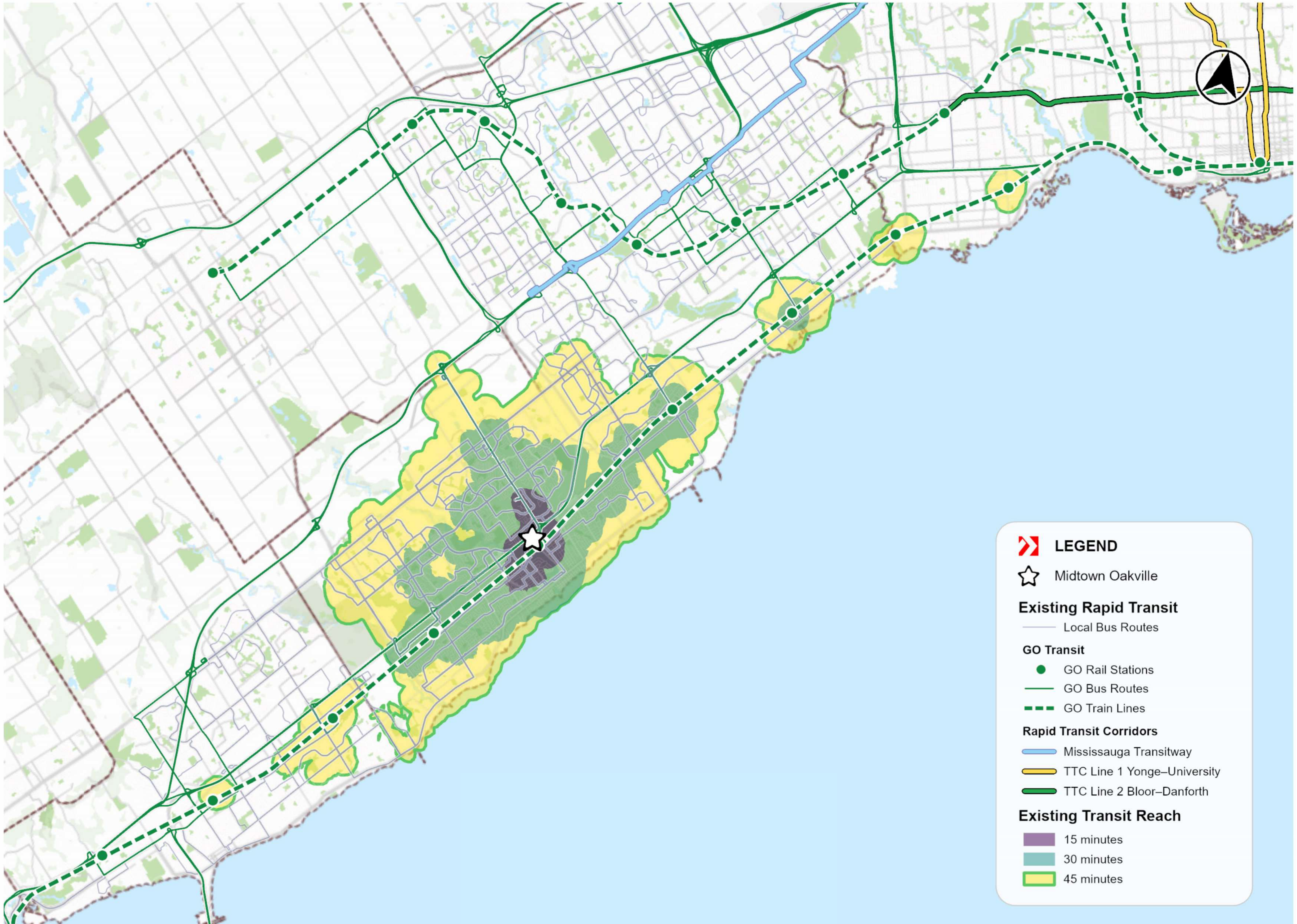

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Figure 10 **EXISTING TRANSIT REACH (TRAVEL AWAY)**

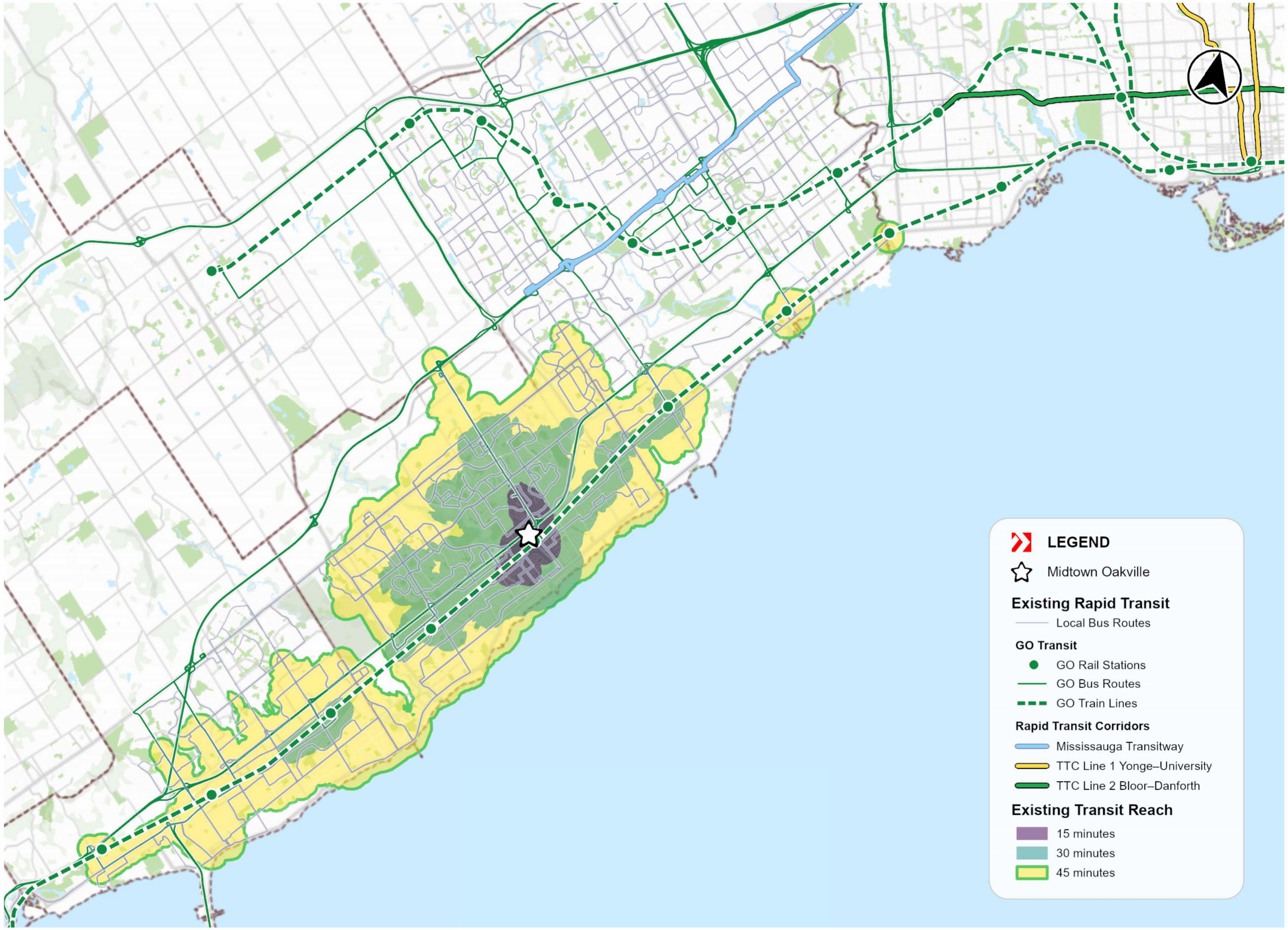

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Figure 11 EXISTING TRANSIT REACH (TRAVEL TOWARDS)

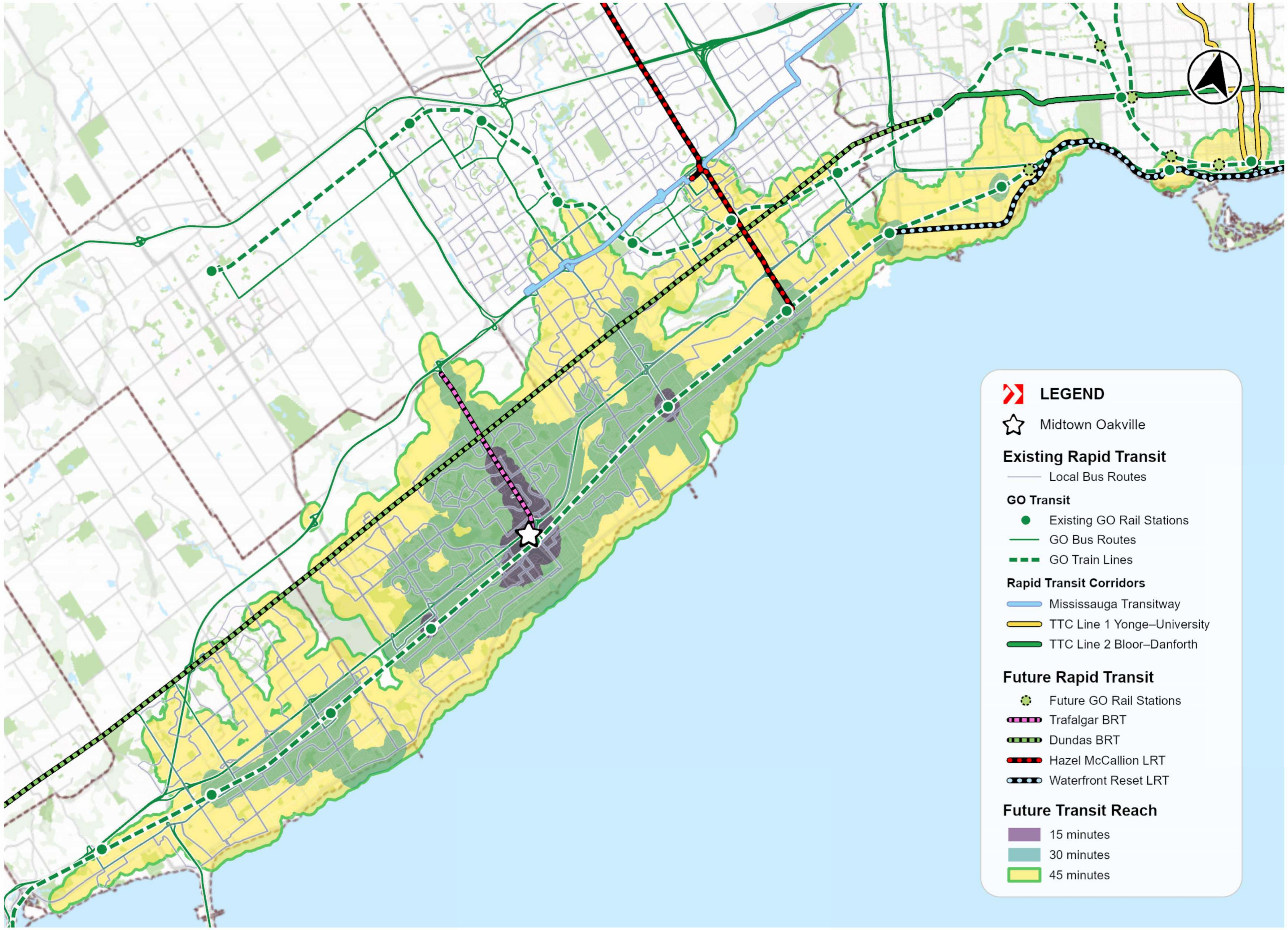

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Figure 12 FUTURE TRANSIT REACH (TRAVEL AWAY)

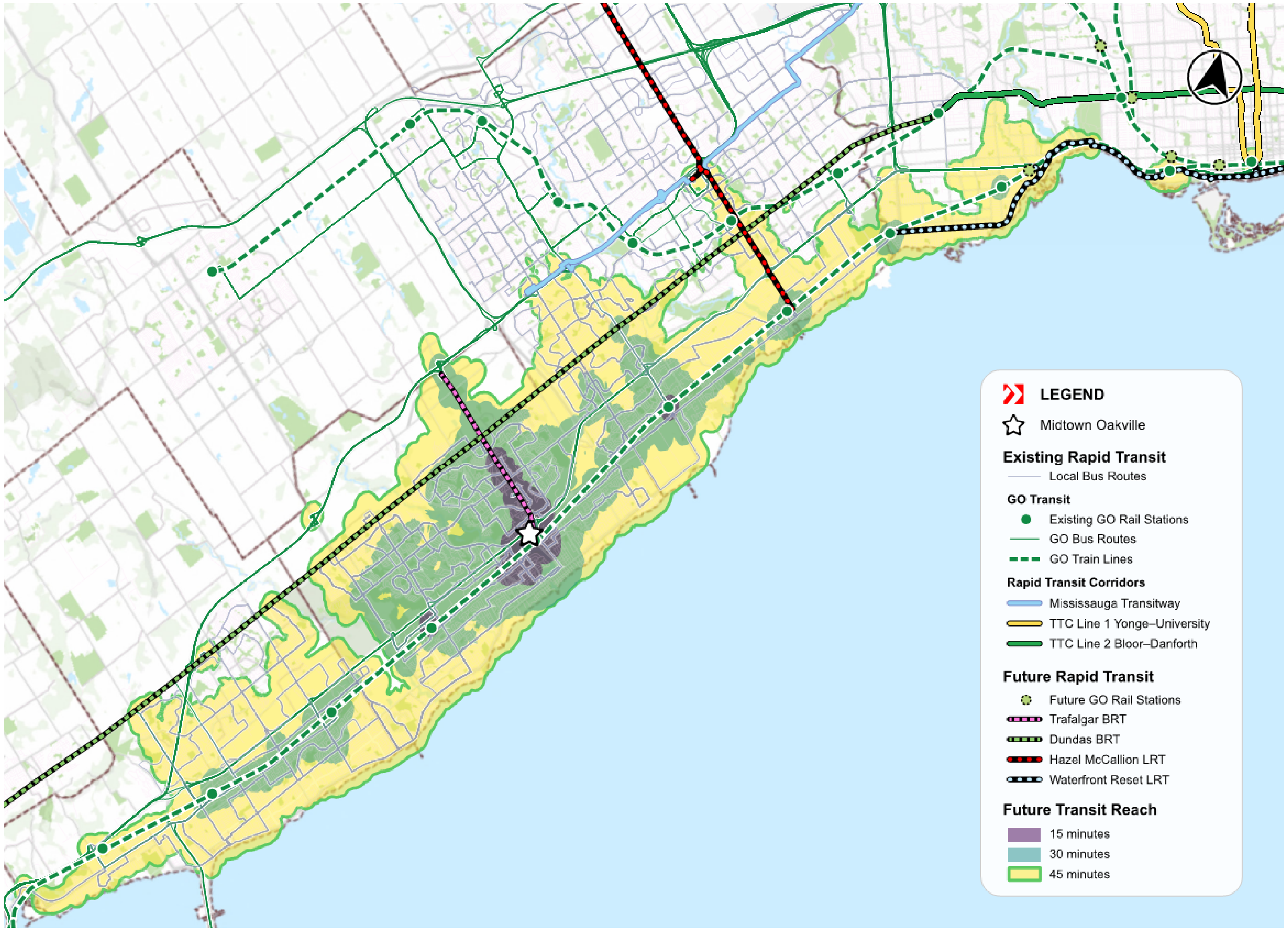

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Figure 13 FUTURE TRANSIT REACH (TRAVEL TOWARDS)

4.3 Area Cycling Network

4.3.1 Existing Cycling Context

Cycling facilities are not currently provided near the Site. Signed bike routes are provided on Trafalgar Road and Chartwell Road south of Cornwall Road, and a multi-use trail is provided on Cornwall Road between Watson Avenue and Chartwell Road.

As cyclists are permitted to ride on most roads except controlled-access highways, the lack of bicycle facilities on local and collector roadways will not prohibit this type of travel.

4.3.2 Future Cycling Context

The Draft Official Plan Amendment for Midtown Oakville proposes cycling facilities within the right-of-way of Cornwall Road, South Service Road East, as well as the extensions of Davis Road and Cross Avenue and the proposed Local streets within Midtown Oakville. Off-road active transportation connections are proposed to be constructed, providing convenient access to the Oakville GO Station and retail possibilities along Cornwall Road.

Active transportation connections are proposed on separate bridges over the QEW, as well as on the N-S Minor Arterial Street crossing the QEW corridor, creating a seamless connection to the lands north of the QEW, eliminating the need to only use Trafalgar Road and cross a busy highway interchange.

The future cycling network is illustrated on **Figure 14**.

4.4 Area Pedestrian Connections

Existing pedestrian facilities are currently limited, with sidewalks not provided on the main accesses to the Site, in South Service Road East and Chartwell Road. However, the proposed development, outlines planned sidewalk improvements in the area of the Site. Walking facilities will be provided on both sides of all proposed roadways, including an off-road direct connection to the Oakville GO Station. Active transportation connections are proposed on separate bridges over the QEW, as well as on the N-S Minor Arterial Street crossing the QEW corridor, creating a seamless connection to the lands north of the QEW, eliminating the need to only use Trafalgar Road and cross a busy highway interchange The Site will be within walking distance to several existing and proposed retail opportunities, as well as transit connections, reducing the need for residents to travel regularly using a car and own a vehicle.

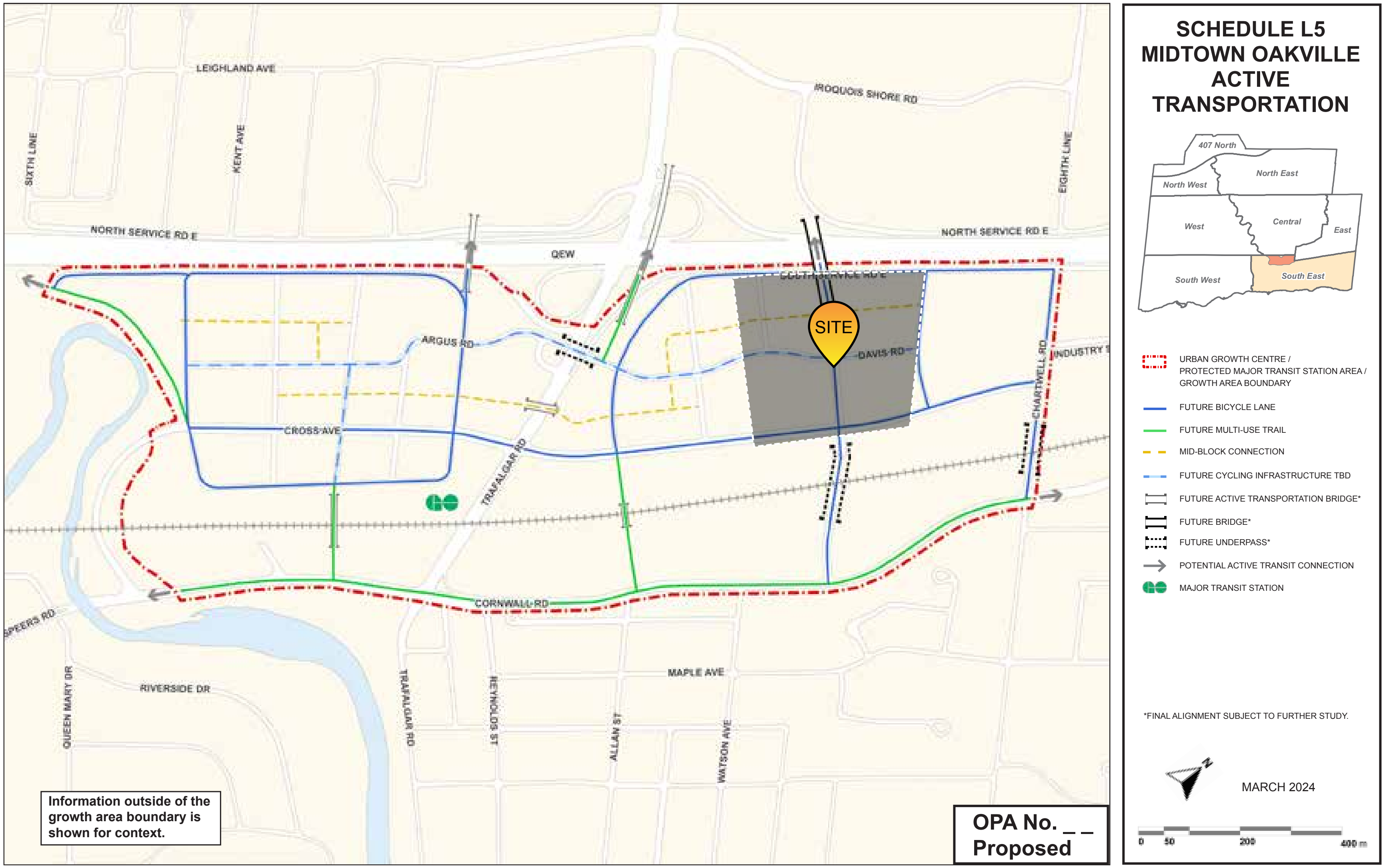


FIGURE 14 FUTURE ACTIVE TRANSPORTATION CONTEXT

5.0 PROPOSED MASTER PLAN DEVELOPMENT - OVERVIEW

5.1 Approach to Transportation Planning

The proposed development Master Plan comprehensively focuses on mobility and providing mobility choice within the framework established by area planning documents and Town of Oakville and Region of Halton transportation design and planning guidelines.

Key transportation elements of the Master Plan are intended to be incorporated into early phases of the development plan, as well as the overall Transportation Demand Management (TDM) Plan Strategy, and will be expanded upon during subsequent development stages.

It is important to note that transportation infrastructure, and the TDM strategy (outlined in detail in Section 9.0), is intended to be flexible in order to adapt to future development and transportation plans as they are implemented over the long-term and as travel demands evolve. The TDM strategy is itself, intended to evolve as travel demands and expectations change, including potential shifts in how / when people travel as a consequence of technology / design advancements, regional transit infrastructure improvements, fuel sources, driverless cars, sharing economy applications, climate change, and travel preferences. The TDM strategy anticipates this, and focuses on measures to implement, adapt, monitor, and mitigate travel demands.

5.1.1 Long Term Planning

The proposed Master Plan is intended to develop over several phases and multiple years and will need to respond to potential changes in travel demands and expectations.

The Master Plan focuses on planned major capital projects, prioritizing the site's "Transit First" principle from the start of occupancy and the early delivery by Metrolinx of the enhanced GO Rail service along the Lakeshore West GO Rail Line and its integration with GO Bus service and the Town of Oakville's local transit service. These investments are scheduled prior to the anticipated implementation of early phases of the Master Plan. This will ensure development of the Master Plan lands occurs in an efficient way and be integrated with existing and planned transit services.

The proposed Master Plan is being designed to be flexible over time and respond to changes in travel demand. For example, vehicular parking and active transportation needs would be reviewed over time, as development is phased, to ensure that the need for vehicle parking, bicycle parking, bicycle amenities, pedestrian amenities, etc. are accounted for within subsequent development phases. Internal areas within development blocks, as well as below-grade parking areas, could be considered for changes in pick-up / drop-off travel behaviour, and how to accommodate these demands "off-street".

Consistent with the Master Plan's long-term planning approach is a need for on-going monitoring and review as the Master Plan is developed, with more detailed planning and transportation strategy measures being pursued as part of subsequent site plan stages of development. This can include updated TDM measures and performance metrics, while maintaining consistent transportation / mobility principles

5.1.2 Approach to Accommodating Travel Demands

This Transportation Report takes a unique approach to travel demand forecasting and planning of the East Harbour development. The intent of the reporting herein is to derive and facilitate future mobility through the application and advancement of Transportation Demand Management (TDM). The TDM framework herein focuses on the following:

- Providing mobility choice;
- Managing vehicle access and parking;
- Managing time of travel and vehicle use through TDM-related measures and incentives; and,

- Providing a framework for long-term management, coordination, communication, and monitoring of transportation travel demands.

5.1.3 Master Plan Transportation Design Principles

The proposed development plan is premised upon the fundamental mobility goal of establishing a major component of the Davis Residential Precinct within the Midtown Oakville area that exceeds the travel characteristics of the rest of the Town of Oakville. To achieve that goal, key mobility principles were established that have guided the Master Plan development process. These key mobility principles include:

Establish a mixed-use development with a sustainable mix of supportive uses that will help to ensure that travel demands are internalized (to Midtown Oakville) to the extent possible, that they make efficient use of available transportation infrastructure, and that efficiencies can be gained in aspects of parking and goods movement.

A "Transit First" Master Plan, focusing on providing sustainable and effective transit options from "opening day" of new development through the development of the Master Plan. The development will incorporate easy access between different modes of transit – particularly direct, safe, and convenient access to public transit – and provide attractive connections between public transit and the public realm. The Master Plan encourages transit use for "opening day" travel demands.

A comprehensive plan to provide Mobility Choice, which includes complementary built form, transit provision, and appropriate infrastructure to support, encourage, and make convenient active transportation alternatives. The plan includes delivering complete streets consistent with the Livable Oakville Official Plan, Midtown Oakville, to achieve an attractive public realm and ensure that streets prioritize pedestrian and transit use while facilitating necessary vehicular access and movement. Furthermore, mobility choice will include providing flexibility in the Master Plan streets and access arrangements to facilitate potential changes in the use / application of automobiles.

A plan supporting the Transportation Demand Management (TDM) Plan strategy, which will focus on discouraging auto dependence and the effective rate of auto-driver trips by dis-incentivizing auto use through parking management / provisions and incentivizing alternative transportation options. Incentive / disincentive measures are advanced through appropriate application, monitoring, and mitigating strategies.

Integration with the larger planning framework, including infrastructure investments and area-wide planning initiatives being led by the Town of Oakville and other public agencies (Province / Metrolinx, Region of Halton). This wider planning framework and associated transportation network planning has informed the Master Plan street network, transit service provisions, and active transportation infrastructure. This ensures that the impact of the proposed development is fully integrated in area-wide planning initiatives.

These principles are reflected in many of the initiatives and design components pursued within the Master Plan, including:

- Large-scale provision of residential development;
- Establishment of an aspirational land use mix that supports optimal use of infrastructure and reduces peak period travel activity.
- Urban style, street-fronting, retail stores located at-grade along the street frontage to create an active, walkable public realm;
- The inclusion of multiple active transportation connections to the existing and planned multi-modal transportation network leading to the Oakville GO Station hub and adjacent areas of Oakville ;
- Provision of complete streets;
- All vehicle parking accommodated below-grade to minimize vehicular disruption to the public realm;

- All servicing / loading consolidated internal to the development blocks to minimize disruption to the public realm;
- Provision of short-term layby and pick-up / drop-off facilities within the development blocks and layby facilities on the public streets;
- Provision of pedestrian amenities on the site, including pedestrian boulevards, generous pedestrian sidewalks, pedestrian paths, and walkways that provide porosity for pedestrian travel through the site and to / from adjacent lands and key transit infrastructure;
- Provision of bicycle lanes on the proposed municipal streets;
- Provision of secure, weather protected long-term bicycle parking in appropriate locations; and
- Convenient, accessible short-term bicycle parking in appropriate locations adjacent to retail entrances

5.2 Overview of Development Programme

The proposed mixed-use development is for four development blocks containing a total of 6,954 residential units within 16 residential towers and 5,849 m^2 of retail space. The development also includes an approximately 18,687 m^2 public park, occupying the entirety of one of the blocks (Block 3).

Redevelopment statistics are summarized in **Table 6**.

Table 6 Master Plan Development Statistics Summary

Land Use / Type		Block 1	Block 2	Block 3	Block 4	Total
Description		**6 Residential Towers** A – 40 stories B – 45 stories C – 35 stories D – 42 stories E – 48 stories F – 45 stories	**6 Residential Towers** G – 48 stories H – 45 stories I – 40 stories J – 35 stories K – 42 stories L – 35 stories	**Public Park**	**6 Residential Towers** M – 40 stories N – 35 stories O – 35 stories P – 30 stories	-
Residential (units)		2,7462	2,584	-	1,624	**6,954 units**
Retail • **GCA** • **NFA**		 2,175 m² 2,001 m²	 1,362 m² 1,253 m²	 - -	 2,331 m² 2,127 m²	 **5,849 m²** **5,381 m²**
Public Park Space				18,687 m²		**18,687 m²**
Vehicle Parking (spaces)	Resident	1,373	1,292		812	**3,477**
	Non-Residential	527	436	-	267	**1,230**
	Total	**1,900**	**1,728**	**-**	**1,079**	**4,707 spaces**
Bicycle Parking (spaces)	Long-Term (Resident)	2,060	1,938	-	1,218	**5,216 spaces**
	Short-Term (Visitor)	684	646	-	406	**1,739 spaces**
	Non-Res.	3	2	-	3	**8 spaces**
	Total	**2,750**	**2,588**	**-**	**1,627**	**6,963 spaces**
Loading Facilities		6	6	-	6	**18 spaces**

Notes:
1. Site statistics based on site plans prepared by Graziani + Corazza Architects, dated November 1, 2024.

5.3 Public Street Network

A new public street network is proposed through and around the Site, providing multi-modal access to all uses on the Site. One minor change is proposed to the north-south minor street grid contained in the latest Town of Oakville Midtown Draft Official Plan Amendment (Draft Midtown OPA) to better align with the Site's western property boundaries and to enable more logical development blocks. The change is minor and does not affect the functionality of the street network. The new major street network remains consistent with the Draft Midtown OPA, including the extension of Davis Road and Cross Avenue through the Site, and the creation of a new north-south grade separated arterial street across the QEW corridor to the north (road-over-highway overpass) and across the Metrolinx / CN rail corridor to the south (rail-over-road underpass).

5.4 Pedestrian Access

Pedestrian access and circulation are afforded from all sides of all four development blocks. This ensures direct and convenient access to and from all new public streets that abut the development blocks as well as to planned transit routings that will permeate the Midtown Oakville area and link to the Oakville GO Transit hub. The four development blocks, inclusive of the public park block, will also exhibit private pedestrian linkages through each block and to each residential building and non-residential retail space within the podiums of the residential buildings. Retail spaces will line the frontages of the residential podiums along the east-west Collector Street through the centre of the mixed-use development. This is consistent with the uses anticipated along “Primary” and “Secondary” main streets in the Midtown area.

5.5 Cycling Access / Circulation

Cycling infrastructure is also planned in the form of dedicated bicycle parking rooms for long-term bicycle uses (i.e., resident bike parking and employee bike parking) and a mix of internal and external bike parking for short term bicycle uses (i.e., residential visitor bike parking and non-residential customer and visitor bike parking). The provision of convenient and direct connections between private bike infrastructure and public cycling infrastructure planned within the new public streets in Midtown will link the development blocks to the multi-modal transportation network emerging within Midtown Oakville and the broader Town of Oakville itself.

5.6 Site Vehicular Access

Each of the three development blocks will have multiple points of vehicular access.

- Block 1 – one access each from South Service Road East and from the new West Local Street;
- Block 2 – one access each from South Service Road East and from the new East Local Street;
- Block 4 – one access each from the new East Local Street and from Cross Avenue

Each site access driveway leads to an internal vehicular circulation system that accommodates pick-up and drop off needs, access to loading facilities, emergency access opportunities, and access to underground parking garage ramps.

5.7 Parking

Vehicular parking is to be provided within below-grade parking facilities within each residential Block. A series of at-grade vehicular contact points (pick-up and drop-off facilities, service vehicle loading areas, and emergency vehicle access conditions) are also planned to ensure that all aspects of the mixed-use intensification will be appropriately served and connected to the planned public transportation systems within Midtown Oakville.

5.8 Bicycle Parking

The proposed development includes the provision of a minimum of 6,963 bicycle parking spaces, consistent with the minimum requirements set out in Zoning By-law 2014-014. Including:

- A minimum of 5,216 long-term resident bicycle parking spaces within secure weather-protected facilities located within the underground parking garage, at grade, or on the mezzanine level.
- A minimum of 1,739 short-term residential bicycle spaces will be provided on the Site.
- A further minimum of 8 bicycle parking spaces will be provided in close proximity to the non-residential (retail) land uses likely along the development frontage of the E-W Collector street.
- Access to the bike parking rooms would be via pass-card or key and be fitted with security features.

- Access is generally afforded long term bike parking via dedicated elevators so as not to conflict with main pedestrian elevators.
- Bike Repair Station would also be contained within the Bike storage rooms. The number and precise configuration of the bike repair stations will depend on the configuration and number of the internal bike storage rooms.
- Short-term bike parking is generally contained outside and near visitor / customer entrances so as to be convenient and encouraging of their use. Some residential visitor bicycle parking will likely be located internal to the residential buildings, given the amount of visitor bike parking.
- Access to visitor internal bike parking storage areas will be coordinated with the architectural layout of the residential buildings and their podiums and will have access to external entrances.

5.9 Pick-up / Drop-off Facilities

Pick-up / drop-off (PUDO) facilities are proposed for each block to accommodate temporary pick-up, drop-off, layby and delivery activities for all buildings on the Site. The PUDO facilities are appropriately sized and carefully laid out to provide convenient front door access.

The PUDO facilities for each block will be further refined through subsequent phases of the development process.

5.10 Loading

Each building or group of buildings on development block, has been evaluated against the practical, functional, and policy requirements associated with the various types of loading operations that would be experienced on a daily basis.

The functional design of loading areas are tested, at a high level of functional review – given the Master Plan level of detail – with appropriate design vehicles and manoeuvring requirements to ensure that the resulting loading space is capable of accommodating the needs – based upon land uses, scale of development, and physical opportunities / constraints – of each individual development building and or Block. This ensures an efficient and compact development and safe Master Plan concept.

A total of 18 formal loading spaces, which comply with, or exceed, the Town of Oakville's dimensional requirements are provided across the three development blocks.

5.11 Traffic Management During Construction Plan

The proposed development application seeks Official Plan approval at this time. The proposed Master Plan has been prepared at a very high level of detail relative to the physical layout and component elements of the overall development.

It is premature at this time to assess and prepare a set of plans that would outline and detail a strategy for the overall, or phased, construction of individual blocks within the Master Plan. Numerous issues will have to be reviewed in greater detail to devise a plan that will speak to the potential phasing and associated steps involved in constructing the proposed buildings and public streets that will be required to support development on the Site.

A Construction Management Plan (CMP) strategy and supporting Traffic Management During Construction (TMDC) Plan will be undertaken at the appropriate time and submitted to the Town of Oakville for review and comment.

6.0 VEHICULAR PARKING CONSIDERATIONS

6.1 Vehicular Parking Requirements

6.1.1 Zoning By-law 2014-014

The prevailing Zoning By-law for the Site for parking supply requirements is the Town of Oakville's Zoning By-law 2014-014, of which the Site is subject to the "Mixed Use Zones" parking standards. The application of the By-la w is illustrated in **Table 7**.

Table 7 Zoning By-law 2014-014 – Minimum Parking Requirements

Land Use		Units / NFA	Minimum Rate	Minimum Requirement
Block 1	Residential	2,746 units	1.05 spaces / unit	2,883 spaces
	Residential Visitor		0.20 spaces / unit	550 spaces
	Non-Residential	2,001 m^2	1.0 spaces / 18m^2 NFA	112 spaces
Block 1 Subtotal				***3,545 spaces***
Block 2	Residential	2,584 units	1.05 spaces / unit	2,714 spaces
	Residential Visitor		0.20 spaces / unit	517 spaces
	Non-Residential	1,253 m^2	1.0 spaces / 18m^2 NFA	70 spaces
Block 2 Subtotal				***3,301 spaces***
Block 4	Residential	1,624 units	1.05 spaces / unit	1,706 spaces
	Residential Visitor		0.20 spaces / unit	325spaces
	Non-Residential	2,127 m^2	1.0 spaces / 18m^2 NFA	119 spaces
Block 4 Subtotal				***2,150 spaces***
Site Total	**Residential Minimum Parking Requirement**			**7,303 spaces**
	Non-Residential Minimum Parking Requirement			**1,693 spaces**
	Total Minimum Parking Requirement			**8,996 spaces**

Notes:

1. Site statistics based on site plans prepared by Graziani + Corazza Architects, dated November 1, 2024.
2. Units have an assumed net floor area (NFA) of 80 m^2.
3. As per Zoning By-law 2014-014 (Table 5.2.2) the parking standards require the provision of 0.80 parking spaces per unit for resident parking for units less than 75 m^2 NFA and 1.05 parking spaces per unit for units equal or greater than 75 m^2 NFA.
4. As per Zoning By-law 2014-014 (Table 5.2.2) "Of the total number of parking spaces required, 0.20 of the parking spaces required per dwelling shall be designated as visitor parking".
5. As per Zoning By-law 2014-014 (Section 5.1.5), should the calculation of the number of parking spaces required end in a fraction, the "the minimum number of spaces shall be increased to the next highest whole number if the fraction is greater than 0.25."

The application of Zoning By-law 2014-014 parking standards to the Site results in a total parking requirement of 8,996 spaces, including 7,303 resident spaces and 1,693 non-residential spaces.

6.1.2 Ontario Bill 185

As discussed in **Section 3.1.4**, the Province of Ontario recently passed (June 6, 2024) Bill 185. Bill 185, among other things, amends the Planning Act of Ontario.

Provisions in Bill 185, in amending the Planning Act, limits the ability of official plans and zoning bylaws to contain policies requiring an owner to provide or maintain parking facilities within protected major transit station areas (PMTSA's), certain other areas surrounding and including an existing or planned higher order station or stop and other prescribed areas.

Bill 185 says (paraphrased) that no official plan may contain any policy that has the effect of requiring, and that a zoning by-law may not require, an owner or occupant of a building or structure to provide and maintain parking facilities, other than parking facilities for bicycles, on land that is not part of a highway and that is located within:

- a protected major transit station area;
- an area delineated in the official plan of the municipality surrounding and including an existing or planned higher order transit station or stop, within which area the official plan policies identify the minimum number of residents and jobs, collectively, per hectare that are planned to be accommodated; or
- any other area prescribed for the purposes of this clause.

The Site is located within the Protected Major Transit Station Area (PMTSA) which is defined as Midtown Oakville.

The impact of Bill 185 renders any requirement for vehicular parking, for lands within a PMTSA, within the Town of Oakville's Midtown area Secondary Plan and Comprehensive Zoning Bylaw as having 'no effect' (i.e., the requirement for vehicular parking is zero if a Site is within a PMTSA).

Application of Bill 185 and the provisions which amend the Planning Act result in vehicular parking requirements of **zero parking spaces per unit (i.e., 0 parking spaces / unit)** for both the resident parking and visitor parking components as well as the non-residential land use components of the development proposal.

6.2 Proposed Vehicular Parking Supply

Notwithstanding the discussion around the Zoning Bylaw parking requirements and the effects of Bill 185 on the parking requirements for the Site, there does exist a practical parking demand that will need to be accommodated for the Site to be marketable and to functional appropriately within Midtown Oakville.

It is our opinion that the above noted parking standards summarized in **Section 6.1.1** overstate the Site's parking demands by some margin, given the excellent existing and future transit and pedestrian/cycling nature of the proposed development and future Mid-Town Oakville environs.

The proposed parking requirements (rates and resulting parking space values) are illustrated in **Table 8**.

Table 8 Proposed Vehicular Parking Requirements

Land Use		Units / NFA	Minimum Rate	Minimum Requirement
Block 1	Residential	2,746 units	0.50 spaces / unit	1,373 spaces
	Residential Visitor		0.15 spaces / unit	412 spaces
	Non-Residential	2,001 m^2 NFA	1.08 spaces / 100m^2 NFA	22 spaces
Block 1 Subtotal				***1,807 spaces***
Block 2	Residential	2,584 units	0.50 spaces / unit	1,292 spaces
	Residential Visitor		0.15 spaces / unit	388 spaces
	Non-Residential	1,253 m^2 NFA	1.08 spaces / 100m^2 NFA	14 spaces
Block 2 Subtotal				***1,694 spaces***
Block 4	Residential	1,624 units	0.50 spaces / unit	812 spaces
	Residential Visitor		0.15 spaces / unit	244 spaces
	Non-Residential	2,127 m^2 NFA	1.08 spaces / 100m^2 NFA	23 spaces
Block 4 Subtotal				***1,079 spaces***
Site Total	**Residential Minimum Parking Requirement**			**3,477 spaces**
	Non-Residential Minimum Parking Requirement			**1,103 spaces** *(incl. 1,044 visitor & 59 non-res)*
	Total Minimum Parking Requirement			**4,580 spaces**

The current proposal includes a total of 4,707 parking spaces for the Site, including 3,477 residential spaces and 1,230 non-residential parking spaces to be shared, on a paid parking basis, between visitors and retail users. The non-residential parking allocation includes 1,044 residential visitor parking spaces and 186 non-residential (retail) parking spaces.

Parking for the development is to be provided within below-grade parking facilities across the three blocks with development. Surface vehicular parking spaces will be dedicated to pick-up and drop-off facilities to accommodate short-term deliveries, passenger pick-up and drop-off, and occasional short-term maintenance vehicle needs.

The proposed parking supply meets the proposed parking ratios and will appropriately meet the parking related needs of the Site.

6.2.1 Accessible Parking

The Town of Oakville Zoning By-law 2014-014 requires that accessible spaces be provided for non-residential uses at a minimum rate of 11 spaces plus 1% of the total number of non-resident parking spaces, for a parking supply greater than 1,001 spaces. Furthermore, the By-law states that where there are an even number of total accessible parking spaces, an equal number of Type 'A' and Type 'B' spaces must be provided, and in the case of an odd number of accessible parking spaces an additional Type 'B' space shall be provided. Both types must include a 1.5-metre pedestrian aisle adjacent to the accessible space. The two types of spaces must adhere to the following dimensions:

- Type A space: 5.7 metres (length) x 3.65 metres (width)
- Type B space: 5.7 metres (length) x 2.7 metres (width)

The proposed accessible parking supply will comply with the Zoning By-law dimensional requirements. Furthermore, accessible parking spaces are proposed to be provided within the below-grade parking facilities and will be located nearest to the elevator cores.

Details regarding the supply and location of accessible parking for the Site will be finalized as part of the Zoning Bylaw and Site Plan Approval processes.

6.3 Adequacy of Proposed Parking Supply

The following sections provide an overview of the adequacy of the recommended parking supply. Adoption of a reduced residential parking minimum standard is considered appropriate based upon the following considerations:

- Provincial and local policy / plan that direct municipalities to reduce or eliminate minimum parking requirements;
- Existing and planned higher-order transit and active transportation facilities in the area;
- Review of other residential parking By-law standards across the Greater Toronto and Hamilton Area (GTHA) and Ontario; and
- TDM measures for the Site will influence parking demand on-Site and in the wider area.

6.3.1 Resident Parking Assessment

The following provides an overview of the contextual factors influencing parking demand at residential developments in the Mid-Town Oakville area and the appropriateness of the proposed reduced parking supply of **0.50 spaces per unit**.

6.3.1.1 PLANNING POLICY AND PLANNING PRINCIPLES

There are many provincial plans and local policies that provide a framework to guide development in Ontario municipalities. These plans and policies often contain direction with regards to development along transit corridors, commenting on parking standards and the future regulations of parking minimums.

As outlined in **Section 3.0** there are several provincial, regional, and local area policy documents that pertain to the Site, including the Provincial Policy Statemen t (2024); MTO Transit Supportive Guidelines. The Site development incorporates the policy direction of these documents by incorporating a mix of uses, greater density and reduced parking standards based on the Site's proximity to existing and planned transit corridors and the implementation of transportation demand management ('TDM') strategies as part of the development. The recent Bill 185 implications on vehicular parking within PMTSA's, reducing the "required" vehicular parking to zero is also taken into account in the recommended minimum residential parking of 0.5 parking spaces per unit by recognizing that a practical need for parking is required, and providing what is intended to be a balance between reducing the vehicular travel demands associated with private vehicle travel and accommodating a vehicle ownership characteristics that will have to address the marketing aspects of high density residential housing. Consdieration for a further reduction could be accommodated should the marketing of housing reflect lower demands by the ultimate occupants of the proposed development. This could be further reviewed through Zoning and Site Plan processes yet to occur.

6.3.1.2 AREA TRANSPORTATION CONTEXT

The Site is well situated in the Midtown Oakville area to take advantage of a diverse set of multi-modal mobility characteristics. The Site is located approximately 800 metres to 1.1 km away from the Oakville GO Station (depending on whether the Oakville GO Station is expanded eastward across Trafalgar Road). This provides convenient access to local and regional transit connections. In addition to the proximity to the Oakville GO Station, there is a planned Trafalgar BRT service that will literally pass through the Site offering direct higher-order transit service to all three development blocks, a direct connection to the Oakville GO Station and Oakville Transit Terminal, as well as other regional transit connections via the Trafalgar BRT linkages to the planned Dundas BRT and its regional network connections. A further discussion of the existing transit context is outlined in **Section4.2**.

As outlined in **Section 4.3** and **Section 4.4** there are also significant pedestrian and cycling improvements planned for the area, which will facilitate a shift away from reliance upon the private automobile to transit and active transportation modes.

6.3.1.3 REVIEW OF RESIDENTIAL ZONING BY-LAW STANDARDS

A comprehensive Zoning By-law review has been undertaken which compares parking standards adopted across numerous municipalities across the GTHA and eastern Ontario with comparable transit access to the Site. The selection of municipalities was primarily based on certain urban characteristics, including density and intensification patterns, conventionally auto-centric network, and a diversity of transit services available in the area. These minimum parking requirements reflect evolving transit contexts, mixed-use environments, and the emergence of alternative modes of travel.

A summary of resident Zoning By-law rates for comparable Ontario municipalities are provided in **Table 9**.

Table 9 Residential Parking Supply Ratio Requirements – Comparable Ontario Municipalities

Municipality	Zoning By-law	City Area	Land Use Category	Nearby Transit	Minimum Resident Parking Requirement
Site	--	**Midtown**	**Mixed-Use Building**	• Oakville Local Bus Routes, • GO Train (Lakeshore West Line) • Future Dundas and Trafalgar BRT	**0.50 spaces / unit**
Mississauga	By-law 0225-2007	Precinct 1	Condo / Rental Apartment	• MiWay Bus • Mississauga Transitway • MiWay Express Bus • GO Bus • Future Hazel McCallion LRT	**0.80 spaces / unit**
	Undergoing City staff investigation	Along future Hazel McCallion LRT	--		**In 2024, the City of Mississauga's Council approved reducing minimum residential parking requirements along the future Hazel McCallion Light Rail Transit line.**
Vaughan	By-law 001-2021 (Passed)	VMC	Apartment Dwelling	• TTC Bus / Subway • GO Bus / Train • YRT Bus • YRT Viva BRT	**0.40 spaces / unit**
Toronto	By-law 569-2013	Parking Zone A & B	Mixed-Use Building	• TTC Bus / Subway / Streetcar • GO Bus / Train • Miway Bus • Future TTC Subway • Future TTC Streetcar • Future TTC BRT	**No Minimum**
Brampton	By-law 270-2004	Central Area / Downtown	Apartment Dwelling	• GO Bus / Train • Brampton Bus • Brampton ZUM BRT • Future Hazel McCallion LRT	**No minimum**
Ottawa [1]	By-law 2008-250	Area "X"	Mixed-Use Building	• O-Train LRT • OC Transpo Rapid Bus • OC Transpo Frequent Bus	**0.0 to 0.5 spaces / unit**
Kingston	By-law 2022-62	Parking Area 1 (Downtown)	Mixed-Use Building	• Kingston Transit Express Bus • Kingston Transit Bus	**0.40 spaces / unit**
Kitchener	By-law 2019-051	Urban Growth Centre	Multiple Residential Buildings	• GO Bus / Train • GRT bus • GRT Ixpress Bus • GRT ION LRT	**No Minimum**
Bill 185 (received Royal Ascent June 6, 2024)					**Zero Parking Requirement in PMTSA's**

Notes:
1. Along select streets within Central Ottawa and where the nearest active entrance of a mixed-use building is within 400 metres or less of a rapid transit station, the City of Ottawa Zoning By-law 2008-250 has no minimum resident parking standards for mixed-use buildings. Otherwise, a minimum standard of 0.5 spaces per unit applies.

A number of municipalities (Brampton, Kitchener, Toronto, Ottawa) have adopted substantial reductions in their residential parking rates within their downtown areas to align with goals of reducing non-auto modes of travel and promote existing and planned investments to transit, cycling, and pedestrian infrastructure. For example, the City of Brampton removed minimum resident parking requirements in the City's Central Area / Downtown with the passing of their most recent zoning by-law, and in June 2023 the City of Mississauga's Council directed City staff to investigate the feasibility of eliminating minimum parking requirements along the future Hazel McCallion LRT line.

Given that the level of existing and planned future transit service levels across the municipalities highlighted in **Table 9** are comparable to that of Midtown Oakville, it is evident that the minimum parking requirements stipulated in the prevailing Zoning By-law 2014-014 exceed what is otherwise considered appropriate in comparable municipalities with a similar transit context. Collectively, the above indicates a general trend within municipalities across the GTHA and eastern Ontario to present a progressive outlook towards the provision of residential parking supply, particularly where transit and transportation context is, or is planned to be, conducive to non-automobile travel.

6.3.1.4 OBSERVED RESIDENT PARKING REDUCTION APPROVALS

Consistent with the trend of reduced parking standards, there is a demonstrated trend towards parking supply reductions across the broader Greater Toronto and Hamilton Area (GTHA) beyond their respective Zoning By-law standards. BA Group has reviewed approvals for developments near GO Stations (with comparable transportation contexts as the site) for which reduced resident standards have been provided by City Council as part of the Zoning By-law Amendment process, by the Committee of Adjustment as part of Minor Variance applications, or at the Ontario Land Tribunal (OLT), formerly known as the Ontario Municipal Board (OMB) and the Local Planning Appeal Tribunal (LPAT).

A summary of these GTHA-wide resident parking reduction approvals for proxy sites with similar or less transit-supportive contexts as the proposed development are provided in **Table 10**.

Table 10 Approved GTHA Wide Resident Parking Supply Reductions

Address	Nearest Major Transit Station	Approved Minimum Resident Parking Rate	Permission Through	Year of Approval
Proposed Development				
Proposed Development area	Oakville GO Station (~800 to 1.1 km from Proposed Development)	0.50 spaces / unit (proposed)	--	--
City of Mississauga				
151 City Centre Drive	City Centre Transit Terminal (~750m from site)	1-Bed – 0.62 spaces / unit 2-Bed – 0.72 spaces / unit	CoA File A355.21 (September 23, 2021)	2021
151 City Centre Drive	City Centre Transit Terminal (~750m from site)	0.62 spaces / unit	CoA File A308.23 (September 7, 2023)	2023
Block 8 Mississauga City Centre	City Centre Transit Terminal (~300m from site)	0.67 spaces / unit	CoA File A323.23 (December 2023)	2023
City of Hamilton				
90 Charlton Avenue West, 85 Robinson Street, and 220 Park Street South	Hamilton GO Centre Station (~700 m from site)	0.58 spaces / unit (effective)	Site-Specific By-law 14-118	2014
98 James Street South	Hamilton GO Centre Station (~150 m from site) West Harbour GO Station (~1.5km from site)	0.47 spaces / unit	Site-Specific By-law 15-024	2015
108 James Street North and 111 and 15 Hughson Street North	West Harbour GO Station (~850m from site)	0.50 spaces / unit	Site-Specific By-law 15-188	2015
71 Rebecca Street	Hamilton GO Centre Station (~750 m from site) West Harbour GO Station (~1.4km from site)	0.65 spaces / unit	Site-Specific By-law 18-293	2018
175 Catharine Street South and 117 Forest Avenue	Hamilton GO Centre Station (~350m from site)	0.65 spaces / unit	Site-Specific By-law 20-216	2020
600 James Street North	West Harbour GO Station (~900m from site)	0.58 spaces / unit	LPAT Case No. PL190517 Site-Specific By-law 21-053-LPAT	2021

Address	Nearest Major Transit Station	Approved Minimum Resident Parking Rate	Permission Through	Year of Approval
City of Pickering				
Universal City 2 & 3 (Bayly Street & Liverpool Road)	Pickering GO Station (~550 m from site)	0.74 spaces / unit	CoA File P/CA 60/19	2019
Universal City 6 (Bayly Street & Liverpool Road)	Pickering GO Station (~550 m from site)	0.71 spaces / unit	Site-Specific By-law 7810/21	2021
Universal City 4 & 5 (Bayly Street & Liverpool Road)	Pickering GO Station (~550 m from site)	0.65 spaces / unit	Site-Specific By-law 7936/22	2022
Universal City 7 (Bayly Street & Liverpool Road)	Pickering GO Station (~550 m from site)	0.65 spaces / unit	Site-Specific By-law 7924/22	2022
PTC Phase 1	Pickering GO Station (~750 m from site)	0.65 spaces / unit	Site-Specific By-law 7981/23	2023
1786-1790 Liverpool Road	Pickering GO Station (~700 m from site)	0.55 spaces / unit	Site-Specific By-law 8023/23	2023
City of Vaughan				
Transit City 3 [1] (Millway Avenue & Portage Parkway)	Vaughan Metropolitan Centre Subway Station (~450 m from site)	0.33 spaces / unit	Site-Specific By-law 096-2018	2018
Transit City 4-6 [1] (Jane Street & Portage Parkway)	Vaughan Metropolitan Centre Subway Station (~400 m from site)	0.41 spaces / unit	Site-Specific By-law 071-2019	2019
101 Edgeley Boulevard [1] (Block A5)	Vaughan Metropolitan Centre Subway Station (~550 m from site)	0.18 spaces / unit	Site-Specific By-law 124-2021	2021
VMC Block 3 South (Interchange Way and Commerce Street)	Vaughan Metropolitan Centre Subway Station (~700 m from site)	0.30 spaces / unit	Site-Specific By-law 147-2022	2022
North-East Corner of Highway 7 and Commerce Street (Block E2)	Vaughan Metropolitan Centre Subway Station (~550 m from site)	0.18 spaces / unit	Site-Specific By-law 151-2022	2022
7800 Jane Street	Vaughan Metropolitan Centre Subway Station (~250 m from site)	0.37 spaces / unit	Site-Specific By-law 153-2022	2022
216 & 220 Doughton Rd	Vaughan Metropolitan Centre Subway Station (~700 m from site)	0.35 spaces / unit	Site-Specific By-law 155-2022	2022

Cities such as Hamilton, Pickering, and Vaughan have shown flexibility and pragmatism in adapting to the evolving transportation landscape as options become available to residents that were not available at the time when the Zoning By-law was enacted. For example, within the City of Pickering near the Pickering GO Station / Pickering Town Centre, decreasing parking supplies have been observed relative to the by-law requirement as the population continues to grow and as transit services levels continue to improve within its urban area. A review of these approvals, shown in **Table 10** illustrates a significant decline in resident parking rates over the last four years as there has been a reduction of 0.19 spaces per unit from 2019 to 2023.

Furthermore, this review of reduced parking approvals illustrates how numerous municipalities across the GTHA continue to approve resident parking standard reductions from their Zoning By-law standards, even for standards updated recently. For example, in 2023, the City of Mississauga approved a parking reduction of 0.62 spaces per unit (from 0.80 spaces per unit) for 151 City Centre Drive, a site located approximately 750 metres from the City Centre Bus Terminal. This approval represents a reduction of approximately 23% from the by-law standard. Furthermore, the applicable by-law standard of 0.80 spaces per unit was already the updated and reduced standard which the City of Mississauga passed in 2021. Therefore, it is not uncommon for municipalities to approve reduced resident parking rates from their Zoning By-law, even for standards updated recently.

In addition, the City of Pickering approved a resident parking reduction of 0.55 spaces per unit (from 0.80 spaces per unit) at 1786-1790 Liverpool Road, representing a reduction of approximately 38% from the by-law standard.

Further in the City of Vaughan, VMC Block 3 South and 216 and 220 Doughton Road are approximately 700 metres from the Vaughan Metropolitan Centre (VMC) subway station and were approved with a minimum resident parking requirement of 0.30 and 0.35 spaces per unit, respectively. By way of comparison, the proposed development is within 800 m to 1.1 km of the existing Oakville GO Station. As such, the proposed development may be considered comparable to some degree to these VMC sites, further considering its future evolving area and mobility context, recognizing new cycling and pedestrian infrastructure and intensification policies on local and regional levels. Moreover, it is appropriate to compare the VMC sites and the proposed TOC Development as they share comparable distances to higher-order transit facilities and similar access to comparable transit reach envelopes. As such, the proposed resident parking rate is viewed as proportionate to the parking approvals observed at other progressive centre areas, such as the VMC.

Overall, approved resident parking rates for comparable transit-oriented approvals within the GTHA range from 0.18 spaces per unit to 0.74 spaces per unit. The proposed minimum resident rate (0.50 spaces per unit) is within this range and is, therefore, considered appropriate for the proposed development's existing and, most notably, future transportation context.

6.3.1.5 RESIDENTIAL BASED TRANSPORTATION DEMAND MANAGEMENT (TDM) STRATEGIES

As discussed in detail in **Section 9.0**, a TDM Plan for the Site is proposed to guide the provision of viable, alternative personal transportation options beyond the single-occupant, private automobile. The objective is to encourage the use of active and sustainable transportation modes, respond to the mobility needs of site residents, and reduce dependence on automobiles, while being flexible to be able to adapt to future mobility needs and a long-term phased development plan.

The future Site area context provides frequent, public transit services and improved pedestrian and cycling connectivity. The TDM Plan supplements and further leverages the physical infrastructure and attributes of the Site area with a goal of reducing or minimizing auto-mode share. The proposed residential-based TDM strategies include, but are not limited to the following:

- Provision of a reduced resident parking supply;
- Provision unbundled parking from unit cost;

- Provision of convenient pick-up and drop-off facilities within and around the development blocks to facilitate passenger pick-up and drop-off via shared use mobility services, short-term small scale residential deliveries (substituting for vehicular shopping trips);
- Consideration of internal residential building facilities to facilitate the secure drop-off of small parcels, packages, and potentially food deliveries;
- Consideration to provide car share spaces on Site;
- Consideration to provide an annual car share membership for each residential unit;
- Provision of the required long-term bicycle parking supply, meeting the Zoning By-law standards;
- Consideration to provide a private bike share stations on Site;
- Consideration of a range of bike parking facilities for long term resident needs, such as cargo bike parking;
- Provision of bicycle repair stations;
- Consideration to provide private or shared micromobility devices; and;
- Provision of direct pedestrian and cycling connections to building entrances, bicycle parking facilities, nearby transit stops, and the external / public network.

Overall, the proposed TDM strategies complement the Site's resident parking reduction. It is noted that the reduced parking supply is, in and of itself, considered one of the most effective TDM strategies that can be implemented for residential developments. In addition, the overall TDM strategies are supportive of and conform to the current and evolving policies discussed in **Section 9.0**. As such, the proposed resident parking reduction can be appropriately accommodated through the proposed resident-based TDM strategies.

6.3.2 Non-Residential Parking Assessment

The following provides an overview of the contextual factors influencing parking demand in the Mid-Town Oakville area and the appropriateness of the proposed reduced residential visitor supply of **0.15 spaces per unit**.

6.3.2.1 PLANNING POLICY AND PLANNING PRINCIPLES

Similar to the resident parking assessment, the applicable provincial, regional, and local policies demonstrate increasing efforts to reduce auto-related trips for non-resident travel. Overall, increasing efforts and investments are being made to change the travel behaviour of future site visitors.

As discussed in **Section 3.0** and **Section 6.3.1.1**, Provincial policy documents such as the Provincial Policy Statement (PPS), the Growth Plan for the Greater Golden Horseshoe, Provincial Planning Statement, and the Ontario Ministry of Transportation Transit-Supportive Guidelines, support the use of appropriate development standards and TDM measures, such as reduced parking standards, to facilitate intensification and support transit-supportive development within site areas. In addition, Metrolinx policy documents, including the 2041 Regional Transportation Plan, Mobility Hub Guidelines, and the GO Rail Station Access Plan, prioritize the intensification of development near transit and the creation of a multi-modal regional transportation system. As such these documents directly state the potential to reduce and potentially remove minimum parking requirements in transit-supportive areas while also providing direction to improve the accessibility of regional transit, including the Oakville GO Station and the designated PMTSA. As such, these documents support the reduced non-residential parking standards.

Overall, a common theme across provincial and regional policy documents is to encourage the reduction of auto-related trips and increase the modal share of more active forms of transportation. The provision reduced visitor and non-residential parking standards encourages visitors to utilize more transit oriented and active forms of transportation to travel to and from the Site, thereby facilitating intensification and supporting the transit and active transportation investments being made within the Site area.

6.3.2.2 EVOLVING AREA TRANSPORTATION CONTEXT

As described in **Section 4.0** and **Section 6.3.1.2** the Site area is in close proximity of the Oakville GO Station and existing and future Oakville Transit bus stops. It will also benefit from various planned improvements to the local area road, transit, cycling, and pedestrian networks as part of the Midtown Oakville OPA and Metrolinx BRT projects. These improvements showcase the Town's direction towards prioritizing non-auto modes of travel and increasing the mode share of transit and active transportation, of which the reduced non-resident parking spaces would align with.

6.3.2.3 REVIEW OF RESIDENTIAL VISITOR ZONING BY-LAW STANDARDS

In addition to the resident parking standards reviewed in **Section 6.3.1.3**, a comprehensive Zoning By-law review was also undertaken to compare residential visitor parking standards adopted across numerous municipalities in Ontario with comparable transit access to the proposed site, summarized in **Table 11**. The selection of municipalities was primarily based on certain urban characteristics, including density and intensification patterns, conventionally auto-centric network, and a diversity of transit services available in the area.

Several municipalities across Ontario have approved relatively low parking standards for residential visitor parking within their respective Zoning By-laws. These reduced minimum parking requirements reflect evolving transit contexts, mixed-use environments, and the emergence of alternative modes of travel.

Overall, the range of minimum resident visitor parking standards was observed to be between 0 to 0.20 spaces per unit. As such, the ratio of 0.15 spaces per unit proposed for the Site is within the range observed for contemporary zoning standards across the GTHA and southern Ontario.

This indicates a general trend within municipalities across the GTA towards a progressive outlook towards the provision of residential visitor parking supply, particularly where transit is existing or planned, conducive to non-automobile travel. Within many of these observed municipalities, the existing and planned transit context is comparable or less than those available near the Site.

Table 11 Residential Visitor Parking Supply Requirements – Comparable Ontario Municipalities

Municipality	Zoning By-law	City Area	Land Use Category	Nearby Transit	Minimum Visitor Parking Requirements
Site	--	**Midtown**	**Mixed-Use Building**	• Oakville Local Bus Routes • GO Train • Future Dundas & Trafalgar BRT	**0.15 spaces / unit**
Barrie	Draft Zoning By-law (June 2023)	District 1 District 2	Any Dwelling Unit	• GO Train • Barrie Transit Bus	**0.10 spaces / unit**
Mississauga	By-law 0225-2007	Precinct 1	Condo / Rental Apartment	• MiWay Bus & Express Bus • Mississauga Transitway • GO Bus / Train • Future Hurontario LRT • Future Lakeshore BRT	**0.20 spaces / unit**
		City Centre	Apartment Dwelling		**0.15 spaces / unit**
Pickering	By-law 7553-17	City Centre	Apartment Dwelling	• Durham Region Transit Bus • GO Train Future Durham-Scarborough BRT	**0.15 spaces / unit**
Waterloo	By-law 2018-050	Residential Mixed-Use Zones (Parking Area A)	Residential	• Grand River Bus • Grand River ION LRT • GO Bus / Train	**0.10 spaces / unit [1]**
Vaughan	By-law 001-2021	VMC	Apartment Dwelling	• YRT Bus & Viva BRT • GO Bus / Train • TTC Bus / Subway	**0.15 spaces / unit**
	Yonge-Steeles Secondary Plan (OLT)	Yonge-Steeles	Apartment Dwelling	• YRT Bus & Viva BRT • GO Bus • TTC Bus / Subway • Future Yonge North Subway Extension	**0.15 spaces / unit**
Toronto	By-law 569-2013	Parking Zone B	All non-residential uses	• TTC Bus / Subway / Streetcar • GO Bus / Train • Miway Bus • Future TTC Subway • Future TTC Streetcar	**2 spaces + 0.05 spaces / unit**
Kingston	By-law 2022-62	Parking Area 1 (Downtown) & Parking Area 2 (Main Street Corridor)	Mixed-Use Building	• Kingston Transit Bus • Kingston Transit Express Bus	**0.10 spaces / unit**
Hamilton	By-law 05-200	Downtown Zone	Multiple Dwelling	• HSR Bus • Future B-Line LRT • Future A-Line BRT • GO Bus / Train	**Inclusive of minimum resident rate**
Kitchener	By-law 2019-051	Urban Growth Centre / Downtown	Multiple Residential Buildings	• Grand River Bus • Grand River ION LRT • GO Bus / Train	**No minimum**

Municipality	Zoning By-law	City Area	Land Use Category	Nearby Transit	Minimum Visitor Parking Requirements
Brampton	By-law 270-2004	Central Area / Downtown	Apartment Dwelling	• Brampton Bus • Brampton ZUM BRT • GO Bus / Train • Future Hurontario LRT	**0.20 spaces / unit**
Bill 185 (received Royal Ascent June 6, 2024)					**Zero Parking Requirement in PMTSA's**

Notes:

1. The City of Waterloo Zoning By-law 2018-050 provides parking standards for each Residential Mixed-Use (RMU) Zone. As such, the range of parking standards across the various RMUs is reported in this table.

6.3.2.4 OBSERVED RESIDENTIAL VISITOR PARKING REDUCTION APPROVALS

Consistent with the trend of reduced residential visitor parking standards, there is a demonstrated trend towards parking supply reductions across the broader Greater Toronto and Hamilton Area (GTHA) beyond their respective Zoning By-law standards. BA Group has reviewed approvals for developments near GO Stations (with comparable transportation contexts as the site) for which reduced residential visitor standards have been provided by City Council as part of the Zoning By-law Amendment process, by the Committee of Adjustment as part of Minor Variance applications, or at the Ontario Land Tribunal (OLT), formerly known as the Ontario Municipal Board (OMB) and the Local Planning Appeal Tribunal (LPAT). The residential visitor parking approvals that are under review are for sites specifically within the Cities of Mississauga and Brampton where they have a minimum residential visitor parking rate of 0.20 spaces per unit and a further reduced rate of 0.15 spaces per unit was approved. These sites provide the best comparison given that the proposed site is proposing a 0.15 spaces per unit ratio within Oakville which has a minimum residential parking requirement of 0.20 spaces per unit.

A summary of these residential visitor parking reduction approvals for proxy sites with similar or less transit-supportive contexts as the proposed development are provided in **Table 12**.

Table 12 Approved GTHA Wide Residential Visitor Parking Supply Reductions

Address	Nearest Major Transit Station	Approved Minimum Residential Visitor Parking Rate	Permission Through	Year of Approval
Proposed TOC Development				
Proposed Development Area	Oakville GO Station (~800 to 1.1 km from site)	0.15 spaces / unit (proposed)	--	--
City of Mississauga				
78 Park Street East and 22 – 28 Ann Street	Port Credit GO Station (~80 m from site)	0.10 spaces / unit	CoA File: A413.20 Site-Specific Zoning By-law 0054-2020	2020
86 Dundas Street East	Cooksville GO Station (~1 km from site)	0.15 spaces / unit	CoA File: A51/21	2021
70 Mississauga Road South & 181 Lakeshore Road West	Port Credit GO Station (~1.3 km from site)	0.15 spaces / unit	CoA File: A226/21	2021
180 Rutledge Road	Streetsville GO Station (~1 km from site)	0.10 spaces / unit	CoA File: A185/23	2023
City of Brampton				
245 Steeles Avenue West (Phase 1)	Brampton Innovation GO Station (~3.3km from site)	0.15 spaces / unit	CoA Application No. A-2022-0023	2022
Block 7 (Mount Pleasant Area)	Mount Pleasant GO Station (~200 m from site)	0.15 spaces / unit	OMB Cases: PL160478 & PL160479	2017
2 & 4 Hanover Road	Bramalea GO Station (~3.4km from site)	0.14 spaces / unit	Site-Specific Zoning By-law 48-2020	2020
80 Scott Street	Brampton Innovation GO Station (~650 m from site)	0.15 spaces / unit	Site-Specific Zoning By-law 140-2020	2020
499 Main Street South (Shoppers World Brampton)	Brampton Innovation GO Station (~3.3km from site)	0.15 spaces / unit	Site-Specific Zoning By-law 228-2020	2020

6.3.2.5 REVIEW OF NON-RESIDENTIAL ZONING BY-LAW STANDARDS

A comprehensive Zoning By-law comparison review for non-residential parking standards was also undertaken and is summarized in **Table 13**.

Similar to **Section 6.3.2.3,** several municipalities across Ontario have approved relatively low parking standards for non-residential parking within their respective Zoning By-laws.

Overall, the range of minimum non-residential parking standards was observed to be between 0.00 to 4.50 spaces per 100 m^2 of non-residential GFA. As such, the proposed rate of 1.08 spaces per 100 m^2 of non-residential NFA proposed for the site is within the range observed across the GTHA and southern Ontario.

The above indicates a general trend within municipalities across the GTA towards a progressive outlook towards the provision of a non-residential parking supply, particularly where transit and transportation context exists or is planned, conducive to non-automobile travel. Within many of these observed municipalities, the existing and planned transit context is comparable or less than those available near the Site.

Table 13 Non-Residential Parking Supply Requirements – Comparable Ontario Municipalities

Municipality	Zoning By-law	City Area	Land Use Category	Nearby Transit	Minimum Parking Requirements
Site	--	**Midtown**	**Mixed-Use Building**	• Oakville Local Bus Routes • GO Train • Future Dundas & Trafalgar BRT	**1.08 spaces / 100 m^2 (for all non-residential uses)**
Barrie	Draft Zoning By-law (June 2023)	District 1 District 2	All non-residential uses	• GO Train • Barrie Transit Bus	**No minimum**
Mississauga	By-law 0225-2007	Precinct 1 [1]	Retail	• MiWay Bus & Express Bus • Mississauga Transitway • GO Bus / Train • Future Hurontario LRT • Future Lakeshore BRT	**3.00 spaces / 100 m^2**
Pickering	By-law 7553-17	City Centre	Retail	• Durham RT Bus • GO Train • Future Durham-Scarborough BRT	**3.50 spaces / 100 m^2**
Vaughan	By-law 001-2021	VMC	Retail [2]	• YRT Bus & Viva BRT • GO Bus / Train • TTC Bus / Subway	**0.70 spaces / 100 m^2**
Toronto	By-law 569-2013	Parking Zone B	All non-residential uses	• TTC Bus / Subway / Streetcar • GO Bus / Train • Miway Bus • Future TTC Subway • Future TTC Streetcar	**No minimum**
Kingston	By-law 2022-62	Parking Area 1 (Downtown) & Parking Area 2 (Main Street Corridor)	Retail & Commercial	• Kingston Transit Bus • Kingston Transit Express Bus	**No minimum**
Hamilton	By-law 05-200	Downtown Zone	Retail & Commercial	• HSR Bus • Future B-Line LRT • Future A-Line BRT • GO Bus / Train	**No minimum**
Kitchener	By-law 2019-051	Urban Growth Centre / Downtown	Retail	• Grand River Bus • Grand River ION LRT • GO Bus / Train	**No minimum**

Municipality	Zoning By-law	City Area	Land Use Category	Nearby Transit	Minimum Parking Requirements
Brampton	By-law 270-2004	Central Area / Downtown	Retail	• Brampton Bus • Brampton ZUM BRT • GO Bus / Train • Future Hurontario LRT	**4.50 spaces / 100 m^2**
Bill 185 (received Royal Ascent June 6, 2024)					**Zero Parking Requirement in PMTSA's**

Notes:

1. Shared parking calculations allow for visitor parking to accommodate non-residential uses as an option for providing non-residential parking.
2. Retail parking rate applies to establishments less than 5,000 m^2 of GFA.

6.3.2.6 APPLICATION OF THE PRINCIPLE OF SHARED PARKING AND ON-SITE RETAIL MARKET

The principle of shared parking will be applied to the vehicular parking supply provided within the underground parking garages within each development block.

The shared parking principle takes advantage of the temporal parking characteristics associated with the non-residential parking demands that will be experienced by the proposed land uses. The residential visitor and retail parking demands will tend to peak at different times through the weekday and weekend periods. Visitor parking tends to peak later in the day on both weekdays and weekends. While the typical retail that would be contemplated within the proposed development will tend to peak earlier in the day.

This will enable segments of the visitor parking supply to supplement the retail parking supply that is proposed.

Similarly, the demand for both visitor parking and for retail parking will be replaced, to a certain degree, by active transportation modes given the relatively significant amount of residential development and the associated population that will serve as an implicit market for the retail uses. Furthermore, with the eventual development of further residential uses within the Midtown Oakville area, additional market sources will be introduced to support the retail (and other non-residential) land uses.

The combined effects of the shared parking principle and the presence of an on-site retail market will serve to reduce the overall non-residential parking demands associated with the proposed development.

6.3.2.7 REVIEW OF PICK-UP AND DROP-OFF CONDITIONS IN URBAN INTENSIFICATION AREAS

BA Group has reviewed vehicular pick-up and drop-off conditions at residential developments in intensification areas to understand a general order of magnitude of the scale of accumulated vehicular pick-up and drop-off conditions at peak times. Pick-up / Drop-off activity generally includes passenger or parcel / food pick-up and drop-off trips near building entrances (given the desire to get close to the subject building).

In general, the rate of pick-up and drop-off activity at residential buildings amounts to an approximate vehicular accumulation of between 0.005 and 0.008 vehicles per unit. The Site plans for the various development blocks include pick-up and drop-off facilities on-site within each Block, and within planned on-street publicly available lay-by parking. This is intended to accommodate all, or the majority of pick-up and drop-off activity associated with the residential and non-residential activity within each Block. This would tend to mitigate impacts generally within the extended Midtown Oakville area and within the Oakville GO Station vicinity.

The planned public streets that abut the proposed development blocks are capable of accommodating lay-by parking within the planned rights-of-way. The precise location and configuration of the lay-by parking will be coordinated with Town of Oakville transportation and urban design staff as the Midtown Oakville public street network design is further advanced.

6.3.2.8 NON-RESIDENTIAL BASED TRANSPORTATION DEMAND MANAGEMENT (TDM) STRATEGIES

As discussed in detail in **Section 9.0**, a TDM Plan for the Site area is proposed to guide the provision of viable, alternative personal transportation options beyond the single-occupant, private automobile. The objective is to encourage the use of active and sustainable transportation modes, respond to the mobility needs of site residents and reduce dependence on automobiles. The future site context provides frequent, public transit services and improved pedestrian and cycling connectivity. The TDM Plan further leverages the physical infrastructure and attributes of the site area with a goal of reducing or minimizing auto-mode share. The proposed non-residential-based TDM strategies include, but are not limited to, the following:

- Provision of a reduced non-resident parking supply; and
- Provision of the required short-term bicycle parking supply, meeting the Zoning By-law standards.
- The location of the proposed development within Midtown Oakville provides for an implicit market to support non-residential land uses. As such, mobility needs of the planned non-residential uses will be accommodated by active transportation modes, offsetting what would otherwise by vehicular travel needs.

6.4 Parking Summary

It is proposed to provide a reduced vehicular parking supply relative to the requirements stipulated in Town of Oakville's Zoning By-law 2014-014. The current proposal includes a total of 4,707 parking spaces for the Site, including 3,477 residential spaces and 1,230 non-residential parking spaces; i.e., shared between residential visitor. The appropriateness of the proposed parking standards, for all uses, are summarized in **Table 14**.

Table 14 Summary Parking Rationale

Theme / Initiative	Description	
	Resident	Non-Resident
Site	Proposed Resident Rate: **0.50 spaces / unit**	Proposed Residential Visitor Rate: **0.15 spaces / unit** Proposed Non-Residential Rate: **1.08 spaces per 100 m^2**
Ontario Bill 185	Application of Bill 185 and the provisions which amend the Planning Act result in vehicular parking requirements of **zero parking spaces** for both the resident parking and visitor parking components **(i.e., 0 parking spaces / unit)** as well as for the non-residential land use components (**0 parking spaces per 100 m^2 of GFA**) of the development proposal.	
Progressive Inter-Governmental Policy Context	Existing and evolving provincial, regional, and local policies prioritize sustainable travel choices over automobiles, supporting the use of parking management strategies and reduced minimum parking requirements.	
Availability of Non-Automobile Travel Options	The Site is in close proximity to existing and planned higher-order transit services, bicycle and pedestrian route facilities, and various transportation improvements that encourage non-automobile dependent travel across the Town and Region.	
Comparison of Zoning By-laws across Ontario	Resident Zoning By-law Range: **0.00 - 0.80 spaces / unit**	Residential Visitor Zoning By-law Range: **0.0 - 0.20 spaces / unit** Non-Residential Zoning By-law Range: **0.00 – 4.50 spaces / 100 m^2 GFA**
On-site or Development frontage PUDO facilities	The Site will be providing either on-site or facilitating on-street pick-up and drop-off (PUDO) facilities within each Block. This will accommodate all or the majority of pick-up and drop-off activities, mitigating impact on the broader Midtown Oakville area and the Oakville GO Station operations.	
TDM Strategies	The proposed comprehensive TDM strategies encourage the use of sustainable transportation modes, reducing reliance on private automobile ownership and usage for both residents and visitors.	

7.0 BICYCLE PARKING CONSIDERATIONS

7.1 Bicycle Parking Requirements

The Site is subject to the minimum bicycle parking requirements of the Town of Oakville Zoning By-law 2014- 014. Application of the minimum bicycle parking requirements based on this Zoning By-law is summarized in **Table 15**.

A total of 6,955 bicycle parking spaces are required for residential uses, including 5,216 spaces located in secure, weather-protected areas for long-term residential use, and 1,739 spaces located in convenient accessible locations for short-term use by residential visitors. In addition, 8 bicycle parking spaces are required for retail / commercial uses on Site.

Table 15 Zoning By-law 2014-014 Bicycle Parking Requirements

Land Use	Units / NFA	Type	Minimum Rate	Minimum Requirement
Residential				
Block 1	2,746 units	Long-Term	0.75 spaces / unit	2,060 spaces
		Short-Term	0.25 spaces / unit	687 spaces
Block 2	2,584 units	Long-Term	0.75 spaces / unit	1,938 spaces
		Short-Term	0.25 spaces / unit	646 spaces
Block 4	1,624 units	Long-Term	0.75 spaces / unit	1,218 spaces
		Short-Term	0.25 spaces / unit	406 spaces
Residential Long-Term Subtotal				*5,216 spaces*
Residential Short-Term Subtotal				*1,739 spaces*
Non-Residential				
Block 1	2,001 m²	Long-Term	Greater of 2 **or** 1 space / 1,000 m^2 NFA	3 spaces
Block 2	1,253 m²	Long-Term		2 spaces
Block 4	2,127 m²	Long-Term		3 spaces
Non-Residential Long-Term Subtotal				*8 spaces*
Site Total	**Residential Minimum Parking Requirement**			**6,955 spaces**
	Non-Residential Minimum Parking Requirement			**8 spaces**
	Total Minimum Bicycle Requirement			**6,963 spaces**

Notes:

1. Site statistics based on site plans prepared by Graziani + Corazza Architects, dated November 1, 2024.
2. As per Zoning By-law 2014-014 (Table 5.4.1) "Of the total number of bicycle parking spaces required (1.0 spaces/unit), 0.25 of the bicycle parking spaces required per dwelling shall be designated as visitors bicycle parking".
3. As per Zoning By-law 2014-014 (Section 5.1.5), should the calculation of the number of parking spaces required end in a fraction, the "the minimum number of spaces shall be increased to the next highest whole number if the fraction is greater than 0.25."

7.2 Proposed Bicycle Parking Supply

The proposed development includes the provision of a minimum of 6,963 bicycle parking spaces, consistent with the minimum requirements set out in Zoning By-law 2014-014.

A minimum of 5,216 long-term bicycle parking spaces will be provided for resident uses and will be located within secure weather-protected facilities located within the underground parking garage, at grade, or on the mezzanine level. A further minimum of 1,739 short-term (residential visitor) bicycle spaces will be provided on the Site. An additional further minimum of 8 bicycle parking spaces will be provided in close proximity to the non-residential (retail) land uses likely along the development frontage of the E-W Collector street.

Long-term bicycle parking is supplied in secure, weather protected internal rooms within each development Block. Access to the bike parking rooms would be via pass-card or key and be fitted with security features to ensure users are able to notify security should there be a need to. Separate rooms would be provided for the Resident and the Non-Resident long-term bike parking facilities.

Long-term bike parking can be located on the ground floor or below-grade or above-grade levels of each development Block buildings. Access is generally afforded via dedicated elevators so as not to conflict with main pedestrian elevators. Alternative means of access via parking ramps can be provided, however, ramp grades pose a challenge for the “up-ramp” direction and need to be designed accordingly, providing cyclists with added room on ramps to facilitate the slower and more challenging exiting experience.

Generally, and in keeping with the TDM plan strategies, a Bike Repair Station would also be contained within the Bike storage rooms. This enables minor repairs and tire inflation to occur conveniently where bikes are stored. The number and precise configuration of the bike repair stations will depend on the configuration and number of the internal bike storage rooms.

Short-term bike parking is generally contained outside and near visitor / customer entrances so as to be convenient and encouraging of their use. Some residential visitor bicycle parking will likely be located internal to the residential buildings, given the amount of visitor bike parking. Access to visitor internal bike parking storage areas will be coordinated with the architectural layout of the residential buildings and their podiums and will have access to external entrances. Security would be commensurate with the ultimately layout and characteristics of any internal visitor bike parking facilities.

8.0 SERVICE VEHICLE LOADING CONSIDERATIONS

8.1 Loading Requirements

The Town of Oakville's Zoning By-law 2014-014 does not include a requirement for a minimum number of loading spaces.

Zoning By-law 2014-014 (Section 5.6) does however require the following, where a loading space is provided:

- The minimum dimensions of a loading space are: 3.5 m width, 12.0 m length and 4.2 m vertical clearance
- A loading space shall abut the building for which the loading space is provided
- A loading space shall be set back 7.5 m from any Residential Zone, except if entirely within a structure.

8.2 Proposed Loading Strategy

Service vehicle loading is, notwithstanding the absence of a Zoning Bylaw requirement, a practical requirement for developments that reflect the kind of intensification that the development proposal reflects.

As such, loading has been evaluated within the context of the following principles:

- Refuse collection needs – driven by the Region of Halton requirements for dimensional standards;
- Resident move-in / move-out needs – driven in part by the scale of the scale development and the mix of non-residential uses;
- Delivery vehicle needs associated with the residential units; and,
- The needs of the non-residential land uses and their associated intensities.

Each residential tower generally would be assigned one (1) refuse collection loading space – commonly referred to as a Type G loading space. This is typically 13 m in length and an allowance of 6 m in width is made to accommodate not only the refuse collection vehicle itself, but also the spaces required around the vehicle for operations related to the collection of refuse in "bins" (bins that are typically collected by an overhead refuse collection vehicle). Additional 'bin-staging area' is provided and is directly related to the scale (number of units) of the residential development and that which is served by the Type G loading area. In some conditions, in order to be space efficient, Type G loading spaces can serve more than one building. This requires coordination in terms of the 'bin staging area" size and the schedule for refuse collection. This is something that is being considered within the proposed development Block 4 in order to ensure that the ground floor area within the component developments be best assigned between the "front of house" and "back-of house" uses that need to be on the ground level of the developments. A total of 15 loading spaces would be provided to accommodate the refuse collection needs of the 16 residential towers on the three development blocks.

Generally speaking, buildings with more than 400 units within them will also be assigned a second loading space that is generally used for the resident move-in / move-out needs. This activity is generally monitored by the building maintenance staff so that a schedule is established and an orderly use of this loading space is maintained. The current Master Plan layout adopts a flexible loading space configuration for each and every loading space provided. In addition to the 15 refuse collection loading spaces, a further 3 dedicated loading spaces are being provided on Block 4, given the layout of the block and the planned retail space contemplated for this Block (i.e., grocery store space plus general retail).

The refuse collection spaces on Blocks 1 and 2 are oversized relative to the Town's Zoning Bylaw requirements. A 6 m wide and 13 m long set of dimensions is currently provided for within the refuse collection loading spaces. Vertical clearances would be 7.5 m where refuse collection operations would be occurring within the loading areas, otherwise the balance of the loading areas would provide a 4.5 m vertical clearance. This "oversizing" is provided in order to offer the flexibility to accommodate multiple vehicles when refuse collection is not underway. During non-refuse collection periods of the week, deliveries and moving operations associated with the residential uses and deliveries to the non-residential uses will be users of these oversized loading areas. In Block 4, the type of retail contemplated, its layout, and the grading of the Block necessitated "grouping" some of the loading spaces to more efficiently allocate the required loading space and associated manoeuvring requirements. Some consolidation of refuse collection operations within Block 4 is planned in order to further economize on the impacts to ground floor layouts. Internal corridors within Block 4 would facilitate the movement of refuse bins to the appropriate loading space on collection days.

Given the "schedule" that is associated with the refuse collection loading spaces, and that it is generally the largest loading space assigned to a residential building, it will be "shared" by deliveries that are made to the residential building by trucks that are larger than a typical moving truck used by private residents. This sharing is subservient to the scheduled needs of the refuse collection by the Region of Halton; i.e., the refuse collection activities generally take precedent over any other use of the refuse loading space. Available "delivery" times can be made known to the residents of the development and tenants of the non-residential floor space.

The resulting loading facilities have been tested with representative design vehicles that meet the Region of Halton refuse collection vehicle dimensions and manoeuvring characteristics along with TAC SU design vehicles and typical "cube van" design vehicles to ensure that all loading spaces are practical and functional.

In addition, the loading areas that are provided are designed so that all vehicles can enter and leave each Block they serve in a forward motion. This ensures that the most efficient, functional and safe circumstance can be built into the proposed development plans.

Vehicle access to all loading facilities on each block is provided via the Site driveways for each respective development block. All delivery and service vehicles can be accommodated within the development blocks. The proposed loading spaces will meet or exceed the dimensional requirements set out in Zoning By-law 2014-014.

The location of the loading areas is illustrated in the Master Plan in **Appendix B**.

8.3 Height Clearances

The Region of Halton has specific vertical clearances for their refuse collection vehicles. A 7.5 m vertical height is provided where the refuse collection vehicle will be engaged in collecting and returning the "bins" to their staging area. Beyond this active loading space, a 4.5 m vertical clearance is provided to ensure that all service vehicle design vehicles are able to enter and exit the loading area without risk of coming into conflict with overhead features of the building (i.e., structural beams, electrical conduits, plumbing pipes, overhead doors, etc.).

8.4 Loading Summary

In summary, each building or group of buildings on development block, has been evaluated against the practical, functional, and policy requirements associated with the various types of loading operations that would be experienced on a daily basis.

The functional design of loading areas are tested, at a high level of functional review – given the Master Plan level of detail – with appropriate design vehicles and manoeuvring requirements to ensure that the resulting loading space is capable of accommodating the needs – based upon land uses, scale of development, and physical opportunities / constraints – of each individual development building and or Block. This ensures an efficient and compact development and safe Master Plan concept.

9.0 TRANSPORTATION DEMAND MANAGEMENT (TDM) PLAN

Transportation Demand Management (TDM) measures will be incorporated within the planned development to minimize the need for automobile travel to and from the site and to encourage and facilitate the use of non-automobile travel modes on a daily basis. The following outlines the proposed physical and operational strategies that complement the Site design with the goal of encouraging a shift in the travel pattern of future residents to sustainable modes of transportation while being flexible to adapt to future mobility needs and a long-term phased development plan.

The TDM Plan strives to reduce automobile use as a part of the design and construction of the development, as well as after construction as an on-going strategy by supporting and promoting the use of non-auto travel modes. The key objective of the TDM Plan is to reduce peak hour single occupant automobile traffic, to a certain degree, by focusing on four specific policy areas:

1. Encourage the use of alternative travel modes (transit, cycling, and walking);
2. Increase vehicle occupancy;
3. Shift travel to off-peak periods; and
4. Reduce vehicle kilometres travelled.

9.1 TDM Plan Strategies

The existing and future area context provides for excellent public transit services as well as travel by active transportation which will reduce the need of future residents of the site to travel using an automobile. Additional TDM strategies, which have been recommended as part of the proposed development are summarized in **Table 16**.

Based upon the site context and proposed land use, the recommended TDM strategies have been selected to further support non-automobile modes of travel. The measures fall into two general categories: a 'hard' or 'soft' measure. A 'hard' TDM measure is a physical infrastructure component, where the applicant or land developer is responsible for implementations. A 'soft' TDM measure is where the applicant or land developer is responsible for notifying a third party for implementations (i.e. Town Staff or Transit Agency). The following sections provide additional details regarding each recommended TDM strategy.

Table 16 Summary of Site TDM Measures

Measure	Type	Description	Objective
		Reduce Car Ownership	
Reduced Vehicular Parking Supply	Hard Measure	A reduced parking supply is proposed for the Site, in comparison with the minimum resident parking requirements outlined in Town Zoning By-law. • resident parking ratio = 0.50 space per unit; • visitor parking ratio = 0.15 spaces per unit; and, • non-residential parking ratio = 1.08 spaces per 100m2 NFA The future area context around the site's location will be rich in transit, cycling and close to key area destinations, which reduces the need to drive. **Providing less parking is a key component in reducing single occupant vehicle trips.** **Potential to gradually reduce parking ratios over time.**	Reduce auto-oriented dependence and the need for everyday travel. Promote non-auto modes of travel during peak travel periods. Adapt to evolving mobility needs over the long-term phased development plan.

Measure	Type	Description	Objective
Unbundled Parking	Soft Measure	Unbundling of unit leases and parking leases will benefit potential tenants who do not need or want parking space.	Reduce auto-oriented dependence and the need for everyday travel.
Car Share Spaces	Hard Measure	Consideration to provide car share spaces on Site through a car share provider. The number and details of the car shares spaces would be negotiated with a car share provider.	Promote alternative transportation service options besides car ownership.
Car Share Memberships	Hard Measure	Consideration to provide an optional annual car share membership per unit for the first year of occupancy.	
Parking Pricing	Hard Measure	Consider a paid parking operation for all non-resident parking, provided in a shared parking environment.	Influence travel mode choice.
Bicycle Use			
Bicycle Parking	Hard Measure	Provide bicycle parking in accordance with the Town standards. 1 space per/ unit split 75% occupant / 25% visitor. Provide bike parking for non-residential uses at a rate of 1/1000 m^2 NFA.	Make cycling an attractive option for travel during the peak travel periods.
Bicycle Repair Station	Hard Measure	Provide bicycle repair stations (one for each internal bike storage room) within the residential bicycle parking storage area on Site.	
Bicycle Parking - Range of Types	Hard Measure	Consider providing a range of bicycle parking facilities for long term residents' needs, such as Cargo Bike parking.	Increase the utility of bicycle travel for a variety of trip types.
Bike Share	Hard Measure	Consider providing private bike share stations, both regular and E-bike support, for residents and visitors of the Site.	Promote alternative transportation service options besides car ownership
Micromobility Use			
Private / Shared Micromobility Devices	Hard Measure	Explore the provision of micromobility devices (manual bikes, e-bikes, e-scooters, etc.) in concert with Town of Oakville policy review of micromobility to facilitate "last kilometer" trip making in the Midtown Oakville context	Promote alternative transportation service options besides car ownership
Transit Use			
Transit Information Centre	Hard Measure	Explore the provision of monitors displaying real-time transit information in the resident lobbies to assist residents taking local transit services (e.g., bus and streetcar routes) and using the GO Transit system.	Reduce car dependence and the need for everyday travel.
Travel Mode Information Package	Soft Measure	Implement marketing programs to ensure that new residents are aware of available modal choices in the area.	Promote transit travel during peak travel periods

Measure	Type	Description	Objective
Pedestrian Access and Walkability			
Pedestrian & Cycling Connections	Hard Measure	Provide direct connections to Davis Road, N-S Minor Arterial Street, and Cross Avenue, which connects pedestrians and cyclists to the surrounding area's bike lanes, Oakville Transit bus stops, and the Oakville GO Station. Ensure internal pedestrian connections facilitate anticipated desire lines within and between development blocks. Ensure continuous, safe, and direct pedestrian connections with enhanced pedestrian amenities (landscaping, benches, shade, etc.) are provided.	Make walking and cycling an attractive option for travel during peak travel periods.
Building Infrastructure			
Pick-up / Drop off Facilities	Hard Measure	Provision of convenient pick-up and drop-off facilities within and around the development blocks to facilitate passenger pick-up and drop-off via shared use mobility services, short-term small scale residential deliveries (substituting for vehicular shopping trips)	Facilitate alternative means of travel other than private auto – use of shared auto services – reduces parking.
Secure Internal Package Storage facilities	Hard Measure	Consideration of internal residential building facilities to facilitate the secure drop-off of small parcels, packages, and potentially food deliveries	Increase opportunities to use delivery services during all times of day/week.
Monitoring			
Monitoring program – travel modal split, parking demands, bicycle parking demands	Soft Measure	Implement a programme to monitor travel demand by mode as development is phased in over time. Respond to evolving demands and adjust mobility characteristics such as vehicular parking supply/configuration (review overall parking supply, adjust car-share resources) or bicycle parking supply/configuration (such as introducing and/or increasing cargo bike, e-Bike, or e-Scooter storage facilities).	Adapt to mobility changes over time with a view to reducing reliance on private vehicular use.
Communication			
Resident / Retail Tenant Information Meetings	Soft Measure	Arrange meetings of new residents or retail tenants to communicate the available mobility resources to accommodate daily needs. Organized by building management or concierge staff within individual buildings.	Ensure the resident and tenant populations are kept informed of mobility options as they evolve over time within Midtown.

10.0 MULTI-MODAL TRIP GENERATION

10.1 Forecasting Approach

Vehicle trip generation for the site has been established for each land use using trip generation rates from the 11th Edition of the ITE Trip Generation Manual. Multi-modal trip generation has been established using the vehicle trip generation and projected auto mode share and vehicle occupancy for Midtown Oakville.

Internal trip making between land uses (i.e. interactions) within the proposal development has been considered. The layout of the proposed development includes 3 mixed-use blocks, and it is expected that two types of internal interaction will occur: (1) interaction between the residential land uses and the retail uses within each block, and (2) interaction between the blocks. Interaction trips were calculated based on the interaction effects for each land use pairing as set out in NCHRP Report 684, the current standard for determining interaction rates. The resulting internal trip interactions considers the trip-making constraints at either trip end so as to not double count the remaining external trip making.

10.2 Gross Vehicle Trip Forecasting

Gross vehicle trip forecasting has been completed for the residential and retail uses of the development, as described in the following sections.

10.2.1 Residential Trip Generation

Vehicle trip generation rates for the residential uses across Blocks 1, 2 and 4 have been determined from the 11th Edition of the ITE Trip Generation Manual. In recognition of the site's proximity to the Oakville GO and ultimate buildout condition of Midtown Oakville, which will be a multi-use, 'complete' community, ITE Land Use Code 222: Multifamily Housing (High-Rise) for sites that are located in dense multi-use urban areas and are located close to rail transit was selected as the most appropriate vehicle trip generation rate for the ultimate buildout condition of the site. The selected rate for vehicle trip generation, and the expected number of gross residential vehicle trips are summarized in **Table 17**.

Table 17 Residential Gross Vehicle Trip Generation

Block	Units	AM Peak Hour			PM Peak Hour		
		In	Out	2-Way	In	Out	2-Way
ITE LUC 222: Multifamily Housing (High-Rise) (Dense Multi-Use Urban – Close to Rail Transit)		0.02	0.20	0.22	0.13	0.06	0.19
Block 1	2832	70	555	625	370	165	540
Block 2	2658	65	520	585	350	155	505
Block 4	1587	40	310	350	210	95	300
Total	**7077**	**175**	**1385**	**1560**	**930**	**415**	**1345**

The residential uses of the site are expected to generate 1,560 and 1,345 two-way gross vehicle trips during the morning and afternoon peak hours, respectively.

10.2.2 Retail Trip Generation

Vehicle trip generation for the retail uses across Blocks 1, 2, and 4 have been determined from the 11th Edition of the ITE Trip Generation Manual. The site plan currently proposes approximately 62,000 ft^2 of retail. The corresponding ITE trip generation rate (per 1000 ft^2 of retail GFA) and the resultant gross retail vehicle trips are summarized in **Table 18**.

Table 18 Retail Gross Vehicle Trip Generation

Block	GFA (ft^2)	AM Peak Hour			PM Peak Hour		
		In	Out	2-Way	In	Out	2-Way
ITE LUC 821: Shopping Plaza (40-150k ft^2)		1.07	0.66	1.73	2.54	2.65	5.19
Block 1	22946	25	15	40	60	60	120
Block 2	14654	15	10	25	35	40	75
Block 4	25090	25	15	40	65	65	130
Total	**62691**	**65**	**40**	**105**	**160**	**165**	**325**

The retail uses of the site are expected to generate 110 and 325 two-way gross vehicle trips during the morning and afternoon peak hours, respectively.

10.2.3 Summary of Gross Trip Forecasting

A summary of the gross trips generated by the residential and retail uses on the site is provided in **Table 19**.

Table 19 Site Gross Trip Generation

	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Residential Trips	175	1385	1560	930	415	1345
Retail Trips	65	40	105	160	165	325
Total Trips	**240**	**1425**	**1665**	**1090**	**580**	**1670**

The site is expected to generate 1,665 and 1,670 two-way gross vehicle trips during the morning and afternoon peak hours, respectively.

10.3 Interaction Considerations

Interaction effects are the result of individual trips from the different land uses on site overlapping with one another. These interaction effects have been studied and summarized as a set of ratios between different land uses. The interaction rates are based upon the gross demand of each land use within Report 684 published by the National Cooperative Highway Research Program (NCHRP). The rates, with respect to each land use pairing, are summarized in **Table 20.**

Table 20 Interaction Trip Rate by Land Use

	AM Peak Hour		PM Peak Hour	
	In	Out	In	Out
Site Residential				
With Retail	2%	1%	46%	42%
Site Retail				
With Residential	17%	14%	10%	26%

Application of these rates to the gross vehicle trips established in the previous sections yields the potential interaction for each land use. The actualized site internal trips will be the smaller of the potential interaction trips calculated for each end of the land use pairing.

10.4 Primary Vehicle Trip Forecasting

10.4.1 Residential Primary Vehicle Trips

A summary of the residential gross, interaction, and net primary vehicle trips for the site is provided in **Table 21**.

Table 21 Residential Vehicle Trip Summary

	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Gross Trips	175	1385	1560	930	415	1345
Interaction Trips	5	10	15	45	15	60
Primary Trips	**170**	**1375**	**1545**	**885**	**400**	**1285**

The residential uses of the site are expected to generate 1,545 and 1,285 two-way primary vehicle trips during the morning and afternoon peak hours, respectively.

10.4.2 Retail Primary Vehicle Trips

A summary of the retail gross, interaction, and net primary vehicle trips for the site is provided in Table 22.

Table 22 Retail Vehicle Trip Summary

	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Gross Trips	65	40	105	160	165	325
Interaction Trips	10	5	15	15	45	60
Primary Trips	**55**	**35**	**90**	**145**	**120**	**265**

The retail uses of the site are expected to generate 90 and 265 two-way primary vehicle trips during the morning and afternoon peak hours, respectively.

10.4.3 Summary of Total Site Primary Vehicle Trips

The total primary vehicle trips forecast for the site are summarized in **Table 23**.

Table 23 Site Primary Trip Generation

	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Residential Trips	170	1375	1545	885	400	1285
Retail Trips	55	35	90	145	120	265
Total Trips	**225**	**1410**	**1635**	**1030**	**520**	**1550**

The site is expected to generate 1,635 and 1,550 two-way primary trips during the morning and afternoon peak hours, respectively.

11.0 TRAFFIC VOLUMES FORECAST

11.1 Traffic Analysis Scenarios and Design Periods

Traffic operations analyses have been undertaken during the weekday morning and afternoon peak hours under the following conditions:

- Existing traffic (2024) – traffic activity levels under current conditions
- Future background conditions (2044) – traffic activity levels 20 years into the future, which includes allowances for the build-out of Midtown Oakville and assumes that the complete road network proposed by the Midtown Oakville EA and OPA is operational.
- Future background conditions (2044) – traffic activity levels 20 years into the future, which includes allowances for the build-out of Midtown Oakville and corridor growth, and assumes that the complete road network proposed by the Midtown Oakville EA and OPA is operational.
- Future total conditions (2044) – traffic activity levels 20 years into the future, with the site fully developed and occupied, and projected site generated traffic added to the future road network.
- Future total conditions (2044) – traffic activity levels 20 years into the future, with the site fully developed and occupied, and projected site generated traffic added to the future road network, and includes allowances for corridor growth.

11.2 Existing Traffic

11.2.1 Existing Baseline Traffic Volumes

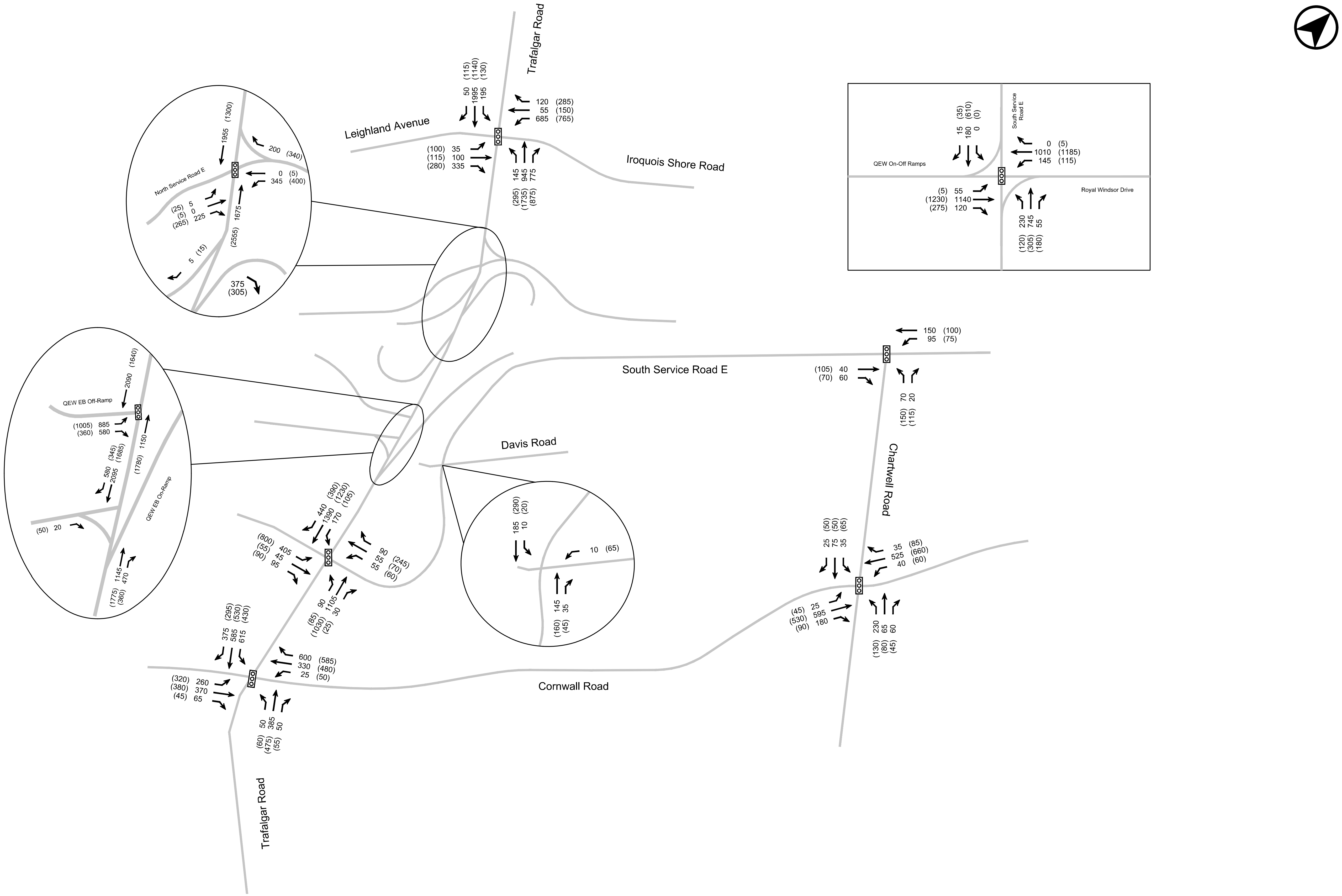
Existing baseline traffic and pedestrian volumes were established at intersections within the study area for the weekday morning and afternoon peak hour using traffic count information obtained from surveys conducted by Spectrum Traffic Data Inc. on Tuesday, June 4th, 2024. A list of the count data and sources is provided in **Table 24**.

Table 24 Study Area Intersections

Intersections	Type of Control	Count Date	Source
Trafalgar Road & Iroquois Shore Road / Leighland Avenue	Signalized	Tuesday, June 4th, 2024	Spectrum Traffic Data Inc.
Trafalgar Road & North Service Road / Highway 403 WB Off-Ramp			
Trafalgar Road & Highway 403 EB Off-Ramp			
Trafalgar Road & Cross Avenue / South Service Road East			
Trafalgar Road & Cornwall Road			
Cornwall Road & Chartwell Road			
South Service Road East & The Canadian Road / Royal Windsor Drive / Highway 403 WB On-Off Ramp			
Trafalgar Road & Argus Road	Stop Control		
South Service Road East & Chartwell Road			
South Service Road East & Davis Road			

The existing turning movement counts were reviewed in detail to ensure a general consistency in the traffic volumes on roadways between intersections. Where necessary, minor adjustments were made to balance the traffic volumes in between intersections to create a representative traffic volume base for the purposes of the traffic operations analyses undertaken as a part of this study.

Existing, balanced baseline area traffic volumes for the weekday morning and afternoon peak hours are illustrated in **Figure 15**.



Date Plotted: November 1, 2024 Filename: P:\69\31\03\Graphics\CAD\1\Fig10-00-EX.dwg

FIGURE 15 EXISTING TRAFFIC VOLUMES

11.3 Future Background Traffic

Traffic growth in the site vicinity has been considered based on an evaluation of traffic volume changes related to:

- General corridor growth on the study area roads (i.e., Trafalgar Road and Highway 403 Ramps)
- Specific area development traffic (i.e., background development traffic)

11.3.1 Corridor Growth

Historical traffic volume counts at the signalized intersection of Trafalgar Road and Cross Avenue / South Service Road from 2001 to 2024 were reviewed to determine if there have been any changes in traffic activity due to general traffic corridor growth within the study area. It was determined that the traffic volumes along Trafalgar Road have remained consistent or declined along this period.

11.3.1.1 MTO AND TOWN GROWTH

The MTO has requested that a 3.1% annual growth rate be added at the Highway 403 Off-Ramp movements, and The Town of Oakville has requested that a 3% annual growth rate be added to all municipal roads in the study area. Recognizing that the study's horizon is 20 years, the compounded traffic volumes from these growth rate result in the order of over a thousand vehicles being added to Trafalgar Road, and hundreds of vehicles being added to other municipal road. While it is important to plan for future growth, a comprehensive review of area background developments has been undertaken and is considered representative of future background traffic at the study horizon. As the area around the site develops, drivers who do not need to access a specific destination in the site area (such as a background development or the GO station), will choose other routes with more capacity available. The traffic analysis presented in this report shows the future background and future total scenarios with and without the addition of the MTO and Town growth for comparison purposes.

11.3.1.2 TRAFALGAR LRT DIVERSIONS

With the Trafalgar LRT being built and operational under future conditions, it is expected that area travel patterns and mode choice will shift as the LRT will improve transit travel times relative to vehicle travel times through the corridor. The LRT will reduce the "last mile" segment of a primarily transit trip along the Trafalgar corridor that had to use another mode to connect with the user to the ultimate designation or from the initial origin. The LRT could replace vehicular trips in three main ways:

1. Replace vehicle trips to and from zones along the Trafalgar corridor, especially park and ride drivers between residential areas along the corridor to and from the Oakville GO Station.
2. Replace local drivers to/from other GO stations areas along the Lake Shore West line, shifting them to use the LRT to connect with Oakville GO Station and then taking GO to their destination or vice versa.
3. Replace driving for local trips that start and end within the Trafalgar corridor.

BA Group has undertaken data analytics of connected vehicle data to estimate the potential proportion of traffic along Trafalgar Road that may shift to use the LRT for the above noted reasons.

Methodology

Connected vehicle data (CVD) is a set of information that modern vehicle onboard electronics passively collect regarding the date, time, vehicle location, travel speed, and various vehicle status. This data is owned by the vehicle manufacturer or the provider of the navigation application provided within the vehicles, such as TomTom. Transportation big data processing platforms, such as StreetLight and similar services, process this disaggregate data to allow users to make customized queries for deriving area specific travel pattern and routing information. Using this platform, BA Group has reviewed the weekday

2023 traffic patterns of vehicles travelling along the segment of Trafalgar Road between Highway 407 in the north and South Service Road in the south.

Study Area

The study area for the connected vehicle data review bounds the length of Trafalgar Road where the new LRT will be in place from South Service Road through to just south of Highway 407. The study area along Trafalgar Road, including the internal zones, external gateways and corridor cordons, is illustrated in **Exhibit 1**.

The external gateways (in red) are set to track traffic going into and out of this study area at the available points of access along the street network. Internal zones (in blue) along either side of Trafalgar Road, separated by the major corridors and future LRT stop locations, help identify the portion of traffic with local origins or destinations. The set of cordon lines (in green) at key locations along Trafalgar Road enable filtering for the trip data that pass through different segments of Trafalgar Road. It is noted that for this study, the cordon line of interest is the segment of Trafalgar Road between the QEW and South Service Road.

For the purposes of tracking the trips that route to and from areas along the Lake Shore West GO rail line, the key GO station areas are illustrated in **Exhibit 2** relative to the study area.

Exhibit 1: Trafalgar Road Study Area

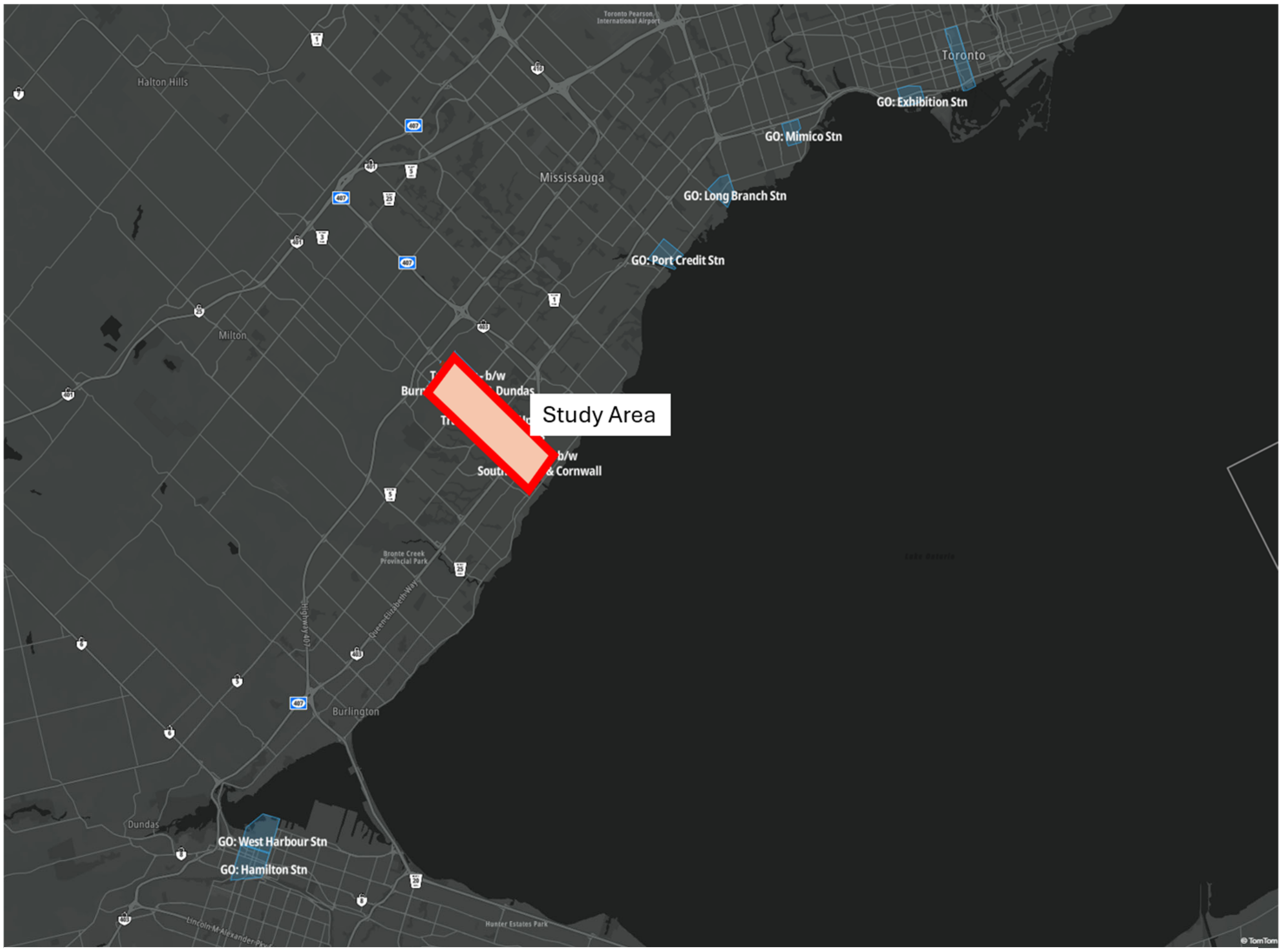


Exhibit 2: Key GO Station Areas

Traffic along Trafalgar Road from / to Oakville Station

The proportion of traffic along the segment of Trafalgar Road between the QEW and South Service Road that starts within the study area (i.e. local) routing to Oakville GO Station and vice versa was extracted from the 2023 weekday dataset. These drivers that were already taking GO transit could shift to use the connecting LRT and avoid the daily parking cost

It was noted where the origins and destinations where relative to the Oakville GO Station parking lot (i.e. they are mostly to the north), such that results in relation to the pairing of each origin/destination and Oakville GO Station parking lot can be defined as travelling northbound or southbound along Trafalgar Road. Similarly, taking consideration of the results from all the non-overlapping pairs of origins and destinations in the study area reflect 100% of the two-way traffic along Trafalgar Road.

Based on a morning period from 06:00-09:00 and an afternoon period from 15:00-19:00, the proportion of local traffic along the segment of Trafalgar Road between the QEW and South Service Road with one trip end along Trafalgar Road and the other trip end at the Oakville GO Station parking lot is summarized in **Table 25** by direction.

Table 25 Traffic Reduction for Local Park and Ride Patrons at Oakville GO Station

Direction	AM	PM
Northbound	0.8%	1.6%
Southbound	2.4%	0.9%

Based on the foregoing, there is some potential for existing local park and riders at Oakville GO Station to shift to connect with the GO station via the new LRT instead of driving.

Traffic Along Trafalgar Road using QEW to/from Key GO Station Areas

The proportion of traffic along the segment of Trafalgar Road between the QEW and South Service Road that starts within the study area (i.e. local) routing to areas around GO stations along the Lake Shore West Line and vice versa was extracted from the 2023 weekday dataset. These drivers could shift over to use the LRT, connecting with the GO train at Oakville GO Station to travel to and from the Lake Shore West GO station areas.

It was noted whether these trips have routed via the QEW to and from the Lake Shore West GO station areas. It is expected only those that already travel to the QEW would be likely to shift to the LRT that also passes by the same area as it connects to the Oakville GO Station. Based on a morning period from 06:00-09:00 and an afternoon period from 15:00-19:00, the proportion of traffic along Trafalgar Road that may shift from auto to a combination of the new LRT and GO rail transit is summarized in **Table 26** by direction.

Table 26 Traffic Reduction for Local Traffic to/from Lake Shore West GO Station Areas

Direction	AM	PM
Northbound	0.04%	0.0%
Southbound	0.0%	0.02%

Based on the existing origin-destination and routing patterns of drivers, the potential for non-current GO train users to shift to use GO rail due to the new LRT is negligible.

Local Traffic Along Trafalgar Road

The proportion of traffic along the segment of Trafalgar Road between the QEW and South Service Road that starts and ends within the study area (i.e. local) was extracted from the 2023 weekday dataset. These drivers could shift over to use the LRT for local trips along the Trafalgar Road corridor.

Based on a morning period from 06:00-09:00 and an afternoon period from 15:00-19:00, the proportion of local traffic along the segment of Trafalgar Road between the QEW and South Service Road is summarized in Table 27 by direction. It is assumed the traffic reduction potential of internal traffic routing along Trafalgar Road will be evenly split between northbound and southbound directions.

Table 27 Traffic Reduction for Local Park and Ride Patrons at Oakville GO Station

Direction	AM	PM
Northbound	0.7%	1.1%
Southbound	0.7%	1.0%

Summary

Based on the foregoing, there is some potential for existing local traffic to shift to the new LRT instead of driving. The combined traffic reduction potential along Trafalgar Road is summarized in Table 28.

Table 28 Total Traffic Reduction reflecting Shift to Trafalgar LRT

Direction	AM	PM
Northbound	1.5%	2.7%
Southbound	3.1%	1.9%

Application of these proportions to the existing link volumes along Trafalgar Road between QEW and South Service Road by direction estimates a reduction in the order of 20 to 70 vehicles by direction during the weekday peak hours.

11.3.2 Corridor Growth Considerations

Considering the significant traffic volumes derived from MTO and Town corridor growth rates, this study considers two scenarios: (1) a scenario where corridor growth volumes are included in the analysis, and (2) a scenario where corridor growth volumes are excluded from the analysis for the future background and future total scenarios.

Corridor growth volumes are illustrated in **Figure 16**.

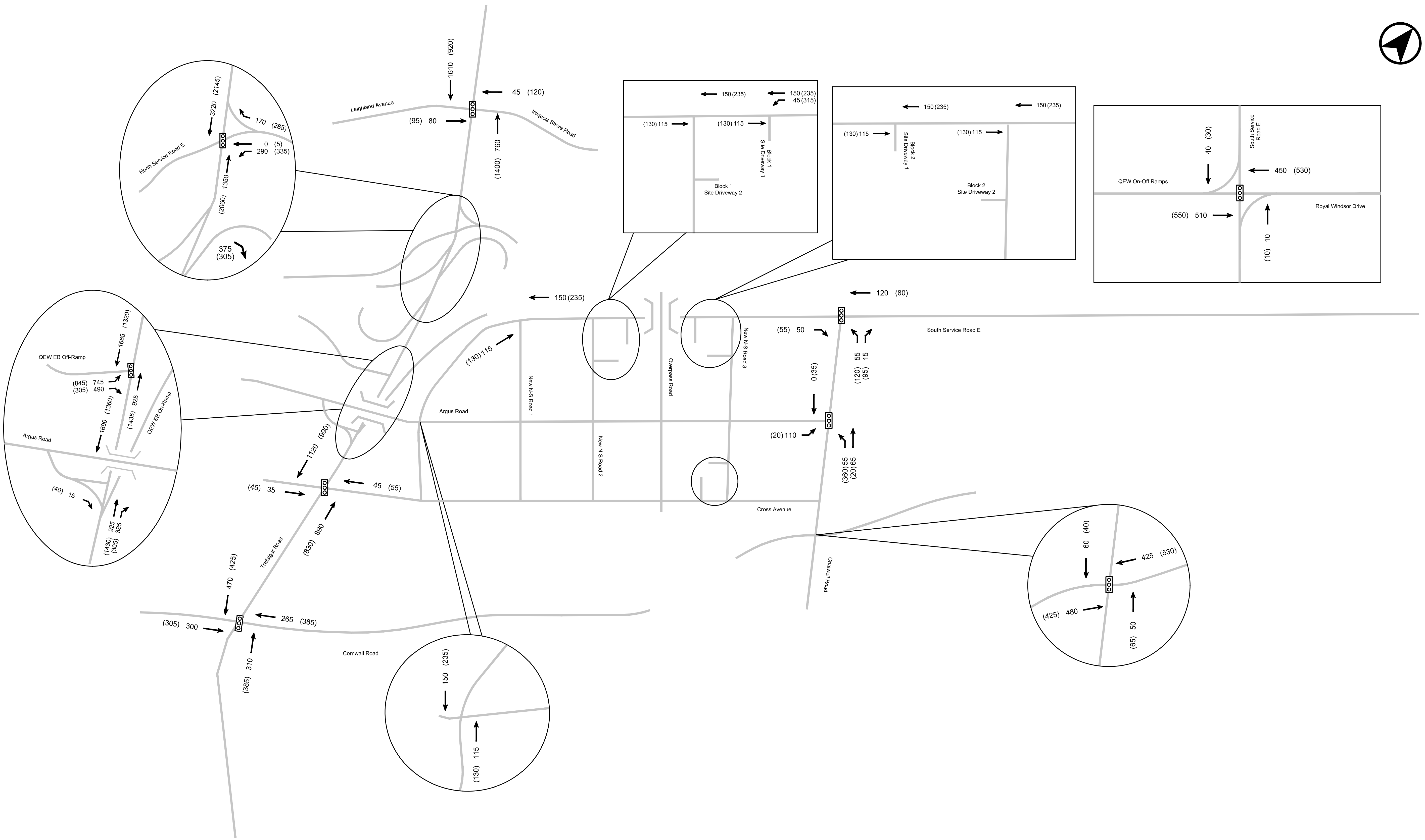


FIGURE 16 CORRIDOR GROWTH VOLUMES

11.3.3 Background Development Traffic

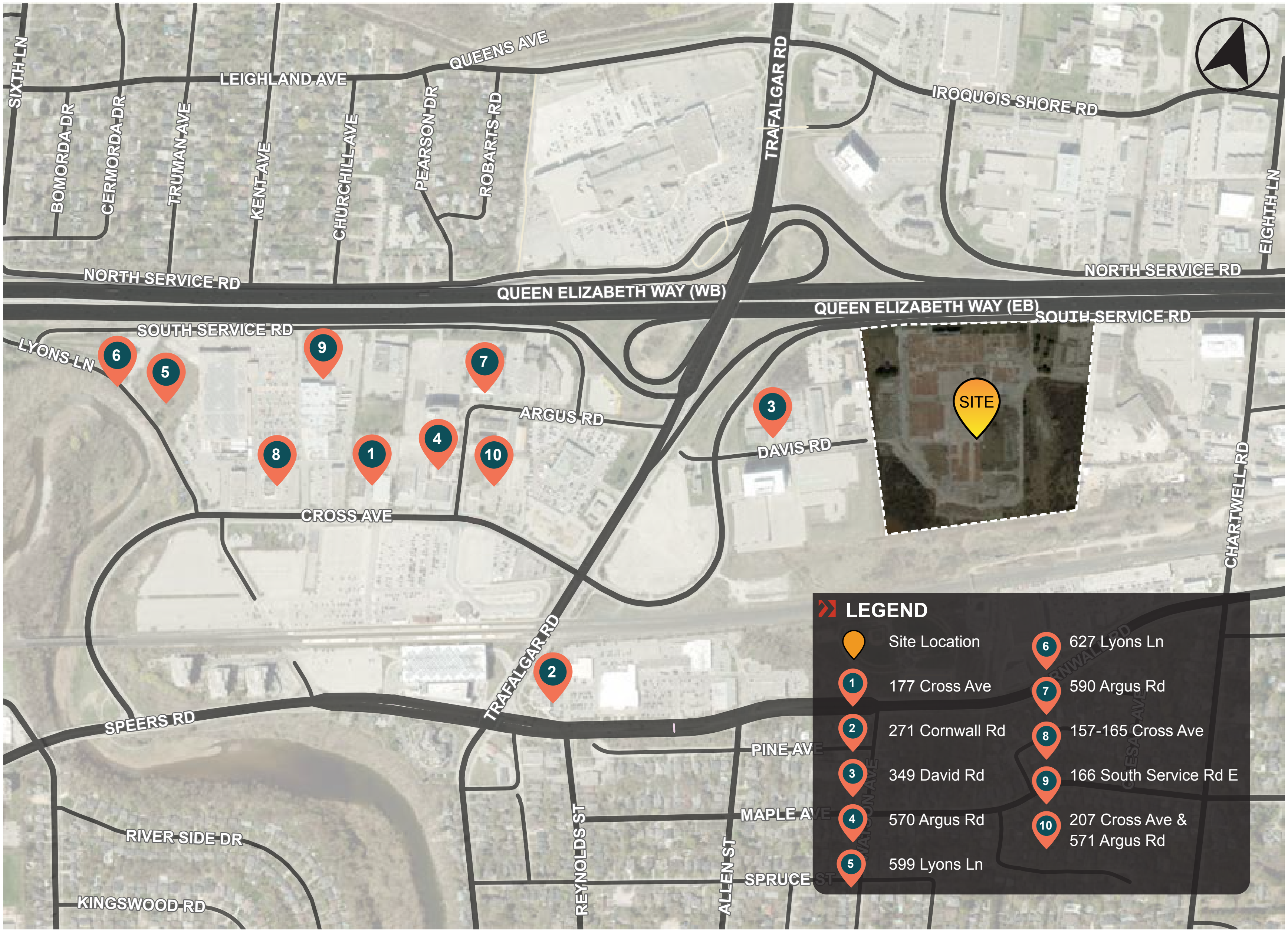
A comprehensive review of background developments expected to be fully built out and occupied by the study horizon was undertaken based on active applications available on the Town of Oakville's website. **Table 29** provides a summary of the background developments considered in this study. These developments represent in the order of 8,593 residential units, and 25,602 m^2 of retail and other uses GFA . The locations of these developments are shown in **Figure 17**.

Table 29 Area Background Developments

Location	Development Statistics			Source[1]	Date	Status
	Residential Units	Retail GFA (m^2)	Other GFA[2] (m^2)			
590 Argus Road	1,842	2,104	450	Paradigm	April 2024	OPA / ZBA Under Review
157 & 167 Cross Avenue	1,198	2,693	1,027	Paradigm	March 2024	OPA / ZBA Under Review
166 South Service Road	1,851	1,252	4,602	Paradigm	April 2024	OPA / ZBA Under Review
207 Cross Avenue & 571 Argus Road	1,938	1,565	2,694	Paradigm	March 2024	OPA / ZBA Under Review
177 Cross Avenue	522	3,000	-	--	2016	Preconstruction
271 Cornwall Road	292	4,065	-	--	--	Preconstruction
349 Davis Road	388	680	1,470	Crozier	March 2023	OPA / ZBA Under Review
599 Lyons Lane	281			--	-	Preconstruction
627 Lyons Lane	281			Paradigm	May 2022	Preconstruction
Total	**8,593**	**15,359**	**10,243**			

Notes:
1. Where no traffic figure exist, trips were generated with trip generation rates selected for the site.
2. "Other" represents uses ranging from daycares, health clubs and office

Background Development Volumes are shown in **Figure 18**. It is noted that some projected traffic from these background developments was reassigned to the area road network projected to be built out at the study area horizon, notably, the Argus Road underpass, and the Highway 403 overpass on the east side of Trafalgar.



/Users/leannedowdall/Library/CloudStorage/GoogleDrive-leannekroll21@gmail.com/My Drive/BA Group/6931-03/Graphics/Adobe/IDs/6931-03.indd

FIGURE 17 BACKGROUND AREA DEVELOPMENTS

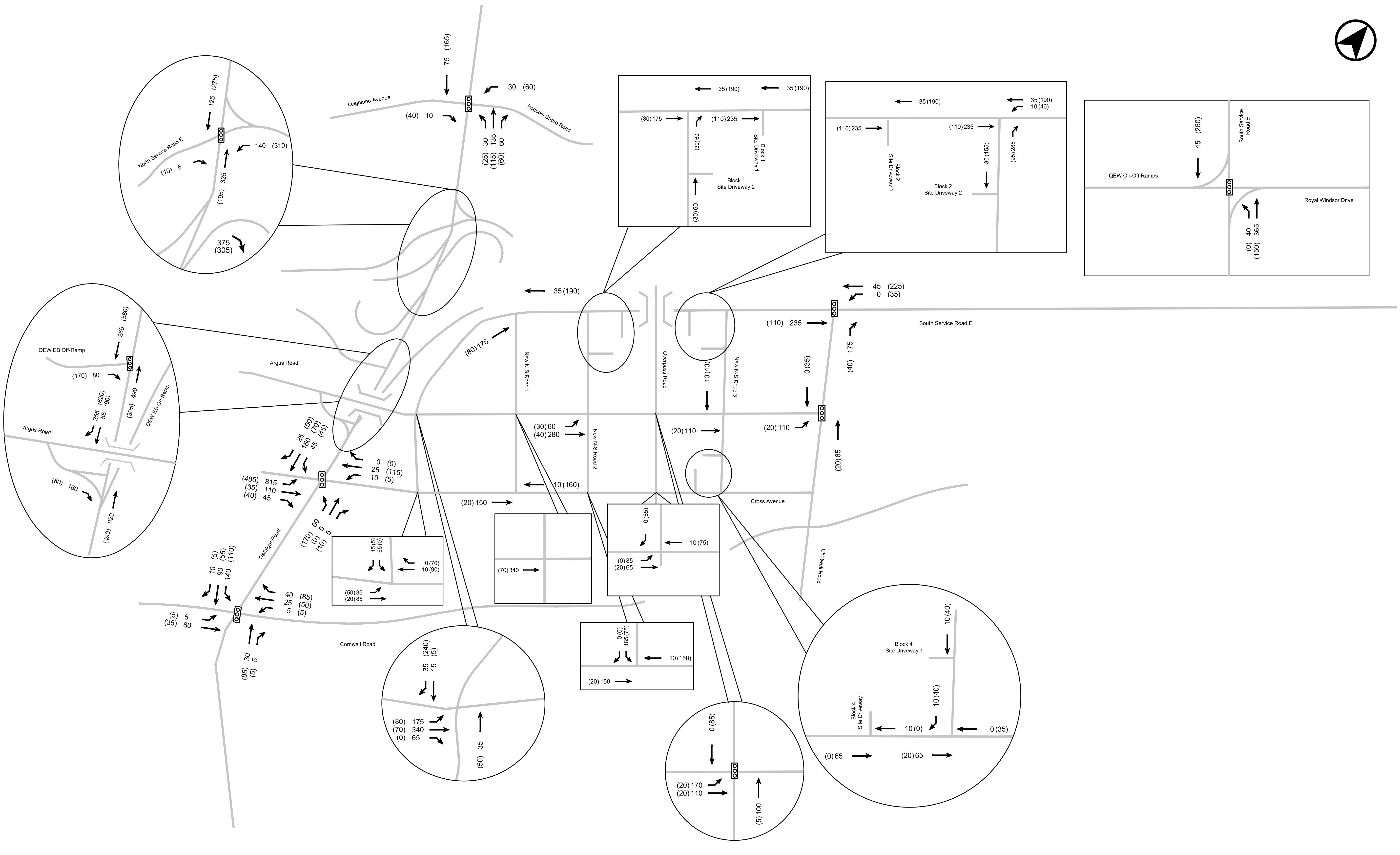


FIGURE 18 BACKGROUND DEVELOPMENT TRAFFIC VOLUMES

11.3.4 Future Background Traffic Volumes

Future background traffic volumes, which represent the sum of existing, background development and corridor growth allowances, are shown for the two analysis scenarios (with and without corridor growth) in **Figure 19** and **Figure 20**, respectively.

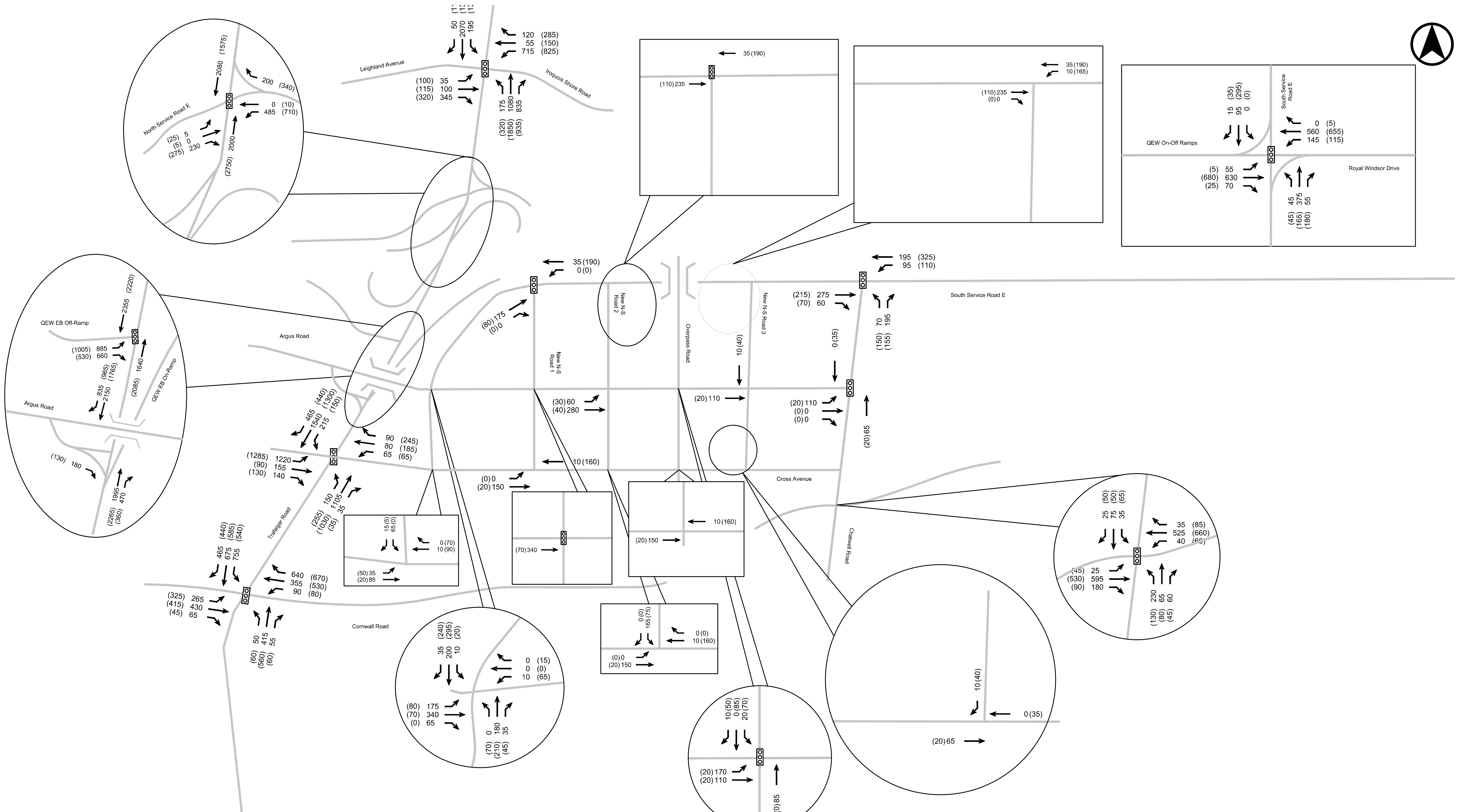
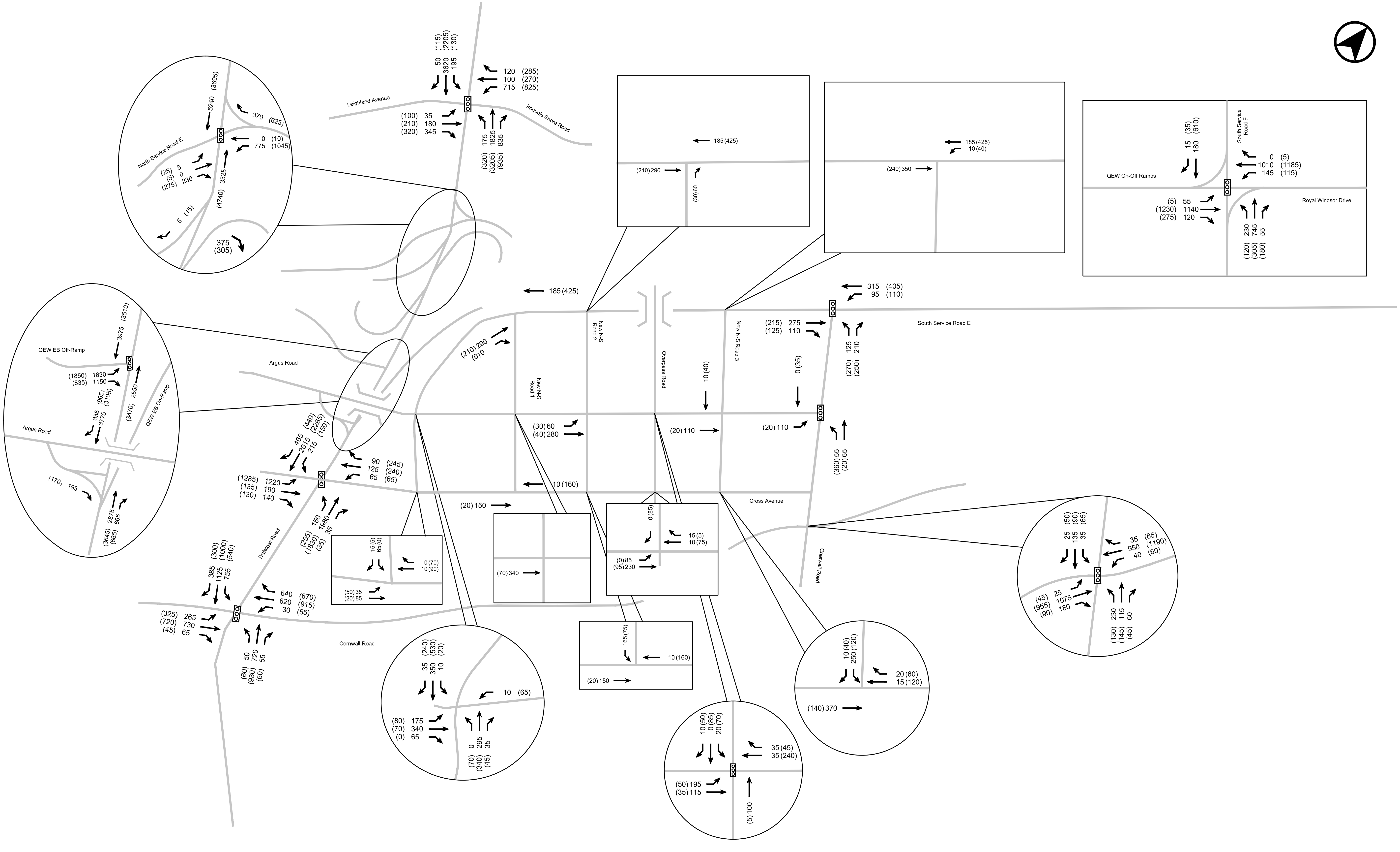


FIGURE 19 FUTURE BACKGROUND TRAFFIC VOLUMES (NO CORRIDOR GROWTH)



Date Plotted: November 1, 2024 Filename: P:\69\31\03\Graphics\CAD\1\Fig20-00-FB DEV + CORRIDOR.dwg

FIGURE 20 FUTURE BACKGROUND TRAFFIC VOLUMES (BACKGROUND DEVELOPMENTS + CORRIDOR GROWTH)

11.4 Site Traffic

11.4.1 Trip Generation

As described in **Section 10.4**, the primary vehicle trips expected to be generated by the residential and retail uses on the site are summarized in **Table 30**.

Table 30 Total Site Trip Generation

	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Residential Trips	170	1375	1545	885	400	1285
Retail Trips	55	35	90	145	120	265
Total Trips	**225**	**1410**	**1635**	**1030**	**520**	**1550**

11.4.2 Trip Distribution

11.4.2.1 RESIDENTIAL

The residential trip distribution for the site has been based on a review of the 2016 Transportation Tomorrow Survey (TTS) for home-based vehicle trips to and from the study area during the weekday morning and afternoon peak periods. The distribution of inbound and outbound residential traffic is summarized in **Table 31**.

Table 31 Residential Traffic Distribution

Route	From / To (Direction)	Inbound	Outbound
Trafalgar Road / Overpass	North	5%	5%
	South	5%	5%
Highway 403	East	25%	30%
	West	20%	15%
Cornwall Road	East	10%	10%
	West	20%	15%
South Service Road	East	10%	5%
Chartwell Road	South	5%	15%
Total		**100%**	**100%**

Notes:

1. Based on a review of home-based trips to and from TTS Traffic Analys Zones (TAZs) 4015-4018 for outbound trips beginning between 6:00 a.m. – 8:59 a.m. and inbound trips beginning between 3:00 p.m. – 5:59 p.m.

11.4.2.2 RETAIL

The retail trip distribution pattern for the site has been based on a review of the 2016 TTS for retail-destined trips to and from the study area during the weekday morning and afternoon peak hours. The distribution of inbound and outbound retail traffic is summarized in **Table 32**.

Table 32 Retail Traffic Distribution

Route	From / To (Direction)	Inbound	Outbound
Trafalgar Road / Overpass	North	40%	45%
	South	0%	0%
Highway 403	East	20%	5%
	West	0%	10%
Cornwall Road	East	20%	20%
	West	20%	20%
South Service Road	East	0%	0%
Chartwell Road	South	0%	0%
Total		**100%**	**100%**

Notes:

1. Based on a review of home-based trips to and from TTS Traffic Analys Zones (TAZs) 4030 for inbound and outbound trips beginning between 3:00 p.m. – 5:59 p.m.

Figure 21 illustrates site traffic volumes.

11.5 Future Total Traffic

Future total traffic, which represents the sum of future background traffic and site generated traffic volumes is illustrated in **Figure 22**. The future total traffic, with the additional corridor growth, is shown in **Figure 23**.

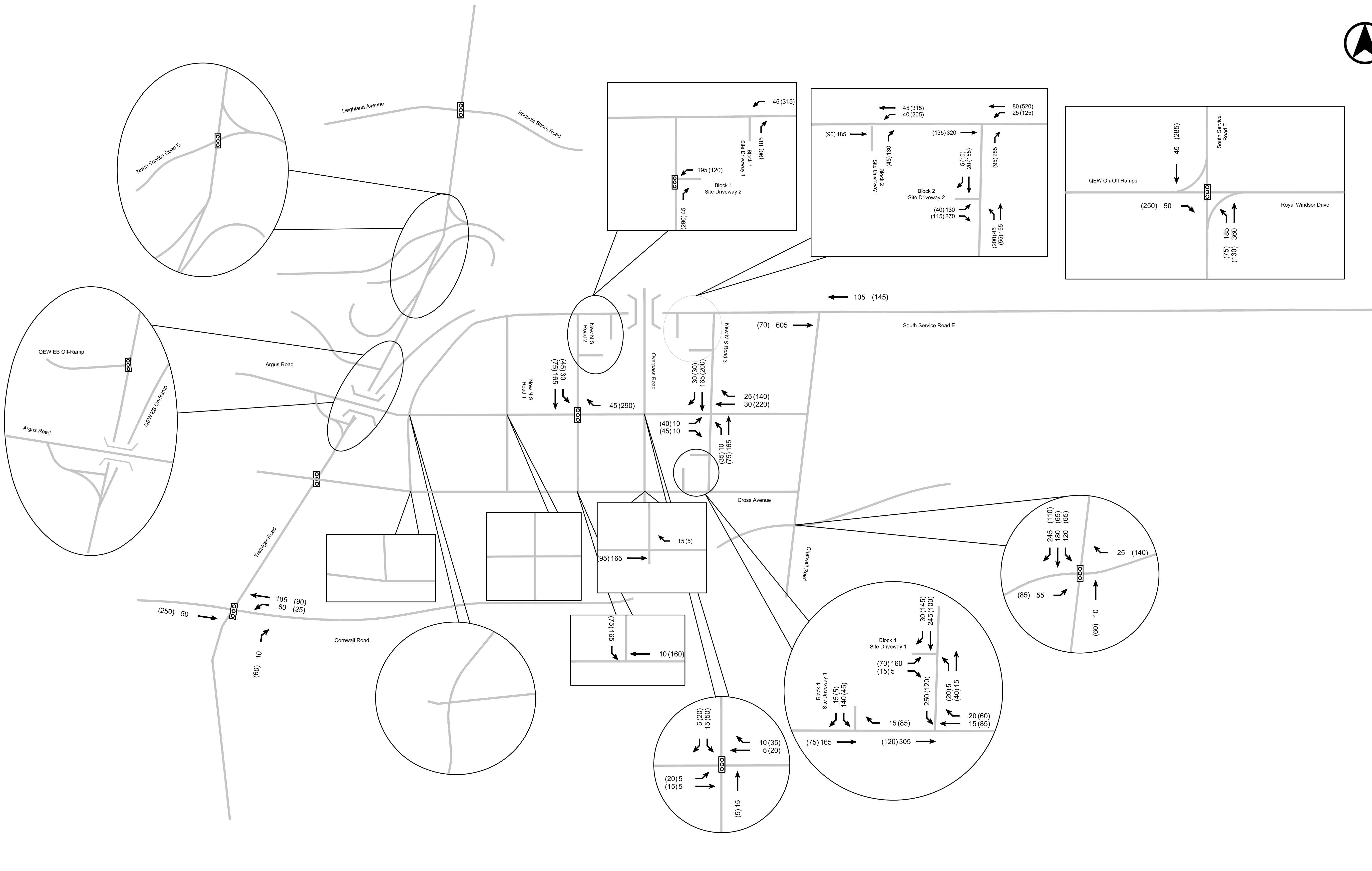
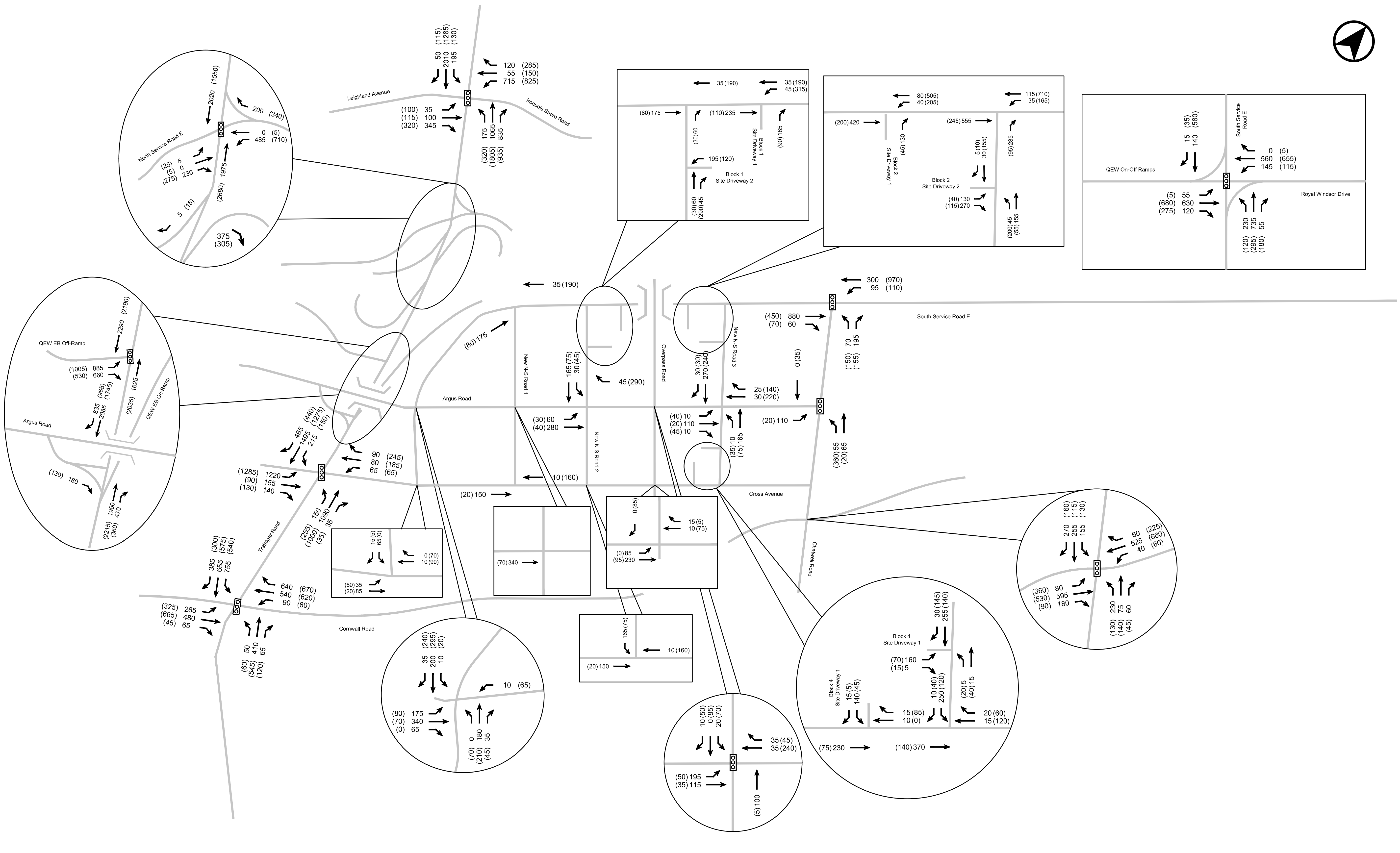
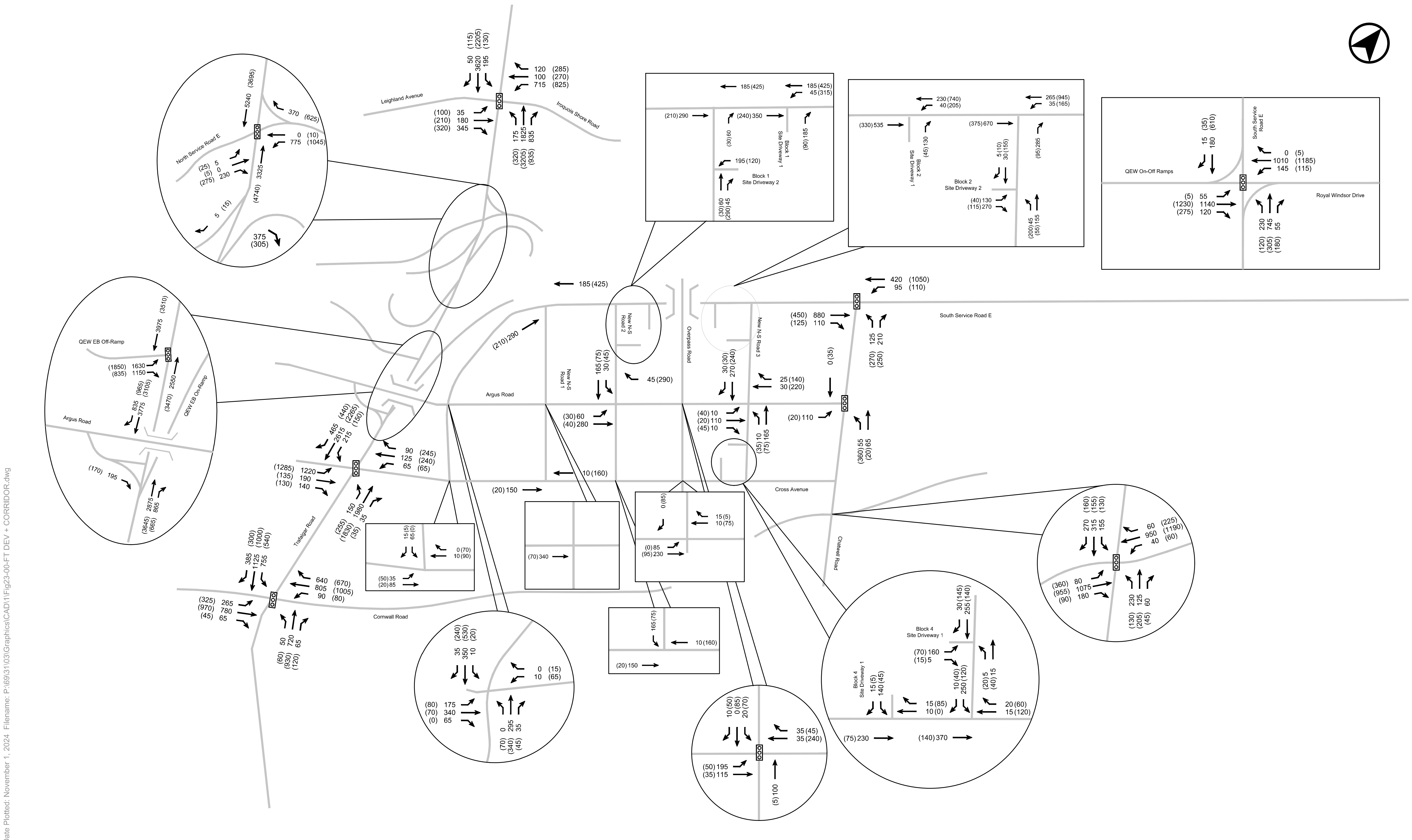


FIGURE 21 SITE TRAFFIC VOLUMES



Date Plotted: November 1, 2024 Filename: P:\6931\03\Graphics\CAD\1\Fig22-00-FT DEV.dwg

FIGURE 22 FUTURE TOTAL TRAFFIC VOLUMES (BACKGROUND DEVELOPMENTS)



Date Plotted: November 1, 2024 Filename: P:\69\31\03\Graphics\CAD\1\Fig23-00-FT DEV + CORRIDOR.dwg

FIGURE 23 FUTURE TOTAL TRAFFIC VOLUMES (BACKGROUND DEVELOPMENTS + CORRIDOR GROWTH)

12.0 TRAFFIC OPERATIONS ANALYSIS

12.1 Overview

Under future conditions, with the full buildout of the Midtown Oakville area, the road network will continue to operate under very busy conditions, with some intersections operating at, or above, their theoretical capacity. This is reflective of a busy urban centre where the majority of mobility needs will be met by non-auto means including transit (particularly GO, BRT and other bus transit) and active modes (walking and cycling and other micro-mobility), while a smaller proportion of travel needs will continue to be met via private automobile.

The Site's mobility choice strategy seeks to encourage and enable travel by non-auto means, while accommodating the smaller proportion of people that own and use a private automobile. Mobility choice strategies that will encourage non-auto travel include limiting the Site's parking supply (Section 6.0), provision of high quality bicycle parking (Section 7.0) a full suite of TDM measures (Section 9.0), and the creation of a dense, mixed-use and walkable community within the Site and Midtown Oakville (Section 5.0). Most importantly, the Site's proximity to frequent higher-order transit – including GO, the future Trafalgar BRT, and other bus services operated by Oakville Transit – will allow residents, employees and visitors of the Site to access local and regional destinations without use of a car.

A number of trends will shape future mobility in and around the Site and in the Town of Oakville more broadly, including:

- **Many residents who choose to live in Midtown Oakville will do so because of its proximity to transit and the ability to live and work without the daily use of a car. Midtown Oakville is intentionally planned to be a transit-oriented community that is characterized by higher density than the rest of Oakville.** Options to travel to / from Midtown Oakville by car will be limited, given that the existing and future road network will operate under very busy conditions and on-site parking supply will be limited. As a result, future residents who choose to live in Midtown Oakville will do so because the other mobility connections that will be available to them – in particular the GO line, the Trafalgar BRT and other bus services – will enable them to meet their day-to-day needs without needing to use a car.

  Consequently, future residents will have different travel characteristics from elsewhere in Oakville today. Importantly, future residents will make significantly more use of transit, supplemented by walking and cycling for shorter journeys – including within the Midtown Oakville neighbourhood – to meet their day-to-day needs.

- **At the same time, travel modes in Halton Region and the rest of the GTAH are evolving, and auto use is decreasing over time. This is particularly true for peak period travel**. This change is partly occurring in response to increasing congestion caused by population and employment growth in the GTAH. At the same time, the change is being supported by ongoing municipal and provincial efforts to promote non-auto travel modes, including improvements to transit service, the expansion of safe cycling and walking infrastructure, the creation of more mixed-use communities that allow people to meet their daily needs locally, and the increased availability of first and last mile travel options, including e-bikes and bike share (in some municipalities; currently not in Oakville).

  This decrease in auto use, particularly in the peak periods, is taking place faster in intensification areas and transit-oriented urban nodes like Midtown Oakville, but is also occurring in car-centric areas of the Region as well. This is borne out through data collected by the 5-yearly TTS, the latest available of which is the 2016 TTS[3]. A more recent TTS was conducted in 2022/2023, but this data has not yet been released.

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[3] "*Transportation Tomorrow Survey 2016, TTS 2016: 2016, 2011, 2006, 1996 and 1986. Travel Summaries for the TTS Area*". Prepared by R.A. Malatest & Associates Ltd., for the Transportation Information Steering Committee (TISC). March 2018. https://dmg.utoronto.ca/wp-content/uploads/2022/06/2016TTS_Summaries_TTSarea.pdf

- **Work commute habits are also changing, as a result of increased work-from-home following the COVID-19 pandemic**. An increased proportion of the population now works remotely for some or all of their employment since the COVID-19 pandemic. This results in the reduced need to travel during peak periods, reducing overall trip rates for all modes and reducing the relative peak period impact of new development.

- **An increasing number of daily needs are being met through e-commerce**. This includes online shopping, grocery online shopping, food / restaurant deliveries, app-based shopping and delivery services, etc. This decreases the need to travel but increases delivery vehicle trips. This results in the need to provide appropriately sized and well-designed pick-up / drop-off and temporary layby areas for delivery services. The proposed pick-up / drop-off and layby areas for the Site are discussed in Section 5.9).

- **Midtown Oakville is a designated Urban Growth Centre and is intended to be a focus of population and employment growth in the Town of Oakville**. Midtown Oakville is identified in Provincial, Regional and Town policy as a place for intensification. A significant portion of the population and employment growth that is designated for Oakville is intended to be accommodated in Midtown Oakville. The area has some of the best transit access in Oakville, and underutilized or vacant land available for redevelopment. The area is a designated Protected Major Transit Station Area (PMTSA), and a designated Primary Growth Area and Urban Growth Centre[4] that is expected to accommodate the highest level of intensification in the Town. As a result, the traffic impact of growth in the Town will be more concentrated in and around Midtown Oakville. At the same time, growth in the MTSA will have a relatively lesser traffic impact, on a per-unit basis, than growth in other less transit-accessible areas of the Town.

- **The proposed development will have minor traffic impact on at-capacity movements on the future area road network.** Rather, the intersections that will operate at, or above, their theoretical capacity will be as a result of background development traffic and general corridor growth elsewhere in Midtown and the rest of Oakville.

- **The planned introduction of significant new road infrastructure in Midtown Oakville, including through the Site, will help support increased traffic volumes to / from Midtown** and help to better distribute traffic to / from the surrounding road network. New infrastructure includes a new overpass over the QEW corridor, a new underpass under the Metrolinx / CN rail corridor, QEW interchange improvements, and a new network of major and minor streets throughout Midtown. Notably for the Site, this includes a new north-south major street connection from Iroquois Shore Road to Cornwall Road that will distribute traffic around the busy Trafalgar Road corridor, and a new network of north-south and east-west streets including an east-west street that will carry the future Trafalgar BRT.

The traffic operations analysis undertaken in this study uses a static, macro-simulation based methodology (i.e. HCM methodology, using Synchro software) to forecast and model future (2051) traffic operations. It is our understanding that the Town of Oakville and its consultant team is currently undertaking a dynamic multi-resolution model that could more accurately reflect the elastic nature of travel routes and travel modes on the area road network. In particular, the Halton Region maintains a macroscopic EMME travel forecasting model for the entire Region that more dynamically assigns trips to different routes and different modes based on overall network capacity. For example, the EMME model can better reflect route and mode choice elasticity compared to a static model – e.g. people can choose different routes, different modes and different times of travel depending on the travel options that are available and the capacity of the road network. Thus, as population in the Oakville and in Midtown grows, the model aims to forecast the changing travel characteristics that would result for the local and regional area. As part of the next steps of the Midtown Oakville planning process, BA Group seeks to collaborate with the Town to understand the inputs and outputs of the Town's modelling work and the changing travel characteristics of the local and regional area as Midtown is built out.

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[4] "*Livable Oakville Plan (2009 Town of Oakville Official Plan)*". Town of Oakville. Latest consolidated dated August 31, 2021. https://www.oakville.ca/business-development/planning-development/official-plan/livable-oakville-plan/

12.2 Capacity Analysis Methodology

Traffic operations analyses have been completed using Synchro Version 11.0, in accordance with the methodologies outlined in the Highway Capacity Manual (HCM) 2000 and Halton Region's Transportation Impact Study Guidelines.

For signalized intersections, the volume-to-capacity ratio (v/c) is an indicator of the capacity utilization for the key movements in the intersections. A v/c of 1.00 indicates that certain governing traffic movements through the key intersections are operating at or near maximum capacity. The primary overall level-of-service (LOS) indicator is delay, both on dividual movements and expressed as an average for all vehicles processed. Many busy urban intersections operate at LOS D to E, which reflects average delays in the range of 35 to 80 seconds.

For unsignalized intersections, level-of-service (LOS) characterizes operational conditions for key movements in terms of delay within the traffic stream. LOS A presents a good level-of-service with short delays, while LOS F represents a poor level-of-service with long delays. The volume-to-capacity ratio is an indicator of the capacity utilization for key movements at the intersection and the resultant residual capacity potential.

The LOS criteria provided by the HCM methodology is summarized as follows:

1. Signalized Intersection LOS
    a. LOS A: Control Delay ≤ 10s
    b. LOS B: 10s < Control Delay ≤ 20s
    c. LOS C: 20s < Control Delay ≤ 35s
    d. LOS D: 35s < Control Delay ≤ 55s
    e. LOS E: 55s < Control Delay ≤ 80s
    f. LOS F: Control Delay > 80s
2. Unsignalized Intersection LOS
    a. LOS A: Control Delay ≤ 10s
    b. LOS B: 10s < Control Delay ≤ 15s
    c. LOS C: 15s < Control Delay ≤ 25s
    d. LOS D: 25s < Control Delay ≤ 35s
    e. LOS E: 35s < Control Delay ≤ 50s
    f. LOS F: Control Delay > 50s

12.3 Analysis Parameters

Heavy Vehicle Assumptions

Heavy and medium truck percentages incorporated into the analysis were based upon information provided as part of intersection turning movement counts.

Saturation Flow Assumptions

A base saturation flow of 1,900 passenger cars per hour of green time per lane (pcphgtl) was adopted as the base assumption for the Synchro analysis, that was assumed for all analysis scenarios.

Signal Timings

Existing traffic signal timings, phasing plans and cycle lengths were obtained from Halton Region. Where necessary, signal timing plans were optimized in future scenarios.

Lost Time Adjustments

For all signalized intersections, a lost-time adjustment (LTA) of -1.0 seconds was applied to all movements. This lost time adjustment provides allowances in the capacity analysis to better account for drivers completing their movements during amber or all-red time (a common phenomenon at busy intersections).

Peak Hour Factor

For all intersections, peak hour factors (PHF) were calculated based on the existing traffic volume data extracted from the traffic counts utilized in the study.

Lane Utilization Factors

The default Synchro lane utilization factors (LUF) were adopted, which take into consideration the distribution of individual lane usage within each group.

12.4 Signalized Intersection Operations

12.4.1 Trafalgar Road / Leighland Avenue / Iroquois Shore Road

Under existing conditions, the intersection operates at busy overall v/c ratios of 0.92 and 0.88, in the AM and PM peak hour, respectively.

Under future background conditions without corridor growth, the intersection will operation at overall v/c ratios of 0.96 and 0.97 in the AM and PM peak hours, respectively. The northbound left movement may exceed its theoretical capacity in the morning peak hour, with a movement v/c ratio of 1.02. This intersection can acceptably accommodate projected background traffic.

Under future background conditions with the addition of corridor growth, the intersection will operate at overall v/c ratios of 1.34 and 1.25 in the AM and PM peak hours, respectively. It should be noted that most movements continue to operate within capacity, but the added corridor growth along Trafalgar Road will push the southbound and northbound through movements well over capacity. It is likely that this volume of projected corridor growth will never materialize, as transit options to access the GO station improve, and drivers who are not accessing a destination in proximity to the study area find other routes that have more capacity, as the roads in the study area transition to more local traffic.

Under future total conditions without corridor growth but with the addition of site traffic, the intersection will operate at overall v/c ratios of 0.96 and 0.97 in the AM and PM peak hours, respectively. The impact of site-related traffic is in the order of 0% for both the AM and PM peak hours, respectively, as trips to and from the site who are travelling to and from the north can make use of the Highway 403 overpass east of Trafalgar.

Under future total conditions with corridor growth, the intersection will operate at overall v/c ratios of 1.34 and 1.25 in the AM and PM peak hours, respectively. Thus, this intersection may exceed its theoretical capacity in the AM peak hour, as a result of the addition of the combination of background traffic and corridor growth traffic. The impact of site-related traffic is in the order of 0% for both the AM and PM peak hours, respectively.

Under future background and future total conditions with corridor growth considered, traffic volumes at this intersection may exceed its theoretical capacity. Under future background and future total conditions without corridor growth, the intersection operates within its overall capacity in both the morning and afternoon peak hours.

Site traffic does not have an impact on this intersection, as trips to and from the site will make use of the overpass.

Traffic capacity analysis results for this intersection are summarized in **Table 33**.

Table 33 Trafalgar Road / Leighland Avenue / Iroquois Shore Road Analysis Results

	Existing		Future Background (without Corridor Growth)		Future Background (with Corridor Growth)		Future Total (without Corridor Growth)		Future Total (with Corridor Growth)	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
EBL	0.13 (0.42)	D (D)	0.12 (0.41)	D (D)	0.13 (0.42)	D (D)	0.12 (0.41)	D (D)	0.13 (0.42)	D (D)
EBT	0.37 (0.67)	D (E)	0.35 (0.63)	D (E)	0.63 (1.14)	E (F)	0.35 (0.63)	D (E)	0.63 (1.14)	E (F)
EBR	0.94 (0.78)	F (F)	0.93 (0.93)	F (F)	0.93 (0.93)	F (F)	0.93 (0.93)	F (F)	0.93 (0.93)	F (F)
WBL	0.83 (0.87)	E (E)	0.90 (0.90)	E (E)	0.90 (0.90)	E (E)	0.90 (0.90)	E (E)	0.90 (0.90)	E (E)
WBT	0.09 (0.30)	C (D)	0.09 (0.28)	C (D)	0.16 (0.50)	C (D)	0.09 (0.28)	C (D)	0.16 (0.50)	C (D)
WBR	0.09 (0.40)	C (D)	0.09 (0.38)	C (D)	0.09 (0.49)	C (D)	0.09 (0.38)	C (D)	0.09 (0.49)	C (D)
NBL	0.79 (0.88)	D (D)	1.02 (0.99)	F (E)	1.02 (0.99)	F (E)	1.02 (0.99)	F (E)	1.02 (0.99)	F (E)
NBT	0.48 (0.81)	D (B)	0.55 (0.88)	C (B)	0.94 (1.56)	C (F)	0.55 (0.88)	C (B)	0.94 (1.56)	C (F)
NBR	0.55 (0.81)	F (D)	0.68 (0.91)	F (D)	0.81 (1.18)	D (F)	0.68 (0.91)	F (D)	0.81 (1.18)	D (F)
SBL	0.67 (0.68)	C (D)	0.74 (0.68)	C (D)	1.02 (0.68)	F (D)	0.74 (0.68)	C (D)	1.02 (0.68)	F (D)
SBT	1.00 (0.63)	E (D)	0.99 (0.78)	E (D)	1.79 (1.33)	F (F)	0.99 (0.78)	E (D)	1.79 (1.33)	F (F)
SBR	0.04 (0.09)	C (C)	0.04 (0.09)	C (C)	0.04 (0.09)	C (C)	0.04 (0.09)	C (C)	0.04 (0.09)	C (C)
Overall	**0.92 (0.88)**	**E (D)**	**0.96 (0.97)**	**E (D)**	**1.34 (1.25)**	**F (F)**	**0.96 (0.97)**	**E (D)**	**1.34 (1.25)**	**F (F)**

Notes:
1. XX (XX) – AM Peak (PM Peak)

12.4.2 Trafalgar Road & North Service Road East / Highway 403 WB Off-Ramp

Under existing conditions, the intersection operates at busy overall v/c ratios of 0.58 and 0.83, in the AM and PM peak hour, respectively.

Under future background conditions with the addition of background traffic but without corridor growth, the intersection operates under very busy conditions with overall v/c ratios of 0.75 and 1.10 in the AM and PM peak hour, respectively, resulting in an operation over theoretical capacity in the afternoon peak hour.

Under future background conditions with the addition of corridor growth, the intersection will operate at overall v/c ratios of 1.63 and 1.80 in the AM and PM peak hours, respectively. It should be noted that most movements continue to operate within capacity, but the added corridor growth along Trafalgar Road will push the southbound and northbound through movements well over capacity. It is likely that this volume of projected corridor growth will never materialize, as transit options to access the GO station improve, and drivers who are not accessing a destination in proximity to the study area find other routes that have more capacity, as the roads in the study area transition to more local traffic.

Under future total conditions without corridor growth but with the addition of site traffic, the intersection will operate at overall v/c ratios of 0.75 and 1.10 in the AM and PM peak hours, respectively. The impact of site-related traffic is in the order of 0% for both the AM and PM peak hours, respectively, as trips to and from the site who are travelling to and from the north can make use of the Highway 403 overpass east of Trafalgar.

Under future total conditions with corridor growth, the intersection will operate at overall v/c ratios of 1.63 and 1.80 in the AM and PM peak hours, respectively. Thus, this intersection may exceed its theoretical capacity in the AM peak hour, as a result of the addition of the combination of background traffic and corridor growth traffic. The impact of site-related traffic is in the order of 0% for both the AM and PM peak hours, respectively.

Under future conditions, with the combined addition of both background development and site-related traffic, traffic volumes at this intersection may exceed its theoretical capacity. Note that the addition of site traffic alone would not cause this intersection to exceed its theoretical capacity; rather it is the combination of both background and site traffic that may cause this condition. With the combined buildout, some movements may experience longer queues that may require more than a single signal cycle to clear (i.e. the northbound through movements in the PM peak hours). Notwithstanding the above, the impact of site related traffic alone is modest (in the order 0% in both peak hours) and can be appropriately accommodated at this intersection.

Traffic capacity analysis results for this intersection are summarized in **Table 34**.

Table 34 Trafalgar Road / North Service Road East / Highway 403 WB Off-Ramp Analysis Results

	Existing		Future Background (without Corridor Growth)		Future Background (with Corridor Growth)		Future Total (without Corridor Growth)		Future Total (with Corridor Growth)	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
EBL	0.17 (0.35)	E (E)	0.02 (0.10)	C (C)	0.02 (0.22)	C (C)	0.02 (0.09)	C (C)	0.02 (0.22)	C (C)
EBR	0.43 (0.32)	D (D)	0.43 (0.42)	D (C)	0.33 (0.45)	C (C)	0.43 (0.42)	D (C)	0.32 (0.45)	C (C)
EBTR	0.43 (0.32)	D (D)	0.43 (0.42)	D (C)	0.33 (0.45)	C (C)	0.43 (0.42)	D (C)	0.32 (0.45)	C (C)
WBL	0.68 (0.54)	E (D)	0.90 (0.99)	E (F)	0.98 (1.57)	F (F)	0.91 (0.99)	F (F)	0.95 (1.57)	E (F)
WBTL	0.68 (0.53)	E (D)	0.90 (1.08)	E (F)	0.99 (1.72)	F (F)	0.91 (1.08)	F (F)	0.95 (1.72)	E (F)
WBR	0.42 (0.80)	D (E)	0.26 (0.45)	D (D)	0.52 (1.09)	D (F)	0.27 (0.45)	D (C)	0.50 (1.08)	C (F)
NBT	0.48 (0.87)	A (B)	0.68 (1.16)	C (F)	1.37 (1.96)	F (F)	0.68 (1.16)	B (F)	1.42 (1.96)	F (F)
SBT	0.56 (0.45)	B (C)	0.69 (0.68)	C (D)	2.15 (1.56)	F (F)	0.69 (0.68)	C (D)	2.21 (1.56)	F (F)
SBR	0.00 (0.01)	A (B)	0.00 (0.01)	B (B)	0.00 (0.01)	B (B)	0.00 (0.01)	B (B)	0.00 (0.01)	B (B)
Overall	0.58 (0.83)	B (C)	0.75 (1.10)	C (E)	1.63 (1.80)	F (F)	0.75 (1.10)	C (F)	1.63 (1.80)	F (F)

Notes:
1. XX (XX) – AM Peak (PM Peak)

12.4.3 Trafalgar Road & Highway 403 EB Off-Ramp

Under existing conditions, the intersection operates at busy overall v/c ratios of 0.92 and 0.88, in the AM and PM peak hour, respectively.

Under future background conditions without corridor growth, the intersection will operate at overall v/c ratios of 0.97 and 0.88 in the AM and PM peak hours, respectively. All movements operate within capacity.

Under future background conditions with the addition of corridor growth, the intersection will operate at theoretical overall v/c ratios of 1.69 and 1.41 in the AM and PM peak hours, respectively. The added corridor growth along Trafalgar Road and at the Highway Off Ramps will push all movements well over capacity. It is likely that this volume of projected corridor growth will never materialize, as transit options to access the GO station improve, and drivers who are not accessing a destination in proximity to the study area find other routes that have more capacity, as the roads in the study area transition to more local traffic.

Under future total conditions without corridor growth but with the addition of site traffic, the intersection will operate at overall v/c ratios of 0.97 and 0.88 in the AM and PM peak hours, respectively. The impact of site-related traffic is in the order of 0% for both the AM and PM peak hours, respectively, as trips to and from the site who are travelling to and from Highway 403 can make use of the new ramp proposed at The Canadian Road.

Under future total conditions with corridor growth, the intersection will operate at theoretical overall v/c ratios of 1.69 and 1.41 in the AM and PM peak hours, respectively. As described for the future background with corridor growth scenario, this amount of corridor growth is not likely to materialize, as transit improves, and drivers find other routes with more capacity.

Site traffic will not have an impact at this intersection.

Traffic capacity analysis results for this intersection are summarized in **Table 35**.

Table 35 Trafalgar Road / Highway 403 EB Off-Ramp Analysis Results

	Existing		Future Background (without Corridor Growth)		Future Background (with Corridor Growth)		Future Total (without Corridor Growth)		Future Total (with Corridor Growth)	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
EBL	0.69 (0.89)	D (D)	0.61 (0.84)	C (D)	1.13 (1.54)	F (F)	0.61 (0.84)	C (D)	1.13 (1.54)	F (F)
EBR	0.98 (0.68)	E (D)	0.99 (0.97)	E (E)	1.73 (1.53)	F (F)	0.99 (0.97)	E (E)	1.73 (1.53)	F (F)
NBT	0.45 (0.64)	B (C)	0.69 (0.76)	C (D)	1.08 (1.31)	E (F)	0.69 (0.76)	C (D)	1.08 (1.31)	E (F)
SBT	0.80 (0.59)	C (C)	0.96 (0.82)	D (C)	1.66 (1.32)	F (F)	0.96 (0.82)	D (C)	1.66 (1.32)	F (F)
Overall	**0.87 (0.74)**	**C (C)**	**0.97 (0.88)**	**D (D)**	**1.69 (1.41)**	**F (F)**	**0.97 (0.88)**	**D (D)**	**1.69 (1.41)**	**F (F)**

Notes:
1. XX (XX) – AM Peak (PM Peak)

12.4.4 Trafalgar Road / Cross Avenue / South Service Road East

Under existing conditions, the intersection operates at busy overall v/c ratios of 0.70 and 0.80, in the AM and PM peak hour, respectively.

Under future background conditions, with the addition of background development traffic, the intersection begins to operate over its theoretical capacity, with overall v/c ratios of 1.09 and 1.23 in the AM and PM peak hours, respectively. These traffic volumes are not likely to actually materialize, as trips to and from these background developments may be overestimated with the rise of hybrid work arrangements, and the very close proximity of these sites to the Oakville GO station, which transports riders to downtown Toronto in under an hour.

Under future background conditions with corridor growth, the intersection will operate at overall v/c ratios of 1.40 and 1.42 in the AM and PM peak hours, respectively, as the northbound and southbound through movements experience very high volumes, that are also not likely to materialize fully. Thus, the intersection may exceed its theoretical capacity in both the AM and PM peak hours because of background traffic (not related to the site).

Under future total conditions, without corridor growth but with the addition of site traffic, the intersection continues to operate over its theoretical capacity, with overall v/c ratios of 1.09 and 1.23 in the AM and PM peak hours, respectively. Site traffic will not have an impact at this intersection.

Under future total conditions with corridor growth, the intersection will operate at overall v/c ratios of 1.40 and 1.42 in the AM and PM peak hours, respectively. Thus, this intersection may exceed its theoretical capacity in the AM and PM peak hours, as a result of the addition of corridor growth and background traffic. As stated, site traffic will not impact this intersection during either the AM or PM peak hour.

Traffic capacity analysis results for this intersection are summarized in Table 36.

Table 36 Trafalgar Road / Cross Avenue / South Service Road East Analysis Results

	Existing		Future Background (without Corridor Growth)		Future Background (with Corridor Growth)		Future Total (without Corridor Growth)		Future Total (with Corridor Growth)	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
EBL	0.74 (0.89)	E (E)	1.33 (1.30)	F (F)	1.38 (1.30)	F (F)	1.33 (1.30)	F (F)	1.38 (1.30)	F (F)
EBTR	0.26 (0.23)	D (D)	0.55(0.37)	D (D)	0.62 (0.47)	D (D)	0.55 (0.37)	D (D)	0.62 (0.47)	D (D)
WBL	0.25 (0.25)	D (D)	0.31 (0.28)	D (D)	0.29 (0.28)	D (D)	0.31 (0.28)	D (D)	0.29 (0.28)	D (D)
WBT	0.32 (0.39)	E (E)	0.52 (1.06)	E (F)	0.70 (1.36)	E (F)	0.52 (1.06)	E (F)	0.70 (1.36)	E (F)
WBR	0.06 (0.64)	E (E)	0.06 (0.64)	E (E)	0.06 (0.64)	E (E)	0.06 (0.64)	E (E)	0.06 (0.64)	E (E)
NBL	0.53 (0.50)	D (D)	0.99 (1.18)	D (F)	1.05 (1.18)	F (F)	0.99 (1.18)	F (F)	1.05 (1.18)	F (F)
NBTR	0.48 (0.52)	C (D)	0.57 (0.55)	C (D)	1.10 (1.00)	F (D)	0.57 (0.55)	C (D)	1.10 (1.00)	F (D)
SBL	0.57 (0.42)	C (C)	0.97 (0.62)	D (C)	1.04 (0.82)	F (D)	0.97 (0.62)	E (C)	1.04 (0.82)	F (D)
SBTR	0.77 (0.83)	C (C)	1.02 (1.02)	D (E)	1.59 (1.60)	F (F)	1.02 (1.02)	E (E)	1.59 (1.60)	F (F)
Overall	**0.70 (0.80)**	**C (D)**	**1.09 (1.23)**	**F (F)**	**1.40 (1.42)**	**F (F)**	**1.09 (1.23)**	**F (F)**	**1.40 (1.42)**	**F (F)**

Notes:
1. XX (XX) – AM Peak (PM Peak)

12.4.5 Trafalgar Road & Cornwall Road

Under existing conditions, the intersection operates at good overall v/c ratios of 0.77 and 0.73, in the AM and PM peak hour, respectively.

Under future background conditions, with the addition of background development traffic but without corridor growth, the intersection operates at acceptable v/c ratios of 0.86 and 0.87 in the AM and PM peak hour, respectively.

Under future background conditions with corridor growth, the intersection will begin to operate over theoretical capacity with overall v/c ratios of 1.33 and 1.23 in the AM and PM peak hour, respectively. As stated previously, the corridor growth volumes are not likely to fully materialize as these roads will serve local traffic as opposed to corridor traffic in the future, and drivers will find other roads with more capacity to reach their destination.

Under future total conditions, with the addition of site traffic and without corridor growth, the intersection operates at acceptable v/c ratios of 0.91 and 0.94. The impact of site traffic is in the order of 5%-7% during the AM and PM peak hour, respectively.

Under future total conditions with corridor growth, the intersection will continue to operate over its theoretical capacity, with overall v/c ratios of 1.40 during the AM and PM peak hour, respectively. It should be noted that a characteristic of the HCM methodology (which has been utilized in this analysis) is an exaggeration of capacity impacts associated with traffic volume increases in above capacity conditions. Essentially, with a linear increase in traffic volume, the resulting v/c ratio increases exponentially once it surpasses a v/c ratio of 1.00. Site traffic still has a minimal impact on the operations of this intersection with the consideration of corridor growth.

Site traffic can be acceptably accommodated at this intersection.

Traffic capacity analysis results for this intersection are summarized in **Table 35**.

Table 37 Trafalgar Road / Cornwall Road Analysis Results

	Existing		Future Background (without Corridor Growth)		Future Background (with Corridor Growth)		Future Total (without Corridor Growth)		Future Total (with Corridor Growth)	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
EBL	0.75 (0.84)	E (E)	0.83 (0.83)	F (E)	1.01 (0.84)	F (E)	0.76 (0.84)	E (E)	1.01 (0.84)	F (E)
EBT	0.74 (0.67)	D (D)	0.77 (0.63)	D (D)	1.13 (0.98)	F (E)	0.94 (0.97)	E (E)	1.41 (1.41)	F (F)
EBR	0.05 (0.03)	D (C)	0.05 (0.03)	C (C)	0.05 (0.03)	C (C)	0.05 (0.03)	D (C)	0.05 (0.03)	C (C)
WBL	0.13 (0.20)	D (D)	0.16 (0.19)	D (C)	0.27 (0.37)	D (C)	0.55 (0.45)	D (C)	0.52 (0.45)	D (C)
WBT	0.46 (0.56)	D (D)	0.42 (0.52)	D (D)	0.58 (0.78)	D (D)	0.66 (0.54)	D (D)	0.78 (0.88)	D (D)
WBR	0.72 (0.74)	E (E)	0.84 (0.91)	E (E)	0.78 (0.85)	D (E)	0.80 (0.85)	E (E)	0.81 (0.86)	E (E)
NBL	0.17 (0.20)	C (C)	0.23 (0.30)	D (D)	0.38 (0.41)	D (D)	0.25 (0.36)	D (D)	0.38 (0.41)	D (D)
NBTR	0.42 (0.48)	D (D)	0.55 (0.71)	D (D)	1.01 (1.38)	F (F)	0.56 (0.90)	D (E)	0.96 (1.43)	E (F)
SBL	0.84 (0.75)	E (E)	0.90 (0.83)	E (E)	1.02 (0.83)	F (E)	0.93 (0.83)	E (E)	1.02 (0.83)	F (E)
SBT	0.67 (0.65)	D (D)	0.78 (0.81)	D (E)	1.50 (1.56)	F (F)	0.79 (0.88)	E (E)	1.46 (1.52)	F (F)
SBR	0.33 (0.25)	E (F)	0.38 (0.29)	C (F)	0.50 (0.41)	C (F)	0.36 (0.31)	F (F)	0.49 (0.40)	C (F)
Overall	**0.77 (0.73)**	**D (E)**	**0.86 (0.87)**	**D (E)**	**1.33 (1.23)**	**F (F)**	**0.91 (0.94)**	**E (E)**	**1.40 (1.40)**	**F (F)**

Notes:
1. XX (XX) – AM Peak (PM Peak)

12.4.6 Chartwell Road / South Service Road East

Under existing conditions, this intersection currently operates as an unsignalized intersection. The operations results for unsignalized intersections are provided in **Section 12.5**.

It is recommended to signalize this intersection under future background and future total scenarios to accommodate traffic to and from the new highway on-ramp at The Canadian Road.

Under future background conditions with the addition of background traffic and without corridor growth, the intersection will operate with good v/c ratios of 0.27 and 0.32 in the AM and PM peak hour, respectively.

Under future background conditions with corridor growth considerations, the intersection will operate with good v/c ratios of 0.32 and 0.45 in the AM and PM peak hour, respectively.

Under future total conditions, with site traffic added to the network and without corridor growth, the intersection will operate with acceptable v/c ratios of 0.77 and 0.74 in the AM and PM peak hours, respectively.

Under future total conditions with corridor growth, the intersection will operate at busy overall v/c ratios of 0.78 and 0.87 in the AM and PM peak hours, respectively.

The impact of Site related traffic volumes at this intersection is moderate, but site traffic volumes can be acceptably accommodated.

Traffic capacity analysis results for this intersection are summarized in **Table 38**.

Table 38 Chartwell Road / South Service Road East Analysis Results

	Existing		Future Background (without Corridor Growth)		Future Background (with Corridor Growth)		Future Total (without Corridor Growth)		Future Total (with Corridor Growth)	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
EBT	Unsignalized under existing conditions.		0.27 (0.20)	A (A)	0.28 (0.22)	A (A)	0.98 (0.40)	D (A)	0.89 (0.43)	C (A)
EBR			0.05 (0.05)	A (A)	0.08 (0.09)	A (A)	0.05 (0.05)	A (A)	0.08 (0.09)	A (A)
WBL			0.14 (0.14)	A (A)	0.15 (0.16)	A (A)	0.61 (0.19)	C (A)	0.44 (0.21)	B (A)
WBT			0.16 (0.25)	A (A)	0.27 (0.35)	A (A)	0.29 (0.75)	A (A)	0.36 (0.87)	A (B)
NBL			0.39 (0.56)	D (C)	0.54 (0.70)	C (C)	0.21 (0.56)	C (C)	0.54 (0.79)	C (D)
NBR			0.16 (0.11)	C (C)	0.17 (0.18)	C (C)	0.25 (0.11)	C (C)	0.33 (0.18)	C (C)
Overall			**0.27 (0.32)**	**B (B)**	**0.32 (0.45)**	**B (B)**	**0.77 (0.74)**	**C (B)**	**0.78 (0.87)**	**B (B)**

Notes:
1. XX (XX) – AM Peak (PM Peak)

12.4.7 Cornwall Road & Chartwell Road

Under existing conditions, the intersection operates at good overall v/c ratios of 0.66 and 0.49, in the AM and PM peak hour, respectively.

Under future background conditions with the addition of background traffic and without corridor growth, the intersection will operate with good overall v/c ratios of 0.52 and 0.43 during the AM and PM peak hour, respectively.

Under future background conditions with corridor growth, the intersection will operate at good overall v/c ratios of 0.72 and 0.64 in the AM and PM peak hours, respectively.

Under future total conditions with the addition of site traffic, the intersection will operate with acceptable v/c ratios of 0.59 and 0.79 in the AM and PM peak hours, respectively.

Under future total conditions with corridor growth, the intersection will operate at acceptable overall v/c ratios of 0.85 and 0.98 in the AM and PM peak hours, respectively.

The impact of Site related traffic volumes is moderate, and can be appropriately accommodated at this intersection.

Traffic capacity analysis results for this intersection are summarized in **Table 39**.

Table 39 Cornwall Road / Chartwell Road Analysis Results

	Existing		Future Background (without Corridor Growth)		Future Background (with Corridor Growth)		Future Total (without Corridor Growth)		Future Total (with Corridor Growth)	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
EBL	0.07 (0.12)	A (A)	0.07 (0.11)	A (A)	0.13 (0.19)	A (A)	0.28 (0.80)	B (B)	0.58 (0.99)	C (E)
EBT	0.63 (0.47)	B (A)	0.44 (0.28)	A (A)	0.71 (0.48)	B (A)	0.50 (0.29)	B (A)	0.80 (0.50)	B (A)
EBR	0.13 (0.06)	A (A)	0.44 (0.28)	A (A)	0.71 (0.48)	B (A)	0.50 (0.29)	B (A)	0.80 (0.50)	B (A)
WBL	0.14 (0.13)	A (A)	0.15 (0.15)	A (A)	0.34 (0.24)	B (B)	0.18 (0.19)	B (B)	0.35 (0.30)	B (B)
WBTR	0.31 (0.35)	A (A)	0.32 (0.40)	A (A)	0.56 (0.69)	A (B)	0.38 (0.60)	B (B)	0.65 (0.97)	B (D)
NBL	0.72 (0.56)	C (C)	0.67 (0.52)	C (C)	0.75 (0.54)	C (C)	0.71 (0.52)	C (C)	0.92 (0.53)	D (C)
NBTR	0.19 (0.28)	B (C)	0.18 (0.29)	B (C)	0.32 (0.51)	B (C)	0.17 (0.47)	B (C)	0.28 (0.62)	B (C)
SBL	0.12 (0.29)	B (C)	0.11 (0.27)	B (C)	0.12 (0.34)	B (C)	0.39 (0.63)	B (C)	0.44 (0.78)	B (D)
SBT	0.16 (0.16)	B (C)	0.15 (0.15)	B (C)	0.28 (0.27)	B (C)	0.41 (0.32)	B (C)	0.53 (0.41)	B (C)
SBR	0.02 (0.04)	B (C)	0.02 (0.04)	B (C)	0.02 (0.03)	B (C)	0.24 (0.11)	B (C)	0.47 (0.11)	B (C)
Overall	**0.66 (0.49)**	**B (A)**	**0.52 (0.42)**	**B (B)**	**0.72 (0.64)**	**B (B)**	**0.59 (0.79)**	**B (B)**	**0.85 (0.98)**	**B (C)**

Notes:
1. XX (XX) – AM Peak (PM Peak)

12.4.8 South Service Road East / The Canadian Road & Royal Windsor Drive / Highway 403 WB On/Off Ramp

Under existing conditions, the intersection operates at good overall v/c ratios of 0.36 and 0.39, in the AM and PM peak hour, respectively.

Under future background conditions with the addition of background traffic and without corridor growth, the intersection will operate with good overall v/c ratios of 0.58 and 0.51 during the AM and PM peak hour, respectively.

Under future background conditions with corridor growth, the intersection will operate at good overall v/c ratios of 0.72 and 0.73 in the AM and PM peak hours, respectively.

Under future total conditions with the addition of site traffic, the intersection will operate with acceptable v/c ratios of 0.85 and 0.83 in the AM and PM peak hours, respectively.

Under future total conditions with corridor growth, the intersection will operate at acceptable overall v/c ratios of 0.96 and 1.04 in the AM and PM peak hours, respectively. It should be noted that the impact of corridor growth has the largest capacity impact on this intersection.

The impact of Site related traffic volumes is moderate, and can be appropriately accommodated at this intersection.

Traffic capacity analysis results for this intersection are summarized in **Table 40**.

Table 40 South Service Road East / The Canadian Road & The Royal Windsor Drive / Highway 403 WB On/Off-Ramp Analysis Results

	Existing		Future Background (without Corridor Growth)		Future Background (with Corridor Growth)		Future Total (without Corridor Growth)		Future Total (with Corridor Growth)	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
EBL	0.11 (0.01)	A (A)	0.11 (0.01)	A (A)	0.20 (0.02)	A (A)	0.11 (0.01)	A (A)	0.20 (0.02)	A (A)
EBTR	0.51 (0.54)	B (B)	0.51 (0.54)	B (B)	0.90 (0.96)	C (C)	0.54 (0.70)	B (B)	0.93 (1.16)	C (F)
WBL	0.66 (0.58)	C (C)	0.66 (0.58)	C (C)	0.92 (0.77)	E (D)	0.72 (0.77)	C (D)	0.92 (0.77)	E (D)
WBT	0.43 (0.49)	B (B)	0.43 (0.49)	B (B)	0.77 (0.88)	B (B)	0.43 (0.49)	B (B)	0.77 (0.88)	B (B)
WBR	0.00 (0.00)	A (A)	0.00 (0.00)	A (A)	0.00 (0.00)	A (A)	0.00 (0.00)	A (A)	0.00 (0.00)	A (A)
NBL	0.01 (0.09)	A (A)	0.09 (0.13)	A (A)	0.09 (0.14)	A (A)	0.46 (0.86)	B (D)	0.48 (0.86)	B (D)
NBT	0.01 (0.02)	A (A)	0.50 (0.23)	B (A)	0.51 (0.24)	B (A)	0.98 (0.40)	D (B)	0.99 (0.42)	D (B)
NBR	0.04 (0.20)	A (A)	0.04 (0.20)	A (A)	0.06 (0.26)	A (A)	0.04 (0.20)	A (A)	0.06 (0.26)	A (A)
SBT	0.07 (0.05)	A (A)	0.13 (0.45)	A (B)	0.18 (0.49)	A (B)	0.19 (0.88)	A (C)	0.24 (0.93)	A (C)
SBR	0.01 (0.02)	A (A)	0.01 (0.02)	A (A)	0.01 (0.03)	A (A)	0.01 (0.02)	A (A)	0.01 (0.03)	A (A)
Overall	**0.36 (0.39)**	**B (B)**	**0.58 (0.51)**	**B (B)**	**0.72 (0.73)**	**B (C)**	**0.85 (0.83)**	**B (B)**	**0.96 (1.04)**	**C (D)**

Notes:
1. XX (XX) – AM Peak (PM Peak)

12.4.9 South Service Road E & Argus Road / Davis Road

This intersection currently operates as the intersection of South Service Road and Davis Road under existing conditions and operates as an unsignalized intersection. The operations results for this intersection as an unsignalized intersection are provided in **Section 12.5**. It is proposed to signalize this intersection under future background and future total conditions to accommodate traffic utilizing the Argus Road underpass under Trafalgar Road.

Under future background conditions with the addition of background traffic and without corridor growth, the intersection will operate with good v/c ratios of 0.33 and 0.28 in the AM and PM peak hour, respectively.

Under future background conditions with corridor growth considerations, the intersection will operate with good v/c ratios of 0.39 and 0.38 in the AM and PM peak hour, respectively.

Under future total conditions, with site traffic added to the network and without corridor growth, the intersection will operate with good v/c ratios of 0.33 and 0.28 in the AM and PM peak hours, respectively.

Under future total conditions with corridor growth, the intersection will operate at good overall v/c ratios of 0.39 and 0.38 in the AM and PM peak hours, respectively.

The impact of Site related traffic volumes at this intersection is moderate, but site traffic volumes can be acceptably accommodated.

Traffic capacity analysis results for this intersection are summarized in **Table 41**.

Table 41 South Service Road E & Argus Road/ Davis Road Analysis Results

	Existing		Future Background (without Corridor Growth)		Future Background (with Corridor Growth)		Future Total (without Corridor Growth)		Future Total (with Corridor Growth)	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
EBTLR	Unsignalized under existing conditions.		0.65 (0.40)	C (C)	0.65 (0.40)	C (D)	0.65 (0.40)	C (C)	0.65 (0.40)	C (D)
WBTLR			0.07 (0.40)	B (C)	0.07 (0.40)	B (C)	0.07 (0.40)	B (C)	0.07 (0.40)	B (C)
NBTLR			0.12 (0.19)	A (A)	0.19 (0.28)	A (A)	0.12 (0.19)	A (A)	0.19 (0.28)	A (A)
SBTLR			0.15 (0.25)	A (A)	0.24 (0.38)	A (A)	0.15 (0.25)	A (A)	0.24 (0.38)	A (A)
Overall			**0.33 (0.28)**	**B (A)**	**0.39 (0.38)**	**B (A)**	**0.33 (0.28)**	**B (A)**	**0.39 (0.38)**	**B (A)**

Notes:
1. XX (XX) – AM Peak (PM Peak)

12.4.10 Davis Road & "Overpass Road"

The intersection of Davis Road and the Overpass Road is proposed in future scenarios, and is the centre intersection of the master plan.

Under both future background conditions, the intersection will operate at good overall v/c ratios of 0.18 and 0.05 in the AM and PM peak hours, respectively.

Under both future total conditions, the intersection will operate at good overall v/c ratios of 0.22 and 0.25 in the AM and PM peak hours, respectively.

The impact of Site related traffic volumes are moderate and can be appropriately accommodated at this intersection.

Traffic capacity analysis results for this intersection are summarized in **Table 42**.

Table 42 Davis Road & "Overpass Road" Analysis Results

	Existing		Future Background (without Corridor Growth)		Future Background (with Corridor Growth)		Future Total (without Corridor Growth)		Future Total (with Corridor Growth)	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
EBL	***Proposed under future conditions.***		0.17 (0.02)	A (A)	0.17 (0.02)	A (A)	0.21 (0.07)	A (A)	0.21 (0.07)	A (A)
EBTR			0.08 (0.02)	A (A)	0.08 (0.02)	A (A)	0.09 (0.03)	A (A)	0.09 (0.03)	A (A)
WBTR			0.00 (0.00)	A (A)	0.00 (0.00)	A (A)	0.05 (0.23)	A (A)	0.05 (0.23)	A (A)
NBTR			0.23 (0.00)	C (A)	0.23 (0.00)	C (A)	0.26 (0.01)	C (C)	0.26 (0.01)	C (C)
SBL			0.00 (0.00)	A (A)	0.00 (0.00)	A (A)	0.15 (0.38)	C (C)	0.15 (0.38)	C (C)
SBTR			0.00 (0.23)	A (C)	0.00 (0.23)	A (C)	0.00 (0.21)	C (C)	0.00 (0.21)	C (C)
Overall			0.18 (0.05)	A (B)	0.18 (0.05)	A (B)	0.22 (0.25)	A (B)	0.22 (0.25)	A (B)

Notes:
1. XX (XX) – AM Peak (PM Peak)

12.5 Unsignalized Intersection Operations

Capacity analysis for the study area unsignalized intersections are summarized in **Table 43**.

Table 43 Unsignalized Intersection Analysis Results

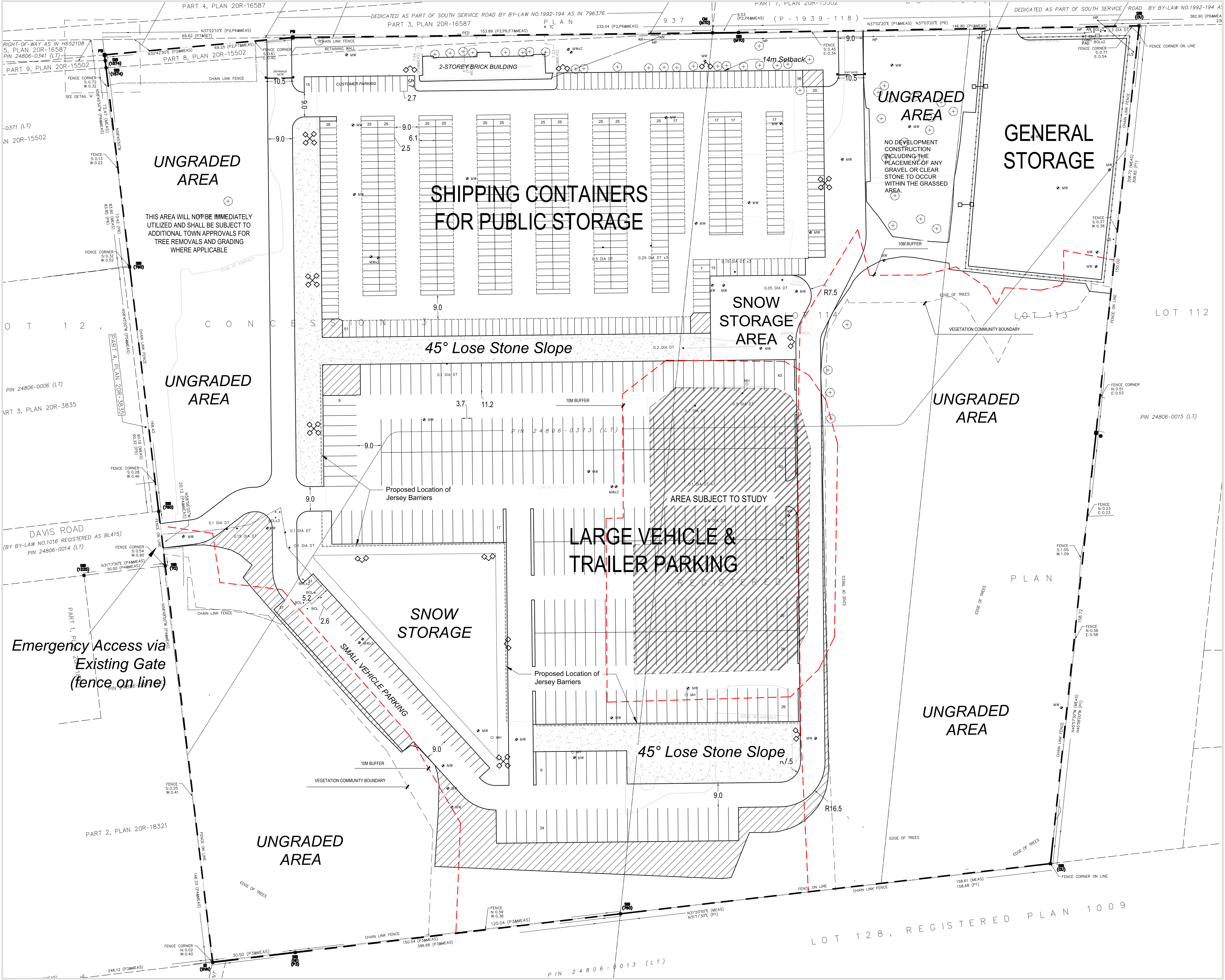
	Existing		Future Background (without Corridor Growth)		Future Background (with Corridor Growth)		Future Total (without Corridor Growth)		Future Total (with Corridor Growth)	
	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)
Trafalgar Road / Argus Road										
EBR	B (A)	10.3 (9.7)	B (B)	14.2 (12.0)	C (C)	15.4 (17.1)	B (B)	14.2 (12.0)	C (C)	15.4 (17.1)
South Service Road E / Davis Road										
EBTLR	A (A)	0.0 (0.0)	Signalized under Future Conditions							
WBTLR	B (B)	11.2 (12.9)								
NBTL	A (A)	0.0 (0.0)								
NBTR	A (A)	0.0 (0.0)								
SBTL	A (A)	0.8 (1.1)								
SBTR	A (A)	0.0 (0.0)								
Chartwell Road & South Service Road E										
EBTR	A (A)	0.0 (0.0)	Signalized under Future Conditions							
WBTL	A (A)	3.4 (3.6)								
NBLR	B (C)	13.2 (15.0)								

	Existing		Future Background (without Corridor Growth)		Future Background (with Corridor Growth)		Future Total (without Corridor Growth)		Future Total (with Corridor Growth)	
	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)
Chartwell Road & Cross Avenue										
EBL	Part of Road Network under future conditions.		A (A)	8.8 (8.7)	A (A)	8.8 (8.7)	A (B)	9.7 (8.6)	A (C)	9.7 (15.9)
EBR			A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	B (A)	12.4 (10.4)	B (A)	12.4 (9.5)
NBTL			A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (C)	2.9 (20.0)	A (A)	2.9 (2.9)
SBTR			A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (8.1)	A (A)	0.0 (0.0)
Block 1 – Site Driveway 1										
WBTL	Constructed with site.						A (A)	4.6 (5.9)	A (A)	1.9 (5.5)
NBLR							B (A)	11.2 (9.3)	B (B)	12.7 (10.3)
Block 1 – Site Driveway 2										
WBTL	Constructed with site.						B (B)	10.1 (10.4)	B (B)	10.1 (10.4)
Block 2 – Site Driveway 1										
WBTL	Constructed with site.						A (A)	3.0 (3.8)	A (A)	1.7 (4.3)
NBLR							B (A)	12.8 (9.7)	B (B)	14.7 (10.7)
Block 2 – Site Driveway 2										
EBLR	Constructed with site.						B (B)	13.0 (12.7)	B (B)	13.0 (12.7)
NBTL							A (A)	1.9 (6.6)	A (A)	1.9 (6.6)
Block 4 – Site Driveway 1										
EBLR	Constructed with site.						B (B)	12.3 (11.1)	B (B)	12.3 (11.1)
NBTL							A (A)	1.9 (2.8)	A (A)	1.9 (2.8)

	Existing		Future Background (without Corridor Growth)		Future Background (with Corridor Growth)		Future Total (without Corridor Growth)		Future Total (with Corridor Growth)	
	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)
Block 4 – Site Driveway 2										
SBLR							B (A)	10.3 (9.2)	B (A)	10.3 (9.2)

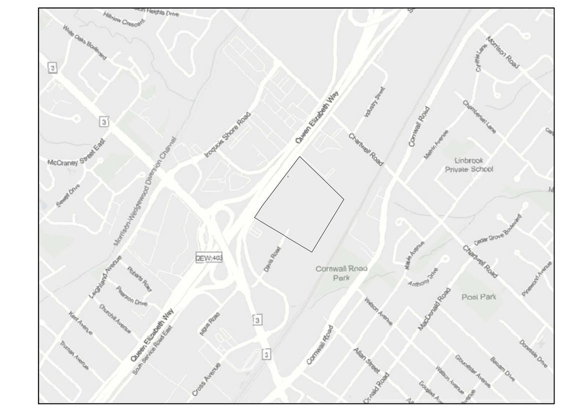
Notes:
1. XX (XX) – AM Peak (PM Peak)

Appendix A:
Approved Temporary Land Use Concept Plan – MHBC, May 2024



CONCEPT PLAN

420-468 South Service Road,
Oakville, ON



Subject Lands

SCALE: 1:10,000

SITE STATISTICS

	HA	AC
Total Site Area	**11.049**	**27.302**
Existing Building	0.041	0.100
Small Vehicle Parking	0.173	0.428
Shipping Containers for Public Storage	1.660	4.101
Large Vehicle & Trailer Parking	2.100	5.189
General Storage	0.459	1.135
Ungraded Area	4.443	10.980
Snow Storage	0.361	0.892
45° Lose Stone Slope	0.452	1.117

STORAGE STATISTICS

Small Vehicle Parking	64
Shipping Containers for Public Storage	502
Large Vehicle & Trailer Parking	312

PARKING STATISTICS

	No. of Spots
Customer Parking Area (north)	15

LIGHT POLE (all lighting to be dark sky friendly)

10M BUFFER

VEGETATION COMMUNITY BOUNDARY

NOTE:
NO DEVELOPMENT CONSTRUCTION INCLUDING THE PLACEMENT OF ANY GRAVEL OR CLEAR STONE TO OCCUR WITHIN THE 10M BUFFER OR WESTERLY UNGRADED AREA.

NOTES:
- Total site area determined via site survey
- Delineated site areas are rough approximations only

No.	Date	Issue/Revision	By
5	2024-05-09	Add jersey barrier and light poles	RM
4	2024-05-08	Reduce small car storage area	RM
3	2024-04-10	Revise customer parking; Revise container storage layout	RM
2	2024-04-08	Issued for submission	HH
1	2024-02-23	Revise north customer parking sizes for by-law conformity	RM

MHBC PLANNING URBAN DESIGN & LANDSCAPE ARCHITECTURE
204-442 BRANT STREET, BURLINGTON, ON, L7R 2G4 | P: 905.639.8686 | WWW.MHBCPLAN.COM

Date: Friday, May 10, 2024

File No.: 1677 - X	Drawn By: P.B. / R.M.
Plan Scale: 1:600	Checked By: initials

Project:
Part of Lot 12, Concession 3
Trafalgar, Town of Oakville
Region of Halton

Appendix B:
Reduced Scale Architectural Plans

PROPOSED MIXED-USE DEVELOPMENT

SOUTH SERVICE ROAD

OAKVILLE THE ROSE CORPORATION ONTARIO

GRAZIANI + CORAZZA ARCHITECTS

8400 JANE STREET, BUILDING D-SUITE 300 CONCORD, ONTARIO L4K 4L8
T.905.795.2601 F.905.795.2844 WWW.GC-ARCHITECTS.COM

LIST OF DRAWINGS								
COVER PAGE	N.T.S	A000	ELEVATIONS	1:400	A401	SECTION	1:600	A501
CONTEXT PLAN	1:1200	A100	ELEVATIONS	1:400	A402	MASSING VIEWS	N.T.S	A601
STATISTICS	N.T.S	A101	ELEVATIONS	1:400	A403	MASSING VIEWS	N.T.S	A602
SITE PLAN	1:750	A101	ELEVATIONS	1:400	A404	MASSING VIEWS	N.T.S	A603
P4-P3 FLOOR PLAN	1:750	A201	ELEVATIONS	1:400	A405	MASSING VIEWS	N.T.S	A604
P2 FLOOR PLAN	1:750	A202	ELEVATIONS	1:400	A406	MASSING VIEWS	N.T.S	A605
P1 FLOOR PLAN	1:750	A203	ELEVATIONS	1:400	A407	MASSING VIEWS	N.T.S	A606
GROUND FLOOR PLAN	1:750	A301	ELEVATIONS	1:400	A408	MASSING VIEWS	N.T.S	A607
2ND FLOOR PLAN	1:750	A302	ELEVATIONS	1:400	A409			
3RD-4TH FLOOR PLAN	1:750	A303	ELEVATIONS	1:400	A410			
5TH-6TH FLOOR PLAN	1:750	A304	ELEVATIONS	1:400	A411			
TYPICAL TOWER FLOOR PLAN	1:750	A305	ELEVATIONS	1:400	A412			
MECHANICAL FLOOR PLAN	1:750	A306	ELEVATIONS	1:400	A413			
			ELEVATIONS	1:400	A414			
			ELEVATIONS	1:400	A415			
			ELEVATIONS	1:400	A416			

1.	SEP.12.2024	ISSUED TO CITY FOR PAC MEETING	J. CHI.
2.	NOV.01.2024	ISSUED TO CITY FOR OPA	J. CHI.

ISSUED FOR REVISIONS

GRAZIANI + CORAZZA ARCHITECTS
8400 JANE STREET, BUILDING D-SUITE 300 CONCORD, ONTARIO L4K 4L8
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ONTARIO ASSOCIATION OF ARCHITECTS
JOHNNY CHIMIENTI
LICENCE
6299

PROPOSED MIXED-USE DEVELOPMENT

SOUTH SERVICE ROAD

THE ROSE CORPORATION

OAKVILLE ONTARIO

PROJECT ARCHITECT:	J. Chimienti
ASSISTANT DESIGNER:	B. DADGOSTAR
DRAWN BY:	B. DADGOSTAR
CHECKED BY:	D. Biase
PLOT DATE:	NOV.01.2024
JOB #	2127.23

CONTEXT PLAN

1:1200

A100

TITLEBLOCK SIZE: 610 x 900

STATISTICAL INFORMATION

	BLOCK 1		BLOCK 2		BLOCK 3 (PUBLIC PARK)	BLOCK 4		TOTAL	
	REQUIRED	PROVIDED	REQUIRED	PROVIDED		REQUIRED	PROVIDED	REQUIRED	PROVIDED
1. SITE AREA	± 24,949 m2 ± 2.49 ha. ± 268,549 ft2 ± 6.16 ac (GROSS SITE LESS ROAD LESS PARK)		± 22,094 m2 ± 2.20 ha. ± 237,818 ft2 ± 5.45 ac (GROSS SITE LESS ROAD LESS PARK)		± 18,687 m2 ± 1.86 ha. ± 201,145 ft2 ± 4.61 ac (GROSS SITE LESS ROAD LESS PARK)	± 13,255 m2 ± 1.32 ha. ± 142,676 ft2 ± 3.27 ac (GROSS SITE LESS ROAD LESS PARK)		BLOCK 1,2,4 : (DEVELOPMENT BLOCKS) ± 60,298 m2 ± 6.02 ha. ± 649,043 ft2 ± 14.89 ac BLOCK 3 : (PUBLIC PARK) ± 18,687 m2 ± 1.86 ha. ± 201,145 ft2 ± 4.61 ac PUBLIC ROADS : ± 31,503 m2 ± 3.15 ha. ± 339,095 ft2 ± 7.80 ac TOTAL : ± 110,488 m2 ± 11.04 ha. ± 1,189,283 ft2 ± 27.30 ac	
2. GCA	RESIDENTIAL : 215,053 M2 NON-RESIDENTIAL : 2,175 M2 TOTAL GCA : 217,228 M2 *		RESIDENTIAL : 202,404 M2 NON-RESIDENTIAL : 1,362 M2 TOTAL GCA : 203,766 M2 *			RESIDENTIAL : 133,978 M2 NON-RESIDENTIAL : 2,312 M2 TOTAL GCA : 136,290 M2 *		RESIDENTIAL : 551,435 M2 NON-RESIDENTIAL : 5,849 M2 TOTAL GCA : 557,284 M2 *	
3. LOT COVERAGE	50 %		52%			56%		52% (BASED ON DEVELOPMENT BLOCKS SITE AREA)	
4. FSI	GROSS : (GROSS SITE AREA) = 217,228 m2 / ±42,673 m2 5.0 X FSI NET : (GROSS SITE LESS ROAD) = 217,228 m2 / ±32,915 m2 6.5 X FSI NET NET : (GROSS SITE LESS ROAD LESS PARK) = 217,228 m2 / ±24.949 m2 8.7 X FSI		GROSS : (GROSS SITE AREA) = 203,766 m2 / ±36,314 m2 5.6 X FSI NET : (GROSS SITE LESS ROAD) = 203,766 m2 / ±26,556 m2 7.6 X FSI NET NET : (GROSS SITE LESS ROAD LESS PARK) = 203,766 m2 / ±22,094 m2 9.2 X FSI			GROSS : (GROSS SITE AREA) = 136,290 m2 / ±31,501 m2 4.3 X FSI NET : (GROSS SITE LESS ROAD) = 136,290 m2 / ±21,743 m2 6.2 X FSI NET NET : (GROSS SITE LESS ROAD LESS PARK) = 136,290 m2 / ±13,255 m2 10.2 X FSI		GROSS : (GROSS SITE AREA) = 557,284 m2 / ±110,488 m2 5.0 X FSI NET : (GROSS SITE LESS ROAD) = 557,284 m2 / ±81,214 m2 6.8 X FSI NET NET : (GROSS SITE LESS ROAD LESS PARK) = 557,284 m2 / ±60,298 m2 9.2 X FSI	
5. UNIT COUNT	2,746 UNITS		2,584 UNITS			1,624 UNITS		6,954 UNITS	
6. UNIT BREAKDOWN	3.8.2.1 (4) NOT LESS THAN 15% OF ALL RESIDENTIAL SUITES SHALL BE PROVIDED WITH A BARRIER-FREE PATH OF TRAVEL FROM THE SUITE ENTRANCE DOOR TO, (a) AT LEAST ONE BEDROOM AT THE SAME LEVEL, AND (b) AT LEAST ONE BATHROOM, (i) HAVING AN AREA NOT LESS THAN 4.5 m2 AT THE SAME LEVEL, AND (ii) CONFORMING TO SENTENCE 9.6.3.3.(1) REQUIRED = 15% x 2,746 *** UNITS = (411.90 UNITS) 412 UNITS	1 BEDROOM 1,647 2 BEDROOM 824 3 BEDROOM 275 TOTAL 2,746 *** OF WHICH 412 UNITS MEET 3.8.2.1 (5) OF THE 2012 OBC	3.8.2.1 (4) NOT LESS THAN 15% OF ALL RESIDENTIAL SUITES SHALL BE PROVIDED WITH A BARRIER-FREE PATH OF TRAVEL FROM THE SUITE ENTRANCE DOOR TO, (a) AT LEAST ONE BEDROOM AT THE SAME LEVEL, AND (b) AT LEAST ONE BATHROOM, (i) HAVING AN AREA NOT LESS THAN 4.5 m2 AT THE SAME LEVEL, AND (ii) CONFORMING TO SENTENCE 9.6.3.3.(1) REQUIRED = 15% x 2,584 *** UNITS = (387.60 UNITS) 388 UNITS	1 BEDROOM 1,551 2 BEDROOM 775 3 BEDROOM 258 TOTAL 2,584 *** OF WHICH 388 UNITS MEET 3.8.2.1 (5) OF THE 2012 OBC		3.8.2.1 (4) NOT LESS THAN 15% OF ALL RESIDENTIAL SUITES SHALL BE PROVIDED WITH A BARRIER-FREE PATH OF TRAVEL FROM THE SUITE ENTRANCE DOOR TO, (a) AT LEAST ONE BEDROOM AT THE SAME LEVEL, AND (b) AT LEAST ONE BATHROOM, (i) HAVING AN AREA NOT LESS THAN 4.5 m2 AT THE SAME LEVEL, AND (ii) CONFORMING TO SENTENCE 9.6.3.3.(1) REQUIRED = 15% x 1,624 *** UNITS = (243.60 UNITS) 244 UNITS	1 BEDROOM 975 2 BEDROOM 487 3 BEDROOM 162 TOTAL 1,624 *** OF WHICH 244 UNITS MEET 3.8.2.1 (5) OF THE 2012 OBC	3.8.2.1 (4) NOT LESS THAN 15% OF ALL RESIDENTIAL SUITES SHALL BE PROVIDED WITH A BARRIER-FREE PATH OF TRAVEL FROM THE SUITE ENTRANCE DOOR TO, (a) AT LEAST ONE BEDROOM AT THE SAME LEVEL, AND (b) AT LEAST ONE BATHROOM, (i) HAVING AN AREA NOT LESS THAN 4.5 m2 AT THE SAME LEVEL, AND (ii) CONFORMING TO SENTENCE 9.6.3.3.(1) REQUIRED = 15% x 6,954 *** UNITS = (1,044 UNITS) 1,044 UNITS	1 BEDROOM 4,173 2 BEDROOM 2,086 3 BEDROOM 695 TOTAL 6,954 *** OF WHICH 1,044 UNITS MEET 3.8.2.1 (5) OF THE 2012 OBC
7. AMENITY	AMENITY REQUIRED: INDOOR = 2 m2 PER UNIT = 2 x 2,746 = 5,492 m2 OUTDOOR = 2 m2 PER UNIT = 2 x 2,746 = 5,492 m2	AMENITY PROVIDED: INDOOR = 6,895 m2 OUTDOOR = 7,125 m2	AMENITY REQUIRED: INDOOR = 2 m2 PER UNIT = 2 x 2,584 = 5,168 m2 OUTDOOR = 2 m2 PER UNIT = 2 x 2,584 = 5,168 m2	AMENITY PROVIDED: INDOOR = 7,175 m2 OUTDOOR = 5,856 m2		AMENITY REQUIRED: INDOOR = 2 m2 PER UNIT = 2 x 1,624 = 3,248 m2 OUTDOOR = 2 m2 PER UNIT = 2 x 1,624 = 3,248 m2	AMENITY PROVIDED: INDOOR = 3,875 m2 OUTDOOR = 3,280 m2	AMENITY REQUIRED: INDOOR = 2 m2 PER UNIT = 2 x 6,954 = 13,908 m2 OUTDOOR = 2 m2 PER UNIT = 2 x 6,954 = 13,908 m2	AMENITY PROVIDED: INDOOR = 17,945 m2 OUTDOOR = 16,261 m2
	TOTAL REQUIRED 10,984 m2	TOTAL PROVIDED 14,020 m2	TOTAL REQUIRED 10,336 m2	TOTAL PROVIDED 13,031 m2		TOTAL REQUIRED 6,496 m2	TOTAL PROVIDED 7,155 m2	TOTAL REQUIRED 27,816 m2	TOTAL PROVIDED 34,206 m2
8. PARKING RESIDENTIAL	REQUIRED : 0.5 SP./UNIT. 2,746 x 0.5 = 1,373 SP.	PROVIDED : 1,900 SP.	REQUIRED : 0.5 SP./UNIT. 2,584 x 0.5 = 1,292 SP.	PROVIDED : 1,728 SP.		REQUIRED : 0.5 SP./UNIT. 1,624 x 0.5 = 812 SP.	PROVIDED : 1,079 SP.	REQUIRED : 0.5 SP./UNIT. 6,954 x 0.5 = 3,477 SP.	PROVIDED : 4,707 SP.
RESIDENTIAL VISITORS	REQUIRED : 0.15 SP./UNIT. 2,746 x 0.15 = 412 SP.		REQUIRED : 0.15 SP./UNIT. 2,584 x 0.15 = 388 SP.			REQUIRED : 0.15 SP./UNIT. 1,624 x 0.15 = 244 SP.		REQUIRED : 0.15 SP./UNIT. 6,954 x 0.15 = 1,044 SP.	
NON-RESIDENTIAL	REQUIRED : 1.08 SP./ 100m2 NFA. = 22 SP.		REQUIRED : 1.08 SP./ 100m2 NFA. = 14 SP.			REQUIRED : 1.08 SP./ 100m2 NFA. = 23 SP.		REQUIRED : 1.08 SP./ 100m2 NFA. = 59 SP.	
	TOTAL REQUIRED 1,807 SP.	TOTAL PROVIDED 1,900 SP. ****	TOTAL REQUIRED 1,694 SP.	TOTAL PROVIDED 1,728 SP. ****		TOTAL REQUIRED 1,079 SP.	TOTAL PROVIDED 1,079 SP. ****	TOTAL REQUIRED 4,580 SP.	TOTAL PROVIDED 4,707 SP. ****
9. BICYCLE STORAGE RESIDENTIAL	REQUIRED : LONG-TERM = 0.75 SP./UNIT. 2,746 x 0.75 = 2,060 SP. SHORT-TERM = 0.25 SP./UNIT. 2,746 x 0.25 = 687 SP.	PROVIDED : LONG-TERM = 2,060 SP. SHORT-TERM = 684 SP.	REQUIRED : LONG-TERM = 0.75 SP./UNIT. 2,584 x 0.75 = 1,938 SP. SHORT-TERM = 0.25 SP./UNIT. 2,584 x 0.25 = 646 SP.	PROVIDED : LONG-TERM = 1,938 SP. SHORT-TERM = 646 SP.		REQUIRED : LONG-TERM = 0.75 SP./UNIT. 1,624 x 0.75 = 1,218 SP. SHORT-TERM = 0.25 SP./UNIT. 1,624 x 0.25 = 406 SP.	PROVIDED : LONG-TERM = 1,218 SP. SHORT-TERM = 406 SP.	REQUIRED : LONG-TERM = 0.75 SP./UNIT. 6,954 x 0.75 = 5,216 SP. SHORT-TERM = 0.25 SP./UNIT. 6,954 x 0.25 = 1,739 SP.	PROVIDED : LONG-TERM = 5,216 SP. SHORT-TERM = 1,739 SP.
NON-RESIDENTIAL	REQUIRED : LONG-TERM = GREATER OF 2 OR 1 SPACE/1,000 m2 NFA = 3 SP.	PROVIDED : LONG-TERM = 3 SP.	REQUIRED : LONG-TERM = GREATER OF 2 OR 1 SPACE/1,000 m2 NFA = 2 SP.	PROVIDED : LONG-TERM = 2 SP.		REQUIRED : LONG-TERM = GREATER OF 2 OR 1 SPACE/1,000 m2 NFA = 3 SP.	PROVIDED : LONG-TERM = 3 SP.	REQUIRED : LONG-TERM = GREATER OF 2 OR 1 SPACE/1,000 m2 NFA = 8 SP.	PROVIDED : LONG-TERM = 8 SP.
	TOTAL REQUIRED 2,750 SP.	TOTAL PROVIDED 2,750 SP.	TOTAL REQUIRED 2,586 SP.	TOTAL PROVIDED 2,586 SP.		TOTAL REQUIRED 1,627 SP.	TOTAL PROVIDED 1,627 SP.	TOTAL REQUIRED 6,963 SP.	TOTAL PROVIDED 6,963 SP.
10. BUILDING HEIGHT	BUILDING A = 40 STOREYS 124.5m + MECH. BUILDING B = 45 STOREYS 139.5m + MECH. BUILDING C = 35 STOREYS 109.5m + MECH. BUILDING D = 42 STOREYS 130.5m + MECH.	BUILDING E = 48 STOREYS 148.5m + MECH. BUILDING F = 45 STOREYS 139.5m + MECH.	BUILDING G = 48 STOREYS 148.5m + MECH. BUILDING H = 45 STOREYS 139.5m + MECH. BUILDING I = 40 STOREYS 124.5m + MECH. BUILDING J = 35 STOREYS 109.5m + MECH.	BUILDING K = 42 STOREYS 130.5m + MECH. BUILDING L = 35 STOREYS 109.5m + MECH.		BUILDING M = 40 STOREYS 124.5m + MECH. BUILDING N = 35 STOREYS 109.5m + MECH. BUILDING O = 35 STOREYS 109.5m + MECH. BUILDING P = 30 STOREYS 94.5m + MECH.			
11. BUILDING SETBACKS	NORTH 14.0 m Min EAST 3.0 m Min SOUTH 3.0 m Min WEST 3.0 m Min		NORTH 14.0 m Min EAST 3.0 m Min SOUTH 3.0 m Min WEST 3.0 m Min			NORTH 3.0 m Min EAST 3.0 m Min SOUTH 5.0 m Min WEST 3.0 m Min			

* GCA DOES NOT INCLUDE ABOVE AND BELOW GRADE PARKING.
** ESTABLISHED GRADE DETERMINED ALONG EACH BUILDING SEPARATELY
*** FINAL SUITE MIX AND DWELLING UNIT COUNT SUBJECT TO MARKET CONDITIONS
**** FINAL PARKING COUNT MAY VARY DEPENDING ON FINAL DWELLING UNIT COUNT

1.	SEP.12.2024	ISSUED TO CITY FOR PAC MEETING	J. CHI.
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ONTARIO ASSOCIATION OF ARCHITECTS
JOHNNY CHIMIENTI
LICENCE
6299

PROPOSED MIXED-USE DEVELOPMENT

SOUTH SERVICE ROAD

THE ROSE CORPORATION
OAKVILLE ONTARIO

PROJECT ARCHITECT:	J. Chimienti
ASSISTANT DESIGNER:	B. DADGOSTAR
DRAWN BY:	B. DADGOSTAR
CHECKED BY:	D. Biase
PLOT DATE:	NOV.01.2024
JOB #	2127.23

STATS

A101

TITLEBLOCK SIZE: 610 x 900

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PROPOSED MIXED-USE DEVELOPMENT

SOUTH SERVICE ROAD

THE ROSE CORPORATION

OAKVILLE ONTARIO

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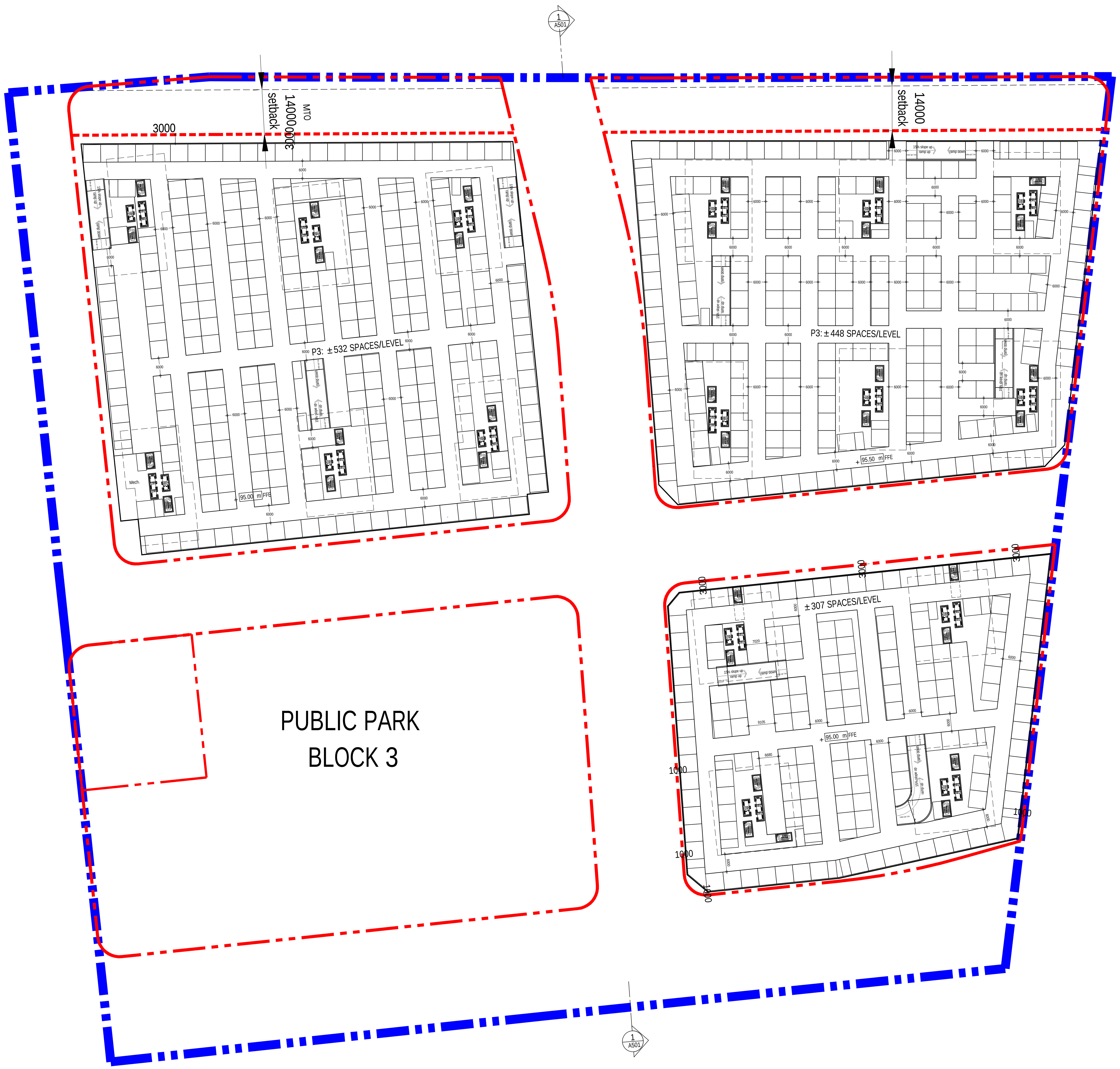
JOB #	2127.23

SITE PLAN

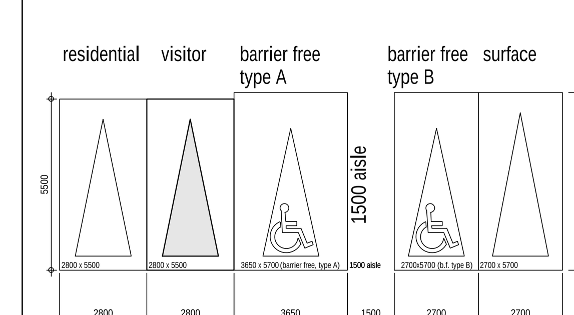
1:750

A102

TITLEBLOCK SIZE: 610 x 900



PARKING LEGEND



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PROPOSED MIXED-USE DEVELOPMENT

SOUTH SERVICE ROAD

THE ROSE CORPORATION

OAKVILLE ONTARIO

PROJECT ARCHITECT:	J. Chimienti
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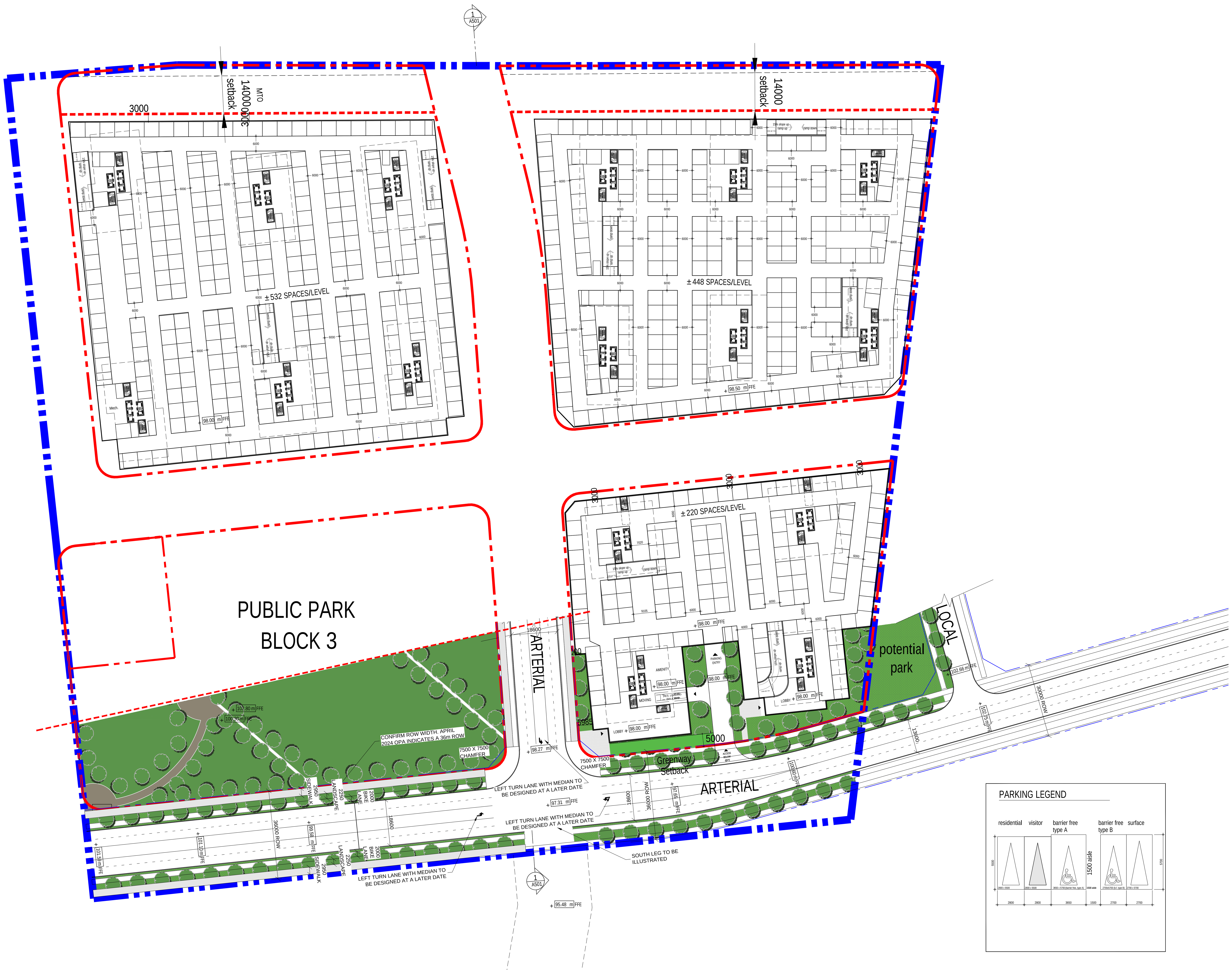
JOB #	2127.23

P4-P3 UNDERGROUND PLAN

1:750

A201

TITLEBLOCK SIZE: 610 x 900



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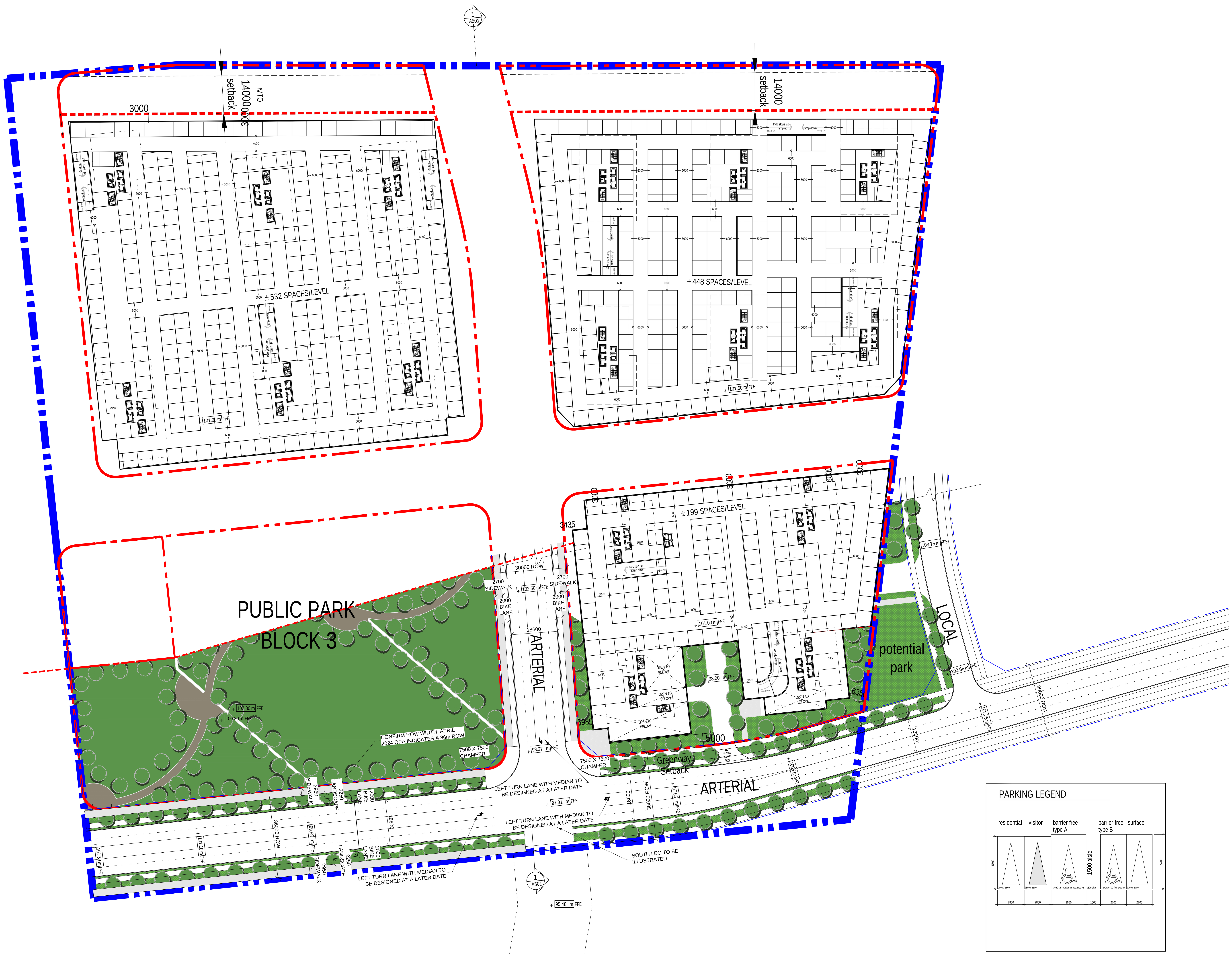
P2 UNDERGROUND PLAN

1:750

A202

TITLEBLOCK SIZE: 610 x 900



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THE ROSE CORPORATION

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P1 UNDERGROUND PLAN

1:750

A203

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PROPOSED MIXED-USE DEVELOPMENT

SOUTH SERVICE ROAD

THE ROSE CORPORATION

OAKVILLE ONTARIO

PROJECT ARCHITECT:	J. Chimienti
ASSISTANT DESIGNER:	B. DADGOSTAR
DRAWN BY:	B. DADGOSTAR
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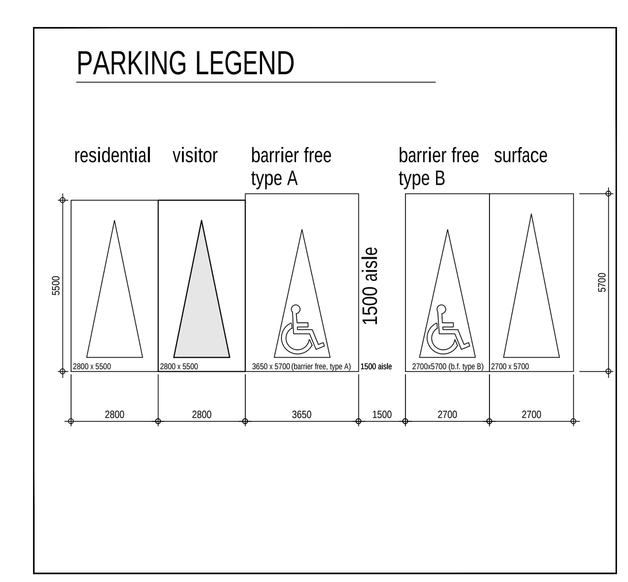
GROUND FLOOR PLAN

1:750

A301

TITLEBLOCK SIZE: 610 x 900



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2ND FLOOR PLAN

1:750

A302

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PROPOSED MIXED-USE DEVELOPMENT

SOUTH SERVICE ROAD

THE ROSE CORPORATION

OAKVILLE ONTARIO

PROJECT ARCHITECT:	J. Chimienti
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3RD-4TH FLOOR PLAN

1:750

A303

TITLEBLOCK SIZE: 610 x 900

Appendix C:
Synchro Analysis Sheets

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	35	101	338	692	56	121	146	955	783	197	2015	51
v/c Ratio	0.12	0.39	0.99	0.83	0.09	0.22	0.78	0.47	0.74	0.65	0.98	0.08
Control Delay	28.7	62.0	81.8	59.1	33.8	6.6	55.1	37.1	18.6	29.5	56.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	28.7	62.0	81.8	59.1	33.8	6.6	55.1	37.1	18.8	29.5	56.4	0.2
Queue Length 50th (m)	5.9	27.3	~61.6	98.8	11.3	0.0	31.3	83.9	51.1	30.2	210.6	0.0
Queue Length 95th (m)	13.1	49.0	#142.3	116.5	22.5	15.0	#61.5	105.4	186.5	45.9	#248.9	0.0
Internal Link Dist (m)		361.1			497.8			251.4			315.2	
Turn Bay Length (m)	80.0			165.0		15.0				85.0		80.0
Base Capacity (vph)	365	256	340	964	624	561	189	2015	1061	304	2059	649
Starvation Cap Reductn	0	0	0	0	0	0	0	0	18	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	0.10	0.39	0.99	0.72	0.09	0.22	0.77	0.47	0.75	0.65	0.98	0.08

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.

1: Trafalgar Road & Leighland Avenue/Iroquois Shore Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	100	335	685	55	120	145	945	775	195	1995	50
Future Volume (vph)	35	100	335	685	55	120	145	945	775	195	1995	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.8	5.8	4.7	5.8	5.8	3.0	5.1	5.1	3.0	5.1	5.1
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.97	1.00	1.00	0.91
Flpb, ped/bikes	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	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)	1659	1863	1568	3367	1827	1410	1719	4988	1513	1786	5085	1383
Flt Permitted	0.72	1.00	1.00	0.95	1.00	1.00	0.07	1.00	1.00	0.21	1.00	1.00
Satd. Flow (perm)	1258	1863	1568	3367	1827	1410	131	4988	1513	390	5085	1383
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	35	101	338	692	56	121	146	955	783	197	2015	51
RTOR Reduction (vph)	0	0	123	0	0	80	0	0	457	0	0	31
Lane Group Flow (vph)	35	101	215	692	56	41	146	955	326	197	2015	20
Confl. Peds. (#/hr)	35					35	35		10	10		35
Heavy Vehicles (%)	3%	2%	3%	4%	4%	4%	5%	4%	3%	1%	2%	6%
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8		8			4	6		6	2		2
Actuated Green, G (s)	25.7	19.5	19.5	33.6	46.9	46.9	64.2	54.4	54.4	64.4	54.5	54.5
Effective Green, g (s)	27.7	20.5	20.5	34.6	47.9	47.9	66.2	55.4	55.4	66.4	55.5	55.5
Actuated g/C Ratio	0.20	0.15	0.15	0.25	0.34	0.34	0.47	0.40	0.40	0.47	0.40	0.40
Clearance Time (s)	5.7	6.8	6.8	5.7	6.8	6.8	4.0	6.1	6.1	4.0	6.1	6.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	269	272	229	832	625	482	184	1973	598	293	2015	548
v/s Ratio Prot	0.01	0.05		c0.21	0.03		c0.06	0.19		0.05	c0.40	
v/s Ratio Perm	0.02		c0.14			0.03	0.31		0.22	0.27		0.01
v/c Ratio	0.13	0.37	0.94	0.83	0.09	0.09	0.79	0.48	0.55	0.67	1.00	0.04
Uniform Delay, d1	46.0	53.9	59.1	49.9	31.3	31.2	34.9	31.6	32.6	23.1	42.2	25.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.02	1.17	5.25	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.9	42.3	7.1	0.1	0.1	18.9	0.8	3.2	6.0	20.0	0.1
Delay (s)	46.2	54.8	101.5	57.1	31.3	31.3	54.5	37.9	174.3	29.0	62.3	26.0
Level of Service	D	D	F	E	C	C	D	D	F	C	E	C
Approach Delay (s)		87.4			51.8			95.9			58.6	
Approach LOS		F			D			F			E	

Intersection Summary			
HCM 2000 Control Delay	72.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	91.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	5	160	178	178	206	1727	2015	5
v/c Ratio	0.05	0.54	0.68	0.68	0.59	0.46	0.54	0.00
Control Delay	63.6	47.4	68.7	68.7	28.4	8.6	11.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.6	47.4	68.7	68.7	28.4	8.6	11.0	0.0
Queue Length 50th (m)	1.4	35.5	52.5	52.5	22.0	57.9	36.5	0.0
Queue Length 95th (m)	6.2	50.1	75.2	75.2	46.5	114.2	m212.8	m0.0
Internal Link Dist (m)				348.8		26.7	251.4	
Turn Bay Length (m)								
Base Capacity (vph)	128	685	543	543	596	3715	3750	1167
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.23	0.33	0.33	0.35	0.46	0.54	0.00

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	155	345	0	200	0	1675	0	0	1955	5
Future Volume (vph)	5	0	155	345	0	200	0	1675	0	0	1955	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		6.0	6.0	6.0	6.0		6.0			6.0	6.0
Lane Util. Factor	1.00		1.00	0.95	0.95	1.00		0.91			0.91	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00		1.00			1.00	0.96
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00		0.85	1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected	0.95		1.00	0.95	0.95	1.00		1.00			1.00	1.00
Satd. Flow (prot)	1805		1599	1715	1715	1615		4988			5036	1543
Flt Permitted	0.95		1.00	0.95	0.95	1.00		1.00			1.00	1.00
Satd. Flow (perm)	1805		1599	1715	1715	1615		4988			5036	1543
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	5	0	160	356	0	206	0	1727	0	0	2015	5
RTOR Reduction (vph)	0	0	25	0	0	104	0	0	0	0	0	1
Lane Group Flow (vph)	5	0	135	178	178	102	0	1727	0	0	2015	4
Confl. Peds. (#/hr)							10		5	5		10
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	0%	4%	4%	0%	3%	0%
Turn Type	Prot		Perm	Perm	NA	Perm		NA			NA	Perm
Protected Phases	7				8			2			6	
Permitted Phases	7		4	8		8						6
Actuated Green, G (s)	1.4		26.7	20.3	20.3	20.3		99.3			99.3	99.3
Effective Green, g (s)	2.4		27.7	21.3	21.3	21.3		100.3			100.3	100.3
Actuated g/C Ratio	0.02		0.20	0.15	0.15	0.15		0.72			0.72	0.72
Clearance Time (s)	5.0		7.0	7.0	7.0	7.0		7.0			7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	30		316	260	260	245		3573			3607	1105
v/s Ratio Prot	0.00							0.35			c0.40	
v/s Ratio Perm			c0.08	c0.10	0.10	0.06						0.00
v/c Ratio	0.17		0.43	0.68	0.68	0.42		0.48			0.56	0.00
Uniform Delay, d1	67.8		49.2	56.2	56.2	53.7		8.6			9.4	5.6
Progression Factor	1.00		1.00	1.00	1.00	1.00		1.00			1.22	1.00
Incremental Delay, d2	2.6		0.9	7.3	7.3	1.1		0.5			0.2	0.0
Delay (s)	70.4		50.1	63.4	63.4	54.9		9.1			11.7	5.6
Level of Service	E		D	E	E	D		A			B	A
Approach Delay (s)		50.8			60.3			9.1			11.6	
Approach LOS		D			E			A			B	

Intersection Summary			
HCM 2000 Control Delay	18.2	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	71.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	903	592	1173	2133
v/c Ratio	0.69	0.98	0.45	0.80
Control Delay	39.7	73.4	18.8	29.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	39.7	73.4	18.8	29.4
Queue Length 50th (m)	113.7	169.1	45.6	177.7
Queue Length 95th (m)	138.2	#251.3	48.0	198.0
Internal Link Dist (m)	190.2		21.3	39.3
Turn Bay Length (m)				
Base Capacity (vph)	1312	607	2646	2697
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.69	0.98	0.44	0.79

Intersection Summary

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

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	885	580	0	1150	2090	0
Future Volume (vph)	885	580	0	1150	2090	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	1.00		0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3433	1583		4940	5036	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3433	1583		4940	5036	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	903	592	0	1173	2133	0
RTOR Reduction (vph)	0	2	0	0	0	0
Lane Group Flow (vph)	903	590	0	1173	2133	0
Confl. Peds. (#/hr)			10			10
Heavy Vehicles (%)	2%	2%	0%	5%	3%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Actuated Green, G (s)	52.5	52.5		73.5	73.5	
Effective Green, g (s)	53.5	53.5		74.5	74.5	
Actuated g/C Ratio	0.38	0.38		0.53	0.53	
Clearance Time (s)	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1311	604		2628	2679	
v/s Ratio Prot	0.26			0.24	c0.42	
v/s Ratio Perm		c0.37				
v/c Ratio	0.69	0.98		0.45	0.80	
Uniform Delay, d1	36.3	42.6		20.1	26.6	
Progression Factor	1.00	1.00		0.91	1.00	
Incremental Delay, d2	1.5	30.3		0.5	2.6	
Delay (s)	37.8	72.9		18.7	29.1	
Level of Service	D	E		B	C	
Approach Delay (s)	51.7			18.7	29.1	
Approach LOS	D			B	C	

Intersection Summary			
HCM 2000 Control Delay	33.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	20	0	0	0	0	1145	470	0	2095	580
Future Volume (Veh/h)	0	0	20	0	0	0	0	1145	470	0	2095	580
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	0	22	0	0	0	0	1231	505	0	2253	624
Pedestrians		10			5							
Lane Width (m)		3.6			0.0							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		1			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								271			45	
pX, platoon unblocked	0.69	0.69	0.65	0.69	0.69	0.92	0.65			0.92		
vC, conflicting volume	2985	4316	1073	1987	4123	415	2887			1741		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1524	3440	0	86	3162	52	2032			1495		
tC, single (s)	7.5	6.5	7.0	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	97	100	100	100	100			100		
cM capacity (veh/h)	56	5	696	599	7	929	183			417		

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3
Volume Total	22	410	410	410	505	901	901	1075
Volume Left	0	0	0	0	0	0	0	0
Volume Right	22	0	0	0	505	0	0	624
cSH	696	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.03	0.24	0.24	0.24	0.30	0.53	0.53	0.63
Queue Length 95th (m)	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	10.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B							
Approach Delay (s)	10.3	0.0				0.0		
Approach LOS	B							

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	418	144	57	57	93	93	1170	175	1887
v/c Ratio	0.74	0.37	0.23	0.35	0.32	0.53	0.47	0.55	0.76
Control Delay	62.7	25.5	37.0	65.8	2.8	40.4	24.2	21.6	29.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.7	25.5	37.0	65.8	2.8	40.4	24.2	21.6	29.7
Queue Length 50th (m)	60.2	17.2	12.1	16.0	0.0	13.0	47.2	18.0	110.1
Queue Length 95th (m)	75.4	35.8	21.2	30.3	0.0	m29.4	83.5	m31.5	m173.5
Internal Link Dist (m)		193.0		396.1			253.9		247.4
Turn Bay Length (m)	130.0		50.0			120.0		55.0	
Base Capacity (vph)	907	493	251	161	294	210	2510	319	2472
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.29	0.23	0.35	0.32	0.44	0.47	0.55	0.76

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	405	45	95	55	55	90	90	1105	30	170	1390	440
Future Volume (vph)	405	45	95	55	55	90	90	1105	30	170	1390	440
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	6.0	4.0	6.0		3.0	6.0	
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.98		1.00	1.00	1.00	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.99	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	1.00	0.85	1.00	1.00		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3273	1582		1725	1810	1553	1671	5013		1735	4824	
Flt Permitted	0.95	1.00		0.67	1.00	1.00	0.06	1.00		0.17	1.00	
Satd. Flow (perm)	3273	1582		1208	1810	1553	102	5013		317	4824	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	418	46	98	57	57	93	93	1139	31	175	1433	454
RTOR Reduction (vph)	0	60	0	0	0	84	0	2	0	0	34	0
Lane Group Flow (vph)	418	84	0	57	57	9	93	1168	0	175	1853	0
Confl. Peds. (#/hr)			5	5			15		5	5		15
Heavy Vehicles (%)	7%	0%	9%	4%	5%	4%	8%	3%	3%	4%	2%	4%
Turn Type	Prot	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8		8	2			6		
Actuated Green, G (s)	23.3	27.9		21.0	12.8	12.8	77.2	67.7		79.6	68.4	
Effective Green, g (s)	24.3	28.9		23.0	13.8	13.8	79.2	68.7		81.6	69.4	
Actuated g/C Ratio	0.17	0.21		0.16	0.10	0.10	0.57	0.49		0.58	0.50	
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	5.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.5	4.0	4.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	568	326		232	178	153	175	2459		308	2391	
v/s Ratio Prot	c0.13	0.05		0.02	c0.03		0.04	0.23		c0.05	c0.38	
v/s Ratio Perm				0.02		0.01	0.26			0.28		
v/c Ratio	0.74	0.26		0.25	0.32	0.06	0.53	0.48		0.57	0.77	
Uniform Delay, d1	54.8	46.5		50.6	58.7	57.2	22.5	23.7		15.3	28.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.54	0.99		1.47	1.00	
Incremental Delay, d2	4.9	0.4		0.7	1.4	0.2	2.3	0.5		1.5	1.5	
Delay (s)	59.7	47.0		51.2	60.2	57.4	36.9	24.1		24.0	30.5	
Level of Service	E	D		D	E	E	D	C		C	C	
Approach Delay (s)		56.5			56.5			25.0			30.0	
Approach LOS		E			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	271	385	68	26	344	625	52	453	641	609	391
v/c Ratio	0.75	0.74	0.12	0.11	0.49	0.89	0.15	0.41	0.84	0.64	0.43
Control Delay	73.6	53.5	0.4	26.8	50.0	26.2	18.9	40.6	67.1	41.4	20.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.6	53.5	0.4	26.8	50.0	26.2	18.9	40.6	67.1	41.4	20.2
Queue Length 50th (m)	38.9	106.3	0.0	4.9	48.6	40.9	6.1	53.8	99.7	129.7	37.6
Queue Length 95th (m)	#69.0	127.2	0.0	9.9	52.8	85.5	15.6	83.1	122.2	#222.2	87.8
Internal Link Dist (m)		551.4			604.3			115.4		253.9	
Turn Bay Length (m)	85.0			85.0		75.0	40.0		85.0		
Base Capacity (vph)	363	532	570	384	1139	825	359	1114	825	953	902
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.72	0.12	0.07	0.30	0.76	0.14	0.41	0.78	0.64	0.43

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	260	370	65	25	330	600	50	385	50	615	585	375
Future Volume (vph)	260	370	65	25	330	600	50	385	50	615	585	375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.4	5.4	4.0	5.4	5.4	3.0	5.9		4.0	5.9	5.9
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3367	1792	1485	1727	3438	1483	1764	3453		3400	1881	1498
Flt Permitted	0.95	1.00	1.00	0.34	1.00	1.00	0.38	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3367	1792	1485	613	3438	1483	700	3453		3400	1881	1498
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	271	385	68	26	344	625	52	401	52	641	609	391
RTOR Reduction (vph)	0	0	48	0	0	391	0	6	0	0	0	150
Lane Group Flow (vph)	271	385	20	26	344	234	52	447	0	641	609	241
Confl. Peds. (#/hr)	25		15	15		25	20		10	10		20
Heavy Vehicles (%)	4%	6%	3%	4%	5%	4%	2%	2%	6%	3%	1%	4%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases			8	4		4	2					6
Actuated Green, G (s)	14.1	39.9	39.9	34.1	29.6	29.6	48.1	41.9		30.4	67.1	67.1
Effective Green, g (s)	15.1	40.9	40.9	36.1	30.6	30.6	50.1	42.9		31.4	68.1	68.1
Actuated g/C Ratio	0.11	0.29	0.29	0.26	0.22	0.22	0.36	0.31		0.22	0.49	0.49
Clearance Time (s)	5.7	6.4	6.4	5.0	6.4	6.4	4.0	6.9		5.0	6.9	6.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	363	523	433	201	751	324	305	1058		762	914	728
v/s Ratio Prot	c0.08	c0.21		0.01	0.10		0.01	0.13		c0.19	c0.32	
v/s Ratio Perm			0.01	0.03		0.16	0.05					0.16
v/c Ratio	0.75	0.74	0.05	0.13	0.46	0.72	0.17	0.42		0.84	0.67	0.33
Uniform Delay, d1	60.6	44.7	35.6	39.6	47.5	50.8	29.9	38.7		51.9	27.3	22.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.14	1.36	2.70
Incremental Delay, d2	8.1	5.3	0.0	0.3	0.4	7.8	0.3	1.2		6.1	2.7	0.9
Delay (s)	68.7	50.0	35.6	39.9	47.9	58.5	30.1	39.9		65.3	40.0	60.2
Level of Service	E	D	D	D	D	E	C	D		E	D	E
Approach Delay (s)		55.7			54.4			38.9			54.7	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	52.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	90.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	10	0	0	0	145	35	10	185	0
Future Volume (Veh/h)	0	0	0	10	0	0	0	145	35	10	185	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	0	0	11	0	0	0	167	40	11	213	0
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	318	442	106	316	422	104	213			207		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	318	442	106	316	422	104	213			207		
tC, single (s)	7.5	6.5	6.9	7.7	6.5	6.9	5.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.7			2.2		
p0 queue free %	100	100	100	98	100	100	100			99		
cM capacity (veh/h)	612	509	934	588	522	938	1067			1376		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	11	84	124	118	106
Volume Left	0	11	0	0	11	0
Volume Right	0	0	0	40	0	0
cSH	1700	588	1067	1700	1376	1700
Volume to Capacity	0.00	0.02	0.00	0.07	0.01	0.06
Queue Length 95th (m)	0.0	0.5	0.0	0.0	0.2	0.0
Control Delay (s)	0.0	11.2	0.0	0.0	0.8	0.0
Lane LOS	A	B			A	
Approach Delay (s)	0.0	11.2	0.0		0.4	
Approach LOS	A	B				

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	22.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	40	60	95	150	70	20
Future Volume (Veh/h)	40	60	95	150	70	20
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	49	73	116	183	85	24
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			122		500	86
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			122		500	86
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			92		83	98
cM capacity (veh/h)			1465		490	965

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	122	299	109
Volume Left	0	116	85
Volume Right	73	0	24
cSH	1700	1465	549
Volume to Capacity	0.07	0.08	0.20
Queue Length 95th (m)	0.0	2.1	5.9
Control Delay (s)	0.0	3.4	13.2
Lane LOS		A	B
Approach Delay (s)	0.0	3.4	13.2
Approach LOS			B

Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	31.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	27	647	196	43	609	250	136	38	82	27
v/c Ratio	0.07	0.63	0.21	0.14	0.31	0.72	0.26	0.12	0.16	0.06
Control Delay	7.8	13.3	2.0	8.9	7.9	31.9	10.4	16.0	16.2	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.8	13.3	2.0	8.9	7.9	31.9	10.4	16.0	16.2	2.4
Queue Length 50th (m)	1.4	48.4	0.0	2.3	18.1	25.1	6.0	3.2	6.9	0.0
Queue Length 95th (m)	4.9	85.6	8.0	7.4	28.7	#46.4	16.8	9.0	15.2	2.3
Internal Link Dist (m)		585.1			130.4		189.6		431.7	
Turn Bay Length (m)	45.0			30.0				25.0		25.0
Base Capacity (vph)	403	1027	950	309	1939	405	592	378	595	521
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	0.63	0.21	0.14	0.31	0.62	0.23	0.10	0.14	0.05

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	595	180	40	525	35	230	65	60	35	75	25
Future Volume (vph)	25	595	180	40	525	35	230	65	60	35	75	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	0.99		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.93		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)	1650	1827	1538	1752	3435		1728	1733		1696	1881	1527
Flt Permitted	0.41	1.00	1.00	0.30	1.00		0.70	1.00		0.67	1.00	1.00
Satd. Flow (perm)	717	1827	1538	549	3435		1280	1733		1196	1881	1527
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	647	196	43	571	38	250	71	65	38	82	27
RTOR Reduction (vph)	0	0	86	0	7	0	0	47	0	0	0	20
Lane Group Flow (vph)	27	647	110	43	602	0	250	89	0	38	82	7
Confl. Peds. (#/hr)	5					5	5		5	5		5
Heavy Vehicles (%)	9%	4%	5%	3%	4%	3%	4%	0%	2%	6%	1%	4%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)	32.7	32.7	32.7	32.7	32.7		15.3	15.3		15.3	15.3	15.3
Effective Green, g (s)	33.7	33.7	33.7	33.7	33.7		16.3	16.3		16.3	16.3	16.3
Actuated g/C Ratio	0.56	0.56	0.56	0.56	0.56		0.27	0.27		0.27	0.27	0.27
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	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)	402	1026	863	308	1929		347	470		324	511	414
v/s Ratio Prot		c0.35			0.18			0.05			0.04	
v/s Ratio Perm	0.04		0.07	0.08			c0.20			0.03		0.00
v/c Ratio	0.07	0.63	0.13	0.14	0.31		0.72	0.19		0.12	0.16	0.02
Uniform Delay, d1	6.0	8.9	6.2	6.3	7.0		19.8	16.8		16.4	16.6	16.0
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	0.3	2.9	0.3	0.9	0.4		7.2	0.2		0.2	0.1	0.0
Delay (s)	6.3	11.9	6.5	7.2	7.4		27.0	17.0		16.6	16.8	16.0
Level of Service	A	B	A	A	A		C	B		B	B	B
Approach Delay (s)		10.5			7.4			23.4			16.6	
Approach LOS		B			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	59	744	154	596	5	11	59	53	16
v/c Ratio	0.11	0.52	0.65	0.43	0.01	0.01	0.09	0.07	0.03
Control Delay	8.6	10.7	28.5	10.4	7.6	7.7	3.3	8.1	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.6	10.7	28.5	10.4	7.6	7.7	3.3	8.1	1.9
Queue Length 50th (m)	1.4	21.1	9.5	17.0	0.3	0.5	0.0	2.4	0.0
Queue Length 95th (m)	4.0	33.4	#33.8	27.2	1.6	2.5	4.6	6.9	1.5
Internal Link Dist (m)		208.7		203.3		1140.2		129.5	
Turn Bay Length (m)	125.0		145.0		15.0		40.0		
Base Capacity (vph)	545	1438	236	1398	579	802	648	786	494
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.52	0.65	0.43	0.01	0.01	0.09	0.07	0.03

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	630	70	145	560	0	5	10	55	0	50	15
Future Volume (vph)	55	630	70	145	560	0	5	10	55	0	50	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5		3.5	3.5
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	3213	3364		1787	3312		1805	1900	1455		1863	1122
Flt Permitted	0.38	1.00		0.30	1.00		0.72	1.00	1.00		1.00	1.00
Satd. Flow (perm)	1292	3364		558	3312		1373	1900	1455		1863	1122
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)	59	670	74	154	596	0	5	11	59	0	53	16
RTOR Reduction (vph)	0	18	0	0	0	0	0	0	34	0	0	9
Lane Group Flow (vph)	59	726	0	154	596	0	5	11	25	0	53	7
Heavy Vehicles (%)	9%	6%	3%	1%	9%	0%	0%	0%	11%	0%	2%	44%
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	18.0	18.0		18.0	18.0		18.0	18.0	18.0		18.0	18.0
Effective Green, g (s)	19.0	19.0		19.0	19.0		19.0	19.0	19.0		19.0	19.0
Actuated g/C Ratio	0.42	0.42		0.42	0.42		0.42	0.42	0.42		0.42	0.42
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5		4.5	4.5
Lane Grp Cap (vph)	545	1420		235	1398		579	802	614		786	473
v/s Ratio Prot		0.22			0.18			0.01			c0.03	
v/s Ratio Perm	0.05			c0.28			0.00		0.02			0.01
v/c Ratio	0.11	0.51		0.66	0.43		0.01	0.01	0.04		0.07	0.01
Uniform Delay, d1	7.9	9.6		10.4	9.2		7.5	7.6	7.6		7.7	7.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.4	1.3		13.4	1.0		0.0	0.0	0.1		0.2	0.1
Delay (s)	8.3	10.9		23.8	10.1		7.6	7.6	7.8		7.9	7.6
Level of Service	A	B		C	B		A	A	A		A	A
Approach Delay (s)		10.7			12.9			7.7			7.8	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	41.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	103	119	289	789	155	294	304	1789	902	134	1175	119
v/c Ratio	0.40	0.67	0.90	0.87	0.30	0.56	0.87	0.81	0.88	0.67	0.63	0.20
Control Delay	34.6	80.1	51.2	60.0	41.4	18.7	50.8	20.2	18.4	45.3	39.3	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.7	0.0	0.0	0.0
Total Delay	34.6	80.1	51.2	60.0	41.4	18.7	50.8	20.2	23.1	45.3	39.3	1.2
Queue Length 50th (m)	18.4	33.7	29.0	112.4	34.9	22.9	54.8	147.8	211.7	21.2	106.8	0.0
Queue Length 95th (m)	31.4	#63.9	#86.2	135.0	56.2	55.1	m#85.3	150.1	#278.3	44.9	124.0	1.6
Internal Link Dist (m)		361.1			497.8			251.4			315.2	
Turn Bay Length (m)	80.0			165.0		15.0				85.0		80.0
Base Capacity (vph)	288	181	325	993	535	533	356	2211	1028	215	1854	588
Starvation Cap Reductn	0	0	0	0	0	0	0	0	81	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	0.36	0.66	0.89	0.79	0.29	0.55	0.85	0.81	0.95	0.62	0.63	0.20

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	115	280	765	150	285	295	1735	875	130	1140	115
Future Volume (vph)	100	115	280	765	150	285	295	1735	875	130	1140	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.8	5.8	4.7	5.8	5.8	3.0	5.1	5.1	3.0	5.1	5.1
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.86	1.00	1.00	0.95	1.00	1.00	0.81
Flpb, ped/bikes	0.93	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	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)	1685	1881	1599	3467	1881	1387	1787	5136	1525	1805	5085	1300
Flt Permitted	0.66	1.00	1.00	0.95	1.00	1.00	0.12	1.00	1.00	0.08	1.00	1.00
Satd. Flow (perm)	1168	1881	1599	3467	1881	1387	224	5136	1525	149	5085	1300
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	103	119	289	789	155	294	304	1789	902	134	1175	119
RTOR Reduction (vph)	0	0	172	0	0	140	0	0	372	0	0	76
Lane Group Flow (vph)	103	119	117	789	155	154	304	1789	530	134	1175	43
Confl. Peds. (#/hr)	55					55	80		15	15		80
Confl. Bikes (#/hr)						5						
Heavy Vehicles (%)	0%	1%	1%	1%	1%	0%	1%	1%	1%	0%	2%	0%
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8		8			4	6		6	2		2
Actuated Green, G (s)	22.4	12.2	12.2	35.8	37.8	37.8	73.4	59.3	59.3	60.1	50.0	50.0
Effective Green, g (s)	24.4	13.2	13.2	36.8	38.8	38.8	74.4	60.3	60.3	62.1	51.0	51.0
Actuated g/C Ratio	0.17	0.09	0.09	0.26	0.28	0.28	0.53	0.43	0.43	0.44	0.36	0.36
Clearance Time (s)	5.7	6.8	6.8	5.7	6.8	6.8	4.0	6.1	6.1	4.0	6.1	6.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	244	177	150	911	521	384	346	2212	656	197	1852	473
v/s Ratio Prot	0.03	0.06		c0.23	0.08		c0.13	0.35		0.05	0.23	
v/s Ratio Perm	0.04		c0.07			0.11	c0.34		0.35	0.25		0.03
v/c Ratio	0.42	0.67	0.78	0.87	0.30	0.40	0.88	0.81	0.81	0.68	0.63	0.09
Uniform Delay, d1	50.8	61.3	62.0	49.2	39.9	41.1	33.1	34.8	34.8	28.8	36.8	29.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.22	0.51	1.18	1.00	1.00	1.00
Incremental Delay, d2	1.2	9.6	22.1	8.7	0.3	0.7	13.1	1.8	5.9	9.3	1.7	0.4
Delay (s)	52.0	70.9	84.1	57.9	40.2	41.8	53.5	19.6	47.0	38.0	38.5	29.6
Level of Service	D	E	F	E	D	D	D	B	D	D	D	C
Approach Delay (s)		74.6			51.9			31.3			37.7	
Approach LOS		E			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	40.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	27	176	217	214	362	2718	1383	16
v/c Ratio	0.24	0.36	0.54	0.53	0.83	0.85	0.44	0.02
Control Delay	67.3	31.2	50.7	50.3	54.8	15.9	26.9	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.3	31.2	50.7	50.3	54.8	15.9	26.9	0.5
Queue Length 50th (m)	7.6	31.6	58.5	57.6	80.7	135.3	127.5	0.0
Queue Length 95th (m)	18.0	45.1	78.1	76.8	108.4	#342.0	152.7	m0.0
Internal Link Dist (m)				348.8		26.7	251.4	
Turn Bay Length (m)								
Base Capacity (vph)	128	685	543	545	565	3198	3136	921
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	19	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.26	0.40	0.39	0.64	0.85	0.44	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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	0	165	400	5	340	0	2555	0	0	1300	15
Future Volume (vph)	25	0	165	400	5	340	0	2555	0	0	1300	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		6.0	6.0	6.0	6.0		6.0			6.0	6.0
Lane Util. Factor	1.00		1.00	0.95	0.95	1.00		0.91			0.91	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00		1.00			1.00	0.94
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00		0.85	1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected	0.95		1.00	0.95	0.95	1.00		1.00			1.00	1.00
Satd. Flow (prot)	1805		1599	1715	1721	1615		5136			5036	1437
Flt Permitted	0.95		1.00	0.95	0.95	1.00		1.00			1.00	1.00
Satd. Flow (perm)	1805		1599	1715	1721	1615		5136			5036	1437
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)	27	0	176	426	5	362	0	2718	0	0	1383	16
RTOR Reduction (vph)	0	0	22	0	0	60	0	0	0	0	0	6
Lane Group Flow (vph)	27	0	154	217	214	302	0	2718	0	0	1383	10
Confl. Peds. (#/hr)							15		10	10		15
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	0%	1%	1%	0%	3%	6%
Turn Type	Prot		Perm	Perm	NA	Perm		NA			NA	Perm
Protected Phases	7				8			2			6	
Permitted Phases	7		4	8		8						6
Actuated Green, G (s)	5.0		41.8	31.8	31.8	31.8		84.2			84.2	84.2
Effective Green, g (s)	6.0		42.8	32.8	32.8	32.8		85.2			85.2	85.2
Actuated g/C Ratio	0.04		0.31	0.23	0.23	0.23		0.61			0.61	0.61
Clearance Time (s)	5.0		7.0	7.0	7.0	7.0		7.0			7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	77		488	401	403	378		3125			3064	874
v/s Ratio Prot	0.01							c0.53			0.27	
v/s Ratio Perm			c0.10	0.13	0.12	c0.19						0.01
v/c Ratio	0.35		0.32	0.54	0.53	0.80		0.87			0.45	0.01
Uniform Delay, d1	65.1		37.4	47.0	46.9	50.5		22.8			14.8	10.8
Progression Factor	1.00		1.00	1.00	1.00	1.00		0.52			1.66	1.00
Incremental Delay, d2	2.8		0.4	1.5	1.3	11.3		2.7			0.3	0.0
Delay (s)	67.9		37.7	48.5	48.2	61.8		14.5			24.9	10.8
Level of Service	E		D	D	D	E		B			C	B
Approach Delay (s)		41.7			54.5			14.5			24.8	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	24.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	87.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1058	379	1874	1726
v/c Ratio	0.89	0.69	0.64	0.59
Control Delay	54.2	45.3	24.4	20.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	54.2	45.3	24.4	20.7
Queue Length 50th (m)	146.5	89.3	101.8	119.0
Queue Length 95th (m)	175.7	127.2	121.7	134.3
Internal Link Dist (m)	190.2		21.3	39.3
Turn Bay Length (m)				
Base Capacity (vph)	1238	574	2913	2913
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.85	0.66	0.64	0.59

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1005	360	0	1780	1640	0
Future Volume (vph)	1005	360	0	1780	1640	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	1.00		0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3467	1583		5085	5085	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3467	1583		5085	5085	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1058	379	0	1874	1726	0
RTOR Reduction (vph)	0	9	0	0	0	0
Lane Group Flow (vph)	1058	370	0	1874	1726	0
Confl. Peds. (#/hr)			25			25
Heavy Vehicles (%)	1%	2%	0%	2%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Actuated Green, G (s)	46.8	46.8		79.2	79.2	
Effective Green, g (s)	47.8	47.8		80.2	80.2	
Actuated g/C Ratio	0.34	0.34		0.57	0.57	
Clearance Time (s)	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1183	540		2912	2912	
v/s Ratio Prot	c0.31			c0.37	0.34	
v/s Ratio Perm		0.23				
v/c Ratio	0.89	0.68		0.64	0.59	
Uniform Delay, d1	43.7	39.6		20.2	19.3	
Progression Factor	1.00	1.00		1.13	1.00	
Incremental Delay, d2	8.9	3.6		0.9	0.9	
Delay (s)	52.6	43.2		23.8	20.2	
Level of Service	D	D		C	C	
Approach Delay (s)	50.2			23.8	20.2	
Approach LOS	D			C	C	

Intersection Summary			
HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	50	0	0	0	0	1775	360	0	1685	345
Future Volume (Veh/h)	0	0	50	0	0	0	0	1775	360	0	1685	345
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	0	0	53	0	0	0	0	1888	383	0	1793	367
Pedestrians		20			10							
Lane Width (m)		3.6			0.0							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		2			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								271			45	
pX, platoon unblocked	0.84	0.84	0.78	0.84	0.84	0.87	0.78			0.87		
vC, conflicting volume	2626	4278	801	2496	4078	639	2180			2281		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1271	3232	0	1117	2995	86	1525			1963		
tC, single (s)	7.5	6.5	7.1	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	94	100	100	100	100			100		
cM capacity (veh/h)	104	8	817	128	12	841	340			263		

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3
Volume Total	53	629	629	629	383	717	717	726
Volume Left	0	0	0	0	0	0	0	0
Volume Right	53	0	0	0	383	0	0	367
cSH	817	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.06	0.37	0.37	0.37	0.23	0.42	0.42	0.43
Queue Length 95th (m)	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	9.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A							
Approach Delay (s)	9.7	0.0				0.0		
Approach LOS	A							

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	825	150	62	72	253	88	1088	108	1670
v/c Ratio	0.89	0.29	0.23	0.44	0.86	0.49	0.51	0.41	0.82
Control Delay	61.4	24.9	31.5	69.4	47.5	41.0	34.9	20.0	30.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.4	24.9	31.5	69.4	47.5	41.0	34.9	20.0	30.2
Queue Length 50th (m)	117.0	20.1	10.8	20.3	23.7	12.0	94.7	11.7	88.5
Queue Length 95th (m)	143.5	39.9	20.6	37.5	#72.4	m26.5	81.6	m23.8	111.6
Internal Link Dist (m)		193.0		396.1			253.9		247.4
Turn Bay Length (m)	130.0		50.0			120.0		55.0	
Base Capacity (vph)	976	523	266	168	297	211	2139	278	2047
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.29	0.23	0.43	0.85	0.42	0.51	0.39	0.82

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	800	55	90	60	70	245	85	1030	25	105	1230	390
Future Volume (vph)	800	55	90	60	70	245	85	1030	25	105	1230	390
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	6.0	4.0	6.0		3.0	6.0	
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.96		1.00	1.00	1.00	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.98	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	1.00		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	1602		1761	1900	1599	1719	5113		1751	4897	
Flt Permitted	0.95	1.00		0.66	1.00	1.00	0.07	1.00		0.18	1.00	
Satd. Flow (perm)	3400	1602		1226	1900	1599	127	5113		326	4897	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	825	57	93	62	72	253	88	1062	26	108	1268	402
RTOR Reduction (vph)	0	41	0	0	0	155	0	2	0	0	40	0
Lane Group Flow (vph)	825	109	0	62	72	98	88	1086	0	108	1630	0
Confl. Peds. (#/hr)			20	20			15		15	15		15
Heavy Vehicles (%)	3%	0%	6%	0%	0%	1%	5%	1%	0%	3%	0%	4%
Turn Type	Prot	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8		8	2			6		
Actuated Green, G (s)	37.2	40.6		21.6	12.5	12.5	65.4	56.2		64.2	55.1	
Effective Green, g (s)	38.2	41.6		23.6	13.5	13.5	67.4	57.2		66.2	56.1	
Actuated g/C Ratio	0.27	0.30		0.17	0.10	0.10	0.48	0.41		0.47	0.40	
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	5.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.5	4.0	4.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	927	476		245	183	154	177	2089		256	1962	
v/s Ratio Prot	c0.24	0.07		0.02	0.04		c0.04	0.21		0.03	c0.33	
v/s Ratio Perm				0.02		c0.06	0.20			0.17		
v/c Ratio	0.89	0.23		0.25	0.39	0.64	0.50	0.52		0.42	0.83	
Uniform Delay, d1	48.9	37.1		50.2	59.4	60.9	26.6	31.1		22.0	37.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.70	1.12		0.95	0.75	
Incremental Delay, d2	10.5	0.2		0.6	1.9	9.4	1.6	0.7		0.9	3.6	
Delay (s)	59.4	37.3		50.8	61.3	70.4	46.9	35.4		21.7	31.8	
Level of Service	E	D		D	E	E	D	D		C	C	
Approach Delay (s)		56.0			65.5			36.2			31.2	
Approach LOS		E			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	41.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	88.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	330	392	46	52	495	603	62	547	443	546	304
v/c Ratio	0.84	0.67	0.08	0.19	0.57	0.87	0.18	0.47	0.75	0.63	0.37
Control Delay	79.7	47.8	0.2	25.3	48.0	26.1	20.3	41.1	63.7	56.3	28.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.7	47.8	0.2	25.3	48.0	26.1	20.3	41.1	63.7	56.3	28.2
Queue Length 50th (m)	48.7	102.9	0.0	9.4	68.7	51.7	8.0	65.1	69.1	150.5	49.9
Queue Length 95th (m)	#88.5	123.6	0.0	15.5	72.3	92.5	19.1	101.1	m85.2	#184.9	m67.5
Internal Link Dist (m)		551.4			604.3			115.4		253.9	
Turn Bay Length (m)	85.0			85.0		75.0	40.0		85.0		
Base Capacity (vph)	391	590	616	456	1279	814	352	1164	725	866	828
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.66	0.07	0.11	0.39	0.74	0.18	0.47	0.61	0.63	0.37

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	320	380	45	50	480	585	60	475	55	430	530	295
Future Volume (vph)	320	380	45	50	480	585	60	475	55	430	530	295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.4	5.4	4.0	5.4	5.4	3.0	5.9		4.0	5.9	5.9
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.93	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1863	1547	1799	3539	1470	1767	3540		3433	1881	1516
Flt Permitted	0.95	1.00	1.00	0.34	1.00	1.00	0.36	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1863	1547	645	3539	1470	666	3540		3433	1881	1516
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	330	392	46	52	495	603	62	490	57	443	546	304
RTOR Reduction (vph)	0	0	32	0	0	332	0	5	0	0	0	133
Lane Group Flow (vph)	330	392	14	52	495	271	62	542	0	443	546	171
Confl. Peds. (#/hr)	45		10	10		45	10		20	20		10
Heavy Vehicles (%)	1%	2%	0%	0%	2%	2%	2%	0%	0%	2%	1%	4%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases			8	4		4	2					6
Actuated Green, G (s)	14.8	42.9	42.9	40.8	34.1	34.1	50.3	43.9		23.2	61.7	61.7
Effective Green, g (s)	15.8	43.9	43.9	42.8	35.1	35.1	52.3	44.9		24.2	62.7	62.7
Actuated g/C Ratio	0.11	0.31	0.31	0.31	0.25	0.25	0.37	0.32		0.17	0.45	0.45
Clearance Time (s)	5.7	6.4	6.4	5.0	6.4	6.4	4.0	6.9		5.0	6.9	6.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	391	584	485	260	887	368	306	1135		593	842	678
v/s Ratio Prot	c0.10	0.21		0.01	0.14		0.01	0.15		c0.13	c0.29	
v/s Ratio Perm			0.01	0.05		c0.18	0.06					0.11
v/c Ratio	0.84	0.67	0.03	0.20	0.56	0.74	0.20	0.48		0.75	0.65	0.25
Uniform Delay, d1	60.9	41.8	33.3	35.3	45.7	48.2	28.8	38.1		55.0	30.1	24.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.07	1.70	3.91
Incremental Delay, d2	15.2	3.0	0.0	0.4	0.8	7.5	0.3	1.4		3.3	2.5	0.6
Delay (s)	76.1	44.8	33.3	35.7	46.5	55.7	29.2	39.6		62.1	53.7	94.6
Level of Service	E	D	C	D	D	E	C	D		E	D	F
Approach Delay (s)		57.6			50.8			38.5			66.2	
Approach LOS		E			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	55.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	91.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	65	0	15	0	160	45	20	290	0
Future Volume (Veh/h)	0	0	0	65	0	15	0	160	45	20	290	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	0	76	0	18	0	188	53	24	341	0
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	501	630	170	433	604	120	341			241		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	501	630	170	433	604	120	341			241		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	85	100	98	100			98		
cM capacity (veh/h)	442	394	850	500	408	915	1229			1337		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	94	94	147	194	170
Volume Left	0	76	0	0	24	0
Volume Right	0	18	0	53	0	0
cSH	1700	547	1229	1700	1337	1700
Volume to Capacity	0.00	0.17	0.00	0.09	0.02	0.10
Queue Length 95th (m)	0.0	4.9	0.0	0.0	0.4	0.0
Control Delay (s)	0.0	12.9	0.0	0.0	1.1	0.0
Lane LOS	A	B			A	
Approach Delay (s)	0.0	12.9	0.0		0.6	
Approach LOS	A	B				

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	29.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	105	70	75	100	150	115
Future Volume (Veh/h)	105	70	75	100	150	115
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	118	79	84	112	169	129
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			197		438	158
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			197		438	158
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		69	86
cM capacity (veh/h)			1388		543	891

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	197	196	298
Volume Left	0	84	169
Volume Right	79	0	129
cSH	1700	1388	654
Volume to Capacity	0.12	0.06	0.46
Queue Length 95th (m)	0.0	1.5	19.1
Control Delay (s)	0.0	3.6	15.0
Lane LOS		A	C
Approach Delay (s)	0.0	3.6	15.0
Approach LOS			C

Intersection Summary			
Average Delay	7.5		
Intersection Capacity Utilization	44.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	48	564	96	64	792	138	133	69	53	53
v/c Ratio	0.11	0.44	0.09	0.12	0.33	0.50	0.33	0.27	0.14	0.15
Control Delay	6.7	8.0	1.9	6.6	5.9	26.5	14.7	21.0	18.5	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.7	8.0	1.9	6.6	5.9	26.5	14.7	21.0	18.5	6.5
Queue Length 50th (m)	1.9	29.5	0.0	2.6	18.6	14.2	8.3	6.8	5.1	0.0
Queue Length 95th (m)	7.2	63.9	5.3	8.8	35.4	26.2	18.8	14.7	11.5	6.5
Internal Link Dist (m)		585.1			130.4		189.6		431.7	
Turn Bay Length (m)	45.0			30.0				25.0		25.0
Base Capacity (vph)	432	1275	1094	517	2387	424	598	404	578	519
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	0.44	0.09	0.12	0.33	0.33	0.22	0.17	0.09	0.10

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	530	90	60	660	85	130	80	45	65	50	50
Future Volume (vph)	45	530	90	60	660	85	130	80	45	65	50	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.95		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)	1765	1863	1554	1799	3472		1761	1786		1805	1827	1517
Flt Permitted	0.34	1.00	1.00	0.40	1.00		0.72	1.00		0.67	1.00	1.00
Satd. Flow (perm)	631	1863	1554	755	3472		1339	1786		1277	1827	1517
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)	48	564	96	64	702	90	138	85	48	69	53	53
RTOR Reduction (vph)	0	0	34	0	12	0	0	39	0	0	0	43
Lane Group Flow (vph)	48	564	62	64	780	0	138	94	0	69	53	10
Confl. Peds. (#/hr)	5		5	5		5	5					5
Confl. Bikes (#/hr)												5
Heavy Vehicles (%)	2%	2%	1%	0%	2%	1%	2%	1%	0%	0%	4%	4%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)	37.9	37.9	37.9	37.9	37.9		10.1	10.1		10.1	10.1	10.1
Effective Green, g (s)	38.9	38.9	38.9	38.9	38.9		11.1	11.1		11.1	11.1	11.1
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.65		0.18	0.18		0.18	0.18	0.18
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	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)	409	1207	1007	489	2251		247	330		236	337	280
v/s Ratio Prot		c0.30			0.22			0.05			0.03	
v/s Ratio Perm	0.08		0.04	0.08			c0.10			0.05		0.01
v/c Ratio	0.12	0.47	0.06	0.13	0.35		0.56	0.28		0.29	0.16	0.04
Uniform Delay, d1	4.0	5.3	3.9	4.1	4.8		22.2	21.0		21.1	20.5	20.1
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	0.6	1.3	0.1	0.6	0.4		2.7	0.5		0.7	0.2	0.1
Delay (s)	4.6	6.6	4.0	4.6	5.2		25.0	21.5		21.8	20.7	20.1
Level of Service	A	A	A	A	A		C	C		C	C	C
Approach Delay (s)		6.1			5.2			23.3			21.0	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	9.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	5	774	126	720	5	49	16	198	38	38
v/c Ratio	0.01	0.54	0.58	0.49	0.01	0.09	0.02	0.27	0.05	0.05
Control Delay	7.8	11.3	24.9	10.9	0.0	8.4	7.7	5.5	8.0	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	7.8	11.3	24.9	10.9	0.0	8.4	7.7	5.5	8.0	3.7
Queue Length 50th (m)	0.1	23.1	7.4	21.2	0.0	2.3	0.7	4.4	1.7	0.0
Queue Length 95th (m)	0.8	36.0	#27.9	32.9	0.0	6.8	3.2	13.8	5.5	3.7
Internal Link Dist (m)		208.7		203.3			1140.2		129.5	
Turn Bay Length (m)	125.0		145.0		55.0	15.0		40.0		
Base Capacity (vph)	482	1435	218	1479	702	538	802	735	722	693
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	0.01	0.54	0.58	0.49	0.01	0.09	0.02	0.27	0.05	0.05

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	680	25	115	655	5	45	15	180	0	35	35
Future Volume (vph)	5	680	25	115	655	5	45	15	180	0	35	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	3502	3386		1752	3505	1615	1656	1900	1599		1712	1591
Flt Permitted	0.31	1.00		0.28	1.00	1.00	0.73	1.00	1.00		1.00	1.00
Satd. Flow (perm)	1141	3386		518	3505	1615	1277	1900	1599		1712	1591
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	5	747	27	126	720	5	49	16	198	0	38	38
RTOR Reduction (vph)	0	6	0	0	0	3	0	0	61	0	0	22
Lane Group Flow (vph)	5	768	0	126	720	2	49	16	137	0	38	16
Confl. Bikes (#/hr)												5
Heavy Vehicles (%)	0%	6%	8%	3%	3%	0%	9%	0%	1%	0%	11%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	18.0	18.0		18.0	18.0	18.0	18.0	18.0	18.0		18.0	18.0
Effective Green, g (s)	19.0	19.0		19.0	19.0	19.0	19.0	19.0	19.0		19.0	19.0
Actuated g/C Ratio	0.42	0.42		0.42	0.42	0.42	0.42	0.42	0.42		0.42	0.42
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lane Grp Cap (vph)	481	1429		218	1479	681	539	802	675		722	671
v/s Ratio Prot		0.23			0.21			0.01			0.02	
v/s Ratio Perm	0.00			c0.24		0.00	0.04		c0.09			0.01
v/c Ratio	0.01	0.54		0.58	0.49	0.00	0.09	0.02	0.20		0.05	0.02
Uniform Delay, d1	7.5	9.7		9.9	9.5	7.5	7.8	7.6	8.2		7.7	7.6
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	0.0	1.5		10.7	1.1	0.0	0.3	0.0	0.7		0.1	0.1
Delay (s)	7.6	11.2		20.6	10.6	7.5	8.1	7.6	8.9		7.8	7.7
Level of Service	A	B		C	B	A	A	A	A		A	A
Approach Delay (s)		11.1			12.1			8.7			7.7	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	35	101	348	722	56	121	177	1076	843	197	2030	51
v/c Ratio	0.12	0.37	0.98	0.90	0.09	0.22	1.00	0.53	0.81	0.72	0.97	0.08
Control Delay	27.9	58.8	78.6	67.3	33.8	6.6	94.7	33.2	28.2	35.1	54.6	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0
Total Delay	27.9	58.8	78.6	67.3	33.8	6.6	94.7	33.2	29.4	35.1	54.6	0.2
Queue Length 50th (m)	5.9	27.2	~66.1	105.0	11.3	0.0	37.5	110.2	160.7	30.2	210.6	0.0
Queue Length 95th (m)	13.1	46.6	#133.2	#136.7	22.5	15.0	#85.5	84.4	251.5	#47.8	#248.2	0.0
Internal Link Dist (m)		361.1			497.8			251.4			315.2	
Turn Bay Length (m)	80.0			165.0		15.0				85.0		80.0
Base Capacity (vph)	377	274	354	824	624	561	177	2013	1041	272	2088	656
Starvation Cap Reductn	0	0	0	0	0	0	0	0	64	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	0.09	0.37	0.98	0.88	0.09	0.22	1.00	0.53	0.86	0.72	0.97	0.08

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	100	345	715	55	120	175	1065	835	195	2010	50
Future Volume (vph)	35	100	345	715	55	120	175	1065	835	195	2010	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.8	5.8	4.7	5.8	5.8	3.0	5.1	5.1	3.0	5.1	5.1
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.97	1.00	1.00	0.91
Flpb, ped/bikes	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	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)	1659	1863	1568	3367	1827	1410	1719	4988	1513	1787	5085	1383
Flt Permitted	0.72	1.00	1.00	0.95	1.00	1.00	0.07	1.00	1.00	0.17	1.00	1.00
Satd. Flow (perm)	1258	1863	1568	3367	1827	1410	131	4988	1513	310	5085	1383
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	35	101	348	722	56	121	177	1076	843	197	2030	51
RTOR Reduction (vph)	0	0	122	0	0	80	0	0	437	0	0	30
Lane Group Flow (vph)	35	101	226	722	56	41	177	1076	406	197	2030	21
Confl. Peds. (#/hr)	35					35	35		10	10		35
Heavy Vehicles (%)	3%	2%	3%	4%	4%	4%	5%	4%	3%	1%	2%	6%
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8		8			4	6		6	2		2
Actuated Green, G (s)	27.0	20.8	20.8	32.3	46.9	46.9	63.3	54.3	54.3	65.3	55.3	55.3
Effective Green, g (s)	29.0	21.8	21.8	33.3	47.9	47.9	65.3	55.3	55.3	67.3	56.3	56.3
Actuated g/C Ratio	0.21	0.16	0.16	0.24	0.34	0.34	0.47	0.39	0.39	0.48	0.40	0.40
Clearance Time (s)	5.7	6.8	6.8	5.7	6.8	6.8	4.0	6.1	6.1	4.0	6.1	6.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	281	290	244	800	625	482	174	1970	597	265	2044	556
v/s Ratio Prot	0.01	0.05		c0.21	0.03		c0.07	0.22		c0.06	0.40	
v/s Ratio Perm	0.02		c0.14			0.03	c0.40		0.27	0.30		0.01
v/c Ratio	0.12	0.35	0.93	0.90	0.09	0.09	1.02	0.55	0.68	0.74	0.99	0.04
Uniform Delay, d1	45.0	52.8	58.3	51.8	31.3	31.2	40.7	32.7	35.0	23.6	41.7	25.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.02	1.01	4.03	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.7	38.1	13.4	0.1	0.1	65.0	0.9	4.9	10.7	18.4	0.1
Delay (s)	45.2	53.5	96.4	65.2	31.3	31.3	106.5	34.0	146.2	34.3	60.0	25.5
Level of Service	D	D	F	E	C	C	F	C	F	C	E	C
Approach Delay (s)		83.8			58.5			85.2			57.0	
Approach LOS		F			E			F			E	

Intersection Summary			
HCM 2000 Control Delay	69.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	93.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	5	237	250	250	206	2036	2082	5
v/c Ratio	0.02	0.50	0.90	0.90	0.39	0.65	0.66	0.01
Control Delay	27.2	37.5	81.4	81.4	16.7	19.5	28.3	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0
Total Delay	27.2	37.5	81.4	81.4	16.7	19.5	28.7	0.0
Queue Length 50th (m)	1.1	50.6	73.1	73.1	17.6	125.8	207.3	0.0
Queue Length 95th (m)	3.6	62.1	104.6	104.6	37.1	203.4	m223.9	m0.0
Internal Link Dist (m)		327.0		348.8		26.7	251.4	
Turn Bay Length (m)								
Base Capacity (vph)	291	691	337	337	609	3136	3167	996
Starvation Cap Reductn	0	0	0	0	0	0	483	0
Spillback Cap Reductn	0	0	0	0	9	13	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.34	0.74	0.74	0.34	0.65	0.78	0.01

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	230	485	0	200	0	1975	0	0	2020	5
Future Volume (vph)	5	0	230	485	0	200	0	1975	0	0	2020	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00		0.91			0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	0.85		1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected	0.95	1.00		0.95	0.95	1.00		1.00			1.00	1.00
Satd. Flow (prot)	1805	1599		1715	1715	1615		4988			5036	1543
Flt Permitted	0.37	1.00		0.58	0.58	1.00		1.00			1.00	1.00
Satd. Flow (perm)	710	1599		1040	1040	1615		4988			5036	1543
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	5	0	237	500	0	206	0	2036	0	0	2082	5
RTOR Reduction (vph)	0	21	0	0	0	93	0	0	0	0	0	2
Lane Group Flow (vph)	5	216	0	250	250	113	0	2036	0	0	2082	3
Confl. Peds. (#/hr)							10		5	5		10
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	0%	4%	4%	0%	3%	0%
Turn Type	pm+pt	NA		Perm	NA	Perm		NA			NA	Perm
Protected Phases	3	8			4			2			6	
Permitted Phases	8			4		4						6
Actuated Green, G (s)	43.0	43.0		36.6	36.6	36.6		83.0			83.0	83.0
Effective Green, g (s)	44.0	44.0		37.6	37.6	37.6		84.0			84.0	84.0
Actuated g/C Ratio	0.31	0.31		0.27	0.27	0.27		0.60			0.60	0.60
Clearance Time (s)	5.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	241	502		279	279	433		2992			3021	925
v/s Ratio Prot	0.00	c0.13						0.41			c0.41	
v/s Ratio Perm	0.01			c0.24	0.24	0.07						0.00
v/c Ratio	0.02	0.43		0.90	0.90	0.26		0.68			0.69	0.00
Uniform Delay, d1	33.9	38.1		49.3	49.3	40.3		18.9			19.1	11.2
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.50	1.00
Incremental Delay, d2	0.0	0.6		28.5	28.5	0.3		1.3			0.4	0.0
Delay (s)	33.9	38.6		77.8	77.8	40.6		20.2			29.1	11.2
Level of Service	C	D		E	E	D		C			C	B
Approach Delay (s)		38.5			66.9			20.2			29.0	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	903	673	1658	2337
v/c Ratio	0.61	0.99	0.69	0.96
Control Delay	33.3	72.2	32.0	45.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	33.3	72.2	32.0	45.1
Queue Length 50th (m)	103.9	192.2	113.8	234.2
Queue Length 95th (m)	126.3	#279.3	m91.2	#263.9
Internal Link Dist (m)	190.2		56.8	39.3
Turn Bay Length (m)				
Base Capacity (vph)	1471	679	2399	2446
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.61	0.99	0.69	0.96

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.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	885	660	0	1625	2290	0
Future Volume (vph)	885	660	0	1625	2290	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	1.00		0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3433	1583		4940	5036	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3433	1583		4940	5036	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	903	673	0	1658	2337	0
RTOR Reduction (vph)	0	1	0	0	0	0
Lane Group Flow (vph)	903	672	0	1658	2337	0
Confl. Peds. (#/hr)			10			10
Heavy Vehicles (%)	2%	2%	0%	5%	3%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Actuated Green, G (s)	59.0	59.0		67.0	67.0	
Effective Green, g (s)	60.0	60.0		68.0	68.0	
Actuated g/C Ratio	0.43	0.43		0.49	0.49	
Clearance Time (s)	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1471	678		2399	2446	
v/s Ratio Prot	0.26			0.34	c0.46	
v/s Ratio Perm		c0.42				
v/c Ratio	0.61	0.99		0.69	0.96	
Uniform Delay, d1	31.0	39.8		27.9	34.5	
Progression Factor	1.00	1.00		1.13	1.00	
Incremental Delay, d2	0.8	32.3		0.2	10.4	
Delay (s)	31.8	72.1		31.7	44.9	
Level of Service	C	E		C	D	
Approach Delay (s)	49.0			31.7	44.9	
Approach LOS	D			C	D	

Intersection Summary			
HCM 2000 Control Delay	42.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	180	0	0	0	0	1950	470	0	2085	835
Future Volume (Veh/h)	0	0	180	0	0	0	0	1950	470	0	2085	835
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	0	194	0	0	0	0	2097	505	0	2242	898
Pedestrians		10			5							
Lane Width (m)		3.6			0.0							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		1			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								198			81	
pX, platoon unblocked	0.62	0.62	0.55	0.62	0.62	0.86	0.55			0.86		
vC, conflicting volume	3400	5308	1206	2849	5252	704	3150			2607		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1150	4227	0	262	4136	61	2035			2286		
tC, single (s)	7.5	6.5	7.0	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	67	100	100	100	100			100		
cM capacity (veh/h)	95	1	584	278	1	853	153			192		

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3
Volume Total	194	699	699	699	505	897	897	1346
Volume Left	0	0	0	0	0	0	0	0
Volume Right	194	0	0	0	505	0	0	898
cSH	584	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.33	0.41	0.41	0.41	0.30	0.53	0.53	0.79
Queue Length 95th (m)	11.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	14.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B							
Approach Delay (s)	14.2	0.0				0.0		
Approach LOS	B							

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1258	304	67	82	93	155	1160	222	2020
v/c Ratio	1.68	0.65	0.25	0.45	0.29	0.74	0.55	0.75	0.98
Control Delay	346.2	49.1	32.6	66.2	2.3	51.3	31.9	36.3	45.2
Queue Delay	0.7	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	346.9	50.6	32.6	66.2	2.3	51.3	31.9	36.3	45.2
Queue Length 50th (m)	~275.5	74.4	12.8	23.0	0.0	27.6	93.0	34.8	170.0
Queue Length 95th (m)	#319.4	103.6	22.4	39.3	0.0	#80.4	108.2	m42.0	m#214.0
Internal Link Dist (m)		97.1		158.4			292.1		174.2
Turn Bay Length (m)	130.0		50.0			120.0		55.0	
Base Capacity (vph)	748	507	267	250	369	210	2105	296	2060
Starvation Cap Reductn	77	81	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.87	0.71	0.25	0.33	0.25	0.74	0.55	0.75	0.98

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1220	155	140	65	80	90	150	1090	35	215	1495	465
Future Volume (vph)	1220	155	140	65	80	90	150	1090	35	215	1495	465
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	6.0	4.0	6.0		3.0	6.0	
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	1.00	0.85	1.00	1.00		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3273	1674		1728	1810	1553	1671	5006		1736	4828	
Flt Permitted	0.95	1.00		0.57	1.00	1.00	0.07	1.00		0.15	1.00	
Satd. Flow (perm)	3273	1674		1046	1810	1553	122	5006		282	4828	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	1258	160	144	67	82	93	155	1124	36	222	1541	479
RTOR Reduction (vph)	0	24	0	0	0	83	0	2	0	0	41	0
Lane Group Flow (vph)	1258	280	0	67	82	10	155	1158	0	222	1979	0
Confl. Peds. (#/hr)			5	5			15		5	5		15
Heavy Vehicles (%)	7%	0%	9%	4%	5%	4%	8%	3%	3%	4%	2%	4%
Turn Type	Prot	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8		8	2			6		
Actuated Green, G (s)	31.0	36.0		24.2	14.6	14.6	68.7	56.5		69.1	56.2	
Effective Green, g (s)	32.0	37.0		26.2	15.6	15.6	70.7	57.5		71.1	57.2	
Actuated g/C Ratio	0.23	0.26		0.19	0.11	0.11	0.51	0.41		0.51	0.41	
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	5.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.5	4.0	4.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	748	442		247	201	173	207	2056		287	1972	
v/s Ratio Prot	c0.38	c0.17		0.02	0.05		0.07	0.23		c0.08	c0.41	
v/s Ratio Perm				0.03		0.01	0.31			0.32		
v/c Ratio	1.68	0.63		0.27	0.41	0.06	0.75	0.56		0.77	1.00	
Uniform Delay, d1	54.0	45.5		48.1	57.9	55.6	36.5	31.6		22.2	41.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.56	0.90	
Incremental Delay, d2	312.6	3.0		0.7	1.8	0.2	13.8	1.1		6.4	15.2	
Delay (s)	366.6	48.5		48.8	59.7	55.8	50.3	32.7		41.1	52.4	
Level of Service	F	D		D	E	E	D	C		D	D	
Approach Delay (s)		304.7			55.2			34.8			51.3	
Approach LOS		F			E			C			D	

Intersection Summary			
HCM 2000 Control Delay	121.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	109.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	276	448	68	31	370	667	52	484	786	682	401
v/c Ratio	0.83	0.77	0.11	0.14	0.44	0.94	0.20	0.53	0.90	0.75	0.47
Control Delay	85.6	55.2	0.4	27.1	47.5	36.5	22.1	49.1	67.3	40.3	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.6	55.2	0.4	27.1	47.5	36.5	22.1	49.1	67.3	40.3	12.3
Queue Length 50th (m)	~45.1	127.3	0.0	5.8	48.7	70.9	7.3	68.5	121.5	179.1	29.0
Queue Length 95th (m)	#76.9	167.4	0.0	12.2	61.5	#137.9	15.3	88.1	#173.4	#271.5	64.8
Internal Link Dist (m)		551.4			604.3			115.4		292.1	
Turn Bay Length (m)	85.0			85.0		75.0	40.0		85.0		
Base Capacity (vph)	333	580	597	362	1075	782	317	917	873	907	853
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.77	0.11	0.09	0.34	0.85	0.16	0.53	0.90	0.75	0.47

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	265	430	65	30	355	640	50	410	55	755	655	385
Future Volume (vph)	265	430	65	30	355	640	50	410	55	755	655	385
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.4	5.4	4.0	5.4	5.4	3.0	5.9		4.0	5.9	5.9
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.94	1.00	1.00	0.95	1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3367	1792	1481	1730	3438	1480	1766	3451		3400	1881	1496
Flt Permitted	0.95	1.00	1.00	0.27	1.00	1.00	0.29	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3367	1792	1481	483	3438	1480	531	3451		3400	1881	1496
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	276	448	68	31	370	667	52	427	57	786	682	401
RTOR Reduction (vph)	0	0	46	0	0	345	0	7	0	0	0	136
Lane Group Flow (vph)	276	448	22	31	370	322	52	477	0	786	682	265
Confl. Peds. (#/hr)	25		15	15		25	20		10	10		20
Heavy Vehicles (%)	4%	6%	3%	4%	5%	4%	2%	2%	6%	3%	1%	4%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases			8	4		4	2					6
Actuated Green, G (s)	13.7	47.0	47.0	42.0	37.3	37.3	42.7	36.2		37.1	67.8	67.8
Effective Green, g (s)	14.7	48.0	48.0	44.0	38.3	38.3	44.7	37.2		38.1	68.8	68.8
Actuated g/C Ratio	0.10	0.32	0.32	0.30	0.26	0.26	0.30	0.25		0.26	0.46	0.46
Clearance Time (s)	5.7	6.4	6.4	5.0	6.4	6.4	4.0	6.9		5.0	6.9	6.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	333	580	479	191	887	382	222	865		873	872	694
v/s Ratio Prot	c0.08	0.25		0.01	0.11		0.01	0.14		c0.23	c0.36	
v/s Ratio Perm			0.01	0.04		c0.22	0.06					0.18
v/c Ratio	0.83	0.77	0.05	0.16	0.42	0.84	0.23	0.55		0.90	0.78	0.38
Uniform Delay, d1	65.6	45.2	34.4	38.5	45.7	52.2	37.7	48.3		53.3	33.4	25.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	15.5	6.3	0.0	0.4	0.3	15.5	0.5	2.5		12.3	6.9	1.6
Delay (s)	81.1	51.6	34.5	38.9	46.0	67.6	38.3	50.8		65.5	40.4	27.5
Level of Service	F	D	C	D	D	E	D	D		E	D	C
Approach Delay (s)		60.4			59.3			49.6			48.2	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	53.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	148.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	96.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	→ EBT	← WBT	↑ NBT	↓ SBT
Lane Group Flow (vph)	667	11	247	281
v/c Ratio	0.66	0.07	0.13	0.15
Control Delay	27.3	12.9	6.5	6.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	27.3	12.9	6.5	6.8
Queue Length 50th (m)	43.8	0.9	5.2	6.3
Queue Length 95th (m)	57.4	3.3	11.9	13.7
Internal Link Dist (m)	146.6	179.3	180.3	263.4
Turn Bay Length (m)				
Base Capacity (vph)	1562	234	1920	1827
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.43	0.05	0.13	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	175	340	65	10	0	0	0	180	35	10	200	35
Future Volume (vph)	175	340	65	10	0	0	0	180	35	10	200	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5			3.5			3.5			3.5	
Lane Util. Factor		0.95			1.00			0.95			0.95	
Frt		0.98			1.00			0.98			0.98	
Flt Protected		0.99			0.95			1.00			1.00	
Satd. Flow (prot)		3496			1626			3420			3442	
Flt Permitted		0.86			0.27			1.00			0.94	
Satd. Flow (perm)		3041			463			3420			3256	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	201	391	75	11	0	0	0	207	40	11	230	40
RTOR Reduction (vph)	0	22	0	0	0	0	0	18	0	0	16	0
Lane Group Flow (vph)	0	645	0	0	11	0	0	229	0	0	265	0
Heavy Vehicles (%)	0%	0%	0%	11%	0%	0%	50%	3%	3%	0%	3%	0%
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		18.6			18.6			32.4			32.4	
Effective Green, g (s)		19.6			19.6			33.4			33.4	
Actuated g/C Ratio		0.33			0.33			0.56			0.56	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		993			151			1903			1812	
v/s Ratio Prot								0.07				
v/s Ratio Perm		c0.21			0.02						c0.08	
v/c Ratio		0.65			0.07			0.12			0.15	
Uniform Delay, d1		17.3			13.9			6.3			6.4	
Progression Factor		1.56			1.00			1.00			1.00	
Incremental Delay, d2		1.2			0.2			0.1			0.2	
Delay (s)		28.1			14.1			6.4			6.6	
Level of Service		C			B			A			A	
Approach Delay (s)		28.1			14.1			6.4			6.6	
Approach LOS		C			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	37.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	335	73	116	238	85	238
v/c Ratio	0.26	0.06	0.14	0.16	0.39	0.60
Control Delay	6.0	1.7	2.2	2.4	38.5	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.0	1.7	2.2	2.4	38.5	11.4
Queue Length 50th (m)	18.3	0.0	2.6	6.3	13.6	0.0
Queue Length 95th (m)	32.8	3.6	6.4	13.0	23.6	14.0
Internal Link Dist (m)	228.8			1140.2	151.2	
Turn Bay Length (m)		100.0	100.0		100.0	
Base Capacity (vph)	1265	1171	858	1486	409	536
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	0.26	0.06	0.14	0.16	0.21	0.44

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	275	60	95	195	70	195
Future Volume (vph)	275	60	95	195	70	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	2.0	3.0	3.0	3.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1776	1615	1770	1845	1787	1538
Flt Permitted	1.00	1.00	0.52	1.00	0.95	1.00
Satd. Flow (perm)	1776	1615	962	1845	1787	1538
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	335	73	116	238	85	238
RTOR Reduction (vph)	0	21	0	0	0	209
Lane Group Flow (vph)	335	52	116	238	85	29
Heavy Vehicles (%)	7%	0%	2%	3%	1%	5%
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	59.0	59.0	67.5	67.5	9.5	9.5
Effective Green, g (s)	60.0	60.0	68.5	68.5	10.5	10.5
Actuated g/C Ratio	0.71	0.71	0.81	0.81	0.12	0.12
Clearance Time (s)	4.0	4.0	3.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1253	1140	837	1486	220	189
v/s Ratio Prot	c0.19		0.01	c0.13	c0.05	
v/s Ratio Perm		0.03	0.10			0.02
v/c Ratio	0.27	0.05	0.14	0.16	0.39	0.16
Uniform Delay, d1	4.5	3.8	1.9	1.8	34.3	33.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.1	0.1	0.2	1.1	0.4
Delay (s)	5.1	3.9	1.9	2.1	35.4	33.7
Level of Service	A	A	A	A	D	C
Approach Delay (s)	4.8			2.0	34.1	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	33.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	27	843	43	609	250	136	38	82	27
v/c Ratio	0.07	0.45	0.15	0.32	0.67	0.25	0.11	0.15	0.06
Control Delay	9.2	9.2	10.4	8.9	27.5	9.3	14.3	14.7	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.2	9.2	10.4	8.9	27.5	9.3	14.3	14.7	2.0
Queue Length 50th (m)	1.4	24.7	2.3	18.2	25.0	6.0	3.2	6.9	0.0
Queue Length 95th (m)	5.7	45.5	8.6	33.5	41.2	15.0	8.0	13.6	2.1
Internal Link Dist (m)		585.1		130.4		189.6		92.5	
Turn Bay Length (m)	45.0		30.0				25.0		25.0
Base Capacity (vph)	390	1877	297	1894	456	658	425	669	579
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.45	0.14	0.32	0.55	0.21	0.09	0.12	0.05

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	595	180	40	525	35	230	65	60	35	75	25
Future Volume (vph)	25	595	180	40	525	35	230	65	60	35	75	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1650	3343		1752	3435		1728	1733		1696	1881	1527
Flt Permitted	0.41	1.00		0.29	1.00		0.70	1.00		0.67	1.00	1.00
Satd. Flow (perm)	711	3343		543	3435		1280	1733		1196	1881	1527
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	647	196	43	571	38	250	71	65	38	82	27
RTOR Reduction (vph)	0	42	0	0	7	0	0	46	0	0	0	19
Lane Group Flow (vph)	27	801	0	43	602	0	250	90	0	38	82	8
Confl. Peds. (#/hr)	5					5	5		5	5		5
Heavy Vehicles (%)	9%	4%	5%	3%	4%	3%	4%	0%	2%	6%	1%	4%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	31.6	31.6		31.6	31.6		16.4	16.4		16.4	16.4	16.4
Effective Green, g (s)	32.6	32.6		32.6	32.6		17.4	17.4		17.4	17.4	17.4
Actuated g/C Ratio	0.54	0.54		0.54	0.54		0.29	0.29		0.29	0.29	0.29
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	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
Lane Grp Cap (vph)	386	1816		295	1866		371	502		346	545	442
v/s Ratio Prot		c0.24			0.18			0.05			0.04	
v/s Ratio Perm	0.04			0.08			c0.20			0.03		0.01
v/c Ratio	0.07	0.44		0.15	0.32		0.67	0.18		0.11	0.15	0.02
Uniform Delay, d1	6.5	8.2		6.8	7.6		18.8	16.0		15.6	15.8	15.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	0.8		1.0	0.5		4.8	0.2		0.1	0.1	0.0
Delay (s)	6.9	9.0		7.8	8.0		23.6	16.1		15.8	15.9	15.2
Level of Service	A	A		A	A		C	B		B	B	B
Approach Delay (s)		8.9			8.0			20.9			15.8	
Approach LOS		A			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

17: South Service Road E & QEW On-Off Ramps/Royal Windsor Drive

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	59	744	154	596	48	399	59	101	16
v/c Ratio	0.11	0.52	0.65	0.43	0.09	0.50	0.09	0.13	0.03
Control Delay	8.6	10.7	28.5	10.4	8.4	12.2	3.3	8.5	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.6	10.7	28.5	10.4	8.4	12.2	3.3	8.5	1.9
Queue Length 50th (m)	1.4	21.1	9.5	17.0	2.2	22.5	0.0	4.7	0.0
Queue Length 95th (m)	4.0	33.4	#33.8	27.2	6.7	41.4	4.6	11.3	1.5
Internal Link Dist (m)		208.7		203.3		1140.2		129.5	
Turn Bay Length (m)	125.0		145.0		15.0		40.0		
Base Capacity (vph)	545	1438	236	1398	555	802	648	786	494
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.52	0.65	0.43	0.09	0.50	0.09	0.13	0.03

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	630	70	145	560	0	45	375	55	0	95	15
Future Volume (vph)	55	630	70	145	560	0	45	375	55	0	95	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5		3.5	3.5
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	3213	3364		1787	3312		1805	1900	1455		1863	1122
Flt Permitted	0.38	1.00		0.30	1.00		0.69	1.00	1.00		1.00	1.00
Satd. Flow (perm)	1292	3364		558	3312		1314	1900	1455		1863	1122
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)	59	670	74	154	596	0	48	399	59	0	101	16
RTOR Reduction (vph)	0	18	0	0	0	0	0	0	34	0	0	9
Lane Group Flow (vph)	59	726	0	154	596	0	48	399	25	0	101	7
Heavy Vehicles (%)	9%	6%	3%	1%	9%	0%	0%	0%	11%	0%	2%	44%
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	18.0	18.0		18.0	18.0		18.0	18.0	18.0		18.0	18.0
Effective Green, g (s)	19.0	19.0		19.0	19.0		19.0	19.0	19.0		19.0	19.0
Actuated g/C Ratio	0.42	0.42		0.42	0.42		0.42	0.42	0.42		0.42	0.42
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5		4.5	4.5
Lane Grp Cap (vph)	545	1420		235	1398		554	802	614		786	473
v/s Ratio Prot		0.22			0.18			c0.21			0.05	
v/s Ratio Perm	0.05			c0.28			0.04		0.02			0.01
v/c Ratio	0.11	0.51		0.66	0.43		0.09	0.50	0.04		0.13	0.01
Uniform Delay, d1	7.9	9.6		10.4	9.2		7.8	9.5	7.6		7.9	7.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.4	1.3		13.4	1.0		0.3	2.2	0.1		0.3	0.1
Delay (s)	8.3	10.9		23.8	10.1		8.1	11.7	7.8		8.3	7.6
Level of Service	A	B		C	B		A	B	A		A	A
Approach Delay (s)		10.7			12.9			10.9			8.2	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	175	0	0	35	0	0
Future Volume (Veh/h)	175	0	0	35	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	190	0	0	38	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	287					
pX, platoon unblocked						
vC, conflicting volume			190		228	190
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			190		228	190
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1384		760	852

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	190	38	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.11	0.02	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	12.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	Y	
Traffic Volume (veh/h)	175	0	0	35	0	60
Future Volume (Veh/h)	175	0	0	35	0	60
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	190	0	0	38	0	65
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	402			296		
pX, platoon unblocked						
vC, conflicting volume			190		228	190
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			190		228	190
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	92
cM capacity (veh/h)			1384		760	852

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	190	38	65
Volume Left	0	0	0
Volume Right	0	0	65
cSH	1700	1700	852
Volume to Capacity	0.11	0.02	0.08
Queue Length 95th (m)	0.0	0.0	2.0
Control Delay (s)	0.0	0.0	9.6
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.6
Approach LOS			A

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	19.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	235	0	10	35	0	0
Future Volume (Veh/h)	235	0	10	35	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	255	0	11	38	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				253		
pX, platoon unblocked						
vC, conflicting volume			255		315	255
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			255		315	255
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			1310		672	784

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	255	49	0
Volume Left	0	11	0
Volume Right	0	0	0
cSH	1700	1310	1700
Volume to Capacity	0.15	0.01	0.13
Queue Length 95th (m)	0.0	0.2	0.0
Control Delay (s)	0.0	1.8	0.0
Lane LOS		A	A
Approach Delay (s)	0.0	1.8	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	15.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	340	0	0	0	0	0	0	0	0	0	0
Future Volume (Veh/h)	0	340	0	0	0	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	370	0	0	0	0	0	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		203			262							
pX, platoon unblocked				0.87			0.87	0.87	0.87	0.87	0.87	
vC, conflicting volume	0			370			370	370	370	370	370	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			196			196	196	196	196	196	0
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 %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1623			1193			661	606	733	661	606	1085

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	370	0	0	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1623	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS			A	A
Approach Delay (s)	0.0	0.0	0.0	0.0
Approach LOS			A	A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	21.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	280	0	0	0	0	0	0	0	0	0	0
Future Volume (Veh/h)	60	280	0	0	0	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	304	0	0	0	0	0	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		313			152							
pX, platoon unblocked				0.98			0.98	0.98	0.98	0.98	0.98	
vC, conflicting volume	0			304			434	434	304	434	434	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			274			407	407	274	407	407	0
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 %	96			100			100	100	100	100	100	100
cM capacity (veh/h)	1623			1258			524	499	746	524	499	1085

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	65	304	0	0	0	0
Volume Left	65	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1623	1700	1700	1700	1700	1700
Volume to Capacity	0.04	0.18	0.00	0.19	0.00	0.20
Queue Length 95th (m)	1.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	7.3	0.0	0.0	0.0	0.0	0.0
Lane LOS	A				A	A
Approach Delay (s)	1.3		0.0		0.0	0.0
Approach LOS					A	A

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	18.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	NBT
Lane Group Flow (vph)	185	120	92
v/c Ratio	0.17	0.08	0.20
Control Delay	1.0	0.8	23.8
Queue Delay	0.0	0.0	0.0
Total Delay	1.0	0.8	23.8
Queue Length 50th (m)	1.3	0.8	5.1
Queue Length 95th (m)	3.3	2.4	10.6
Internal Link Dist (m)		128.4	150.5
Turn Bay Length (m)	50.0		
Base Capacity (vph)	1121	1482	1268
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.17	0.08	0.07

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	110	0	0	0	0	0	85	0	0	0	0
Future Volume (vph)	170	110	0	0	0	0	0	85	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5						3.5				
Lane Util. Factor	1.00	1.00						0.95				
Frt	1.00	1.00						1.00				
Flt Protected	0.95	1.00						1.00				
Satd. Flow (prot)	1770	1863						3539				
Flt Permitted	0.76	1.00						1.00				
Satd. Flow (perm)	1410	1863						3539				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	185	120	0	0	0	0	0	92	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	185	120	0	0	0	0	0	92	0	0	0	0
Turn Type	Perm	NA		Perm			Perm	NA		Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	45.1	45.1						5.9				
Effective Green, g (s)	46.1	46.1						6.9				
Actuated g/C Ratio	0.77	0.77						0.12				
Clearance Time (s)	4.5	4.5						4.5				
Vehicle Extension (s)	3.0	3.0						3.0				
Lane Grp Cap (vph)	1083	1431						406				
v/s Ratio Prot		0.06						c0.03				
v/s Ratio Perm	c0.13											
v/c Ratio	0.17	0.08						0.23				
Uniform Delay, d1	1.9	1.7						24.1				
Progression Factor	0.30	0.33						1.00				
Incremental Delay, d2	0.3	0.1						0.3				
Delay (s)	0.9	0.7						24.4				
Level of Service	A	A						C				
Approach Delay (s)		0.8			0.0			24.4			0.0	
Approach LOS		A			A			C			A	

Intersection Summary			
HCM 2000 Control Delay	6.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.18		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	20.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	110	0	0	0	0	0	0	0	0	10	0
Future Volume (Veh/h)	0	110	0	0	0	0	0	0	0	0	10	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	120	0	0	0	0	0	0	0	0	11	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		131										
pX, platoon unblocked												
vC, conflicting volume	0			120			126	120	120	120	120	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			120			126	120	120	120	120	0
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 %	100			100			100	100	100	100	99	100
cM capacity (veh/h)	1623			1468			839	770	931	855	770	1085

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	0	120	0	0	0	11
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	770
Volume to Capacity	0.00	0.07	0.00	0.23	0.34	0.01
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	9.7
Lane LOS					A	A
Approach Delay (s)	0.0		0.0		0.0	9.7
Approach LOS					A	A

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	15.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	110	0	0	65	0	0
Future Volume (Veh/h)	110	0	0	65	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	120	0	0	71	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				280	175	
pX, platoon unblocked						
vC, conflicting volume	71	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	71	0	0			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	87	100	100			
cM capacity (veh/h)	933	1085	1623			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	120	71	0
Volume Left	120	0	0
Volume Right	0	0	0
cSH	933	1623	1700
Volume to Capacity	0.13	0.00	0.02
Queue Length 95th (m)	3.5	0.0	0.0
Control Delay (s)	9.4	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.4	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	5.9		
Intersection Capacity Utilization	16.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	35	85	10	0	65	15
Future Volume (Veh/h)	35	85	10	0	65	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	92	11	0	71	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		182	224			
pX, platoon unblocked						
vC, conflicting volume	11				179	11
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	11				179	11
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				91	99
cM capacity (veh/h)	1608				791	1070

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	130	11	87
Volume Left	38	0	71
Volume Right	0	0	16
cSH	1608	1700	831
Volume to Capacity	0.02	0.01	0.10
Queue Length 95th (m)	0.6	0.0	2.8
Control Delay (s)	2.3	0.0	9.8
Lane LOS	A		A
Approach Delay (s)	2.3	0.0	9.8
Approach LOS			A

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	24.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	150	10	0	0	0
Future Volume (Veh/h)	0	150	10	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	163	11	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			252			
pX, platoon unblocked						
vC, conflicting volume	11				174	11
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	11				174	11
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1608				816	1070

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	0	163	11	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.00	0.10	0.01	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				A
Approach Delay (s)	0.0		0.0	0.0
Approach LOS				A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	11.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	150	10	0	0	0
Future Volume (Veh/h)	0	150	10	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	163	11	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		111	141			
pX, platoon unblocked						
vC, conflicting volume	11				174	11
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	11				174	11
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1608				816	1070

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	0	163	11	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.10	0.01	0.00	0.10
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	11.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	65	0	0	10	0	0	0	0	0	0	0
Future Volume (Veh/h)	85	65	0	0	10	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	71	0	0	11	0	0	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					373							
pX, platoon unblocked												
vC, conflicting volume	11			71			260	266	36	230	266	6
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	11			71			260	266	36	230	266	6
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
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 %	94			100			100	100	100	100	100	100
cM capacity (veh/h)	1607			1527			642	602	1029	674	602	1076

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	92	36	36	0	6	6	0	0	0	0	0
Volume Left	92	0	0	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0	0	0	0	0
cSH	1607	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.06	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
Queue Length 95th (m)	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						A	A	A	A	A
Approach Delay (s)	4.2			0.0			0.0		0.0		
Approach LOS							A		A		

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	14.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	65	0	0	0	10
Future Volume (Veh/h)	0	65	0	0	0	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	71	0	0	0	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		127	245			
pX, platoon unblocked						
vC, conflicting volume	0				36	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				36	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1622				973	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	24	47	0	0	11
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	11
cSH	1622	1700	1700	1700	1084
Volume to Capacity	0.00	0.03	0.05	0.06	0.01
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.2
Control Delay (s)	0.0	0.0	0.0	0.0	8.4
Lane LOS					A
Approach Delay (s)	0.0		0.0		8.4
Approach LOS					A

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	65	0	0	0	0	0
Future Volume (Veh/h)	65	0	0	0	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	71	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				116	339	
pX, platoon unblocked						
vC, conflicting volume	0	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0	0			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	100	100			
cM capacity (veh/h)	1023	1085	1623			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	71	0	0	0
Volume Left	71	0	0	0
Volume Right	0	0	0	0
cSH	1023	1700	1700	1700
Volume to Capacity	0.07	0.39	0.00	0.05
Queue Length 95th (m)	1.8	0.0	0.0	0.0
Control Delay (s)	8.8	0.0	0.0	0.0
Lane LOS	A	A		
Approach Delay (s)	8.8		0.0	0.0
Approach LOS	A			

Intersection Summary			
Average Delay	8.8		
Intersection Capacity Utilization	6.9%	ICU Level of Service	A
Analysis Period (min)	15		

1: Trafalgar Road & Leighland Avenue/Iroquois Shore Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	35	182	348	722	101	121	177	1843	843	197	3657	51
v/c Ratio	0.12	0.66	0.98	0.90	0.16	0.22	1.00	0.92	0.88	1.00	1.75	0.08
Control Delay	27.9	69.5	78.6	67.3	34.5	6.6	64.9	19.7	14.8	99.0	368.3	0.2
Queue Delay	0.0	0.0	50.8	60.7	0.0	0.0	0.0	0.0	6.4	0.0	0.7	0.0
Total Delay	27.9	69.5	129.4	128.0	34.5	6.6	64.9	19.7	21.2	99.0	369.0	0.2
Queue Length 50th (m)	5.9	51.3	~66.1	105.0	21.0	0.0	33.0	172.7	210.1	40.6	~578.6	0.0
Queue Length 95th (m)	13.1	#82.0	#133.2	#136.7	36.8	15.0	m23.5	m102.8	m66.1	#94.4	#598.2	0.0
Internal Link Dist (m)		361.1			497.8			251.4			315.2	
Turn Bay Length (m)	80.0			165.0		15.0				85.0		80.0
Base Capacity (vph)	370	274	354	824	624	561	177	2013	963	197	2088	656
Starvation Cap Reductn	0	0	0	0	0	0	0	0	88	0	0	0
Spillback Cap Reductn	0	0	225	618	0	0	0	0	0	0	449	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.66	2.70	3.50	0.16	0.22	1.00	0.92	0.96	1.00	2.23	0.08

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	180	345	715	100	120	175	1825	835	195	3620	50
Future Volume (vph)	35	180	345	715	100	120	175	1825	835	195	3620	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.8	5.8	4.7	5.8	5.8	3.0	5.1	5.1	3.0	5.1	5.1
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.97	1.00	1.00	0.91
Flpb, ped/bikes	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	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)	1668	1863	1568	3367	1827	1410	1719	4988	1513	1787	5085	1383
Flt Permitted	0.69	1.00	1.00	0.95	1.00	1.00	0.07	1.00	1.00	0.07	1.00	1.00
Satd. Flow (perm)	1215	1863	1568	3367	1827	1410	131	4988	1513	134	5085	1383
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	35	182	348	722	101	121	177	1843	843	197	3657	51
RTOR Reduction (vph)	0	0	122	0	0	80	0	0	358	0	0	30
Lane Group Flow (vph)	35	182	226	722	101	41	177	1843	485	197	3657	21
Confl. Peds. (#/hr)	35					35	35		10	10		35
Heavy Vehicles (%)	3%	2%	3%	4%	4%	4%	5%	4%	3%	1%	2%	6%
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8		8			4	6		6	2		2
Actuated Green, G (s)	27.0	20.8	20.8	32.3	46.9	46.9	63.3	54.3	54.3	65.3	55.3	55.3
Effective Green, g (s)	29.0	21.8	21.8	33.3	47.9	47.9	65.3	55.3	55.3	67.3	56.3	56.3
Actuated g/C Ratio	0.21	0.16	0.16	0.24	0.34	0.34	0.47	0.39	0.39	0.48	0.40	0.40
Clearance Time (s)	5.7	6.8	6.8	5.7	6.8	6.8	4.0	6.1	6.1	4.0	6.1	6.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	274	290	244	800	625	482	174	1970	597	194	2044	556
v/s Ratio Prot	0.01	0.10		c0.21	0.06		0.07	0.37		c0.08	c0.72	
v/s Ratio Perm	0.02		c0.14			0.03	0.40		0.32	0.41		0.01
v/c Ratio	0.13	0.63	0.93	0.90	0.16	0.09	1.02	0.94	0.81	1.02	1.79	0.04
Uniform Delay, d1	44.9	55.3	58.3	51.8	32.1	31.2	40.7	40.6	37.7	41.5	41.9	25.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.40	0.46	1.22	1.00	1.00	1.00
Incremental Delay, d2	0.2	4.2	38.1	13.4	0.1	0.1	24.9	1.1	1.2	68.7	357.1	0.1
Delay (s)	45.2	59.5	96.4	65.2	32.2	31.3	81.8	20.0	47.1	110.2	398.9	25.5
Level of Service	D	E	F	E	C	C	F	C	D	F	F	C
Approach Delay (s)		81.4			57.3			31.8			379.5	
Approach LOS		F			E			C			F	

Intersection Summary			
HCM 2000 Control Delay	202.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	125.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	5	237	399	400	381	3428	5402	5
v/c Ratio	0.02	0.37	0.98	0.99	0.57	1.30	2.03	0.01
Control Delay	25.4	28.6	84.3	84.9	28.6	168.3	490.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.4	28.6	84.3	84.9	28.7	168.3	490.5	0.0
Queue Length 50th (m)	0.9	42.6	116.9	117.4	59.7	~467.2	~896.8	0.0
Queue Length 95th (m)	3.9	66.2	#218.6	#219.2	107.5	#488.5	m#549.7	m0.0
Internal Link Dist (m)		327.0		348.8		26.7	251.4	
Turn Bay Length (m)								
Base Capacity (vph)	306	635	406	406	668	2636	2661	848
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	5	8	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.37	0.98	0.99	0.57	1.30	2.03	0.01

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	230	775	0	370	0	3325	0	0	5240	5
Future Volume (vph)	5	0	230	775	0	370	0	3325	0	0	5240	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00		0.91			0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	0.85		1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected	0.95	1.00		0.95	0.95	1.00		1.00			1.00	1.00
Satd. Flow (prot)	1805	1599		1715	1715	1615		4988			5036	1543
Flt Permitted	0.28	1.00		0.61	0.61	1.00		1.00			1.00	1.00
Satd. Flow (perm)	540	1599		1103	1103	1615		4988			5036	1543
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	5	0	237	799	0	381	0	3428	0	0	5402	5
RTOR Reduction (vph)	0	18	0	0	0	73	0	0	0	0	0	3
Lane Group Flow (vph)	5	219	0	399	400	308	0	3428	0	0	5402	3
Confl. Peds. (#/hr)							10		5	5		10
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	0%	4%	4%	0%	3%	0%
Turn Type	pm+pt	NA		Perm	NA	Perm		NA			NA	Perm
Protected Phases	3	8			4			2			6	
Permitted Phases	8			4		4						6
Actuated Green, G (s)	57.0	57.0		50.6	50.6	50.6		69.0			69.0	69.0
Effective Green, g (s)	58.0	58.0		51.6	51.6	51.6		70.0			70.0	70.0
Actuated g/C Ratio	0.41	0.41		0.37	0.37	0.37		0.50			0.50	0.50
Clearance Time (s)	5.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	245	662		406	406	595		2494			2518	771
v/s Ratio Prot	0.00	c0.14						0.69			c1.07	
v/s Ratio Perm	0.01			0.36	c0.36	0.19						0.00
v/c Ratio	0.02	0.33		0.98	0.99	0.52		1.37			2.15	0.00
Uniform Delay, d1	26.3	27.8		43.8	43.8	34.5		35.0			35.0	17.5
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.48	1.00
Incremental Delay, d2	0.0	0.3		39.9	40.4	0.8		171.1			515.5	0.0
Delay (s)	26.4	28.1		83.6	84.2	35.2		206.1			567.3	17.5
Level of Service	C	C		F	F	D		F			F	B
Approach Delay (s)		28.1			68.2			206.1			566.8	
Approach LOS		C			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	376.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.63		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	152.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1663	1173	2602	4056
v/c Ratio	1.13	1.73	1.08	1.66
Control Delay	105.2	362.7	72.1	325.5
Queue Delay	0.0	0.0	0.4	0.0
Total Delay	105.2	362.7	72.5	325.5
Queue Length 50th (m)	~289.0	~504.2	~307.9	~627.4
Queue Length 95th (m)	#332.6	#588.8	m#240.0	#643.4
Internal Link Dist (m)	190.2		56.8	39.3
Turn Bay Length (m)				
Base Capacity (vph)	1471	678	2399	2446
Starvation Cap Reductn	0	0	2	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.13	1.73	1.09	1.66

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.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1630	1150	0	2550	3975	0
Future Volume (vph)	1630	1150	0	2550	3975	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	1.00		0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3433	1583		4940	5036	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3433	1583		4940	5036	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	1663	1173	0	2602	4056	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1663	1173	0	2602	4056	0
Confl. Peds. (#/hr)			10			10
Heavy Vehicles (%)	2%	2%	0%	5%	3%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Actuated Green, G (s)	59.0	59.0		67.0	67.0	
Effective Green, g (s)	60.0	60.0		68.0	68.0	
Actuated g/C Ratio	0.43	0.43		0.49	0.49	
Clearance Time (s)	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1471	678		2399	2446	
v/s Ratio Prot	0.48			0.53	c0.81	
v/s Ratio Perm		c0.74				
v/c Ratio	1.13	1.73		1.08	1.66	
Uniform Delay, d1	40.0	40.0		36.0	36.0	
Progression Factor	1.00	1.00		0.87	1.00	
Incremental Delay, d2	67.9	334.7		41.3	298.0	
Delay (s)	107.9	374.7		72.5	334.0	
Level of Service	F	F		E	F	
Approach Delay (s)	218.3			72.5	334.0	
Approach LOS	F			E	F	

Intersection Summary			
HCM 2000 Control Delay	227.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.69		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	137.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	195	0	0	0	0	2875	865	0	3775	835
Future Volume (Veh/h)	0	0	195	0	0	0	0	2875	865	0	3775	835
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	0	210	0	0	0	0	3091	930	0	4059	898
Pedestrians		10			5							
Lane Width (m)		3.6			0.0							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		1			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								198			81	
pX, platoon unblocked	0.70	0.70	0.52	0.70	0.70	0.63	0.52			0.63		
vC, conflicting volume	5548	8544	1812	4449	8063	1035	4967			4026		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2463	6721	0	900	6037	0	5399			3750		
tC, single (s)	7.5	6.5	7.0	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	62	100	100	100	100			100		
cM capacity (veh/h)	11	0	554	103	0	690	6			37		

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3
Volume Total	210	1030	1030	1030	930	1624	1624	1710
Volume Left	0	0	0	0	0	0	0	0
Volume Right	210	0	0	0	930	0	0	898
cSH	554	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.38	0.61	0.61	0.61	0.55	0.96	0.96	1.01
Queue Length 95th (m)	14.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	15.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	C							
Approach Delay (s)	15.4	0.0				0.0		
Approach LOS	C							

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	110.5%	ICU Level of Service	H
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1258	340	67	129	93	155	2077	222	3175
v/c Ratio	1.33	0.64	0.29	0.93	0.34	0.97	1.00	1.27	1.55
Control Delay	193.3	46.6	33.2	122.5	3.2	95.1	60.2	161.8	279.6
Queue Delay	1.3	4.3	0.0	0.0	0.1	0.0	37.7	0.0	0.0
Total Delay	194.5	50.9	33.2	122.5	3.4	95.1	98.0	161.8	279.6
Queue Length 50th (m)	~244.1	82.7	11.9	38.0	0.0	29.1	219.0	~65.1	~473.0
Queue Length 95th (m)	#288.1	119.7	22.4	#79.9	0.0	#76.2	#259.7	m27.6	m167.0
Internal Link Dist (m)		97.1		158.4			292.1		174.2
Turn Bay Length (m)	130.0		50.0			120.0		55.0	
Base Capacity (vph)	949	532	234	139	277	160	2079	175	2042
Starvation Cap Reductn	196	124	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	13	0	407	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.67	0.83	0.29	0.93	0.35	0.97	1.24	1.27	1.55

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1220	190	140	65	125	90	150	1980	35	215	2615	465
Future Volume (vph)	1220	190	140	65	125	90	150	1980	35	215	2615	465
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	6.0	4.0	6.0		3.0	6.0	
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3273	1697		1729	1810	1553	1671	5019		1736	4921	
Flt Permitted	0.95	1.00		0.56	1.00	1.00	0.07	1.00		0.07	1.00	
Satd. Flow (perm)	3273	1697		1012	1810	1553	124	5019		130	4921	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	1258	196	144	67	129	93	155	2041	36	222	2696	479
RTOR Reduction (vph)	0	18	0	0	0	85	0	1	0	0	19	0
Lane Group Flow (vph)	1258	322	0	67	129	8	155	2076	0	222	3156	0
Confl. Peds. (#/hr)			5	5			15		5	5		15
Heavy Vehicles (%)	7%	0%	9%	4%	5%	4%	8%	3%	3%	4%	2%	4%
Turn Type	Prot	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8		8	2			6		
Actuated Green, G (s)	39.6	41.5		20.5	11.2	11.2	63.6	55.6		63.8	55.2	
Effective Green, g (s)	40.6	42.5		22.5	12.2	12.2	65.6	56.6		65.8	56.2	
Actuated g/C Ratio	0.29	0.30		0.16	0.09	0.09	0.47	0.40		0.47	0.40	
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	5.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.5	4.0	4.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	949	515		215	157	135	157	2029		171	1975	
v/s Ratio Prot	c0.38	0.19		0.02	c0.07		0.06	0.41		c0.09	c0.64	
v/s Ratio Perm				0.03		0.01	0.40			0.52		
v/c Ratio	1.33	0.63		0.31	0.82	0.06	0.99	1.02		1.30	1.60	
Uniform Delay, d1	49.7	41.9		51.3	62.8	58.6	39.2	41.7		40.5	41.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.38	0.95	
Incremental Delay, d2	153.9	2.4		1.0	29.0	0.3	67.4	26.1		138.2	269.4	
Delay (s)	203.6	44.3		52.3	91.8	58.9	106.6	67.8		194.0	309.3	
Level of Service	F	D		D	F	E	F	E		F	F	
Approach Delay (s)		169.7			72.1			70.5			301.8	
Approach LOS		F			E			E			F	

Intersection Summary			
HCM 2000 Control Delay	196.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.41		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	130.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	276	760	68	31	646	667	52	807	786	1172	401
v/c Ratio	1.01	1.13	0.10	0.21	0.60	0.88	0.32	0.95	1.02	1.44	0.54
Control Delay	122.5	119.7	0.3	27.8	45.9	31.1	27.4	75.6	92.1	237.2	22.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	122.5	119.7	0.3	27.8	45.9	31.1	27.4	75.6	92.1	237.2	22.0
Queue Length 50th (m)	~45.1	~289.1	0.0	5.5	89.2	82.4	7.8	129.7	~131.8	~498.8	56.7
Queue Length 95th (m)	#76.9	#376.3	0.0	12.2	110.7	#166.0	15.3	#171.3	#173.4	#587.6	92.7
Internal Link Dist (m)		551.4			604.3			115.4		292.1	
Turn Bay Length (m)	85.0			85.0		75.0	40.0		85.0		
Base Capacity (vph)	274	670	663	292	1075	757	172	849	774	815	736
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.01	1.13	0.10	0.11	0.60	0.88	0.30	0.95	1.02	1.44	0.54

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	265	730	65	30	620	640	50	720	55	755	1125	385
Future Volume (vph)	265	730	65	30	620	640	50	720	55	755	1125	385
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.4	5.4	4.0	5.4	5.4	3.0	5.9		4.0	5.9	5.9
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.94	1.00	1.00	0.95	1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3367	1792	1481	1736	3438	1480	1769	3486		3400	1881	1496
Flt Permitted	0.95	1.00	1.00	0.08	1.00	1.00	0.12	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3367	1792	1481	151	3438	1480	219	3486		3400	1881	1496
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	276	760	68	31	646	667	52	750	57	786	1172	401
RTOR Reduction (vph)	0	0	43	0	0	288	0	4	0	0	0	91
Lane Group Flow (vph)	276	760	25	31	646	379	52	803	0	786	1172	310
Confl. Peds. (#/hr)	25		15	15		25	20		10	10		20
Heavy Vehicles (%)	4%	6%	3%	4%	5%	4%	2%	2%	6%	3%	1%	4%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases			8	4		4	2					6
Actuated Green, G (s)	11.1	54.5	54.5	52.1	47.4	47.4	39.3	33.0		32.8	60.5	60.5
Effective Green, g (s)	12.1	55.5	55.5	54.1	48.4	48.4	41.3	34.0		33.8	61.5	61.5
Actuated g/C Ratio	0.08	0.37	0.37	0.36	0.33	0.33	0.28	0.23		0.23	0.41	0.41
Clearance Time (s)	5.7	6.4	6.4	5.0	6.4	6.4	4.0	6.9		5.0	6.9	6.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	274	670	554	116	1122	483	137	799		774	780	620
v/s Ratio Prot	c0.08	c0.42		0.01	0.19		0.02	0.23		c0.23	c0.62	
v/s Ratio Perm			0.02	0.09		0.26	0.09					0.21
v/c Ratio	1.01	1.13	0.05	0.27	0.58	0.78	0.38	1.01		1.02	1.50	0.50
Uniform Delay, d1	68.1	46.4	29.5	37.2	41.4	45.2	42.9	57.2		57.3	43.4	32.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	56.2	78.0	0.0	1.2	0.7	8.1	1.8	33.1		36.3	232.9	2.9
Delay (s)	124.3	124.4	29.6	38.5	42.2	53.4	44.6	90.3		93.5	276.3	34.9
Level of Service	F	F	C	D	D	D	D	F		F	F	C
Approach Delay (s)		118.6			47.6			87.5			174.3	
Approach LOS		F			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	120.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.33		
Actuated Cycle Length (s)	148.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	125.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	667	11	379	453
v/c Ratio	0.66	0.07	0.20	0.25
Control Delay	28.8	12.9	7.4	7.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	28.8	12.9	7.4	7.8
Queue Length 50th (m)	43.8	0.9	9.4	11.9
Queue Length 95th (m)	55.9	3.3	18.7	23.0
Internal Link Dist (m)	146.6	179.3	180.3	263.4
Turn Bay Length (m)				
Base Capacity (vph)	1562	234	1929	1834
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.43	0.05	0.20	0.25

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	175	340	65	10	0	0	0	295	35	10	350	35
Future Volume (vph)	175	340	65	10	0	0	0	295	35	10	350	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5			3.5			3.5			3.5	
Lane Util. Factor		0.95			1.00			0.95			0.95	
Frt		0.98			1.00			0.98			0.99	
Flt Protected		0.99			0.95			1.00			1.00	
Satd. Flow (prot)		3496			1626			3449			3466	
Flt Permitted		0.86			0.27			1.00			0.95	
Satd. Flow (perm)		3041			463			3449			3282	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	201	391	75	11	0	0	0	339	40	11	402	40
RTOR Reduction (vph)	0	22	0	0	0	0	0	11	0	0	8	0
Lane Group Flow (vph)	0	645	0	0	11	0	0	368	0	0	445	0
Heavy Vehicles (%)	0%	0%	0%	11%	0%	0%	50%	3%	3%	0%	3%	0%
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		18.6			18.6			32.4			32.4	
Effective Green, g (s)		19.6			19.6			33.4			33.4	
Actuated g/C Ratio		0.33			0.33			0.56			0.56	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		993			151			1919			1826	
v/s Ratio Prot								0.11				
v/s Ratio Perm		c0.21			0.02						c0.14	
v/c Ratio		0.65			0.07			0.19			0.24	
Uniform Delay, d1		17.3			13.9			6.6			6.8	
Progression Factor		1.66			1.00			1.00			1.00	
Incremental Delay, d2		1.2			0.2			0.2			0.3	
Delay (s)		29.8			14.1			6.8			7.1	
Level of Service		C			B			A			A	
Approach Delay (s)		29.8			14.1			6.8			7.1	
Approach LOS		C			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	41.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	335	134	116	384	152	256
v/c Ratio	0.28	0.12	0.14	0.27	0.54	0.56
Control Delay	7.6	1.7	3.1	3.8	39.4	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.6	1.7	3.1	3.8	39.4	9.2
Queue Length 50th (m)	21.3	0.0	3.5	14.6	24.2	0.0
Queue Length 95th (m)	38.0	5.4	8.1	26.8	36.2	13.5
Internal Link Dist (m)	228.8			1140.2	151.2	
Turn Bay Length (m)		100.0	100.0		100.0	
Base Capacity (vph)	1208	1141	815	1422	409	550
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	0.28	0.12	0.14	0.27	0.37	0.47

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	275	110	95	315	125	210
Future Volume (vph)	275	110	95	315	125	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	2.0	3.0	3.0	3.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1776	1615	1770	1845	1787	1538
Flt Permitted	1.00	1.00	0.51	1.00	0.95	1.00
Satd. Flow (perm)	1776	1615	944	1845	1787	1538
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	335	134	116	384	152	256
RTOR Reduction (vph)	0	45	0	0	0	215
Lane Group Flow (vph)	335	89	116	384	152	41
Heavy Vehicles (%)	7%	0%	2%	3%	1%	5%
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	55.7	55.7	64.5	64.5	12.5	12.5
Effective Green, g (s)	56.7	56.7	65.5	65.5	13.5	13.5
Actuated g/C Ratio	0.67	0.67	0.77	0.77	0.16	0.16
Clearance Time (s)	4.0	4.0	3.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1184	1077	793	1421	283	244
v/s Ratio Prot	c0.19		0.01	c0.21	c0.09	
v/s Ratio Perm		0.06	0.10			0.03
v/c Ratio	0.28	0.08	0.15	0.27	0.54	0.17
Uniform Delay, d1	5.8	5.0	2.6	2.8	32.9	30.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.2	0.1	0.5	2.0	0.3
Delay (s)	6.4	5.1	2.7	3.3	34.8	31.2
Level of Service	A	A	A	A	C	C
Approach Delay (s)	6.0			3.2	32.6	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	12.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	36.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	27	1364	43	1071	250	190	38	147	27
v/c Ratio	0.13	0.72	0.34	0.56	0.75	0.36	0.12	0.28	0.06
Control Delay	9.6	12.9	18.3	10.5	34.4	14.3	15.9	17.6	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.6	12.9	18.3	10.5	34.4	14.3	15.9	17.6	2.4
Queue Length 50th (m)	1.5	57.6	2.7	40.5	24.9	12.3	3.1	12.6	0.0
Queue Length 95th (m)	5.6	83.5	11.7	58.3	#53.6	26.3	9.0	24.7	2.3
Internal Link Dist (m)		585.1		130.4		189.6		92.5	
Turn Bay Length (m)	45.0		30.0				25.0		25.0
Base Capacity (vph)	203	1902	125	1919	381	595	358	595	521
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.72	0.34	0.56	0.66	0.32	0.11	0.25	0.05

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	1075	180	40	950	35	230	115	60	35	135	25
Future Volume (vph)	25	1075	180	40	950	35	230	115	60	35	135	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1653	3392		1752	3450		1729	1780		1696	1881	1527
Flt Permitted	0.21	1.00		0.12	1.00		0.66	1.00		0.63	1.00	1.00
Satd. Flow (perm)	365	3392		227	3450		1207	1780		1132	1881	1527
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	1168	196	43	1033	38	250	125	65	38	147	27
RTOR Reduction (vph)	0	21	0	0	4	0	0	33	0	0	0	19
Lane Group Flow (vph)	27	1343	0	43	1067	0	250	157	0	38	147	8
Confl. Peds. (#/hr)	5					5	5		5	5		5
Heavy Vehicles (%)	9%	4%	5%	3%	4%	3%	4%	0%	2%	6%	1%	4%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	32.3	32.3		32.3	32.3		15.7	15.7		15.7	15.7	15.7
Effective Green, g (s)	33.3	33.3		33.3	33.3		16.7	16.7		16.7	16.7	16.7
Actuated g/C Ratio	0.55	0.55		0.55	0.55		0.28	0.28		0.28	0.28	0.28
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	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
Lane Grp Cap (vph)	202	1882		125	1914		335	495		315	523	425
v/s Ratio Prot		c0.40			0.31			0.09			0.08	
v/s Ratio Perm	0.07			0.19			c0.21			0.03		0.00
v/c Ratio	0.13	0.71		0.34	0.56		0.75	0.32		0.12	0.28	0.02
Uniform Delay, d1	6.4	9.8		7.3	8.6		19.7	17.1		16.2	17.0	15.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.4	2.3		7.4	1.2		8.7	0.4		0.2	0.3	0.0
Delay (s)	7.8	12.2		14.7	9.8		28.5	17.5		16.3	17.2	15.7
Level of Service	A	B		B	A		C	B		B	B	B
Approach Delay (s)		12.1			10.0			23.7			16.9	
Approach LOS		B			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	59	1287	154	1074	48	410	59	144	16
v/c Ratio	0.20	0.90	0.92	0.77	0.09	0.51	0.09	0.18	0.03
Control Delay	10.3	23.0	74.6	16.0	8.4	12.4	5.1	9.0	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.3	23.0	74.6	16.0	8.4	12.4	5.1	9.0	1.9
Queue Length 50th (m)	1.4	47.7	11.2	37.2	2.2	23.3	1.0	6.9	0.0
Queue Length 95th (m)	4.5	#88.2	#40.0	#56.9	6.8	42.7	5.8	15.2	1.5
Internal Link Dist (m)		208.7		203.3		1140.2		129.5	
Turn Bay Length (m)	125.0		145.0		15.0		40.0		
Base Capacity (vph)	301	1437	167	1398	533	802	635	786	494
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.90	0.92	0.77	0.09	0.51	0.09	0.18	0.03

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	1140	70	145	1010	0	45	385	55	0	135	15
Future Volume (vph)	55	1140	70	145	1010	0	45	385	55	0	135	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5		3.5	3.5
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	3213	3382		1787	3312		1805	1900	1455		1863	1122
Flt Permitted	0.21	1.00		0.21	1.00		0.67	1.00	1.00		1.00	1.00
Satd. Flow (perm)	712	3382		396	3312		1264	1900	1455		1863	1122
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)	59	1213	74	154	1074	0	48	410	59	0	144	16
RTOR Reduction (vph)	0	10	0	0	0	0	0	0	21	0	0	9
Lane Group Flow (vph)	59	1277	0	154	1074	0	48	410	38	0	144	7
Heavy Vehicles (%)	9%	6%	3%	1%	9%	0%	0%	0%	11%	0%	2%	44%
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	18.0	18.0		18.0	18.0		18.0	18.0	18.0		18.0	18.0
Effective Green, g (s)	19.0	19.0		19.0	19.0		19.0	19.0	19.0		19.0	19.0
Actuated g/C Ratio	0.42	0.42		0.42	0.42		0.42	0.42	0.42		0.42	0.42
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5		4.5	4.5
Lane Grp Cap (vph)	300	1427		167	1398		533	802	614		786	473
v/s Ratio Prot		0.38			0.32			c0.22			0.08	
v/s Ratio Perm	0.08			c0.39			0.04		0.03			0.01
v/c Ratio	0.20	0.90		0.92	0.77		0.09	0.51	0.06		0.18	0.01
Uniform Delay, d1	8.2	12.1		12.3	11.1		7.8	9.6	7.7		8.1	7.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.5	9.0		51.6	4.1		0.3	2.3	0.2		0.5	0.1
Delay (s)	9.7	21.1		63.9	15.2		8.1	11.9	7.9		8.7	7.6
Level of Service	A	C		E	B		A	B	A		A	A
Approach Delay (s)		20.6			21.3			11.1			8.5	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	290	0	0	185	0	0
Future Volume (Veh/h)	290	0	0	185	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	315	0	0	201	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	287					
pX, platoon unblocked						
vC, conflicting volume			315		516	315
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			315		516	315
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1245		519	725

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	315	201	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.19	0.12	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	18.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	290	0	0	185	0	60
Future Volume (Veh/h)	290	0	0	185	0	60
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	315	0	0	201	0	65
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	402			296		
pX, platoon unblocked						
vC, conflicting volume			315		516	315
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			315		516	315
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	91
cM capacity (veh/h)			1245		519	725

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	315	201	65
Volume Left	0	0	0
Volume Right	0	0	65
cSH	1700	1700	725
Volume to Capacity	0.19	0.12	0.09
Queue Length 95th (m)	0.0	0.0	2.4
Control Delay (s)	0.0	0.0	10.5
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.5
Approach LOS			B

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	25.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	350	0	10	185	0	0
Future Volume (Veh/h)	350	0	10	185	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	380	0	11	201	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				253		
pX, platoon unblocked						
vC, conflicting volume			380		603	380
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			380		603	380
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			1178		458	667

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	380	212	0
Volume Left	0	11	0
Volume Right	0	0	0
cSH	1700	1178	1700
Volume to Capacity	0.22	0.01	0.13
Queue Length 95th (m)	0.0	0.2	0.0
Control Delay (s)	0.0	0.5	0.0
Lane LOS		A	A
Approach Delay (s)	0.0	0.5	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	21.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	340	0	0	0	0	0	0	0	0	0	0
Future Volume (Veh/h)	0	340	0	0	0	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	370	0	0	0	0	0	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		203			262							
pX, platoon unblocked				0.87			0.87	0.87	0.87	0.87	0.87	
vC, conflicting volume	0			370			370	370	370	370	370	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			196			196	196	196	196	196	0
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 %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1623			1193			661	606	733	661	606	1085

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	370	0	0	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1623	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS			A	A
Approach Delay (s)	0.0	0.0	0.0	0.0
Approach LOS			A	A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	21.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	280	0	0	0	0	0	0	0	0	0	0
Future Volume (Veh/h)	60	280	0	0	0	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	304	0	0	0	0	0	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		313			152							
pX, platoon unblocked				0.98			0.98	0.98	0.98	0.98	0.98	
vC, conflicting volume	0			304			434	434	304	434	434	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			274			407	407	274	407	407	0
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 %	96			100			100	100	100	100	100	100
cM capacity (veh/h)	1623			1258			524	499	746	524	499	1085

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	65	304	0	0	0	0
Volume Left	65	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1623	1700	1700	1700	1700	1700
Volume to Capacity	0.04	0.18	0.00	0.19	0.00	0.20
Queue Length 95th (m)	1.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	7.3	0.0	0.0	0.0	0.0	0.0
Lane LOS	A				A	A
Approach Delay (s)	1.3		0.0		0.0	0.0
Approach LOS					A	A

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	18.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	NBT
Lane Group Flow (vph)	185	120	92
v/c Ratio	0.17	0.08	0.20
Control Delay	1.1	0.9	23.8
Queue Delay	0.0	0.0	0.0
Total Delay	1.1	0.9	23.8
Queue Length 50th (m)	1.8	1.1	5.1
Queue Length 95th (m)	3.2	2.2	10.6
Internal Link Dist (m)		128.4	150.5
Turn Bay Length (m)	50.0		
Base Capacity (vph)	1121	1482	1268
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.17	0.08	0.07

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	110	0	0	0	0	0	85	0	0	0	0
Future Volume (vph)	170	110	0	0	0	0	0	85	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5						3.5				
Lane Util. Factor	1.00	1.00						0.95				
Frt	1.00	1.00						1.00				
Flt Protected	0.95	1.00						1.00				
Satd. Flow (prot)	1770	1863						3539				
Flt Permitted	0.76	1.00						1.00				
Satd. Flow (perm)	1410	1863						3539				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	185	120	0	0	0	0	0	92	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	185	120	0	0	0	0	0	92	0	0	0	0
Turn Type	Perm	NA		Perm			Perm	NA		Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	45.1	45.1						5.9				
Effective Green, g (s)	46.1	46.1						6.9				
Actuated g/C Ratio	0.77	0.77						0.12				
Clearance Time (s)	4.5	4.5						4.5				
Vehicle Extension (s)	3.0	3.0						3.0				
Lane Grp Cap (vph)	1083	1431						406				
v/s Ratio Prot		0.06						c0.03				
v/s Ratio Perm	c0.13											
v/c Ratio	0.17	0.08						0.23				
Uniform Delay, d1	1.9	1.7						24.1				
Progression Factor	0.34	0.36						1.00				
Incremental Delay, d2	0.3	0.1						0.3				
Delay (s)	0.9	0.7						24.4				
Level of Service	A	A						C				
Approach Delay (s)		0.9			0.0			24.4			0.0	
Approach LOS		A			A			C			A	

Intersection Summary			
HCM 2000 Control Delay	6.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.18		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	20.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	110	0	0	0	0	0	0	0	0	10	0
Future Volume (Veh/h)	0	110	0	0	0	0	0	0	0	0	10	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	120	0	0	0	0	0	0	0	0	11	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		131										
pX, platoon unblocked												
vC, conflicting volume	0			120			126	120	120	120	120	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			120			126	120	120	120	120	0
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 %	100			100			100	100	100	100	99	100
cM capacity (veh/h)	1623			1468			839	770	931	855	770	1085

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	0	120	0	0	0	11
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	770
Volume to Capacity	0.00	0.07	0.00	0.23	0.34	0.01
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	9.7
Lane LOS					A	A
Approach Delay (s)	0.0		0.0		0.0	9.7
Approach LOS					A	A

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	15.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	110	0	0	65	0	0
Future Volume (Veh/h)	110	0	0	65	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	120	0	0	71	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				280	175	
pX, platoon unblocked						
vC, conflicting volume	71	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	71	0	0			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	87	100	100			
cM capacity (veh/h)	933	1085	1623			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	120	71	0
Volume Left	120	0	0
Volume Right	0	0	0
cSH	933	1623	1700
Volume to Capacity	0.13	0.00	0.02
Queue Length 95th (m)	3.5	0.0	0.0
Control Delay (s)	9.4	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.4	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	5.9		
Intersection Capacity Utilization	16.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	35	85	10	0	65	15
Future Volume (Veh/h)	35	85	10	0	65	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	92	11	0	71	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		182	224			
pX, platoon unblocked						
vC, conflicting volume	11				179	11
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	11				179	11
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				91	99
cM capacity (veh/h)	1608				791	1070

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	130	11	87
Volume Left	38	0	71
Volume Right	0	0	16
cSH	1608	1700	831
Volume to Capacity	0.02	0.01	0.10
Queue Length 95th (m)	0.6	0.0	2.8
Control Delay (s)	2.3	0.0	9.8
Lane LOS	A		A
Approach Delay (s)	2.3	0.0	9.8
Approach LOS			A

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	24.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	150	10	0	0	0
Future Volume (Veh/h)	0	150	10	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	163	11	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			252			
pX, platoon unblocked						
vC, conflicting volume	11				174	11
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	11				174	11
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1608				816	1070

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	0	163	11	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.00	0.10	0.01	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				A
Approach Delay (s)	0.0		0.0	0.0
Approach LOS				A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	11.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	150	10	0	0	0
Future Volume (Veh/h)	0	150	10	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	163	11	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		111	141			
pX, platoon unblocked						
vC, conflicting volume	11				174	11
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	11				174	11
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1608				816	1070

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	0	163	11	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.10	0.01	0.00	0.10
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	11.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	65	0	0	10	0	0	0	0	0	0	0
Future Volume (Veh/h)	85	65	0	0	10	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	71	0	0	11	0	0	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					373							
pX, platoon unblocked												
vC, conflicting volume	11			71			260	266	36	230	266	6
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	11			71			260	266	36	230	266	6
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
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 %	94			100			100	100	100	100	100	100
cM capacity (veh/h)	1607			1527			642	602	1029	674	602	1076

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	92	36	36	0	6	6	0	0	0	0	0
Volume Left	92	0	0	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0	0	0	0	0
cSH	1607	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.06	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
Queue Length 95th (m)	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						A	A	A	A	A
Approach Delay (s)	4.2			0.0			0.0		0.0		
Approach LOS							A		A		

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	14.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	65	0	0	0	10
Future Volume (Veh/h)	0	65	0	0	0	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	71	0	0	0	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		127	245			
pX, platoon unblocked						
vC, conflicting volume	0				36	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				36	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1622				973	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	24	47	0	0	11
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	11
cSH	1622	1700	1700	1700	1084
Volume to Capacity	0.00	0.03	0.05	0.06	0.01
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.2
Control Delay (s)	0.0	0.0	0.0	0.0	8.4
Lane LOS					A
Approach Delay (s)	0.0		0.0		8.4
Approach LOS					A

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	65	0	0	0	0	0
Future Volume (Veh/h)	65	0	0	0	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	71	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				116	339	
pX, platoon unblocked						
vC, conflicting volume	0	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0	0			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	100	100			
cM capacity (veh/h)	1023	1085	1623			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	71	0	0	0
Volume Left	71	0	0	0
Volume Right	0	0	0	0
cSH	1023	1700	1700	1700
Volume to Capacity	0.07	0.39	0.00	0.05
Queue Length 95th (m)	1.8	0.0	0.0	0.0
Control Delay (s)	8.8	0.0	0.0	0.0
Lane LOS	A	A		
Approach Delay (s)	8.8		0.0	0.0
Approach LOS	A			

Intersection Summary			
Average Delay	8.8		
Intersection Capacity Utilization	6.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	103	119	330	851	155	294	330	1861	964	134	1325	119
v/c Ratio	0.39	0.63	0.97	0.90	0.28	0.54	0.98	0.88	0.94	0.67	0.78	0.21
Control Delay	33.9	76.1	65.6	61.9	40.2	18.1	63.2	14.3	16.6	43.8	45.7	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.5	0.0	0.0	0.0
Total Delay	33.9	76.1	65.6	61.9	40.2	18.1	63.2	14.3	41.1	43.8	45.7	1.4
Queue Length 50th (m)	18.4	34.3	~45.0	121.2	34.9	22.9	73.1	125.0	251.5	20.0	127.1	0.0
Queue Length 95th (m)	31.4	#63.9	#108.8	147.9	56.2	55.1	m69.6	m110.0	m236.4	43.6	146.1	1.6
Internal Link Dist (m)		361.1			497.8			251.4			315.2	
Turn Bay Length (m)	80.0			165.0		15.0				85.0		80.0
Base Capacity (vph)	296	190	341	993	555	546	336	2116	1022	216	1703	555
Starvation Cap Reductn	0	0	0	0	0	0	0	0	104	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	0.35	0.63	0.97	0.86	0.28	0.54	0.98	0.88	1.05	0.62	0.78	0.21

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	115	320	825	150	285	320	1805	935	130	1285	115
Future Volume (vph)	100	115	320	825	150	285	320	1805	935	130	1285	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.8	5.8	4.7	5.8	5.8	3.0	5.1	5.1	3.0	5.1	5.1
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.86	1.00	1.00	0.95	1.00	1.00	0.81
Flpb, ped/bikes	0.93	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	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)	1685	1881	1599	3467	1881	1388	1787	5136	1525	1805	5085	1300
Flt Permitted	0.66	1.00	1.00	0.95	1.00	1.00	0.08	1.00	1.00	0.09	1.00	1.00
Satd. Flow (perm)	1168	1881	1599	3467	1881	1388	151	5136	1525	162	5085	1300
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	103	119	330	851	155	294	330	1861	964	134	1325	119
RTOR Reduction (vph)	0	0	180	0	0	137	0	0	394	0	0	79
Lane Group Flow (vph)	103	119	150	851	155	157	330	1861	570	134	1325	40
Confl. Peds. (#/hr)	55					55	80		15	15		80
Confl. Bikes (#/hr)						5						
Heavy Vehicles (%)	0%	1%	1%	1%	1%	0%	1%	1%	1%	0%	2%	0%
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8		8			4	6		6	2		2
Actuated Green, G (s)	23.4	13.2	13.2	37.3	40.3	40.3	70.9	56.7	56.7	56.1	45.9	45.9
Effective Green, g (s)	25.4	14.2	14.2	38.3	41.3	41.3	71.9	57.7	57.7	58.1	46.9	46.9
Actuated g/C Ratio	0.18	0.10	0.10	0.27	0.29	0.29	0.51	0.41	0.41	0.42	0.33	0.33
Clearance Time (s)	5.7	6.8	6.8	5.7	6.8	6.8	4.0	6.1	6.1	4.0	6.1	6.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	253	190	162	948	554	409	334	2116	628	198	1703	435
v/s Ratio Prot	0.03	0.06		c0.25	0.08		c0.15	0.36		0.05	0.26	
v/s Ratio Perm	0.04		c0.09			0.11	c0.35		0.37	0.23		0.03
v/c Ratio	0.41	0.63	0.93	0.90	0.28	0.38	0.99	0.88	0.91	0.68	0.78	0.09
Uniform Delay, d1	50.0	60.4	62.4	49.0	37.9	39.2	44.5	37.9	38.7	31.3	41.9	31.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.32	0.35	1.17	1.00	1.00	1.00
Incremental Delay, d2	1.1	6.3	49.4	11.1	0.3	0.6	12.0	0.6	2.4	8.8	3.6	0.4
Delay (s)	51.0	66.7	111.8	60.0	38.2	39.8	70.6	13.9	47.7	40.1	45.4	32.4
Level of Service	D	E	F	E	D	D	E	B	D	D	D	C
Approach Delay (s)		90.7			52.9			30.1			44.0	
Approach LOS		F			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	43.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	90.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	27	298	377	383	362	2851	1649	16
v/c Ratio	0.09	0.46	1.06	1.16	0.57	1.08	0.64	0.02
Control Delay	25.2	32.4	109.1	143.0	30.6	76.6	41.0	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	6.0	0.0	0.0
Total Delay	25.2	32.4	109.1	143.0	30.6	82.6	41.0	0.3
Queue Length 50th (m)	4.6	60.7	~137.2	~148.6	62.9	~338.9	158.6	0.0
Queue Length 95th (m)	11.0	88.7	#209.0	#220.2	100.3	#364.4	m175.7	m0.0
Internal Link Dist (m)		327.0		348.8		26.7	251.4	
Turn Bay Length (m)								
Base Capacity (vph)	321	649	355	329	631	2641	2589	773
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	2	34	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.46	1.06	1.16	0.58	1.09	0.64	0.02

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	5	275	710	5	340	0	2680	0	0	1550	15
Future Volume (vph)	25	5	275	710	5	340	0	2680	0	0	1550	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00		0.91			0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	0.94
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	0.85		1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected	0.95	1.00		0.95	0.95	1.00		1.00			1.00	1.00
Satd. Flow (prot)	1805	1604		1715	1720	1615		5136			5036	1437
Flt Permitted	0.28	1.00		0.57	0.53	1.00		1.00			1.00	1.00
Satd. Flow (perm)	534	1604		1027	952	1615		5136			5036	1437
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)	27	5	293	755	5	362	0	2851	0	0	1649	16
RTOR Reduction (vph)	0	7	0	0	0	73	0	0	0	0	0	8
Lane Group Flow (vph)	27	291	0	377	383	289	0	2851	0	0	1649	8
Confl. Peds. (#/hr)							15		10	10		15
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	0%	1%	1%	0%	3%	6%
Turn Type	pm+pt	NA		Perm	NA	Perm		NA			NA	Perm
Protected Phases	3	8			4			2			6	
Permitted Phases	8			4		4						6
Actuated Green, G (s)	57.0	57.0		47.5	47.5	47.5		69.0			69.0	69.0
Effective Green, g (s)	58.0	58.0		48.5	48.5	48.5		70.0			70.0	70.0
Actuated g/C Ratio	0.41	0.41		0.35	0.35	0.35		0.50			0.50	0.50
Clearance Time (s)	5.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	271	664		355	329	559		2568			2518	718
v/s Ratio Prot	0.00	c0.18						c0.56			0.33	
v/s Ratio Perm	0.04			0.37	c0.40	0.18						0.01
v/c Ratio	0.10	0.44		1.06	1.16	0.52		1.11			0.65	0.01
Uniform Delay, d1	26.6	29.3		45.8	45.8	36.4		35.0			26.0	17.6
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.63	1.00
Incremental Delay, d2	0.2	0.5		65.1	102.0	0.8		55.9			0.7	0.0
Delay (s)	26.7	29.8		110.9	147.7	37.3		90.9			43.2	17.6
Level of Service	C	C		F	F	D		F			D	B
Approach Delay (s)		29.5			99.7			90.9			42.9	
Approach LOS		C			F			F			D	

Intersection Summary			
HCM 2000 Control Delay	75.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	105.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1058	558	2142	2305
v/c Ratio	0.84	0.97	0.76	0.82
Control Delay	48.3	74.4	36.5	29.0
Queue Delay	0.0	0.0	0.5	0.0
Total Delay	48.3	74.4	37.0	29.0
Queue Length 50th (m)	144.7	158.1	197.8	195.6
Queue Length 95th (m)	173.6	#236.6	m182.4	216.7
Internal Link Dist (m)	190.2		56.8	39.3
Turn Bay Length (m)				
Base Capacity (vph)	1262	578	2805	2805
Starvation Cap Reductn	0	0	254	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.84	0.97	0.84	0.82

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.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1005	530	0	2035	2190	0
Future Volume (vph)	1005	530	0	2035	2190	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	1.00		0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3467	1583		5085	5085	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3467	1583		5085	5085	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1058	558	0	2142	2305	0
RTOR Reduction (vph)	0	2	0	0	0	0
Lane Group Flow (vph)	1058	556	0	2142	2305	0
Confl. Peds. (#/hr)			25			25
Heavy Vehicles (%)	1%	2%	0%	2%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Actuated Green, G (s)	49.8	49.8		76.2	76.2	
Effective Green, g (s)	50.8	50.8		77.2	77.2	
Actuated g/C Ratio	0.36	0.36		0.55	0.55	
Clearance Time (s)	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1258	574		2804	2804	
v/s Ratio Prot	0.31			0.42	c0.45	
v/s Ratio Perm		c0.35				
v/c Ratio	0.84	0.97		0.76	0.82	
Uniform Delay, d1	40.9	43.8		24.3	25.8	
Progression Factor	1.00	1.00		1.45	1.00	
Incremental Delay, d2	5.2	29.4		0.8	2.9	
Delay (s)	46.1	73.3		36.1	28.6	
Level of Service	D	E		D	C	
Approach Delay (s)	55.5			36.1	28.6	
Approach LOS	E			D	C	

Intersection Summary			
HCM 2000 Control Delay	38.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	130	0	0	0	0	2215	360	0	1745	965
Future Volume (Veh/h)	0	0	130	0	0	0	0	2215	360	0	1745	965
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	0	0	138	0	0	0	0	2356	383	0	1856	1027
Pedestrians		20			10							
Lane Width (m)		3.6			0.0							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		2			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								198			81	
pX, platoon unblocked	0.69	0.69	0.62	0.69	0.69	0.86	0.62			0.86		
vC, conflicting volume	3175	5138	1152	2985	5269	795	2903			2749		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1204	4043	0	930	4231	185	1929			2460		
tC, single (s)	7.5	6.5	7.1	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	79	100	100	100	100			100		
cM capacity (veh/h)	95	2	651	121	1	714	189			165		

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3
Volume Total	138	785	785	785	383	742	742	1398
Volume Left	0	0	0	0	0	0	0	0
Volume Right	138	0	0	0	383	0	0	1027
cSH	651	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.21	0.46	0.46	0.46	0.23	0.44	0.44	0.82
Queue Length 95th (m)	6.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B							
Approach Delay (s)	12.0	0.0				0.0		
Approach LOS	B							

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1325	227	67	191	253	263	1067	155	1768
v/c Ratio	1.30	0.41	0.25	1.18	0.86	1.16	0.54	0.60	0.99
Control Delay	181.5	32.4	31.0	180.2	48.3	139.3	35.3	28.9	56.3
Queue Delay	1.4	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	182.9	33.3	31.0	180.2	48.3	139.3	35.3	28.9	56.3
Queue Length 50th (m)	~254.0	41.3	11.4	~66.3	23.7	~75.4	68.9	22.4	154.3
Queue Length 95th (m)	#297.9	67.6	21.5	#117.1	#72.9	m#112.1	m79.5	m30.0	m#213.8
Internal Link Dist (m)		97.1		158.4			292.1		174.2
Turn Bay Length (m)	130.0		50.0			120.0		55.0	
Base Capacity (vph)	1020	551	274	162	293	227	1979	264	1785
Starvation Cap Reductn	236	138	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.69	0.55	0.24	1.18	0.86	1.16	0.54	0.59	0.99

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1285	90	130	65	185	245	255	1000	35	150	1275	440
Future Volume (vph)	1285	90	130	65	185	245	255	1000	35	150	1275	440
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	6.0	4.0	6.0		3.0	6.0	
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.97		1.00	1.00	1.00	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.98	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	1616		1768	1900	1599	1719	5098		1750	4878	
Flt Permitted	0.95	1.00		0.62	1.00	1.00	0.08	1.00		0.18	1.00	
Satd. Flow (perm)	3400	1616		1148	1900	1599	138	5098		337	4878	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	1325	93	134	67	191	253	263	1031	36	155	1314	454
RTOR Reduction (vph)	0	35	0	0	0	155	0	2	0	0	45	0
Lane Group Flow (vph)	1325	192	0	67	191	98	263	1065	0	155	1723	0
Confl. Peds. (#/hr)			20	20			15		15	15		15
Heavy Vehicles (%)	3%	0%	6%	0%	0%	1%	5%	1%	0%	3%	0%	4%
Turn Type	Prot	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8		8	2			6		
Actuated Green, G (s)	41.0	43.8		22.0	12.4	12.4	64.9	51.9		57.3	47.6	
Effective Green, g (s)	42.0	44.8		24.0	13.4	13.4	66.6	52.9		59.3	48.6	
Actuated g/C Ratio	0.30	0.32		0.17	0.10	0.10	0.48	0.38		0.42	0.35	
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	5.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.5	4.0	4.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1020	517		243	181	153	223	1926		250	1693	
v/s Ratio Prot	c0.39	0.12		0.02	c0.10		c0.12	0.21		0.05	0.35	
v/s Ratio Perm				0.03		0.06	c0.44			0.21		
v/c Ratio	1.30	0.37		0.28	1.06	0.64	1.18	0.55		0.62	1.02	
Uniform Delay, d1	49.0	36.7		49.9	63.3	61.0	43.9	34.2		26.5	45.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.37	1.04		1.20	0.98	
Incremental Delay, d2	141.8	0.5		0.7	82.3	9.9	103.7	0.6		2.7	21.4	
Delay (s)	190.8	37.2		50.7	145.6	70.9	163.9	36.4		34.4	66.2	
Level of Service	F	D		D	F	E	F	D		C	E	
Approach Delay (s)		168.4			96.2			61.6			63.7	
Approach LOS		F			F			E			E	

Intersection Summary			
HCM 2000 Control Delay	96.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	113.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	335	428	46	57	546	691	62	624	557	593	309
v/c Ratio	0.83	0.63	0.07	0.18	0.53	0.96	0.26	0.69	0.83	0.78	0.41
Control Delay	77.7	41.0	0.2	21.4	42.7	43.2	25.6	53.5	65.3	71.2	37.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.7	41.0	0.2	21.4	42.7	43.2	25.6	53.5	65.3	71.2	37.3
Queue Length 50th (m)	50.0	98.0	0.0	8.5	66.1	91.0	10.0	92.2	87.1	168.3	54.4
Queue Length 95th (m)	#73.9	138.2	0.0	16.7	84.2	#178.2	19.1	#125.2	m90.3	m174.8	m58.3
Internal Link Dist (m)		551.4			604.3			115.4		292.1	
Turn Bay Length (m)	85.0			85.0		75.0	40.0		85.0		
Base Capacity (vph)	409	682	682	497	1172	764	261	900	725	761	746
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.63	0.07	0.11	0.47	0.90	0.24	0.69	0.77	0.78	0.41

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	325	415	45	55	530	670	60	545	60	540	575	300
Future Volume (vph)	325	415	45	55	530	670	60	545	60	540	575	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.4	5.4	4.0	5.4	5.4	3.0	5.9		4.0	5.9	5.9
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.93	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1863	1547	1799	3539	1470	1768	3544		3433	1881	1516
Flt Permitted	0.95	1.00	1.00	0.36	1.00	1.00	0.24	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1863	1547	673	3539	1470	450	3544		3433	1881	1516
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	335	428	46	57	546	691	62	562	62	557	593	309
RTOR Reduction (vph)	0	0	29	0	0	291	0	5	0	0	0	136
Lane Group Flow (vph)	335	428	17	57	546	400	62	619	0	557	593	173
Confl. Peds. (#/hr)	45		10	10		45	10		20	20		10
Heavy Vehicles (%)	1%	2%	0%	0%	2%	2%	2%	0%	0%	2%	1%	4%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases			8	4		4	2					6
Actuated Green, G (s)	15.4	50.3	50.3	47.6	40.9	40.9	40.2	33.3		26.4	53.8	53.8
Effective Green, g (s)	16.4	51.3	51.3	49.6	41.9	41.9	42.2	34.3		27.4	54.8	54.8
Actuated g/C Ratio	0.12	0.37	0.37	0.35	0.30	0.30	0.30	0.24		0.20	0.39	0.39
Clearance Time (s)	5.7	6.4	6.4	5.0	6.4	6.4	4.0	6.9		5.0	6.9	6.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	406	682	566	300	1059	439	210	868		671	736	593
v/s Ratio Prot	c0.10	0.23		0.01	0.15		0.02	0.17		c0.16	c0.32	
v/s Ratio Perm			0.01	0.06		c0.27	0.07					0.11
v/c Ratio	0.83	0.63	0.03	0.19	0.52	0.91	0.30	0.71		0.83	0.81	0.29
Uniform Delay, d1	60.4	36.5	28.4	30.8	40.6	47.3	36.3	48.3		54.1	37.9	29.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.12	1.76	3.66
Incremental Delay, d2	12.8	1.8	0.0	0.3	0.4	23.0	0.8	5.0		3.7	3.9	0.5
Delay (s)	73.2	38.3	28.4	31.1	41.1	70.2	37.1	53.3		64.1	70.7	107.6
Level of Service	E	D	C	C	D	E	D	D		E	E	F
Approach Delay (s)		52.2			56.2			51.8			76.0	
Approach LOS		D			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	61.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	96.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	176	94	382	653
v/c Ratio	0.35	0.43	0.19	0.26
Control Delay	29.1	22.4	3.1	2.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	29.1	22.4	3.1	2.1
Queue Length 50th (m)	12.2	7.0	5.1	5.4
Queue Length 95th (m)	20.2	16.3	10.7	11.6
Internal Link Dist (m)	146.6	179.3	180.3	263.4
Turn Bay Length (m)				
Base Capacity (vph)	1491	613	2029	2471
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.12	0.15	0.19	0.26

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	70	0	65	0	15	70	210	45	20	295	240
Future Volume (vph)	80	70	0	65	0	15	70	210	45	20	295	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5			3.5			3.5			3.5	
Lane Util. Factor		0.95			1.00			0.95			0.95	
Frt		1.00			0.97			0.98			0.94	
Flt Protected		0.97			0.96			0.99			1.00	
Satd. Flow (prot)		3516			1751			3431			3370	
Flt Permitted		0.81			0.65			0.77			0.94	
Satd. Flow (perm)		2936			1180			2659			3162	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	94	82	0	76	0	18	82	247	53	24	347	282
RTOR Reduction (vph)	0	0	0	0	23	0	0	9	0	0	75	0
Lane Group Flow (vph)	0	176	0	0	71	0	0	373	0	0	578	0
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	3%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		8.0			8.0			43.0			43.0	
Effective Green, g (s)		9.0			9.0			44.0			44.0	
Actuated g/C Ratio		0.15			0.15			0.73			0.73	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		440			177			1949			2318	
v/s Ratio Prot												
v/s Ratio Perm		0.06			c0.06			0.14			c0.18	
v/c Ratio		0.40			0.40			0.19			0.25	
Uniform Delay, d1		23.1			23.1			2.5			2.6	
Progression Factor		1.27			1.00			1.00			1.00	
Incremental Delay, d2		0.6			1.5			0.2			0.3	
Delay (s)		30.0			24.6			2.7			2.9	
Level of Service		C			C			A			A	
Approach Delay (s)		30.0			24.6			2.7			2.9	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	46.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Future Background PM - No Corridor

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	242	79	124	365	169	174
v/c Ratio	0.19	0.07	0.14	0.25	0.57	0.42
Control Delay	7.4	2.2	3.2	3.9	39.3	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.4	2.2	3.2	3.9	39.3	8.1
Queue Length 50th (m)	14.9	0.0	4.0	14.4	26.8	0.0
Queue Length 95th (m)	31.1	5.5	9.9	29.6	43.0	15.1
Internal Link Dist (m)	228.8			1140.2	151.2	
Turn Bay Length (m)		100.0	100.0		100.0	
Base Capacity (vph)	1263	1079	907	1447	409	500
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	0.19	0.07	0.14	0.25	0.41	0.35

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	215	70	110	325	150	155
Future Volume (vph)	215	70	110	325	150	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	2.0	3.0	3.0	3.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1881	1568	1805	1900	1787	1599
Flt Permitted	1.00	1.00	0.57	1.00	0.95	1.00
Satd. Flow (perm)	1881	1568	1085	1900	1787	1599
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	242	79	124	365	169	174
RTOR Reduction (vph)	0	27	0	0	0	145
Lane Group Flow (vph)	242	52	124	365	169	29
Heavy Vehicles (%)	1%	3%	0%	0%	1%	1%
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	54.8	54.8	63.7	63.7	13.3	13.3
Effective Green, g (s)	55.8	55.8	64.7	64.7	14.3	14.3
Actuated g/C Ratio	0.66	0.66	0.76	0.76	0.17	0.17
Clearance Time (s)	4.0	4.0	3.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1234	1029	884	1446	300	269
v/s Ratio Prot	0.13		0.01	c0.19	c0.09	
v/s Ratio Perm		0.03	0.10			0.02
v/c Ratio	0.20	0.05	0.14	0.25	0.56	0.11
Uniform Delay, d1	5.8	5.2	2.7	3.0	32.5	30.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.1	0.1	0.4	2.4	0.2
Delay (s)	6.1	5.3	2.8	3.4	34.9	30.1
Level of Service	A	A	A	A	C	C
Approach Delay (s)	5.9			3.3	32.5	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	35.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	48	660	64	792	138	133	69	53	53
v/c Ratio	0.10	0.29	0.15	0.39	0.53	0.35	0.27	0.15	0.14
Control Delay	4.6	5.4	11.1	10.2	32.7	19.7	26.2	23.4	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.6	5.4	11.1	10.2	32.7	19.7	26.2	23.4	2.3
Queue Length 50th (m)	1.7	15.3	4.2	31.3	17.9	11.7	8.5	6.4	0.0
Queue Length 95th (m)	5.7	28.8	13.0	54.3	31.8	23.8	17.6	13.9	2.8
Internal Link Dist (m)		585.1		130.4		189.6		92.5	
Turn Bay Length (m)	45.0		30.0				25.0		25.0
Base Capacity (vph)	526	2308	440	2025	352	499	336	482	472
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.29	0.15	0.39	0.39	0.27	0.21	0.11	0.11

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	530	90	60	660	85	130	80	45	65	50	50
Future Volume (vph)	45	530	90	60	660	85	130	80	45	65	50	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.5	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1768	3452		1798	3471		1760	1786		1805	1827	1516
Flt Permitted	0.29	1.00		0.40	1.00		0.72	1.00		0.67	1.00	1.00
Satd. Flow (perm)	548	3452		759	3471		1338	1786		1277	1827	1516
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)	48	564	96	64	702	90	138	85	48	69	53	53
RTOR Reduction (vph)	0	16	0	0	11	0	0	31	0	0	0	43
Lane Group Flow (vph)	48	644	0	64	781	0	138	102	0	69	53	10
Confl. Peds. (#/hr)	5		5	5		5	5					5
Confl. Bikes (#/hr)												5
Heavy Vehicles (%)	2%	2%	1%	0%	2%	1%	2%	1%	0%	0%	4%	4%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	46.8	46.8		39.4	39.4		13.2	13.2		13.2	13.2	13.2
Effective Green, g (s)	47.8	47.8		40.4	40.4		14.2	14.2		14.2	14.2	14.2
Actuated g/C Ratio	0.66	0.66		0.56	0.56		0.20	0.20		0.20	0.20	0.20
Clearance Time (s)	3.5	6.0		6.0	6.0		6.0	6.0		6.0	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
Lane Grp Cap (vph)	446	2291		425	1947		263	352		251	360	298
v/s Ratio Prot	0.01	c0.19			c0.23			0.06			0.03	
v/s Ratio Perm	0.06			0.08			c0.10			0.05		0.01
v/c Ratio	0.11	0.28		0.15	0.40		0.52	0.29		0.27	0.15	0.04
Uniform Delay, d1	4.6	5.0		7.6	8.9		25.9	24.6		24.5	23.9	23.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.1	0.3		0.7	0.6		1.9	0.5		0.6	0.2	0.0
Delay (s)	4.7	5.3		8.3	9.6		27.8	25.1		25.1	24.1	23.4
Level of Service	A	A		A	A		C	C		C	C	C
Approach Delay (s)		5.3			9.5			26.4			24.3	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

17: South Service Road E & QEW On-Off Ramps/Royal Windsor Drive

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	5	774	126	720	5	49	181	198	324	38
v/c Ratio	0.01	0.54	0.58	0.49	0.01	0.13	0.23	0.27	0.45	0.05
Control Delay	7.8	11.3	24.9	10.9	0.0	9.2	9.3	5.5	11.8	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	7.8	11.3	24.9	10.9	0.0	9.2	9.3	5.5	11.8	3.7
Queue Length 50th (m)	0.1	23.1	7.4	21.2	0.0	2.3	8.9	4.4	17.8	0.0
Queue Length 95th (m)	0.8	36.0	#27.9	32.9	0.0	7.2	18.5	13.8	34.2	3.7
Internal Link Dist (m)		208.7		203.3			1140.2		129.5	
Turn Bay Length (m)	125.0		145.0		55.0	15.0		40.0		
Base Capacity (vph)	482	1435	218	1479	702	367	802	735	722	693
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	0.01	0.54	0.58	0.49	0.01	0.13	0.23	0.27	0.45	0.05

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	680	25	115	655	5	45	165	180	0	295	35
Future Volume (vph)	5	680	25	115	655	5	45	165	180	0	295	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	3502	3386		1752	3505	1615	1656	1900	1599		1712	1591
Flt Permitted	0.31	1.00		0.28	1.00	1.00	0.50	1.00	1.00		1.00	1.00
Satd. Flow (perm)	1141	3386		518	3505	1615	870	1900	1599		1712	1591
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	5	747	27	126	720	5	49	181	198	0	324	38
RTOR Reduction (vph)	0	6	0	0	0	3	0	0	61	0	0	22
Lane Group Flow (vph)	5	768	0	126	720	2	49	181	137	0	324	16
Confl. Bikes (#/hr)												5
Heavy Vehicles (%)	0%	6%	8%	3%	3%	0%	9%	0%	1%	0%	11%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	18.0	18.0		18.0	18.0	18.0	18.0	18.0	18.0		18.0	18.0
Effective Green, g (s)	19.0	19.0		19.0	19.0	19.0	19.0	19.0	19.0		19.0	19.0
Actuated g/C Ratio	0.42	0.42		0.42	0.42	0.42	0.42	0.42	0.42		0.42	0.42
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lane Grp Cap (vph)	481	1429		218	1479	681	367	802	675		722	671
v/s Ratio Prot		0.23			0.21			0.10			c0.19	
v/s Ratio Perm	0.00			c0.24		0.00	0.06		0.09			0.01
v/c Ratio	0.01	0.54		0.58	0.49	0.00	0.13	0.23	0.20		0.45	0.02
Uniform Delay, d1	7.5	9.7		9.9	9.5	7.5	8.0	8.3	8.2		9.3	7.6
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	0.0	1.5		10.7	1.1	0.0	0.8	0.7	0.7		2.0	0.1
Delay (s)	7.6	11.2		20.6	10.6	7.5	8.7	9.0	8.9		11.3	7.7
Level of Service	A	B		C	B	A	A	A	A		B	A
Approach Delay (s)		11.1			12.1			8.9			10.9	
Approach LOS		B			B			A			B	

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	80	0	0	190	0	0
Future Volume (Veh/h)	80	0	0	190	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	87	0	0	207	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	287					
pX, platoon unblocked						
vC, conflicting volume			87		294	87
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			87		294	87
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1509		697	971

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	87	207	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.05	0.12	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	80	0	0	190	0	30
Future Volume (Veh/h)	80	0	0	190	0	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	87	0	0	207	0	33
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	402			296		
pX, platoon unblocked						
vC, conflicting volume			87		294	87
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			87		294	87
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	97
cM capacity (veh/h)			1509		697	971

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	87	207	33
Volume Left	0	0	0
Volume Right	0	0	33
cSH	1700	1700	971
Volume to Capacity	0.05	0.12	0.03
Queue Length 95th (m)	0.0	0.0	0.8
Control Delay (s)	0.0	0.0	8.8
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.8
Approach LOS			A

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	20.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	110	0	40	190	0	0
Future Volume (Veh/h)	110	0	40	190	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	120	0	43	207	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				253		
pX, platoon unblocked						
vC, conflicting volume			120		413	120
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			120		413	120
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		100	100
cM capacity (veh/h)			1468		578	931

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	120	250	0
Volume Left	0	43	0
Volume Right	0	0	0
cSH	1700	1468	1700
Volume to Capacity	0.07	0.03	0.13
Queue Length 95th (m)	0.0	0.7	0.0
Control Delay (s)	0.0	1.5	0.0
Lane LOS		A	A
Approach Delay (s)	0.0	1.5	0.0
Approach LOS			A

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	22.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	70	0	0	0	0	0	0	0	0	0	0
Future Volume (Veh/h)	0	70	0	0	0	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	76	0	0	0	0	0	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		203			262							
pX, platoon unblocked												
vC, conflicting volume	0			76			76	76	76	76	76	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			76			76	76	76	76	76	0
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 %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1623			1523			914	814	985	914	814	1085

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	76	0	0	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1623	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS			A	A
Approach Delay (s)	0.0	0.0	0.0	0.0
Approach LOS			A	A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	7.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	40	0	0	0	0	0	0	0	0	0	0
Future Volume (Veh/h)	30	40	0	0	0	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	43	0	0	0	0	0	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		313			152							
pX, platoon unblocked												
vC, conflicting volume	0			43			109	109	43	109	109	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			43			109	109	43	109	109	0
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 %	98			100			100	100	100	100	100	100
cM capacity (veh/h)	1623			1566			856	765	1027	856	765	1085

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	33	43	0	0	0	0
Volume Left	33	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1623	1700	1700	1700	1700	1700
Volume to Capacity	0.02	0.03	0.00	0.19	0.00	0.20
Queue Length 95th (m)	0.5	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	7.3	0.0	0.0	0.0	0.0	0.0
Lane LOS	A				A	A
Approach Delay (s)	3.2		0.0		0.0	0.0
Approach LOS					A	A

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	SBT
Lane Group Flow (vph)	22	22	92
v/c Ratio	0.02	0.01	0.20
Control Delay	3.3	3.2	23.8
Queue Delay	0.0	0.0	0.0
Total Delay	3.3	3.2	23.8
Queue Length 50th (m)	1.1	1.0	5.1
Queue Length 95th (m)	1.3	1.2	10.6
Internal Link Dist (m)		128.4	264.2
Turn Bay Length (m)	50.0		
Base Capacity (vph)	1121	1482	1268
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.02	0.01	0.07

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	20	0	0	0	0	0	0	0	0	85	0
Future Volume (vph)	20	20	0	0	0	0	0	0	0	0	85	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5									3.5	
Lane Util. Factor	1.00	1.00									0.95	
Frt	1.00	1.00									1.00	
Flt Protected	0.95	1.00									1.00	
Satd. Flow (prot)	1770	1863									3539	
Flt Permitted	0.76	1.00									1.00	
Satd. Flow (perm)	1410	1863									3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	22	0	0	0	0	0	0	0	0	92	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	22	22	0	0	0	0	0	0	0	0	92	0
Turn Type	Perm	NA		Perm			Perm			Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	45.1	45.1									5.9	
Effective Green, g (s)	46.1	46.1									6.9	
Actuated g/C Ratio	0.77	0.77									0.12	
Clearance Time (s)	4.5	4.5									4.5	
Vehicle Extension (s)	3.0	3.0									3.0	
Lane Grp Cap (vph)	1083	1431									406	
v/s Ratio Prot		0.01									c0.03	
v/s Ratio Perm	c0.02											
v/c Ratio	0.02	0.02									0.23	
Uniform Delay, d1	1.6	1.6									24.1	
Progression Factor	1.49	1.46									1.00	
Incremental Delay, d2	0.0	0.0									0.3	
Delay (s)	2.5	2.4									24.4	
Level of Service	A	A									C	
Approach Delay (s)		2.4			0.0			0.0			24.4	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.05		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	15.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	20	0	0	0	0	0	0	0	0	40	0
Future Volume (Veh/h)	0	20	0	0	0	0	0	0	0	0	40	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	22	0	0	0	0	0	0	0	0	43	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		131										
pX, platoon unblocked												
vC, conflicting volume	0			22			44	22	22	22	22	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			22			44	22	22	22	22	0
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 %	100			100			100	100	100	100	95	100
cM capacity (veh/h)	1623			1593			923	872	1055	990	872	1085

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	0	22	0	0	0	43
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	872
Volume to Capacity	0.00	0.01	0.00	0.23	0.34	0.05
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	1.2
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	9.3
Lane LOS					A	A
Approach Delay (s)	0.0		0.0		0.0	9.3
Approach LOS					A	A

Intersection Summary			
Average Delay	6.2		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	0	0	20	35	0
Future Volume (Veh/h)	20	0	0	20	35	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	0	0	22	38	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				280	175	
pX, platoon unblocked						
vC, conflicting volume	60	38	38			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	60	38	38			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	100			
cM capacity (veh/h)	947	1034	1572			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	22	22	38
Volume Left	22	0	0
Volume Right	0	0	0
cSH	947	1572	1700
Volume to Capacity	0.02	0.00	0.02
Queue Length 95th (m)	0.6	0.0	0.0
Control Delay (s)	8.9	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.9	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	50	20	90	70	0	5
Future Volume (Veh/h)	50	20	90	70	0	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	22	98	76	0	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		182	224			
pX, platoon unblocked						
vC, conflicting volume	174				266	136
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	174				266	136
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				100	99
cM capacity (veh/h)	1403				695	913

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	76	174	5
Volume Left	54	0	0
Volume Right	0	76	5
cSH	1403	1700	913
Volume to Capacity	0.04	0.10	0.01
Queue Length 95th (m)	1.0	0.0	0.1
Control Delay (s)	5.5	0.0	9.0
Lane LOS	A		A
Approach Delay (s)	5.5	0.0	9.0
Approach LOS			A

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	26.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	20	160	0	0	0
Future Volume (Veh/h)	0	20	160	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	22	174	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			252			
pX, platoon unblocked						
vC, conflicting volume	174				196	174
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	174				196	174
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1403				793	869

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	0	22	174	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.00	0.01	0.10	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				A
Approach Delay (s)	0.0		0.0	0.0
Approach LOS				A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	11.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	20	160	0	0	0
Future Volume (Veh/h)	0	20	160	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	22	174	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		111	141			
pX, platoon unblocked						
vC, conflicting volume	174				196	174
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	174				196	174
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1403				793	869

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	0	22	174	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.01	0.10	0.00	0.10
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	11.8%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.

Channelized right turn lanes are not counted.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	20	35	0	0	40
Future Volume (Veh/h)	0	20	35	0	0	40
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	22	38	0	0	43
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		127	245			
pX, platoon unblocked						
vC, conflicting volume	38				49	19
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	38				49	19
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	96
cM capacity (veh/h)	1571				954	1055

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	7	15	25	13	43
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	43
cSH	1571	1700	1700	1700	1055
Volume to Capacity	0.00	0.01	0.01	0.01	0.04
Queue Length 95th (m)	0.0	0.0	0.0	0.0	1.0
Control Delay (s)	0.0	0.0	0.0	0.0	8.6
Lane LOS					A
Approach Delay (s)	0.0		0.0		8.6
Approach LOS					A

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	0	0	0	0	35
Future Volume (Veh/h)	20	0	0	0	0	35
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	0	0	0	0	38
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				116	339	
pX, platoon unblocked						
vC, conflicting volume	19	19	38			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	19	19	38			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	100			
cM capacity (veh/h)	998	1059	1572			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	22	0	0	38
Volume Left	22	0	0	0
Volume Right	0	0	0	38
cSH	998	1700	1700	1700
Volume to Capacity	0.02	0.39	0.00	0.02
Queue Length 95th (m)	0.5	0.0	0.0	0.0
Control Delay (s)	8.7	0.0	0.0	0.0
Lane LOS	A	A		
Approach Delay (s)	8.7		0.0	0.0
Approach LOS	A			

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	103	216	330	851	278	294	330	3304	964	134	2273	119
v/c Ratio	0.40	1.14	0.97	0.90	0.50	0.59	0.98	1.56	1.13	0.67	1.33	0.21
Control Delay	34.4	160.7	65.8	61.9	45.1	28.4	62.5	273.4	76.1	43.8	192.1	1.4
Queue Delay	0.0	0.0	48.9	53.0	0.0	0.0	0.0	0.0	0.4	0.0	0.2	0.0
Total Delay	34.4	160.7	114.8	114.8	45.1	28.4	62.5	273.4	76.5	43.8	192.3	1.4
Queue Length 50th (m)	18.4	~80.3	~45.5	121.2	67.4	40.5	73.5	~497.9	~253.5	20.0	~314.7	0.0
Queue Length 95th (m)	31.4	#134.1	#109.3	147.9	98.9	74.8	m26.7	m135.4	m16.0	43.6	#343.8	1.6
Internal Link Dist (m)		361.1			497.8			251.4			315.2	
Turn Bay Length (m)	80.0			165.0		15.0				85.0		80.0
Base Capacity (vph)	285	190	341	993	555	501	336	2116	850	216	1703	555
Starvation Cap Reductn	0	0	0	0	0	0	0	0	57	0	0	0
Spillback Cap Reductn	0	0	179	562	0	0	0	0	0	0	100	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	1.14	2.04	1.97	0.50	0.59	0.98	1.56	1.22	0.62	1.42	0.21

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	210	320	825	270	285	320	3205	935	130	2205	115
Future Volume (vph)	100	210	320	825	270	285	320	3205	935	130	2205	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.8	5.8	4.7	5.8	5.8	3.0	5.1	5.1	3.0	5.1	5.1
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.86	1.00	1.00	0.95	1.00	1.00	0.81
Flpb, ped/bikes	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	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)	1716	1881	1599	3467	1881	1388	1787	5136	1525	1805	5085	1300
Flt Permitted	0.59	1.00	1.00	0.95	1.00	1.00	0.08	1.00	1.00	0.09	1.00	1.00
Satd. Flow (perm)	1063	1881	1599	3467	1881	1388	151	5136	1525	162	5085	1300
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	103	216	330	851	278	294	330	3304	964	134	2273	119
RTOR Reduction (vph)	0	0	179	0	0	92	0	0	222	0	0	79
Lane Group Flow (vph)	103	216	151	851	278	202	330	3304	742	134	2273	40
Confl. Peds. (#/hr)	55					55	80		15	15		80
Confl. Bikes (#/hr)						5						
Heavy Vehicles (%)	0%	1%	1%	1%	1%	0%	1%	1%	1%	0%	2%	0%
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8		8			4	6		6	2		2
Actuated Green, G (s)	23.4	13.2	13.2	37.3	40.3	40.3	70.9	56.7	56.7	56.1	45.9	45.9
Effective Green, g (s)	25.4	14.2	14.2	38.3	41.3	41.3	71.9	57.7	57.7	58.1	46.9	46.9
Actuated g/C Ratio	0.18	0.10	0.10	0.27	0.29	0.29	0.51	0.41	0.41	0.42	0.33	0.33
Clearance Time (s)	5.7	6.8	6.8	5.7	6.8	6.8	4.0	6.1	6.1	4.0	6.1	6.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	245	190	162	948	554	409	334	2116	628	198	1703	435
v/s Ratio Prot	0.03	c0.11		c0.25	0.15		c0.15	c0.64		0.05	0.45	
v/s Ratio Perm	0.04		0.09			0.15	0.35		0.49	0.23		0.03
v/c Ratio	0.42	1.14	0.93	0.90	0.50	0.49	0.99	1.56	1.18	0.68	1.33	0.09
Uniform Delay, d1	49.9	62.9	62.4	49.0	40.8	40.7	45.6	41.1	41.1	32.9	46.5	31.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.29	0.39	0.41	1.00	1.00	1.00
Incremental Delay, d2	1.2	106.9	51.1	11.1	0.7	0.9	12.0	252.9	83.2	8.8	154.7	0.4
Delay (s)	51.1	169.8	113.5	60.0	41.6	41.7	71.1	268.9	99.9	41.8	201.3	32.4
Level of Service	D	F	F	E	D	D	E	F	F	D	F	C
Approach Delay (s)		122.3			52.6			219.2			184.9	
Approach LOS		F			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	177.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	120.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

2: Trafalgar Road & North Service Road E/Highway 403 WB Off-Ramp

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	27	298	556	567	665	5043	3931	16
v/c Ratio	0.17	0.46	1.57	1.72	1.08	1.91	1.52	0.02
Control Delay	26.9	33.9	300.8	364.8	97.4	435.0	269.4	0.6
Queue Delay	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0
Total Delay	26.9	33.9	300.8	364.8	98.8	435.0	269.4	0.6
Queue Length 50th (m)	4.6	63.5	~251.1	~265.3	~212.9	~824.4	~576.8	0.0
Queue Length 95th (m)	11.0	91.7	#331.8	#345.8	#295.0	#830.8	m#458.2	m0.0
Internal Link Dist (m)		327.0		348.8		26.7	251.4	
Turn Bay Length (m)								
Base Capacity (vph)	178	642	355	330	616	2641	2589	773
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	2	45	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.46	1.57	1.72	1.08	1.94	1.52	0.02

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	5	275	1045	10	625	0	4740	0	0	3695	15
Future Volume (vph)	25	5	275	1045	10	625	0	4740	0	0	3695	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00		0.91			0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	0.94
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	0.85		1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected	0.95	1.00		0.95	0.95	1.00		1.00			1.00	1.00
Satd. Flow (prot)	1805	1604		1715	1721	1615		5136			5036	1437
Flt Permitted	0.08	1.00		0.57	0.53	1.00		1.00			1.00	1.00
Satd. Flow (perm)	145	1604		1027	955	1615		5136			5036	1437
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)	27	5	293	1112	11	665	0	5043	0	0	3931	16
RTOR Reduction (vph)	0	0	0	0	0	57	0	0	0	0	0	8
Lane Group Flow (vph)	27	298	0	556	567	608	0	5043	0	0	3931	8
Confl. Peds. (#/hr)							15		10	10		15
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	0%	1%	1%	0%	3%	6%
Turn Type	pm+pt	NA		Perm	NA	Perm		NA			NA	Perm
Protected Phases	3	8			4			2			6	
Permitted Phases	8			4		4						6
Actuated Green, G (s)	57.0	57.0		47.5	47.5	47.5		69.0			69.0	69.0
Effective Green, g (s)	58.0	58.0		48.5	48.5	48.5		70.0			70.0	70.0
Actuated g/C Ratio	0.41	0.41		0.35	0.35	0.35		0.50			0.50	0.50
Clearance Time (s)	5.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	125	664		355	330	559		2568			2518	718
v/s Ratio Prot	0.01	c0.19						c0.98			0.78	
v/s Ratio Perm	0.08			0.54	c0.59	0.38						0.01
v/c Ratio	0.22	0.45		1.57	1.72	1.09		1.96			1.56	0.01
Uniform Delay, d1	31.3	29.5		45.8	45.8	45.8		35.0			35.0	17.6
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.53	1.00
Incremental Delay, d2	0.9	0.5		268.1	335.7	64.1		435.1			252.7	0.0
Delay (s)	32.2	30.0		313.9	381.5	109.9		470.1			306.2	17.6
Level of Service	C	C		F	F	F		F			F	B
Approach Delay (s)		30.2			259.4			470.1			305.0	
Approach LOS		C			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	364.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.80		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	162.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1947	879	3653	3695
v/c Ratio	1.54	1.53	1.31	1.32
Control Delay	280.6	278.1	168.3	176.4
Queue Delay	0.0	0.0	0.1	0.0
Total Delay	280.6	278.1	168.4	176.4
Queue Length 50th (m)	~410.0	~357.2	~507.9	~508.6
Queue Length 95th (m)	#452.7	#438.2	m#467.2	#527.9
Internal Link Dist (m)	190.2		56.8	39.3
Turn Bay Length (m)				
Base Capacity (vph)	1262	576	2796	2796
Starvation Cap Reductn	0	0	184	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.54	1.53	1.40	1.32

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.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1850	835	0	3470	3510	0
Future Volume (vph)	1850	835	0	3470	3510	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	1.00		0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3467	1583		5085	5085	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3467	1583		5085	5085	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1947	879	0	3653	3695	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1947	879	0	3653	3695	0
Confl. Peds. (#/hr)			25			25
Heavy Vehicles (%)	1%	2%	0%	2%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Actuated Green, G (s)	50.0	50.0		76.0	76.0	
Effective Green, g (s)	51.0	51.0		77.0	77.0	
Actuated g/C Ratio	0.36	0.36		0.55	0.55	
Clearance Time (s)	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1262	576		2796	2796	
v/s Ratio Prot	c0.56			0.72	c0.73	
v/s Ratio Perm		0.56				
v/c Ratio	1.54	1.53		1.31	1.32	
Uniform Delay, d1	44.5	44.5		31.5	31.5	
Progression Factor	1.00	1.00		0.98	1.00	
Incremental Delay, d2	248.2	245.5		139.4	147.3	
Delay (s)	292.7	290.0		170.3	178.8	
Level of Service	F	F		F	F	
Approach Delay (s)	291.9			170.3	178.8	
Approach LOS	F			F	F	

Intersection Summary			
HCM 2000 Control Delay	207.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.41		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	136.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	170	0	0	0	0	3645	665	0	3105	965
Future Volume (Veh/h)	0	0	170	0	0	0	0	3645	665	0	3105	965
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	0	0	181	0	0	0	0	3878	707	0	3303	1027
Pedestrians		20			10							
Lane Width (m)		3.6			0.0							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		2			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								198			81	
pX, platoon unblocked	0.63	0.63	0.46	0.63	0.63	0.65	0.46			0.65		
vC, conflicting volume	5129	8432	1634	4989	8238	1303	4350			4595		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1752	6994	0	1529	6687	0	4170			4646		
tC, single (s)	7.5	6.5	7.1	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	62	100	100	100	100			100		
cM capacity (veh/h)	34	0	477	32	0	709	18			16		

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3
Volume Total	181	1293	1293	1293	707	1321	1321	1688
Volume Left	0	0	0	0	0	0	0	0
Volume Right	181	0	0	0	707	0	0	1027
cSH	477	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.38	0.76	0.76	0.76	0.42	0.78	0.78	0.99
Queue Length 95th (m)	14.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	17.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	C							
Approach Delay (s)	17.1	0.0				0.0		
Approach LOS	C							

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	99.2%	ICU Level of Service	F
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1325	273	67	247	253	263	1923	155	2789
v/c Ratio	1.30	0.49	0.26	1.52	0.86	1.16	0.97	0.80	1.55
Control Delay	181.5	38.2	31.1	305.9	48.3	130.3	36.3	39.8	280.1
Queue Delay	1.4	1.6	0.0	0.0	19.0	0.0	45.0	0.0	0.0
Total Delay	182.9	39.9	31.1	305.9	67.3	130.3	81.4	39.8	280.1
Queue Length 50th (m)	~254.0	58.3	11.4	~100.1	23.7	~75.3	110.2	31.4	~415.0
Queue Length 95th (m)	#297.9	88.5	21.5	#156.4	#72.9	m#74.3	m102.8	m21.7	m#261.6
Internal Link Dist (m)		97.1		158.4			292.1		174.2
Turn Bay Length (m)	130.0		50.0			120.0		55.0	
Base Capacity (vph)	1020	555	271	162	293	227	1977	194	1803
Starvation Cap Reductn	236	144	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	38	0	1169	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.69	0.66	0.25	1.52	0.99	1.16	2.38	0.80	1.55

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1285	135	130	65	240	245	255	1830	35	150	2265	440
Future Volume (vph)	1285	135	130	65	240	245	255	1830	35	150	2265	440
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	6.0	4.0	6.0		3.0	6.0	
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.97		1.00	1.00	1.00	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.98	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	1661		1772	1900	1599	1719	5115		1752	4990	
Flt Permitted	0.95	1.00		0.59	1.00	1.00	0.08	1.00		0.08	1.00	
Satd. Flow (perm)	3400	1661		1103	1900	1599	138	5115		152	4990	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	1325	139	134	67	247	253	263	1887	36	155	2335	454
RTOR Reduction (vph)	0	24	0	0	0	155	0	1	0	0	21	0
Lane Group Flow (vph)	1325	249	0	67	247	98	263	1922	0	155	2768	0
Confl. Peds. (#/hr)			20	20			15		15	15		15
Heavy Vehicles (%)	3%	0%	6%	0%	0%	1%	5%	1%	0%	3%	0%	4%
Turn Type	Prot	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8		8	2			6		
Actuated Green, G (s)	41.0	43.8		22.0	12.4	12.4	64.7	51.7		57.5	47.6	
Effective Green, g (s)	42.0	44.8		24.0	13.4	13.4	66.6	52.7		59.5	48.6	
Actuated g/C Ratio	0.30	0.32		0.17	0.10	0.10	0.48	0.38		0.42	0.35	
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	5.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.5	4.0	4.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1020	531		239	181	153	223	1925		189	1732	
v/s Ratio Prot	c0.39	0.15		0.02	c0.13		c0.12	0.38		0.06	c0.55	
v/s Ratio Perm				0.03		0.06	0.44			0.28		
v/c Ratio	1.30	0.47		0.28	1.36	0.64	1.18	1.00		0.82	1.60	
Uniform Delay, d1	49.0	38.1		49.9	63.3	61.0	43.9	43.6		33.8	45.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.53	0.73		1.24	1.09	
Incremental Delay, d2	141.8	0.7		0.8	195.4	9.9	91.3	9.4		2.7	269.4	
Delay (s)	190.8	38.7		50.7	258.7	70.9	158.4	41.1		44.5	319.1	
Level of Service	F	D		D	F	E	F	D		D	F	
Approach Delay (s)		164.8			150.3			55.2			304.7	
Approach LOS		F			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	187.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.42		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	135.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	335	742	46	57	943	691	62	1021	557	1031	309
v/c Ratio	0.84	0.98	0.06	0.33	0.80	0.91	0.35	1.33	0.83	1.50	0.48
Control Delay	79.4	70.6	0.2	25.0	48.8	35.1	29.6	200.9	67.4	273.3	50.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.4	70.6	0.2	25.0	48.8	35.1	29.6	200.9	67.4	273.3	50.1
Queue Length 50th (m)	50.0	~229.0	0.0	8.5	131.8	93.8	10.0	~209.2	88.0	~413.3	66.9
Queue Length 95th (m)	#73.9	#316.1	0.0	16.7	159.1	#181.1	19.1	#257.4	m60.0	m#226.5	m41.6
Internal Link Dist (m)		551.4			604.3			115.4		292.1	
Turn Bay Length (m)	85.0			85.0		75.0	40.0		85.0		
Base Capacity (vph)	403	754	736	360	1176	760	199	766	725	687	643
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.98	0.06	0.16	0.80	0.91	0.31	1.33	0.77	1.50	0.48

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	325	720	45	55	915	670	60	930	60	540	1000	300
Future Volume (vph)	325	720	45	55	915	670	60	930	60	540	1000	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.4	5.4	4.0	5.4	5.4	3.0	5.9		4.0	5.9	5.9
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.93	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1863	1547	1805	3539	1470	1769	3569		3433	1881	1516
Flt Permitted	0.95	1.00	1.00	0.08	1.00	1.00	0.14	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1863	1547	160	3539	1470	258	3569		3433	1881	1516
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	335	742	46	57	943	691	62	959	62	557	1031	309
RTOR Reduction (vph)	0	0	27	0	0	269	0	3	0	0	0	91
Lane Group Flow (vph)	335	742	19	57	943	422	62	1018	0	557	1031	218
Confl. Peds. (#/hr)	45		10	10		45	10		20	20		10
Heavy Vehicles (%)	1%	2%	0%	0%	2%	2%	2%	0%	0%	2%	1%	4%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases			8	4		4	2					6
Actuated Green, G (s)	15.1	55.7	55.7	53.3	46.6	46.6	34.8	27.9		26.4	48.4	48.4
Effective Green, g (s)	16.1	56.7	56.7	55.3	47.6	47.6	36.8	28.9		27.4	49.4	49.4
Actuated g/C Ratio	0.12	0.41	0.41	0.39	0.34	0.34	0.26	0.21		0.20	0.35	0.35
Clearance Time (s)	5.7	6.4	6.4	5.0	6.4	6.4	4.0	6.9		5.0	6.9	6.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	398	754	626	153	1203	499	153	736		671	663	534
v/s Ratio Prot	c0.10	c0.40		0.02	0.27		0.02	0.29		c0.16	c0.55	
v/s Ratio Perm			0.01	0.13		0.29	0.08					0.14
v/c Ratio	0.84	0.98	0.03	0.37	0.78	0.85	0.41	1.38		0.83	1.56	0.41
Uniform Delay, d1	60.7	41.2	25.1	33.5	41.6	42.8	41.7	55.5		54.1	45.3	34.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.23	1.74	2.63
Incremental Delay, d2	14.8	28.6	0.0	1.5	3.4	12.4	1.8	180.7		0.8	250.5	0.2
Delay (s)	75.5	69.8	25.1	35.0	45.0	55.2	43.5	236.3		67.2	329.4	90.2
Level of Service	E	E	C	C	D	E	D	F		E	F	F
Approach Delay (s)		69.7			48.8			225.2			213.4	
Approach LOS		E			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	139.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	118.3%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	176	94	535	930
v/c Ratio	0.35	0.43	0.27	0.37
Control Delay	34.5	22.4	3.5	3.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.5	22.4	3.5	3.5
Queue Length 50th (m)	12.2	7.0	8.2	13.6
Queue Length 95th (m)	20.2	16.3	16.1	25.0
Internal Link Dist (m)	146.6	179.3	180.3	263.4
Turn Bay Length (m)				
Base Capacity (vph)	1491	613	1995	2486
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.12	0.15	0.27	0.37

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	70	0	65	0	15	70	340	45	20	530	240
Future Volume (vph)	80	70	0	65	0	15	70	340	45	20	530	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5			3.5			3.5			3.5	
Lane Util. Factor		0.95			1.00			0.95			0.95	
Frt		1.00			0.97			0.99			0.95	
Flt Protected		0.97			0.96			0.99			1.00	
Satd. Flow (prot)		3516			1751			3452			3441	
Flt Permitted		0.81			0.65			0.75			0.94	
Satd. Flow (perm)		2936			1180			2619			3230	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	94	82	0	76	0	18	82	400	53	24	624	282
RTOR Reduction (vph)	0	0	0	0	23	0	0	6	0	0	35	0
Lane Group Flow (vph)	0	176	0	0	71	0	0	529	0	0	895	0
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	3%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		8.0			8.0			43.0			43.0	
Effective Green, g (s)		9.0			9.0			44.0			44.0	
Actuated g/C Ratio		0.15			0.15			0.73			0.73	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		440			177			1920			2368	
v/s Ratio Prot												
v/s Ratio Perm		0.06			c0.06			0.20			c0.28	
v/c Ratio		0.40			0.40			0.28			0.38	
Uniform Delay, d1		23.1			23.1			2.7			3.0	
Progression Factor		1.53			1.00			1.00			1.00	
Incremental Delay, d2		0.6			1.5			0.4			0.5	
Delay (s)		35.9			24.6			3.0			3.4	
Level of Service		D			C			A			A	
Approach Delay (s)		35.9			24.6			3.0			3.4	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	242	140	124	455	303	281
v/c Ratio	0.22	0.14	0.15	0.35	0.70	0.47
Control Delay	11.2	2.7	5.5	7.2	37.6	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.2	2.7	5.5	7.2	37.6	5.8
Queue Length 50th (m)	19.2	0.0	5.9	27.7	47.2	0.0
Queue Length 95th (m)	39.8	9.2	14.2	53.5	66.6	16.1
Internal Link Dist (m)	228.8			1140.2	151.2	
Turn Bay Length (m)		100.0	100.0		100.0	
Base Capacity (vph)	1198	1050	809	1359	462	622
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.13	0.15	0.33	0.66	0.45

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	215	125	110	405	270	250
Future Volume (vph)	215	125	110	405	270	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	2.0	3.0	3.0	3.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1881	1568	1805	1900	1787	1599
Flt Permitted	1.00	1.00	0.55	1.00	0.95	1.00
Satd. Flow (perm)	1881	1568	1051	1900	1787	1599
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	242	140	124	455	303	281
RTOR Reduction (vph)	0	59	0	0	0	213
Lane Group Flow (vph)	242	81	124	455	303	68
Heavy Vehicles (%)	1%	3%	0%	0%	1%	1%
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	47.9	47.9	57.3	57.3	19.7	19.7
Effective Green, g (s)	48.9	48.9	58.3	58.3	20.7	20.7
Actuated g/C Ratio	0.58	0.58	0.69	0.69	0.24	0.24
Clearance Time (s)	4.0	4.0	3.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1082	902	786	1303	435	389
v/s Ratio Prot	0.13		0.01	c0.24	c0.17	
v/s Ratio Perm		0.05	0.09			0.04
v/c Ratio	0.22	0.09	0.16	0.35	0.70	0.18
Uniform Delay, d1	8.8	8.1	4.6	5.5	29.3	25.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.2	0.1	0.7	4.8	0.2
Delay (s)	9.3	8.3	4.7	6.3	34.1	25.6
Level of Service	A	A	A	A	C	C
Approach Delay (s)	8.9			5.9	30.0	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	42.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	48	1112	64	1356	138	202	69	96	53
v/c Ratio	0.16	0.48	0.23	0.67	0.54	0.53	0.34	0.26	0.14
Control Delay	5.4	7.2	13.6	14.8	33.3	27.8	28.6	25.1	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.4	7.2	13.6	14.8	33.3	27.8	28.6	25.1	2.3
Queue Length 50th (m)	1.7	33.2	4.5	70.1	17.9	23.3	8.6	11.8	0.0
Queue Length 95th (m)	5.7	58.0	14.9	#120.4	32.1	39.1	18.3	22.0	2.8
Internal Link Dist (m)		585.1		130.4		189.6		92.5	
Turn Bay Length (m)	45.0		30.0				25.0		25.0
Base Capacity (vph)	332	2316	280	2028	339	495	265	482	472
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.48	0.23	0.67	0.41	0.41	0.26	0.20	0.11

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	955	90	60	1190	85	130	145	45	65	90	50
Future Volume (vph)	45	955	90	60	1190	85	130	145	45	65	90	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.5	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3487		1801	3499		1760	1818		1805	1827	1517
Flt Permitted	0.11	1.00		0.26	1.00		0.69	1.00		0.53	1.00	1.00
Satd. Flow (perm)	214	3487		486	3499		1288	1818		1007	1827	1517
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)	48	1016	96	64	1266	90	138	154	48	69	96	53
RTOR Reduction (vph)	0	8	0	0	6	0	0	17	0	0	0	42
Lane Group Flow (vph)	48	1104	0	64	1350	0	138	185	0	69	96	11
Confl. Peds. (#/hr)	5		5	5		5	5					5
Confl. Bikes (#/hr)												5
Heavy Vehicles (%)	2%	2%	1%	0%	2%	1%	2%	1%	0%	0%	4%	4%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	46.7	46.7		39.3	39.3		13.3	13.3		13.3	13.3	13.3
Effective Green, g (s)	47.7	47.7		40.3	40.3		14.3	14.3		14.3	14.3	14.3
Actuated g/C Ratio	0.66	0.66		0.56	0.56		0.20	0.20		0.20	0.20	0.20
Clearance Time (s)	3.5	6.0		6.0	6.0		6.0	6.0		6.0	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
Lane Grp Cap (vph)	247	2310		272	1958		255	361		200	362	301
v/s Ratio Prot	0.01	c0.32			c0.39			0.10			0.05	
v/s Ratio Perm	0.12			0.13			c0.11			0.07		0.01
v/c Ratio	0.19	0.48		0.24	0.69		0.54	0.51		0.34	0.27	0.03
Uniform Delay, d1	6.9	6.0		8.0	11.4		25.9	25.7		24.8	24.4	23.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	0.7		2.0	2.0		2.3	1.2		1.0	0.4	0.0
Delay (s)	7.3	6.7		10.1	13.4		28.2	27.0		25.9	24.8	23.3
Level of Service	A	A		B	B		C	C		C	C	C
Approach Delay (s)		6.7			13.2			27.5			24.8	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	5	1379	126	1302	5	49	192	198	357	38
v/c Ratio	0.02	0.96	0.77	0.88	0.01	0.14	0.24	0.28	0.49	0.05
Control Delay	7.8	31.7	48.6	21.6	0.0	9.4	9.4	8.3	12.5	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.8	31.7	48.6	21.6	0.0	9.4	9.4	8.3	12.5	3.9
Queue Length 50th (m)	0.1	54.1	8.3	48.5	0.0	2.3	9.5	8.1	20.1	0.1
Queue Length 95th (m)	0.8	#98.6	#32.8	#87.4	0.0	7.4	19.4	18.5	38.2	3.8
Internal Link Dist (m)		208.7		203.3			1140.2		129.5	
Turn Bay Length (m)	125.0		145.0		55.0	15.0		40.0		
Base Capacity (vph)	328	1435	164	1479	702	340	802	695	722	692
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	0.02	0.96	0.77	0.88	0.01	0.14	0.24	0.28	0.49	0.05

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1230	25	115	1185	5	45	175	180	0	325	35
Future Volume (vph)	5	1230	25	115	1185	5	45	175	180	0	325	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	3502	3394		1752	3505	1615	1656	1900	1599		1712	1591
Flt Permitted	0.21	1.00		0.21	1.00	1.00	0.46	1.00	1.00		1.00	1.00
Satd. Flow (perm)	776	3394		388	3505	1615	807	1900	1599		1712	1591
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	5	1352	27	126	1302	5	49	192	198	0	357	38
RTOR Reduction (vph)	0	3	0	0	0	3	0	0	21	0	0	21
Lane Group Flow (vph)	5	1376	0	126	1302	2	49	192	177	0	357	17
Confl. Bikes (#/hr)												5
Heavy Vehicles (%)	0%	6%	8%	3%	3%	0%	9%	0%	1%	0%	11%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	18.0	18.0		18.0	18.0	18.0	18.0	18.0	18.0		18.0	18.0
Effective Green, g (s)	19.0	19.0		19.0	19.0	19.0	19.0	19.0	19.0		19.0	19.0
Actuated g/C Ratio	0.42	0.42		0.42	0.42	0.42	0.42	0.42	0.42		0.42	0.42
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lane Grp Cap (vph)	327	1433		163	1479	681	340	802	675		722	671
v/s Ratio Prot		c0.41			0.37			0.10			c0.21	
v/s Ratio Perm	0.01			0.32		0.00	0.06		0.11			0.01
v/c Ratio	0.02	0.96		0.77	0.88	0.00	0.14	0.24	0.26		0.49	0.03
Uniform Delay, d1	7.6	12.6		11.2	12.0	7.5	8.0	8.4	8.4		9.5	7.6
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	0.1	16.0		29.2	7.8	0.0	0.9	0.7	0.9		2.4	0.1
Delay (s)	7.6	28.7		40.4	19.8	7.5	8.9	9.1	9.4		11.9	7.7
Level of Service	A	C		D	B	A	A	A	A		B	A
Approach Delay (s)		28.6			21.5			9.2			11.5	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	210	0	0	425	0	0
Future Volume (Veh/h)	210	0	0	425	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	228	0	0	462	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	287					
pX, platoon unblocked						
vC, conflicting volume			228		690	228
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			228		690	228
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1340		411	811

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	228	462	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.13	0.27	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	25.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	210	0	0	425	0	30
Future Volume (Veh/h)	210	0	0	425	0	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	228	0	0	462	0	33
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	402			296		
pX, platoon unblocked						
vC, conflicting volume			228		690	228
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			228		690	228
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	96
cM capacity (veh/h)			1340		411	811

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	228	462	33
Volume Left	0	0	0
Volume Right	0	0	33
cSH	1700	1700	811
Volume to Capacity	0.13	0.27	0.04
Queue Length 95th (m)	0.0	0.0	1.0
Control Delay (s)	0.0	0.0	9.6
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.6
Approach LOS			A

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	32.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	240	0	40	425	0	0
Future Volume (Veh/h)	240	0	40	425	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	261	0	43	462	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				253		
pX, platoon unblocked						
vC, conflicting volume			261		809	261
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			261		809	261
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		100	100
cM capacity (veh/h)			1303		338	778

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	261	505	0
Volume Left	0	43	0
Volume Right	0	0	0
cSH	1700	1303	1700
Volume to Capacity	0.15	0.03	0.13
Queue Length 95th (m)	0.0	0.8	0.0
Control Delay (s)	0.0	1.0	0.0
Lane LOS		A	A
Approach Delay (s)	0.0	1.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	70	0	0	0	0	0	0	0	0	0	0
Future Volume (Veh/h)	0	70	0	0	0	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	76	0	0	0	0	0	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		203			262							
pX, platoon unblocked												
vC, conflicting volume	0			76			76	76	76	76	76	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			76			76	76	76	76	76	0
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 %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1623			1523			914	814	985	914	814	1085

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	76	0	0	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1623	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS			A	A
Approach Delay (s)	0.0	0.0	0.0	0.0
Approach LOS			A	A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	7.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	40	0	0	0	0	0	0	0	0	0	0
Future Volume (Veh/h)	30	40	0	0	0	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	43	0	0	0	0	0	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		313			152							
pX, platoon unblocked												
vC, conflicting volume	0			43			109	109	43	109	109	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			43			109	109	43	109	109	0
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 %	98			100			100	100	100	100	100	100
cM capacity (veh/h)	1623			1566			856	765	1027	856	765	1085

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	33	43	0	0	0	0
Volume Left	33	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1623	1700	1700	1700	1700	1700
Volume to Capacity	0.02	0.03	0.00	0.19	0.00	0.20
Queue Length 95th (m)	0.5	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	7.3	0.0	0.0	0.0	0.0	0.0
Lane LOS	A				A	A
Approach Delay (s)	3.2		0.0		0.0	0.0
Approach LOS					A	A

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	SBT
Lane Group Flow (vph)	22	22	92
v/c Ratio	0.02	0.01	0.20
Control Delay	1.2	1.2	23.8
Queue Delay	0.0	0.0	0.0
Total Delay	1.2	1.2	23.8
Queue Length 50th (m)	0.2	0.2	5.1
Queue Length 95th (m)	m0.9	m0.9	10.6
Internal Link Dist (m)		128.4	264.2
Turn Bay Length (m)	50.0		
Base Capacity (vph)	1121	1482	1268
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.02	0.01	0.07

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	20	0	0	0	0	0	0	0	0	85	0
Future Volume (vph)	20	20	0	0	0	0	0	0	0	0	85	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5									3.5	
Lane Util. Factor	1.00	1.00									0.95	
Frt	1.00	1.00									1.00	
Flt Protected	0.95	1.00									1.00	
Satd. Flow (prot)	1770	1863									3539	
Flt Permitted	0.76	1.00									1.00	
Satd. Flow (perm)	1410	1863									3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	22	0	0	0	0	0	0	0	0	92	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	22	22	0	0	0	0	0	0	0	0	92	0
Turn Type	Perm	NA		Perm			Perm			Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	45.1	45.1									5.9	
Effective Green, g (s)	46.1	46.1									6.9	
Actuated g/C Ratio	0.77	0.77									0.12	
Clearance Time (s)	4.5	4.5									4.5	
Vehicle Extension (s)	3.0	3.0									3.0	
Lane Grp Cap (vph)	1083	1431									406	
v/s Ratio Prot		0.01									c0.03	
v/s Ratio Perm	c0.02											
v/c Ratio	0.02	0.02									0.23	
Uniform Delay, d1	1.6	1.6									24.1	
Progression Factor	0.55	0.55									1.00	
Incremental Delay, d2	0.0	0.0									0.3	
Delay (s)	0.9	0.9									24.4	
Level of Service	A	A									C	
Approach Delay (s)		0.9			0.0			0.0			24.4	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.05		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	15.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	20	0	0	0	0	0	0	0	0	40	0
Future Volume (Veh/h)	0	20	0	0	0	0	0	0	0	0	40	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	22	0	0	0	0	0	0	0	0	43	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		131										
pX, platoon unblocked												
vC, conflicting volume	0			22			44	22	22	22	22	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			22			44	22	22	22	22	0
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 %	100			100			100	100	100	100	95	100
cM capacity (veh/h)	1623			1593			923	872	1055	990	872	1085

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	0	22	0	0	0	43
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	872
Volume to Capacity	0.00	0.01	0.00	0.23	0.34	0.05
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	1.2
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	9.3
Lane LOS					A	A
Approach Delay (s)	0.0		0.0		0.0	9.3
Approach LOS					A	A

Intersection Summary			
Average Delay	6.2		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	0	0	20	35	0
Future Volume (Veh/h)	20	0	0	20	35	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	0	0	22	38	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				280	175	
pX, platoon unblocked						
vC, conflicting volume	60	38	38			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	60	38	38			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	100			
cM capacity (veh/h)	947	1034	1572			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	22	22	38
Volume Left	22	0	0
Volume Right	0	0	0
cSH	947	1572	1700
Volume to Capacity	0.02	0.00	0.02
Queue Length 95th (m)	0.6	0.0	0.0
Control Delay (s)	8.9	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.9	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	50	20	90	70	0	5
Future Volume (Veh/h)	50	20	90	70	0	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	22	98	76	0	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		182	224			
pX, platoon unblocked						
vC, conflicting volume	174				266	136
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	174				266	136
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				100	99
cM capacity (veh/h)	1403				695	913

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	76	174	5
Volume Left	54	0	0
Volume Right	0	76	5
cSH	1403	1700	913
Volume to Capacity	0.04	0.10	0.01
Queue Length 95th (m)	1.0	0.0	0.1
Control Delay (s)	5.5	0.0	9.0
Lane LOS	A		A
Approach Delay (s)	5.5	0.0	9.0
Approach LOS			A

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	26.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	20	160	0	0	0
Future Volume (Veh/h)	0	20	160	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	22	174	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			252			
pX, platoon unblocked						
vC, conflicting volume	174				196	174
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	174				196	174
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1403				793	869

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	0	22	174	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.00	0.01	0.10	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				A
Approach Delay (s)	0.0		0.0	0.0
Approach LOS				A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	11.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	20	160	0	0	0
Future Volume (Veh/h)	0	20	160	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	22	174	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		111	141			
pX, platoon unblocked						
vC, conflicting volume	174				196	174
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	174				196	174
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1403				793	869

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	0	22	174	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.01	0.10	0.00	0.10
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	11.8%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection has too many lanes per leg.
HCM All-Way analysis is limited to two lanes per leg.
Channelized right turn lanes are not counted.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	20	35	0	0	40
Future Volume (Veh/h)	0	20	35	0	0	40
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	22	38	0	0	43
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		127	245			
pX, platoon unblocked						
vC, conflicting volume	38				49	19
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	38				49	19
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	96
cM capacity (veh/h)	1571				954	1055

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	7	15	25	13	43
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	43
cSH	1571	1700	1700	1700	1055
Volume to Capacity	0.00	0.01	0.01	0.01	0.04
Queue Length 95th (m)	0.0	0.0	0.0	0.0	1.0
Control Delay (s)	0.0	0.0	0.0	0.0	8.6
Lane LOS					A
Approach Delay (s)	0.0		0.0		8.6
Approach LOS					A

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	0	0	0	0	35
Future Volume (Veh/h)	20	0	0	0	0	35
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	0	0	0	0	38
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				116	339	
pX, platoon unblocked						
vC, conflicting volume	19	19	38			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	19	19	38			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	100			
cM capacity (veh/h)	998	1059	1572			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	22	0	0	38
Volume Left	22	0	0	0
Volume Right	0	0	0	38
cSH	998	1700	1700	1700
Volume to Capacity	0.02	0.39	0.00	0.02
Queue Length 95th (m)	0.5	0.0	0.0	0.0
Control Delay (s)	8.7	0.0	0.0	0.0
Lane LOS	A	A		
Approach Delay (s)	8.7		0.0	0.0
Approach LOS	A			

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	35	101	348	722	56	121	177	1076	843	197	2030	51
v/c Ratio	0.12	0.37	0.98	0.90	0.09	0.22	1.00	0.53	0.81	0.72	0.97	0.08
Control Delay	27.9	58.8	78.6	67.3	33.8	6.6	94.7	32.7	28.1	35.1	54.6	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0
Total Delay	27.9	58.8	78.6	67.3	33.8	6.6	94.7	32.7	29.2	35.1	54.6	0.2
Queue Length 50th (m)	5.9	27.2	~66.1	105.0	11.3	0.0	37.0	108.8	162.2	30.2	210.6	0.0
Queue Length 95th (m)	13.1	46.6	#133.2	#136.7	22.5	15.0	#85.6	84.5	246.8	#47.8	#248.2	0.0
Internal Link Dist (m)		361.1			497.8			251.4			315.2	
Turn Bay Length (m)	80.0			165.0		15.0				85.0		80.0
Base Capacity (vph)	377	274	354	824	624	561	177	2013	1041	272	2088	656
Starvation Cap Reductn	0	0	0	0	0	0	0	0	64	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	0.09	0.37	0.98	0.88	0.09	0.22	1.00	0.53	0.86	0.72	0.97	0.08

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	100	345	715	55	120	175	1065	835	195	2010	50
Future Volume (vph)	35	100	345	715	55	120	175	1065	835	195	2010	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.8	5.8	4.7	5.8	5.8	3.0	5.1	5.1	3.0	5.1	5.1
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.97	1.00	1.00	0.91
Flpb, ped/bikes	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	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)	1659	1863	1568	3367	1827	1410	1719	4988	1513	1787	5085	1383
Flt Permitted	0.72	1.00	1.00	0.95	1.00	1.00	0.07	1.00	1.00	0.17	1.00	1.00
Satd. Flow (perm)	1258	1863	1568	3367	1827	1410	131	4988	1513	310	5085	1383
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	35	101	348	722	56	121	177	1076	843	197	2030	51
RTOR Reduction (vph)	0	0	122	0	0	80	0	0	437	0	0	30
Lane Group Flow (vph)	35	101	226	722	56	41	177	1076	406	197	2030	21
Confl. Peds. (#/hr)	35					35	35		10	10		35
Heavy Vehicles (%)	3%	2%	3%	4%	4%	4%	5%	4%	3%	1%	2%	6%
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8		8			4	6		6	2		2
Actuated Green, G (s)	27.0	20.8	20.8	32.3	46.9	46.9	63.3	54.3	54.3	65.3	55.3	55.3
Effective Green, g (s)	29.0	21.8	21.8	33.3	47.9	47.9	65.3	55.3	55.3	67.3	56.3	56.3
Actuated g/C Ratio	0.21	0.16	0.16	0.24	0.34	0.34	0.47	0.39	0.39	0.48	0.40	0.40
Clearance Time (s)	5.7	6.8	6.8	5.7	6.8	6.8	4.0	6.1	6.1	4.0	6.1	6.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	281	290	244	800	625	482	174	1970	597	265	2044	556
v/s Ratio Prot	0.01	0.05		c0.21	0.03		c0.07	0.22		c0.06	0.40	
v/s Ratio Perm	0.02		c0.14			0.03	c0.40		0.27	0.30		0.01
v/c Ratio	0.12	0.35	0.93	0.90	0.09	0.09	1.02	0.55	0.68	0.74	0.99	0.04
Uniform Delay, d1	45.0	52.8	58.3	51.8	31.3	31.2	40.7	32.7	35.0	23.6	41.7	25.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.02	1.00	4.01	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.7	38.1	13.4	0.1	0.1	65.0	0.9	4.9	10.7	18.4	0.1
Delay (s)	45.2	53.5	96.4	65.2	31.3	31.3	106.5	33.4	145.2	34.3	60.0	25.5
Level of Service	D	D	F	E	C	C	F	C	F	C	E	C
Approach Delay (s)		83.8			58.5			84.6			57.0	
Approach LOS		F			E			F			E	

Intersection Summary			
HCM 2000 Control Delay	69.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	93.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	5	237	250	250	206	2036	2082	5
v/c Ratio	0.02	0.50	0.91	0.91	0.40	0.65	0.66	0.01
Control Delay	28.2	38.0	83.3	83.3	17.8	19.1	27.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0
Total Delay	28.2	38.0	83.3	83.3	17.8	19.1	28.2	0.0
Queue Length 50th (m)	1.1	50.5	72.9	72.9	18.4	126.8	213.2	0.0
Queue Length 95th (m)	3.8	64.6	#115.1	#115.1	39.6	194.1	m215.1	m0.0
Internal Link Dist (m)		327.0		348.8		26.7	251.4	
Turn Bay Length (m)								
Base Capacity (vph)	288	658	317	317	578	3146	3176	999
Starvation Cap Reductn	0	0	0	0	0	0	492	0
Spillback Cap Reductn	0	0	0	0	6	13	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.36	0.79	0.79	0.36	0.65	0.78	0.01

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	230	485	0	200	0	1975	0	0	2020	5
Future Volume (vph)	5	0	230	485	0	200	0	1975	0	0	2020	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00		0.91			0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	0.85		1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected	0.95	1.00		0.95	0.95	1.00		1.00			1.00	1.00
Satd. Flow (prot)	1805	1599		1715	1715	1615		4988			5036	1543
Flt Permitted	0.37	1.00		0.58	0.58	1.00		1.00			1.00	1.00
Satd. Flow (perm)	706	1599		1038	1038	1615		4988			5036	1543
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	5	0	237	500	0	206	0	2036	0	0	2082	5
RTOR Reduction (vph)	0	21	0	0	0	90	0	0	0	0	0	2
Lane Group Flow (vph)	5	216	0	250	250	116	0	2036	0	0	2082	3
Confl. Peds. (#/hr)							10		5	5		10
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	0%	4%	4%	0%	3%	0%
Turn Type	pm+pt	NA		Perm	NA	Perm		NA			NA	Perm
Protected Phases	3	8			4			2			6	
Permitted Phases	8			4		4						6
Actuated Green, G (s)	42.7	42.7		36.3	36.3	36.3		83.3			83.3	83.3
Effective Green, g (s)	43.7	43.7		37.3	37.3	37.3		84.3			84.3	84.3
Actuated g/C Ratio	0.31	0.31		0.27	0.27	0.27		0.60			0.60	0.60
Clearance Time (s)	5.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	239	499		276	276	430		3003			3032	929
v/s Ratio Prot	0.00	c0.13						0.41			c0.41	
v/s Ratio Perm	0.01			c0.24	0.24	0.07						0.00
v/c Ratio	0.02	0.43		0.91	0.91	0.27		0.68			0.69	0.00
Uniform Delay, d1	34.1	38.3		49.7	49.7	40.6		18.7			18.9	11.1
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.51	1.00
Incremental Delay, d2	0.0	0.6		30.6	30.6	0.3		1.3			0.4	0.0
Delay (s)	34.1	38.9		80.2	80.2	40.9		20.0			28.9	11.1
Level of Service	C	D		F	F	D		B			C	B
Approach Delay (s)		38.8			68.8			20.0			28.9	
Approach LOS		D			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	31.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	903	673	1658	2337
v/c Ratio	0.61	0.99	0.69	0.96
Control Delay	33.3	72.2	31.5	45.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	33.3	72.2	31.5	45.1
Queue Length 50th (m)	103.9	192.2	109.7	234.2
Queue Length 95th (m)	126.3	#279.3	m97.5	#263.9
Internal Link Dist (m)	190.2		56.8	39.3
Turn Bay Length (m)				
Base Capacity (vph)	1471	679	2399	2446
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.61	0.99	0.69	0.96

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.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	885	660	0	1625	2290	0
Future Volume (vph)	885	660	0	1625	2290	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	1.00		0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3433	1583		4940	5036	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3433	1583		4940	5036	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	903	673	0	1658	2337	0
RTOR Reduction (vph)	0	1	0	0	0	0
Lane Group Flow (vph)	903	672	0	1658	2337	0
Confl. Peds. (#/hr)			10			10
Heavy Vehicles (%)	2%	2%	0%	5%	3%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Actuated Green, G (s)	59.0	59.0		67.0	67.0	
Effective Green, g (s)	60.0	60.0		68.0	68.0	
Actuated g/C Ratio	0.43	0.43		0.49	0.49	
Clearance Time (s)	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1471	678		2399	2446	
v/s Ratio Prot	0.26			0.34	c0.46	
v/s Ratio Perm		c0.42				
v/c Ratio	0.61	0.99		0.69	0.96	
Uniform Delay, d1	31.0	39.8		27.9	34.5	
Progression Factor	1.00	1.00		1.10	1.00	
Incremental Delay, d2	0.8	32.3		0.7	10.4	
Delay (s)	31.8	72.1		31.2	44.9	
Level of Service	C	E		C	D	
Approach Delay (s)	49.0			31.2	44.9	
Approach LOS	D			C	D	

Intersection Summary			
HCM 2000 Control Delay	42.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	180	0	0	0	0	1950	470	0	2085	835
Future Volume (Veh/h)	0	0	180	0	0	0	0	1950	470	0	2085	835
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	0	194	0	0	0	0	2097	505	0	2242	898
Pedestrians		10			5							
Lane Width (m)		3.6			0.0							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		1			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								198			81	
pX, platoon unblocked	0.62	0.62	0.55	0.62	0.62	0.85	0.55			0.85		
vC, conflicting volume	3400	5308	1206	2849	5252	704	3150			2607		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1134	4206	0	247	4116	51	2035			2281		
tC, single (s)	7.5	6.5	7.0	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	67	100	100	100	100			100		
cM capacity (veh/h)	98	1	584	285	2	864	153			193		

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3
Volume Total	194	699	699	699	505	897	897	1346
Volume Left	0	0	0	0	0	0	0	0
Volume Right	194	0	0	0	505	0	0	898
cSH	584	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.33	0.41	0.41	0.41	0.30	0.53	0.53	0.79
Queue Length 95th (m)	11.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	14.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B							
Approach Delay (s)	14.2	0.0				0.0		
Approach LOS	B							

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1258	304	67	82	93	155	1160	222	2020
v/c Ratio	1.33	0.57	0.28	0.59	0.34	0.97	0.56	0.93	1.00
Control Delay	193.3	43.0	33.1	80.2	3.2	92.4	29.7	57.3	49.6
Queue Delay	1.3	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	194.5	45.4	33.1	80.2	3.2	92.4	29.7	57.3	49.6
Queue Length 50th (m)	~244.1	69.8	11.9	23.5	0.0	33.8	76.0	37.1	177.8
Queue Length 95th (m)	#288.1	103.2	22.4	#43.6	0.0	m#56.3	88.7	m#42.5	m#233.9
Internal Link Dist (m)		97.1		158.4			292.1		174.2
Turn Bay Length (m)	130.0		50.0			120.0		55.0	
Base Capacity (vph)	949	531	236	139	277	160	2075	239	2025
Starvation Cap Reductn	196	123	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.67	0.75	0.28	0.59	0.34	0.97	0.56	0.93	1.00

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1220	155	140	65	80	90	150	1090	35	215	1495	465
Future Volume (vph)	1220	155	140	65	80	90	150	1090	35	215	1495	465
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	6.0	4.0	6.0		3.0	6.0	
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	1.00	0.85	1.00	1.00		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3273	1674		1728	1810	1553	1671	5006		1736	4828	
Flt Permitted	0.95	1.00		0.57	1.00	1.00	0.07	1.00		0.15	1.00	
Satd. Flow (perm)	3273	1674		1046	1810	1553	124	5006		278	4828	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	1258	160	144	67	82	93	155	1124	36	222	1541	479
RTOR Reduction (vph)	0	22	0	0	0	85	0	2	0	0	41	0
Lane Group Flow (vph)	1258	282	0	67	82	8	155	1158	0	222	1979	0
Confl. Peds. (#/hr)			5	5			15		5	5		15
Heavy Vehicles (%)	7%	0%	9%	4%	5%	4%	8%	3%	3%	4%	2%	4%
Turn Type	Prot	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8		8	2			6		
Actuated Green, G (s)	39.6	41.5		20.5	11.2	11.2	63.6	55.6		63.8	55.2	
Effective Green, g (s)	40.6	42.5		22.5	12.2	12.2	65.6	56.6		65.8	56.2	
Actuated g/C Ratio	0.29	0.30		0.16	0.09	0.09	0.47	0.40		0.47	0.40	
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	5.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.5	4.0	4.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	949	508		218	157	135	157	2023		230	1938	
v/s Ratio Prot	c0.38	c0.17		0.02	0.05		0.06	0.23		c0.07	c0.41	
v/s Ratio Perm				0.03		0.01	0.40			0.39		
v/c Ratio	1.33	0.55		0.31	0.52	0.06	0.99	0.57		0.97	1.02	
Uniform Delay, d1	49.7	40.8		51.3	61.1	58.6	39.2	32.3		28.2	41.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.47	0.93		1.45	0.91	
Incremental Delay, d2	153.9	1.3		0.9	4.0	0.3	53.4	0.8		32.7	20.1	
Delay (s)	203.6	42.1		52.2	65.1	58.9	111.1	30.7		73.5	58.1	
Level of Service	F	D		D	E	E	F	C		E	E	
Approach Delay (s)		172.2			59.2			40.2			59.6	
Approach LOS		F			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	87.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	109.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	276	500	68	94	563	667	52	495	786	682	401
v/c Ratio	0.76	0.94	0.13	0.54	0.66	0.90	0.22	0.57	0.93	0.78	0.47
Control Delay	74.2	74.2	0.5	39.6	51.2	28.7	21.0	47.7	66.6	57.9	26.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.2	74.2	0.5	39.6	51.2	28.7	21.0	47.7	66.6	57.9	26.7
Queue Length 50th (m)	40.0	140.3	0.0	16.5	77.4	55.7	7.2	66.8	123.6	180.3	59.7
Queue Length 95th (m)	#66.7	#212.7	0.0	30.5	98.4	#139.2	13.3	82.8	m126.4	m171.8	m58.1
Internal Link Dist (m)		551.4			604.3			115.4		292.1	
Turn Bay Length (m)	85.0			85.0		75.0	40.0		85.0		
Base Capacity (vph)	365	542	546	173	879	749	239	937	843	899	868
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.92	0.12	0.54	0.64	0.89	0.22	0.53	0.93	0.76	0.46

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	265	480	65	90	540	640	50	410	65	755	655	385
Future Volume (vph)	265	480	65	90	540	640	50	410	65	755	655	385
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.4	5.4	4.0	5.4	5.4	3.0	5.9		4.0	5.9	5.9
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3367	1792	1485	1734	3438	1483	1766	3436		3400	1881	1498
Flt Permitted	0.95	1.00	1.00	0.13	1.00	1.00	0.28	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3367	1792	1485	233	3438	1483	513	3436		3400	1881	1498
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	276	500	68	94	562	667	52	427	68	786	682	401
RTOR Reduction (vph)	0	0	48	0	0	373	0	9	0	0	0	157
Lane Group Flow (vph)	276	500	20	94	563	294	52	486	0	786	682	244
Confl. Peds. (#/hr)	25		15	15		25	20		10	10		20
Heavy Vehicles (%)	4%	6%	3%	4%	5%	4%	2%	2%	6%	3%	1%	4%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases			8	4		4	2					6
Actuated Green, G (s)	14.2	40.7	40.7	42.2	34.0	34.0	39.7	34.1		33.7	63.2	63.2
Effective Green, g (s)	15.2	41.7	41.7	44.2	35.0	35.0	41.7	35.1		34.7	64.2	64.2
Actuated g/C Ratio	0.11	0.30	0.30	0.32	0.25	0.25	0.30	0.25		0.25	0.46	0.46
Clearance Time (s)	5.7	6.4	6.4	5.0	6.4	6.4	4.0	6.9		5.0	6.9	6.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	365	533	442	172	859	370	211	861		842	862	686
v/s Ratio Prot	c0.08	c0.28		0.04	0.16		0.01	0.14		c0.23	c0.36	
v/s Ratio Perm			0.01	0.14		0.20	0.06					0.16
v/c Ratio	0.76	0.94	0.05	0.55	0.66	0.80	0.25	0.56		0.93	0.79	0.36
Uniform Delay, d1	60.6	47.9	35.0	37.3	47.1	49.1	36.0	45.8		51.5	32.2	24.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.10	1.64	3.60
Incremental Delay, d2	8.6	24.3	0.0	3.5	1.8	11.2	0.6	2.7		9.3	3.5	0.7
Delay (s)	69.2	72.2	35.0	40.8	48.9	60.4	36.7	48.5		65.9	56.4	88.9
Level of Service	E	E	D	D	D	E	D	D		E	E	F
Approach Delay (s)		68.2			54.1			47.3			67.4	
Approach LOS		E			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	61.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	667	11	247	281
v/c Ratio	0.66	0.07	0.13	0.15
Control Delay	27.3	12.9	6.5	6.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	27.3	12.9	6.5	6.8
Queue Length 50th (m)	43.8	0.9	5.2	6.3
Queue Length 95th (m)	57.4	3.3	11.9	13.7
Internal Link Dist (m)	146.6	179.3	180.3	263.4
Turn Bay Length (m)				
Base Capacity (vph)	1562	234	1920	1827
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.43	0.05	0.13	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	175	340	65	10	0	0	0	180	35	10	200	35
Future Volume (vph)	175	340	65	10	0	0	0	180	35	10	200	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5			3.5			3.5			3.5	
Lane Util. Factor		0.95			1.00			0.95			0.95	
Frt		0.98			1.00			0.98			0.98	
Flt Protected		0.99			0.95			1.00			1.00	
Satd. Flow (prot)		3496			1626			3420			3442	
Flt Permitted		0.86			0.27			1.00			0.94	
Satd. Flow (perm)		3041			463			3420			3256	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	201	391	75	11	0	0	0	207	40	11	230	40
RTOR Reduction (vph)	0	22	0	0	0	0	0	18	0	0	16	0
Lane Group Flow (vph)	0	645	0	0	11	0	0	229	0	0	265	0
Heavy Vehicles (%)	0%	0%	0%	11%	0%	0%	50%	3%	3%	0%	3%	0%
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		18.6			18.6			32.4			32.4	
Effective Green, g (s)		19.6			19.6			33.4			33.4	
Actuated g/C Ratio		0.33			0.33			0.56			0.56	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		993			151			1903			1812	
v/s Ratio Prot								0.07				
v/s Ratio Perm		c0.21			0.02						c0.08	
v/c Ratio		0.65			0.07			0.12			0.15	
Uniform Delay, d1		17.3			13.9			6.3			6.4	
Progression Factor		1.56			1.00			1.00			1.00	
Incremental Delay, d2		1.2			0.2			0.1			0.2	
Delay (s)		28.1			14.1			6.4			6.6	
Level of Service		C			B			A			A	
Approach Delay (s)		28.1			14.1			6.4			6.6	
Approach LOS		C			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	37.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1073	73	116	366	85	238
v/c Ratio	0.97	0.07	0.54	0.29	0.21	0.47
Control Delay	38.1	2.0	18.6	5.7	28.2	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.1	2.0	18.6	5.7	28.2	10.6
Queue Length 50th (m)	166.1	0.0	5.1	20.3	11.8	6.0
Queue Length 95th (m)	#226.9	3.9	15.6	27.9	21.8	19.7
Internal Link Dist (m)	228.8			1140.2	151.2	
Turn Bay Length (m)		100.0	100.0		100.0	
Base Capacity (vph)	1109	1036	213	1280	409	502
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	0.97	0.07	0.54	0.29	0.21	0.47

Intersection Summary

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	880	60	95	300	70	195
Future Volume (vph)	880	60	95	300	70	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	2.0	3.5	3.0	3.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1776	1615	1770	1845	1787	1538
Flt Permitted	1.00	1.00	0.07	1.00	0.95	1.00
Satd. Flow (perm)	1776	1615	138	1845	1787	1538
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	1073	73	116	366	85	238
RTOR Reduction (vph)	0	28	0	0	0	149
Lane Group Flow (vph)	1073	45	116	366	85	89
Heavy Vehicles (%)	7%	0%	2%	3%	1%	5%
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	51.5	51.5	58.0	58.0	18.5	18.5
Effective Green, g (s)	52.5	52.5	59.0	59.0	19.5	19.5
Actuated g/C Ratio	0.62	0.62	0.69	0.69	0.23	0.23
Clearance Time (s)	4.0	4.0	3.0	4.5	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1096	997	191	1280	409	352
v/s Ratio Prot	c0.60		c0.04	0.20	0.05	
v/s Ratio Perm		0.03	0.38			c0.06
v/c Ratio	0.98	0.05	0.61	0.29	0.21	0.25
Uniform Delay, d1	15.7	6.4	18.8	5.0	26.5	26.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	22.6	0.1	5.4	0.6	1.2	1.7
Delay (s)	38.3	6.5	24.2	5.5	27.7	28.5
Level of Service	D	A	C	A	C	C
Approach Delay (s)	36.3			10.0	28.3	
Approach LOS	D			B	C	

Intersection Summary			
HCM 2000 Control Delay	28.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	87	843	43	636	250	147	168	277	293
v/c Ratio	0.28	0.52	0.18	0.39	0.72	0.22	0.40	0.41	0.41
Control Delay	14.0	11.6	12.9	11.2	29.7	8.2	16.7	15.9	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.0	11.6	12.9	11.2	29.7	8.2	16.7	15.9	4.9
Queue Length 50th (m)	6.2	31.4	2.9	23.9	22.6	5.8	13.1	21.8	2.8
Queue Length 95th (m)	15.1	44.6	8.7	34.0	#55.8	16.4	28.2	40.3	17.0
Internal Link Dist (m)		585.1		130.4		189.6		92.5	
Turn Bay Length (m)	45.0		30.0				25.0		25.0
Base Capacity (vph)	348	1817	266	1822	362	691	441	701	727
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.46	0.16	0.35	0.69	0.21	0.38	0.40	0.40

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	595	180	40	525	60	230	75	60	155	255	270
Future Volume (vph)	80	595	180	40	525	60	230	75	60	155	255	270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.98		1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1651	3343		1752	3411		1730	1745		1696	1881	1527
Flt Permitted	0.38	1.00		0.27	1.00		0.54	1.00		0.66	1.00	1.00
Satd. Flow (perm)	657	3343		502	3411		975	1745		1184	1881	1527
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	647	196	43	571	65	250	82	65	168	277	293
RTOR Reduction (vph)	0	52	0	0	16	0	0	42	0	0	0	161
Lane Group Flow (vph)	87	791	0	43	620	0	250	105	0	168	277	132
Confl. Peds. (#/hr)	5					5	5		5	5		5
Heavy Vehicles (%)	9%	4%	5%	3%	4%	3%	4%	0%	2%	6%	1%	4%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	27.4	27.4		27.4	27.4		20.6	20.6		20.6	20.6	20.6
Effective Green, g (s)	28.4	28.4		28.4	28.4		21.6	21.6		21.6	21.6	21.6
Actuated g/C Ratio	0.47	0.47		0.47	0.47		0.36	0.36		0.36	0.36	0.36
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	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
Lane Grp Cap (vph)	310	1582		237	1614		351	628		426	677	549
v/s Ratio Prot		c0.24			0.18			0.06			0.15	
v/s Ratio Perm	0.13			0.09			c0.26			0.14		0.09
v/c Ratio	0.28	0.50		0.18	0.38		0.71	0.17		0.39	0.41	0.24
Uniform Delay, d1	9.6	10.9		9.1	10.2		16.5	13.1		14.3	14.4	13.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.2	1.1		1.7	0.7		6.7	0.1		0.6	0.4	0.2
Delay (s)	11.8	12.0		10.8	10.9		23.2	13.2		14.9	14.8	13.7
Level of Service	B	B		B	B		C	B		B	B	B
Approach Delay (s)		12.0			10.9			19.5			14.4	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	59	798	154	596	245	782	59	149	16
v/c Ratio	0.11	0.55	0.72	0.43	0.46	0.98	0.09	0.19	0.03
Control Delay	8.6	10.8	36.2	10.4	12.9	43.5	3.3	9.0	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.6	10.8	36.2	10.4	12.9	43.5	3.3	9.0	1.9
Queue Length 50th (m)	1.4	22.2	9.9	17.0	13.5	59.2	0.0	7.2	0.0
Queue Length 95th (m)	4.0	35.2	#35.8	27.2	28.9	#122.8	4.6	15.7	1.5
Internal Link Dist (m)		208.7		203.3		1140.2		129.5	
Turn Bay Length (m)	125.0		145.0		15.0		40.0		
Base Capacity (vph)	545	1445	213	1398	531	802	648	786	494
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.55	0.72	0.43	0.46	0.98	0.09	0.19	0.03

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	630	120	145	560	0	230	735	55	0	140	15
Future Volume (vph)	55	630	120	145	560	0	230	735	55	0	140	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5		3.5	3.5
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.98		1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	3213	3339		1787	3312		1805	1900	1455		1863	1122
Flt Permitted	0.38	1.00		0.27	1.00		0.66	1.00	1.00		1.00	1.00
Satd. Flow (perm)	1292	3339		506	3312		1258	1900	1455		1863	1122
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)	59	670	128	154	596	0	245	782	59	0	149	16
RTOR Reduction (vph)	0	35	0	0	0	0	0	0	34	0	0	9
Lane Group Flow (vph)	59	763	0	154	596	0	245	782	25	0	149	7
Heavy Vehicles (%)	9%	6%	3%	1%	9%	0%	0%	0%	11%	0%	2%	44%
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	18.0	18.0		18.0	18.0		18.0	18.0	18.0		18.0	18.0
Effective Green, g (s)	19.0	19.0		19.0	19.0		19.0	19.0	19.0		19.0	19.0
Actuated g/C Ratio	0.42	0.42		0.42	0.42		0.42	0.42	0.42		0.42	0.42
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5		4.5	4.5
Lane Grp Cap (vph)	545	1409		213	1398		531	802	614		786	473
v/s Ratio Prot		0.23			0.18			c0.41			0.08	
v/s Ratio Perm	0.05			c0.30			0.19		0.02			0.01
v/c Ratio	0.11	0.54		0.72	0.43		0.46	0.98	0.04		0.19	0.01
Uniform Delay, d1	7.9	9.7		10.8	9.2		9.3	12.8	7.6		8.2	7.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.4	1.5		19.1	1.0		2.9	26.3	0.1		0.5	0.1
Delay (s)	8.3	11.2		29.9	10.1		12.2	39.0	7.8		8.7	7.6
Level of Service	A	B		C	B		B	D	A		A	A
Approach Delay (s)		11.0			14.2			31.3			8.6	
Approach LOS		B			B			C			A	

Intersection Summary			
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	85.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	175	0	0	35	0	0
Future Volume (Veh/h)	175	0	0	35	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	190	0	0	38	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	287					
pX, platoon unblocked						
vC, conflicting volume			190		228	190
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			190		228	190
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1384		760	852

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	190	38	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.11	0.02	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	12.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	Y	
Traffic Volume (veh/h)	175	0	0	35	0	60
Future Volume (Veh/h)	175	0	0	35	0	60
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	190	0	0	38	0	65
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	402			296		
pX, platoon unblocked						
vC, conflicting volume			190		228	190
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			190		228	190
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	92
cM capacity (veh/h)			1384		760	852

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	190	38	65
Volume Left	0	0	0
Volume Right	0	0	65
cSH	1700	1700	852
Volume to Capacity	0.11	0.02	0.08
Queue Length 95th (m)	0.0	0.0	2.0
Control Delay (s)	0.0	0.0	9.6
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.6
Approach LOS			A

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	19.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	555	0	35	115	0	285
Future Volume (Veh/h)	555	0	35	115	0	285
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	603	0	38	125	0	310
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				253		
pX, platoon unblocked						
vC, conflicting volume			603		804	603
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			603		804	603
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		100	38
cM capacity (veh/h)			975		338	499

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	603	163	310
Volume Left	0	38	0
Volume Right	0	0	310
cSH	1700	975	499
Volume to Capacity	0.35	0.04	0.62
Queue Length 95th (m)	0.0	1.0	33.5
Control Delay (s)	0.0	2.3	23.3
Lane LOS		A	C
Approach Delay (s)	0.0	2.3	23.3
Approach LOS			C

Intersection Summary			
Average Delay	7.1		
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	340	0	0	0	0	0	0	0	0	0	0
Future Volume (Veh/h)	0	340	0	0	0	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	370	0	0	0	0	0	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		203			262							
pX, platoon unblocked				0.87			0.87	0.87	0.87	0.87	0.87	
vC, conflicting volume	0			370			370	370	370	370	370	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			196			196	196	196	196	196	0
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 %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1623			1193			661	606	733	661	606	1085

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	370	0	0	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1623	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS			A	A
Approach Delay (s)	0.0	0.0	0.0	0.0
Approach LOS			A	A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	21.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	280	0	0	0	45	0	0	0	30	165	0
Future Volume (Veh/h)	60	280	0	0	0	45	0	0	0	30	165	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	304	0	0	0	49	0	0	0	33	179	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		313			152							
pX, platoon unblocked				0.98			0.98	0.98	0.98	0.98	0.98	
vC, conflicting volume	49			304			524	483	304	458	458	24
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	49			274			499	458	274	432	432	24
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 %	96			100			100	100	100	93	63	100
cM capacity (veh/h)	1558			1258			325	467	746	504	483	1052

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	65	304	0	49	0	212
Volume Left	65	0	0	0	0	33
Volume Right	0	0	0	49	0	0
cSH	1558	1700	1700	1700	1700	486
Volume to Capacity	0.04	0.18	0.00	0.03	0.00	0.44
Queue Length 95th (m)	1.0	0.0	0.0	0.0	0.0	17.5
Control Delay (s)	7.4	0.0	0.0	0.0	0.0	18.0
Lane LOS	A				A	C
Approach Delay (s)	1.3		0.0		0.0	18.0
Approach LOS					A	C

Intersection Summary			
Average Delay	6.8		
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	212	125	76	109	22	11
v/c Ratio	0.20	0.08	0.06	0.23	0.13	0.01
Control Delay	1.3	1.0	1.5	23.8	23.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.3	1.0	1.5	23.8	23.9	0.0
Queue Length 50th (m)	1.3	0.7	0.8	6.0	2.3	0.0
Queue Length 95th (m)	4.5	2.9	3.5	11.9	7.7	0.0
Internal Link Dist (m)		128.4	106.7	150.5		264.2
Turn Bay Length (m)	50.0				50.0	
Base Capacity (vph)	1044	1475	1372	1268	455	1716
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.08	0.06	0.09	0.05	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	195	115	0	0	35	35	0	100	0	20	0	10
Future Volume (vph)	195	115	0	0	35	35	0	100	0	20	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5			3.5			3.5		3.5	3.5	
Lane Util. Factor	1.00	1.00			1.00			0.95		1.00	0.95	
Frt	1.00	1.00			0.93			1.00		1.00	0.85	
Flt Protected	0.95	1.00			1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863			1723			3539		1770	3008	
Flt Permitted	0.71	1.00			1.00			1.00		0.68	1.00	
Satd. Flow (perm)	1318	1863			1723			3539		1273	3008	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	212	125	0	0	38	38	0	109	0	22	0	11
RTOR Reduction (vph)	0	0	0	0	9	0	0	0	0	0	10	0
Lane Group Flow (vph)	212	125	0	0	67	0	0	109	0	22	1	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	44.9	44.9			44.9			6.1		6.1	6.1	
Effective Green, g (s)	45.9	45.9			45.9			7.1		7.1	7.1	
Actuated g/C Ratio	0.76	0.76			0.76			0.12		0.12	0.12	
Clearance Time (s)	4.5	4.5			4.5			4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	1008	1425			1318			418		150	355	
v/s Ratio Prot		0.07			0.04			c0.03			0.00	
v/s Ratio Perm	c0.16									0.02		
v/c Ratio	0.21	0.09			0.05			0.26		0.15	0.00	
Uniform Delay, d1	2.0	1.8			1.7			24.1		23.7	23.3	
Progression Factor	0.34	0.39			0.96			1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.1			0.1			0.3		0.5	0.0	
Delay (s)	1.1	0.8			1.7			24.4		24.2	23.3	
Level of Service	A	A			A			C		C	C	
Approach Delay (s)		1.0			1.7			24.4			23.9	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	31.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	110	10	0	30	25	10	165	0	0	270	30
Future Volume (Veh/h)	10	110	10	0	30	25	10	165	0	0	270	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	120	11	0	33	27	11	179	0	0	293	33
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		131										
pX, platoon unblocked												
vC, conflicting volume	60			131			360	208	126	278	200	46
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	60			131			360	208	126	278	200	46
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 %	99			100			97	74	100	100	58	97
cM capacity (veh/h)	1544			1454			384	684	925	535	691	1023

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	11	131	0	60	190	326
Volume Left	11	0	0	0	11	0
Volume Right	0	11	0	27	0	33
cSH	1544	1700	1700	1700	655	715
Volume to Capacity	0.01	0.08	0.00	0.04	0.29	0.46
Queue Length 95th (m)	0.2	0.0	0.0	0.0	9.6	19.2
Control Delay (s)	7.3	0.0	0.0	0.0	12.7	14.2
Lane LOS	A				B	B
Approach Delay (s)	0.6		0.0		12.7	14.2
Approach LOS					B	B

Intersection Summary			
Average Delay	9.9		
Intersection Capacity Utilization	30.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	110	0	55	65	0	0
Future Volume (Veh/h)	110	0	55	65	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	120	0	60	71	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				280	175	
pX, platoon unblocked						
vC, conflicting volume	191	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	191	0	0			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	84	100	96			
cM capacity (veh/h)	768	1085	1623			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	120	131	0
Volume Left	120	60	0
Volume Right	0	0	0
cSH	768	1623	1700
Volume to Capacity	0.16	0.04	0.02
Queue Length 95th (m)	4.4	0.9	0.0
Control Delay (s)	10.5	3.5	0.0
Lane LOS	B	A	
Approach Delay (s)	10.5	3.5	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	6.9		
Intersection Capacity Utilization	19.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	35	85	10	0	65	15
Future Volume (Veh/h)	35	85	10	0	65	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	92	11	0	71	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		182	224			
pX, platoon unblocked						
vC, conflicting volume	11				179	11
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	11				179	11
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				91	99
cM capacity (veh/h)	1608				791	1070

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	130	11	87
Volume Left	38	0	71
Volume Right	0	0	16
cSH	1608	1700	831
Volume to Capacity	0.02	0.01	0.10
Queue Length 95th (m)	0.6	0.0	2.8
Control Delay (s)	2.3	0.0	9.8
Lane LOS	A		A
Approach Delay (s)	2.3	0.0	9.8
Approach LOS			A

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	24.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	150	10	0	0	0
Future Volume (Veh/h)	0	150	10	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	163	11	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			252			
pX, platoon unblocked						
vC, conflicting volume	11				174	11
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	11				174	11
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1608				816	1070

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	0	163	11	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.00	0.10	0.01	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				A
Approach Delay (s)	0.0		0.0	0.0
Approach LOS				A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	11.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	150	10	0	165	0
Future Volume (Veh/h)	0	150	10	0	165	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	163	11	0	179	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		111	141			
pX, platoon unblocked						
vC, conflicting volume	11				174	11
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	11				174	11
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				78	100
cM capacity (veh/h)	1608				816	1070

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	0	163	11	0	179
Volume Left	0	0	0	0	179
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	816
Volume to Capacity	0.00	0.10	0.01	0.00	0.22
Queue Length 95th (m)	0.0	0.0	0.0	0.0	6.7
Control Delay (s)	0.0	0.0	0.0	0.0	10.6
Lane LOS					B
Approach Delay (s)	0.0		0.0		10.6
Approach LOS					B

Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	23.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	230	0	0	10	15	0	0	0	0	0	0
Future Volume (Veh/h)	85	230	0	0	10	15	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	250	0	0	11	16	0	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					373							
pX, platoon unblocked												
vC, conflicting volume	27			250			440	461	125	328	453	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	27			250			440	461	125	328	453	14
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
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 %	94			100			100	100	100	100	100	100
cM capacity (veh/h)	1585			1313			479	467	902	575	472	1063

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	92	125	125	0	7	20	0	0	0	0	0
Volume Left	92	0	0	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	16	0	0	0	0	0
cSH	1585	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.06	0.07	0.07	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.09
Queue Length 95th (m)	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						A	A	A	A	A
Approach Delay (s)	2.0			0.0			0.0		0.0		
Approach LOS							A		A		

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	14.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	370	15	20	250	10
Future Volume (Veh/h)	0	370	15	20	250	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	402	16	22	272	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		127	245			
pX, platoon unblocked						
vC, conflicting volume	38				228	19
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	38				228	19
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				63	99
cM capacity (veh/h)	1571				740	1055

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	134	268	11	27	283
Volume Left	0	0	0	0	272
Volume Right	0	0	0	22	11
cSH	1571	1700	1700	1700	749
Volume to Capacity	0.00	0.16	0.01	0.02	0.38
Queue Length 95th (m)	0.0	0.0	0.0	0.0	14.2
Control Delay (s)	0.0	0.0	0.0	0.0	12.7
Lane LOS					B
Approach Delay (s)	0.0		0.0		12.7
Approach LOS					B

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	31.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	65	555	35	55	0	0
Future Volume (Veh/h)	65	555	35	55	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	71	603	38	60	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				116	339	
pX, platoon unblocked						
vC, conflicting volume	136	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	136	0	0			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	44	98			
cM capacity (veh/h)	837	1085	1623			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	71	603	98	0
Volume Left	71	0	38	0
Volume Right	0	603	0	0
cSH	837	1085	1623	1700
Volume to Capacity	0.08	0.56	0.02	0.02
Queue Length 95th (m)	2.2	28.4	0.6	0.0
Control Delay (s)	9.7	12.4	2.9	0.0
Lane LOS	A	B	A	
Approach Delay (s)	12.1		2.9	0.0
Approach LOS	B			

Intersection Summary			
Average Delay	10.9		
Intersection Capacity Utilization	37.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	195	0	60	45	0	0
Future Volume (Veh/h)	195	0	60	45	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	212	0	65	49	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			84			105
pX, platoon unblocked						
vC, conflicting volume	90	90			114	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	90	90			114	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	77	100			100	
cM capacity (veh/h)	911	968			1475	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	212	114	0
Volume Left	212	0	0
Volume Right	0	49	0
cSH	911	1700	1700
Volume to Capacity	0.23	0.07	0.00
Queue Length 95th (m)	7.2	0.0	0.0
Control Delay (s)	10.1	0.0	0.0
Lane LOS	B		
Approach Delay (s)	10.1	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	6.6		
Intersection Capacity Utilization	23.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	235	0	45	35	0	185
Future Volume (Veh/h)	235	0	45	35	0	185
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	255	0	49	38	0	201
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	70			80		
pX, platoon unblocked						
vC, conflicting volume			255		391	255
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			255		391	255
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		100	74
cM capacity (veh/h)			1310		590	784

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	255	87	201
Volume Left	0	49	0
Volume Right	0	0	201
cSH	1700	1310	784
Volume to Capacity	0.15	0.04	0.26
Queue Length 95th (m)	0.0	0.9	8.2
Control Delay (s)	0.0	4.6	11.2
Lane LOS		A	B
Approach Delay (s)	0.0	4.6	11.2
Approach LOS			B

Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	38.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	420	0	40	80	0	130
Future Volume (Veh/h)	420	0	40	80	0	130
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	457	0	43	87	0	141
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	75			323		
pX, platoon unblocked						
vC, conflicting volume			457		630	457
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			457		630	457
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		100	77
cM capacity (veh/h)			1104		428	604

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	457	130	141
Volume Left	0	43	0
Volume Right	0	0	141
cSH	1700	1104	604
Volume to Capacity	0.27	0.04	0.23
Queue Length 95th (m)	0.0	1.0	7.2
Control Delay (s)	0.0	3.0	12.8
Lane LOS		A	B
Approach Delay (s)	0.0	3.0	12.8
Approach LOS			B

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	46.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	130	270	45	155	30	5
Future Volume (Veh/h)	130	270	45	155	30	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	141	293	49	168	33	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				87	96	
pX, platoon unblocked						
vC, conflicting volume	302	36	38			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	302	36	38			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	79	72	97			
cM capacity (veh/h)	669	1037	1572			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	434	217	38
Volume Left	141	49	0
Volume Right	293	0	5
cSH	880	1572	1700
Volume to Capacity	0.49	0.03	0.02
Queue Length 95th (m)	22.3	0.8	0.0
Control Delay (s)	13.0	1.9	0.0
Lane LOS	B	A	
Approach Delay (s)	13.0	1.9	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	8.8		
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	160	5	5	15	255	30
Future Volume (Veh/h)	160	5	5	15	255	30
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	174	5	5	16	277	33
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				81	89	
pX, platoon unblocked						
vC, conflicting volume	320	294	310			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	320	294	310			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	74	99	100			
cM capacity (veh/h)	671	746	1250			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	179	21	310
Volume Left	174	5	0
Volume Right	5	0	33
cSH	673	1250	1700
Volume to Capacity	0.27	0.00	0.18
Queue Length 95th (m)	8.5	0.1	0.0
Control Delay (s)	12.3	1.9	0.0
Lane LOS	B	A	
Approach Delay (s)	12.3	1.9	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	4.4		
Intersection Capacity Utilization	31.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	230	10	15	140	15
Future Volume (Veh/h)	0	230	10	15	140	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	250	11	16	152	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		62	66			
pX, platoon unblocked						
vC, conflicting volume	27				144	14
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	27				144	14
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				82	98
cM capacity (veh/h)	1585				834	1063

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	83	167	7	20	168
Volume Left	0	0	0	0	152
Volume Right	0	0	0	16	16
cSH	1585	1700	1700	1700	851
Volume to Capacity	0.00	0.10	0.00	0.01	0.20
Queue Length 95th (m)	0.0	0.0	0.0	0.0	5.8
Control Delay (s)	0.0	0.0	0.0	0.0	10.3
Lane LOS					B
Approach Delay (s)	0.0		0.0		10.3
Approach LOS					B

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	21.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	35	182	348	722	101	121	177	1843	843	197	3657	51
v/c Ratio	0.12	0.66	0.98	0.90	0.16	0.22	1.00	0.92	0.88	1.00	1.75	0.08
Control Delay	27.9	69.5	78.6	67.3	34.5	6.6	65.0	20.0	15.7	99.0	368.3	0.2
Queue Delay	0.0	0.0	51.0	60.7	0.0	0.0	0.0	0.0	6.4	0.0	0.8	0.0
Total Delay	27.9	69.5	129.6	128.0	34.5	6.6	65.0	20.0	22.1	99.0	369.1	0.2
Queue Length 50th (m)	5.9	51.3	~66.1	105.0	21.0	0.0	~33.2	182.5	211.8	40.6	~578.6	0.0
Queue Length 95th (m)	13.1	#82.0	#133.2	#136.7	36.8	15.0	m22.3	m102.8	m67.9	#94.4	#598.2	0.0
Internal Link Dist (m)		361.1			497.8			251.4			315.2	
Turn Bay Length (m)	80.0			165.0		15.0				85.0		80.0
Base Capacity (vph)	370	274	354	824	624	561	177	2013	963	197	2088	656
Starvation Cap Reductn	0	0	0	0	0	0	0	0	88	0	0	0
Spillback Cap Reductn	0	0	226	618	0	0	0	0	0	0	504	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.66	2.72	3.50	0.16	0.22	1.00	0.92	0.96	1.00	2.31	0.08

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	180	345	715	100	120	175	1825	835	195	3620	50
Future Volume (vph)	35	180	345	715	100	120	175	1825	835	195	3620	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.8	5.8	4.7	5.8	5.8	3.0	5.1	5.1	3.0	5.1	5.1
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.97	1.00	1.00	0.91
Flpb, ped/bikes	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	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)	1668	1863	1568	3367	1827	1410	1719	4988	1513	1787	5085	1383
Flt Permitted	0.69	1.00	1.00	0.95	1.00	1.00	0.07	1.00	1.00	0.07	1.00	1.00
Satd. Flow (perm)	1215	1863	1568	3367	1827	1410	131	4988	1513	134	5085	1383
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	35	182	348	722	101	121	177	1843	843	197	3657	51
RTOR Reduction (vph)	0	0	122	0	0	80	0	0	358	0	0	30
Lane Group Flow (vph)	35	182	226	722	101	41	177	1843	485	197	3657	21
Confl. Peds. (#/hr)	35					35	35		10	10		35
Heavy Vehicles (%)	3%	2%	3%	4%	4%	4%	5%	4%	3%	1%	2%	6%
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8		8			4	6		6	2		2
Actuated Green, G (s)	27.0	20.8	20.8	32.3	46.9	46.9	63.3	54.3	54.3	65.3	55.3	55.3
Effective Green, g (s)	29.0	21.8	21.8	33.3	47.9	47.9	65.3	55.3	55.3	67.3	56.3	56.3
Actuated g/C Ratio	0.21	0.16	0.16	0.24	0.34	0.34	0.47	0.39	0.39	0.48	0.40	0.40
Clearance Time (s)	5.7	6.8	6.8	5.7	6.8	6.8	4.0	6.1	6.1	4.0	6.1	6.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	274	290	244	800	625	482	174	1970	597	194	2044	556
v/s Ratio Prot	0.01	0.10		c0.21	0.06		0.07	0.37		c0.08	c0.72	
v/s Ratio Perm	0.02		c0.14			0.03	0.40		0.32	0.41		0.01
v/c Ratio	0.13	0.63	0.93	0.90	0.16	0.09	1.02	0.94	0.81	1.02	1.79	0.04
Uniform Delay, d1	44.9	55.3	58.3	51.8	32.1	31.2	40.7	40.6	37.7	41.5	41.9	25.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.40	0.47	1.31	1.00	1.00	1.00
Incremental Delay, d2	0.2	4.2	38.1	13.4	0.1	0.1	24.9	1.1	1.2	68.7	357.1	0.1
Delay (s)	45.2	59.5	96.4	65.2	32.2	31.3	82.1	20.4	50.6	110.2	398.9	25.5
Level of Service	D	E	F	E	C	C	F	C	D	F	F	C
Approach Delay (s)		81.4			57.3			33.1			379.5	
Approach LOS		F			E			C			F	

Intersection Summary			
HCM 2000 Control Delay	202.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	125.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	5	237	399	400	381	3428	5402	5
v/c Ratio	0.02	0.36	0.95	0.95	0.55	1.34	2.09	0.01
Control Delay	24.4	27.2	74.2	74.7	26.9	184.5	515.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.4	27.2	74.2	74.7	26.9	184.5	515.8	0.0
Queue Length 50th (m)	0.9	41.5	114.1	114.5	57.4	~475.2	~905.0	0.0
Queue Length 95th (m)	3.8	64.6	#213.6	#214.3	104.3	#496.4	m#557.9	m0.0
Internal Link Dist (m)		327.0		348.8		26.7	251.4	
Turn Bay Length (m)								
Base Capacity (vph)	322	658	422	422	691	2565	2589	827
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	6	8	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.36	0.95	0.95	0.56	1.34	2.09	0.01

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	230	775	0	370	0	3325	0	0	5240	5
Future Volume (vph)	5	0	230	775	0	370	0	3325	0	0	5240	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00		0.91			0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	0.85		1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected	0.95	1.00		0.95	0.95	1.00		1.00			1.00	1.00
Satd. Flow (prot)	1805	1599		1715	1715	1615		4988			5036	1543
Flt Permitted	0.30	1.00		0.61	0.61	1.00		1.00			1.00	1.00
Satd. Flow (perm)	566	1599		1103	1103	1615		4988			5036	1543
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	5	0	237	799	0	381	0	3428	0	0	5402	5
RTOR Reduction (vph)	0	18	0	0	0	73	0	0	0	0	0	3
Lane Group Flow (vph)	5	219	0	399	400	308	0	3428	0	0	5402	2
Confl. Peds. (#/hr)							10		5	5		10
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	0%	4%	4%	0%	3%	0%
Turn Type	pm+pt	NA		Perm	NA	Perm		NA			NA	Perm
Protected Phases	3	8			4			2			6	
Permitted Phases	8			4		4						6
Actuated Green, G (s)	59.0	59.0		52.6	52.6	52.6		67.0			67.0	67.0
Effective Green, g (s)	60.0	60.0		53.6	53.6	53.6		68.0			68.0	68.0
Actuated g/C Ratio	0.43	0.43		0.38	0.38	0.38		0.49			0.49	0.49
Clearance Time (s)	5.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	263	685		422	422	618		2422			2446	749
v/s Ratio Prot	0.00	c0.14						0.69			c1.07	
v/s Ratio Perm	0.01			0.36	c0.36	0.19						0.00
v/c Ratio	0.02	0.32		0.95	0.95	0.50		1.42			2.21	0.00
Uniform Delay, d1	25.1	26.5		41.8	41.8	32.9		36.0			36.0	18.5
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.51	1.00
Incremental Delay, d2	0.0	0.3		30.1	30.5	0.6		189.4			543.9	0.0
Delay (s)	25.1	26.8		71.8	72.3	33.6		225.4			598.4	18.5
Level of Service	C	C		E	E	C		F			F	B
Approach Delay (s)		26.7			59.7			225.4			597.9	
Approach LOS		C			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	398.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.63		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	152.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1663	1173	2602	4056
v/c Ratio	1.13	1.73	1.08	1.66
Control Delay	105.2	362.7	70.6	325.5
Queue Delay	0.0	0.0	0.4	0.0
Total Delay	105.2	362.7	70.9	325.5
Queue Length 50th (m)	~289.0	~504.2	~307.1	~627.4
Queue Length 95th (m)	#332.6	#588.8	m183.7	#643.4
Internal Link Dist (m)	190.2		56.8	39.3
Turn Bay Length (m)				
Base Capacity (vph)	1471	678	2399	2446
Starvation Cap Reductn	0	0	2	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.13	1.73	1.09	1.66

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.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1630	1150	0	2550	3975	0
Future Volume (vph)	1630	1150	0	2550	3975	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	1.00		0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3433	1583		4940	5036	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3433	1583		4940	5036	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	1663	1173	0	2602	4056	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1663	1173	0	2602	4056	0
Confl. Peds. (#/hr)			10			10
Heavy Vehicles (%)	2%	2%	0%	5%	3%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Actuated Green, G (s)	59.0	59.0		67.0	67.0	
Effective Green, g (s)	60.0	60.0		68.0	68.0	
Actuated g/C Ratio	0.43	0.43		0.49	0.49	
Clearance Time (s)	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1471	678		2399	2446	
v/s Ratio Prot	0.48			0.53	c0.81	
v/s Ratio Perm		c0.74				
v/c Ratio	1.13	1.73		1.08	1.66	
Uniform Delay, d1	40.0	40.0		36.0	36.0	
Progression Factor	1.00	1.00		0.84	1.00	
Incremental Delay, d2	67.9	334.7		40.4	298.0	
Delay (s)	107.9	374.7		70.8	334.0	
Level of Service	F	F		E	F	
Approach Delay (s)	218.3			70.8	334.0	
Approach LOS	F			E	F	

Intersection Summary			
HCM 2000 Control Delay	227.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.69		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	137.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	195	0	0	0	0	2875	865	0	3775	835
Future Volume (Veh/h)	0	0	195	0	0	0	0	2875	865	0	3775	835
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	0	210	0	0	0	0	3091	930	0	4059	898
Pedestrians		10			5							
Lane Width (m)		3.6			0.0							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		1			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								198			81	
pX, platoon unblocked	0.69	0.69	0.52	0.69	0.69	0.65	0.52			0.65		
vC, conflicting volume	5548	8544	1812	4449	8063	1035	4967			4026		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2628	6947	0	1043	6253	0	5399			3773		
tC, single (s)	7.5	6.5	7.0	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	62	100	100	100	100			100		
cM capacity (veh/h)	8	0	554	80	0	712	6			37		

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3
Volume Total	210	1030	1030	1030	930	1624	1624	1710
Volume Left	0	0	0	0	0	0	0	0
Volume Right	210	0	0	0	930	0	0	898
cSH	554	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.38	0.61	0.61	0.61	0.55	0.96	0.96	1.01
Queue Length 95th (m)	14.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	15.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	C							
Approach Delay (s)	15.4	0.0				0.0		
Approach LOS	C							

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	110.5%	ICU Level of Service	H
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1258	340	67	129	93	155	2077	222	3175
v/c Ratio	1.38	0.64	0.26	0.78	0.30	1.03	1.07	1.01	1.54
Control Delay	216.7	46.4	31.8	91.4	2.6	112.9	84.2	67.6	275.8
Queue Delay	1.2	4.4	0.0	0.0	0.1	0.0	12.1	0.0	0.0
Total Delay	217.9	50.7	31.8	91.4	2.7	112.9	96.2	67.6	275.8
Queue Length 50th (m)	~250.0	82.5	11.8	37.3	0.0	~32.0	~245.8	~53.5	~471.5
Queue Length 95th (m)	#293.9	119.5	22.2	#71.3	0.0	#79.9	#276.0	m28.0	m164.3
Internal Link Dist (m)		97.1		158.4			292.1		174.2
Turn Bay Length (m)	130.0		50.0			120.0		55.0	
Base Capacity (vph)	911	535	253	168	306	151	1936	219	2056
Starvation Cap Reductn	174	127	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	13	0	380	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.71	0.83	0.26	0.77	0.32	1.03	1.33	1.01	1.54

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1220	190	140	65	125	90	150	1980	35	215	2615	465
Future Volume (vph)	1220	190	140	65	125	90	150	1980	35	215	2615	465
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	6.0	4.0	6.0		3.0	6.0	
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3273	1697		1729	1810	1553	1671	5019		1736	4921	
Flt Permitted	0.95	1.00		0.56	1.00	1.00	0.08	1.00		0.07	1.00	
Satd. Flow (perm)	3273	1697		1012	1810	1553	134	5019		131	4921	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	1258	196	144	67	129	93	155	2041	36	222	2696	479
RTOR Reduction (vph)	0	18	0	0	0	84	0	1	0	0	18	0
Lane Group Flow (vph)	1258	322	0	67	129	9	155	2076	0	222	3157	0
Confl. Peds. (#/hr)			5	5			15		5	5		15
Heavy Vehicles (%)	7%	0%	9%	4%	5%	4%	8%	3%	3%	4%	2%	4%
Turn Type	Prot	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8		8	2			6		
Actuated Green, G (s)	38.0	41.7		22.9	13.3	13.3	58.7	51.6		67.7	55.6	
Effective Green, g (s)	39.0	42.7		24.9	14.3	14.3	60.7	52.6		68.7	56.6	
Actuated g/C Ratio	0.28	0.31		0.18	0.10	0.10	0.43	0.38		0.49	0.40	
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	5.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.5	4.0	4.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	911	517		234	184	158	147	1885		214	1989	
v/s Ratio Prot	c0.38	c0.19		0.02	0.07		0.06	0.41		c0.10	c0.64	
v/s Ratio Perm				0.03		0.01	0.40			0.41		
v/c Ratio	1.38	0.62		0.29	0.70	0.06	1.05	1.10		1.04	1.59	
Uniform Delay, d1	50.5	41.7		49.2	60.8	56.8	36.8	43.7		44.0	41.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.35	1.00	
Incremental Delay, d2	178.3	2.3		0.8	12.2	0.2	89.4	54.3		29.0	264.4	
Delay (s)	228.8	44.1		50.0	73.0	57.0	126.2	98.0		88.2	306.1	
Level of Service	F	D		D	E	E	F	F		F	F	
Approach Delay (s)		189.5			62.5			99.9			291.9	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	204.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.40		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	130.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	276	813	68	94	839	667	52	818	786	1172	401
v/c Ratio	1.01	1.41	0.11	0.51	0.78	0.88	0.33	0.96	1.02	1.44	0.54
Control Delay	122.5	231.5	0.4	35.8	52.4	31.1	27.8	78.2	92.1	237.2	22.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	122.5	231.5	0.4	35.8	52.4	31.1	27.8	78.2	92.1	237.2	22.0
Queue Length 50th (m)	~45.1	~335.5	0.0	17.2	124.4	82.4	7.8	131.9	~131.8	~498.8	56.7
Queue Length 95th (m)	#76.9	#430.6	0.0	30.2	150.9	#166.0	15.3	#175.4	#173.4	#587.6	92.7
Internal Link Dist (m)		551.4			604.3			115.4		292.1	
Turn Bay Length (m)	85.0			85.0		75.0	40.0		85.0		
Base Capacity (vph)	274	577	595	294	1075	757	168	848	774	815	736
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.01	1.41	0.11	0.32	0.78	0.88	0.31	0.96	1.02	1.44	0.54

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	265	780	65	90	805	640	50	720	65	755	1125	385
Future Volume (vph)	265	780	65	90	805	640	50	720	65	755	1125	385
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.4	5.4	4.0	5.4	5.4	3.0	5.9		4.0	5.9	5.9
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.94	1.00	1.00	0.95	1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3367	1792	1481	1736	3438	1480	1770	3477		3400	1881	1496
Flt Permitted	0.95	1.00	1.00	0.09	1.00	1.00	0.11	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3367	1792	1481	157	3438	1480	207	3477		3400	1881	1496
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	276	812	68	94	839	667	52	750	68	786	1172	401
RTOR Reduction (vph)	0	0	46	0	0	294	0	5	0	0	0	89
Lane Group Flow (vph)	276	813	22	94	839	373	52	813	0	786	1172	312
Confl. Peds. (#/hr)	25		15	15		25	20		10	10		20
Heavy Vehicles (%)	4%	6%	3%	4%	5%	4%	2%	2%	6%	3%	1%	4%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases			8	4		4	2					6
Actuated Green, G (s)	11.1	46.8	46.8	55.8	45.4	45.4	41.3	35.0		32.8	62.5	62.5
Effective Green, g (s)	12.1	47.8	47.8	57.8	46.4	46.4	43.3	36.0		33.8	63.5	63.5
Actuated g/C Ratio	0.08	0.32	0.32	0.39	0.31	0.31	0.29	0.24		0.23	0.43	0.43
Clearance Time (s)	5.7	6.4	6.4	5.0	6.4	6.4	4.0	6.9		5.0	6.9	6.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	274	577	477	182	1075	463	137	844		774	805	640
v/s Ratio Prot	c0.08	c0.45		0.04	0.24		0.02	0.23		c0.23	c0.62	
v/s Ratio Perm			0.01	0.16		0.25	0.09					0.21
v/c Ratio	1.01	1.41	0.05	0.52	0.78	0.81	0.38	0.96		1.02	1.46	0.49
Uniform Delay, d1	68.1	50.3	34.6	35.6	46.3	46.8	41.8	55.5		57.3	42.4	30.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	56.2	194.2	0.0	2.5	3.7	9.8	1.8	23.3		36.3	212.1	2.6
Delay (s)	124.3	244.5	34.6	38.1	50.1	56.6	43.6	78.8		93.5	254.5	33.3
Level of Service	F	F	C	D	D	E	D	E		F	F	C
Approach Delay (s)		203.5			52.1			76.7			163.2	
Approach LOS		F			D			E			F	

Intersection Summary			
HCM 2000 Control Delay	128.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.40		
Actuated Cycle Length (s)	148.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	128.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	667	11	379	453
v/c Ratio	0.66	0.07	0.20	0.25
Control Delay	28.8	12.9	7.4	7.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	28.8	12.9	7.4	7.8
Queue Length 50th (m)	43.8	0.9	9.4	11.9
Queue Length 95th (m)	55.9	3.3	18.7	23.0
Internal Link Dist (m)	146.6	179.3	180.3	263.4
Turn Bay Length (m)				
Base Capacity (vph)	1562	234	1929	1834
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.43	0.05	0.20	0.25

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	175	340	65	10	0	0	0	295	35	10	350	35
Future Volume (vph)	175	340	65	10	0	0	0	295	35	10	350	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5			3.5			3.5			3.5	
Lane Util. Factor		0.95			1.00			0.95			0.95	
Frt		0.98			1.00			0.98			0.99	
Flt Protected		0.99			0.95			1.00			1.00	
Satd. Flow (prot)		3496			1626			3449			3466	
Flt Permitted		0.86			0.27			1.00			0.95	
Satd. Flow (perm)		3041			463			3449			3282	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	201	391	75	11	0	0	0	339	40	11	402	40
RTOR Reduction (vph)	0	22	0	0	0	0	0	11	0	0	8	0
Lane Group Flow (vph)	0	645	0	0	11	0	0	368	0	0	445	0
Heavy Vehicles (%)	0%	0%	0%	11%	0%	0%	50%	3%	3%	0%	3%	0%
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		18.6			18.6			32.4			32.4	
Effective Green, g (s)		19.6			19.6			33.4			33.4	
Actuated g/C Ratio		0.33			0.33			0.56			0.56	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		993			151			1919			1826	
v/s Ratio Prot								0.11				
v/s Ratio Perm		c0.21			0.02						c0.14	
v/c Ratio		0.65			0.07			0.19			0.24	
Uniform Delay, d1		17.3			13.9			6.6			6.8	
Progression Factor		1.66			1.00			1.00			1.00	
Incremental Delay, d2		1.2			0.2			0.2			0.3	
Delay (s)		29.8			14.1			6.8			7.1	
Level of Service		C			B			A			A	
Approach Delay (s)		29.8			14.1			6.8			7.1	
Approach LOS		C			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	41.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1073	134	116	512	152	256
v/c Ratio	0.88	0.12	0.40	0.36	0.54	0.61
Control Delay	23.8	1.6	7.6	4.3	39.4	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.8	1.6	7.6	4.3	39.4	14.4
Queue Length 50th (m)	134.1	0.0	3.2	21.2	24.2	7.1
Queue Length 95th (m)	#226.9	5.0	8.0	37.6	36.2	21.1
Internal Link Dist (m)	228.8			1140.2	151.2	
Turn Bay Length (m)		100.0	100.0		100.0	
Base Capacity (vph)	1219	1150	292	1422	409	513
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	0.88	0.12	0.40	0.36	0.37	0.50

Intersection Summary

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	880	110	95	420	125	210
Future Volume (vph)	880	110	95	420	125	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	1.0	3.0	3.0	3.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1776	1615	1770	1845	1787	1538
Flt Permitted	1.00	1.00	0.10	1.00	0.95	1.00
Satd. Flow (perm)	1776	1615	186	1845	1787	1538
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	1073	134	116	512	152	256
RTOR Reduction (vph)	0	43	0	0	0	176
Lane Group Flow (vph)	1073	91	116	512	152	80
Heavy Vehicles (%)	7%	0%	2%	3%	1%	5%
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	56.9	56.9	64.5	64.5	12.5	12.5
Effective Green, g (s)	57.9	57.9	65.5	65.5	13.5	13.5
Actuated g/C Ratio	0.68	0.68	0.77	0.77	0.16	0.16
Clearance Time (s)	4.0	4.0	2.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1209	1100	266	1421	283	244
v/s Ratio Prot	c0.60		c0.03	0.28	c0.09	
v/s Ratio Perm		0.06	0.30			0.05
v/c Ratio	0.89	0.08	0.44	0.36	0.54	0.33
Uniform Delay, d1	10.9	4.6	13.3	3.1	32.9	31.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.8	0.1	1.1	0.7	2.0	0.8
Delay (s)	20.8	4.7	14.4	3.8	34.8	32.5
Level of Service	C	A	B	A	C	C
Approach Delay (s)	19.0			5.8	33.4	
Approach LOS	B			A	C	

Intersection Summary			
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	87	1364	43	1098	250	201	168	342	293
v/c Ratio	0.58	0.81	0.35	0.65	0.91	0.32	0.44	0.53	0.51
Control Delay	29.4	16.7	18.3	13.1	62.0	13.8	20.6	20.3	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.4	16.7	18.3	13.1	62.0	13.8	20.6	20.3	16.0
Queue Length 50th (m)	6.2	58.7	2.7	42.6	28.3	13.6	15.4	32.6	19.9
Queue Length 95th (m)	#26.3	83.5	10.7	60.1	#69.5	28.4	31.8	55.9	41.6
Internal Link Dist (m)		585.1		130.4		189.6		92.5	
Turn Bay Length (m)	45.0		30.0				25.0		25.0
Base Capacity (vph)	159	1774	129	1783	274	638	386	643	571
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.77	0.33	0.62	0.91	0.32	0.44	0.53	0.51

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	1075	180	40	950	60	230	125	60	155	315	270
Future Volume (vph)	80	1075	180	40	950	60	230	125	60	155	315	270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1654	3392		1752	3437		1731	1786		1696	1881	1527
Flt Permitted	0.18	1.00		0.14	1.00		0.44	1.00		0.63	1.00	1.00
Satd. Flow (perm)	308	3392		250	3437		801	1786		1128	1881	1527
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	1168	196	43	1033	65	250	136	65	168	342	293
RTOR Reduction (vph)	0	24	0	0	8	0	0	28	0	0	0	49
Lane Group Flow (vph)	87	1340	0	43	1090	0	250	173	0	168	342	244
Confl. Peds. (#/hr)	5					5	5		5	5		5
Heavy Vehicles (%)	9%	4%	5%	3%	4%	3%	4%	0%	2%	6%	1%	4%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	28.5	28.5		28.5	28.5		19.5	19.5		19.5	19.5	19.5
Effective Green, g (s)	29.5	29.5		29.5	29.5		20.5	20.5		20.5	20.5	20.5
Actuated g/C Ratio	0.49	0.49		0.49	0.49		0.34	0.34		0.34	0.34	0.34
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	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
Lane Grp Cap (vph)	151	1667		122	1689		273	610		385	642	521
v/s Ratio Prot		c0.40			0.32			0.10			0.18	
v/s Ratio Perm	0.28			0.17			c0.31			0.15		0.16
v/c Ratio	0.58	0.80		0.35	0.65		0.92	0.28		0.44	0.53	0.47
Uniform Delay, d1	10.8	12.8		9.4	11.4		18.9	14.4		15.3	15.9	15.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	15.0	4.2		7.8	1.9		32.9	0.3		0.8	0.9	0.7
Delay (s)	25.8	17.0		17.2	13.3		51.8	14.7		16.1	16.7	16.2
Level of Service	C	B		B	B		D	B		B	B	B
Approach Delay (s)		17.6			13.4			35.2			16.4	
Approach LOS		B			B			D			B	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	59	1341	154	1074	245	793	59	191	16
v/c Ratio	0.20	0.93	0.92	0.77	0.48	0.99	0.09	0.24	0.03
Control Delay	10.3	26.9	74.6	16.0	13.4	46.7	5.1	9.4	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.3	26.9	74.6	16.0	13.4	46.7	5.1	9.4	1.9
Queue Length 50th (m)	1.4	50.7	11.2	37.2	13.7	60.7	1.0	9.5	0.0
Queue Length 95th (m)	4.5	#93.5	#40.0	#56.9	29.5	#125.0	5.8	19.5	1.5
Internal Link Dist (m)		208.7		203.3		1140.2		129.5	
Turn Bay Length (m)	125.0		145.0		15.0		40.0		
Base Capacity (vph)	301	1439	167	1398	510	802	635	786	494
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.93	0.92	0.77	0.48	0.99	0.09	0.24	0.03

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	1140	120	145	1010	0	230	745	55	0	180	15
Future Volume (vph)	55	1140	120	145	1010	0	230	745	55	0	180	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5		3.5	3.5
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	3213	3366		1787	3312		1805	1900	1455		1863	1122
Flt Permitted	0.21	1.00		0.21	1.00		0.64	1.00	1.00		1.00	1.00
Satd. Flow (perm)	712	3366		396	3312		1211	1900	1455		1863	1122
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)	59	1213	128	154	1074	0	245	793	59	0	191	16
RTOR Reduction (vph)	0	18	0	0	0	0	0	0	21	0	0	9
Lane Group Flow (vph)	59	1323	0	154	1074	0	245	793	38	0	191	7
Heavy Vehicles (%)	9%	6%	3%	1%	9%	0%	0%	0%	11%	0%	2%	44%
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	18.0	18.0		18.0	18.0		18.0	18.0	18.0		18.0	18.0
Effective Green, g (s)	19.0	19.0		19.0	19.0		19.0	19.0	19.0		19.0	19.0
Actuated g/C Ratio	0.42	0.42		0.42	0.42		0.42	0.42	0.42		0.42	0.42
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5		4.5	4.5
Lane Grp Cap (vph)	300	1421		167	1398		511	802	614		786	473
v/s Ratio Prot		c0.39			0.32			c0.42			0.10	
v/s Ratio Perm	0.08			0.39			0.20		0.03			0.01
v/c Ratio	0.20	0.93		0.92	0.77		0.48	0.99	0.06		0.24	0.01
Uniform Delay, d1	8.2	12.4		12.3	11.1		9.4	12.9	7.7		8.4	7.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.5	12.3		51.6	4.1		3.2	29.2	0.2		0.7	0.1
Delay (s)	9.7	24.6		63.9	15.2		12.6	42.1	7.9		9.1	7.6
Level of Service	A	C		E	B		B	D	A		A	A
Approach Delay (s)		24.0			21.3			33.7			9.0	
Approach LOS		C			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	100.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	290	0	0	185	0	0
Future Volume (Veh/h)	290	0	0	185	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	315	0	0	201	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	287					
pX, platoon unblocked						
vC, conflicting volume			315		516	315
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			315		516	315
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1245		519	725

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	315	201	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.19	0.12	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	18.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	Y	
Traffic Volume (veh/h)	290	0	0	185	0	60
Future Volume (Veh/h)	290	0	0	185	0	60
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	315	0	0	201	0	65
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	402			296		
pX, platoon unblocked						
vC, conflicting volume			315		516	315
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			315		516	315
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	91
cM capacity (veh/h)			1245		519	725

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	315	201	65
Volume Left	0	0	0
Volume Right	0	0	65
cSH	1700	1700	725
Volume to Capacity	0.19	0.12	0.09
Queue Length 95th (m)	0.0	0.0	2.4
Control Delay (s)	0.0	0.0	10.5
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.5
Approach LOS			B

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	25.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	670	0	35	265	0	285
Future Volume (Veh/h)	670	0	35	265	0	285
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	728	0	38	288	0	310
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				253		
pX, platoon unblocked						
vC, conflicting volume			728		1092	728
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			728		1092	728
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		100	27
cM capacity (veh/h)			876		227	423

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	728	326	310
Volume Left	0	38	0
Volume Right	0	0	310
cSH	1700	876	423
Volume to Capacity	0.43	0.04	0.73
Queue Length 95th (m)	0.0	1.1	46.5
Control Delay (s)	0.0	1.5	33.4
Lane LOS		A	D
Approach Delay (s)	0.0	1.5	33.4
Approach LOS			D

Intersection Summary			
Average Delay	8.0		
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	340	0	0	0	0	0	0	0	0	0	0
Future Volume (Veh/h)	0	340	0	0	0	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	370	0	0	0	0	0	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		203			262							
pX, platoon unblocked				0.87			0.87	0.87	0.87	0.87	0.87	
vC, conflicting volume	0			370			370	370	370	370	370	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			196			196	196	196	196	196	0
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 %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1623			1193			661	606	733	661	606	1085

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	370	0	0	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1623	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS			A	A
Approach Delay (s)	0.0	0.0	0.0	0.0
Approach LOS			A	A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	21.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	280	0	0	0	45	0	0	0	30	165	0
Future Volume (Veh/h)	60	280	0	0	0	45	0	0	0	30	165	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	304	0	0	0	49	0	0	0	33	179	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		313			152							
pX, platoon unblocked				0.98			0.98	0.98	0.98	0.98	0.98	
vC, conflicting volume	49			304			524	483	304	458	458	24
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	49			274			499	458	274	432	432	24
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 %	96			100			100	100	100	93	63	100
cM capacity (veh/h)	1558			1258			325	467	746	504	483	1052

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	65	304	0	49	0	212
Volume Left	65	0	0	0	0	33
Volume Right	0	0	0	49	0	0
cSH	1558	1700	1700	1700	1700	486
Volume to Capacity	0.04	0.18	0.00	0.03	0.00	0.44
Queue Length 95th (m)	1.0	0.0	0.0	0.0	0.0	17.5
Control Delay (s)	7.4	0.0	0.0	0.0	0.0	18.0
Lane LOS	A				A	C
Approach Delay (s)	1.3		0.0		0.0	18.0
Approach LOS					A	C

Intersection Summary			
Average Delay	6.8		
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	212	125	76	109	22	11
v/c Ratio	0.20	0.08	0.06	0.23	0.13	0.01
Control Delay	1.4	1.1	1.7	23.9	23.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.4	1.1	1.7	23.9	23.9	0.0
Queue Length 50th (m)	2.3	1.4	1.1	6.0	2.3	0.0
Queue Length 95th (m)	5.4	3.3	m3.5	m12.0	7.7	0.0
Internal Link Dist (m)		128.4	106.7	150.5		264.2
Turn Bay Length (m)	50.0				50.0	
Base Capacity (vph)	1044	1475	1372	1268	455	1716
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.08	0.06	0.09	0.05	0.01

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	195	115	0	0	35	35	0	100	0	20	0	10
Future Volume (vph)	195	115	0	0	35	35	0	100	0	20	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5			3.5			3.5		3.5	3.5	
Lane Util. Factor	1.00	1.00			1.00			0.95		1.00	0.95	
Frt	1.00	1.00			0.93			1.00		1.00	0.85	
Flt Protected	0.95	1.00			1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863			1723			3539		1770	3008	
Flt Permitted	0.71	1.00			1.00			1.00		0.68	1.00	
Satd. Flow (perm)	1318	1863			1723			3539		1273	3008	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	212	125	0	0	38	38	0	109	0	22	0	11
RTOR Reduction (vph)	0	0	0	0	9	0	0	0	0	0	10	0
Lane Group Flow (vph)	212	125	0	0	67	0	0	109	0	22	1	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	44.9	44.9			44.9			6.1		6.1	6.1	
Effective Green, g (s)	45.9	45.9			45.9			7.1		7.1	7.1	
Actuated g/C Ratio	0.76	0.76			0.76			0.12		0.12	0.12	
Clearance Time (s)	4.5	4.5			4.5			4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	1008	1425			1318			418		150	355	
v/s Ratio Prot		0.07			0.04			c0.03			0.00	
v/s Ratio Perm	c0.16									0.02		
v/c Ratio	0.21	0.09			0.05			0.26		0.15	0.00	
Uniform Delay, d1	2.0	1.8			1.7			24.1		23.7	23.3	
Progression Factor	0.39	0.43			1.15			1.01		1.00	1.00	
Incremental Delay, d2	0.5	0.1			0.1			0.3		0.5	0.0	
Delay (s)	1.2	0.9			2.1			24.5		24.2	23.3	
Level of Service	A	A			A			C		C	C	
Approach Delay (s)		1.1			2.1			24.5			23.9	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	31.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	110	10	0	30	25	10	165	0	0	270	30
Future Volume (Veh/h)	10	110	10	0	30	25	10	165	0	0	270	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	120	11	0	33	27	11	179	0	0	293	33
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		131										
pX, platoon unblocked												
vC, conflicting volume	60			131			360	208	126	278	200	46
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	60			131			360	208	126	278	200	46
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 %	99			100			97	74	100	100	58	97
cM capacity (veh/h)	1544			1454			384	684	925	535	691	1023

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	11	131	0	60	190	326
Volume Left	11	0	0	0	11	0
Volume Right	0	11	0	27	0	33
cSH	1544	1700	1700	1700	655	715
Volume to Capacity	0.01	0.08	0.00	0.04	0.29	0.46
Queue Length 95th (m)	0.2	0.0	0.0	0.0	9.6	19.2
Control Delay (s)	7.3	0.0	0.0	0.0	12.7	14.2
Lane LOS	A				B	B
Approach Delay (s)	0.6		0.0		12.7	14.2
Approach LOS					B	B

Intersection Summary			
Average Delay	9.9		
Intersection Capacity Utilization	30.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	110	0	55	65	0	0
Future Volume (Veh/h)	110	0	55	65	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	120	0	60	71	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				280	175	
pX, platoon unblocked						
vC, conflicting volume	191	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	191	0	0			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	84	100	96			
cM capacity (veh/h)	768	1085	1623			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	120	131	0
Volume Left	120	60	0
Volume Right	0	0	0
cSH	768	1623	1700
Volume to Capacity	0.16	0.04	0.02
Queue Length 95th (m)	4.4	0.9	0.0
Control Delay (s)	10.5	3.5	0.0
Lane LOS	B	A	
Approach Delay (s)	10.5	3.5	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	6.9		
Intersection Capacity Utilization	19.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	35	85	10	0	65	15
Future Volume (Veh/h)	35	85	10	0	65	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	92	11	0	71	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		182	224			
pX, platoon unblocked						
vC, conflicting volume	11				179	11
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	11				179	11
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				91	99
cM capacity (veh/h)	1608				791	1070

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	130	11	87
Volume Left	38	0	71
Volume Right	0	0	16
cSH	1608	1700	831
Volume to Capacity	0.02	0.01	0.10
Queue Length 95th (m)	0.6	0.0	2.8
Control Delay (s)	2.3	0.0	9.8
Lane LOS	A		A
Approach Delay (s)	2.3	0.0	9.8
Approach LOS			A

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	24.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	150	10	0	0	0
Future Volume (Veh/h)	0	150	10	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	163	11	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			252			
pX, platoon unblocked						
vC, conflicting volume	11				174	11
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	11				174	11
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1608				816	1070

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	0	163	11	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.00	0.10	0.01	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				A
Approach Delay (s)	0.0		0.0	0.0
Approach LOS				A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	11.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	150	10	0	165	0
Future Volume (Veh/h)	0	150	10	0	165	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	163	11	0	179	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		111	141			
pX, platoon unblocked						
vC, conflicting volume	11				174	11
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	11				174	11
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				78	100
cM capacity (veh/h)	1608				816	1070

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	0	163	11	0	179
Volume Left	0	0	0	0	179
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	816
Volume to Capacity	0.00	0.10	0.01	0.00	0.22
Queue Length 95th (m)	0.0	0.0	0.0	0.0	6.7
Control Delay (s)	0.0	0.0	0.0	0.0	10.6
Lane LOS					B
Approach Delay (s)	0.0		0.0		10.6
Approach LOS					B

Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	23.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	230	0	0	10	15	0	0	0	0	0	0
Future Volume (Veh/h)	85	230	0	0	10	15	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	250	0	0	11	16	0	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					373							
pX, platoon unblocked												
vC, conflicting volume	27			250			440	461	125	328	453	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	27			250			440	461	125	328	453	14
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
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 %	94			100			100	100	100	100	100	100
cM capacity (veh/h)	1585			1313			479	467	902	575	472	1063

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	92	125	125	0	7	20	0	0	0	0	0
Volume Left	92	0	0	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	16	0	0	0	0	0
cSH	1585	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.06	0.07	0.07	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.09
Queue Length 95th (m)	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						A	A	A	A	A
Approach Delay (s)	2.0			0.0			0.0		0.0		
Approach LOS							A		A		

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	14.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	370	15	20	250	10
Future Volume (Veh/h)	0	370	15	20	250	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	402	16	22	272	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		127	245			
pX, platoon unblocked						
vC, conflicting volume	38				228	19
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	38				228	19
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				63	99
cM capacity (veh/h)	1571				740	1055

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	134	268	11	27	283
Volume Left	0	0	0	0	272
Volume Right	0	0	0	22	11
cSH	1571	1700	1700	1700	749
Volume to Capacity	0.00	0.16	0.01	0.02	0.38
Queue Length 95th (m)	0.0	0.0	0.0	0.0	14.2
Control Delay (s)	0.0	0.0	0.0	0.0	12.7
Lane LOS					B
Approach Delay (s)	0.0		0.0		12.7
Approach LOS					B

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	31.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	65	555	35	55	0	0
Future Volume (Veh/h)	65	555	35	55	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	71	603	38	60	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				116	339	
pX, platoon unblocked						
vC, conflicting volume	136	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	136	0	0			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	44	98			
cM capacity (veh/h)	837	1085	1623			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	71	603	98	0
Volume Left	71	0	38	0
Volume Right	0	603	0	0
cSH	837	1085	1623	1700
Volume to Capacity	0.08	0.56	0.02	0.02
Queue Length 95th (m)	2.2	28.4	0.6	0.0
Control Delay (s)	9.7	12.4	2.9	0.0
Lane LOS	A	B	A	
Approach Delay (s)	12.1		2.9	0.0
Approach LOS	B			

Intersection Summary			
Average Delay	10.9		
Intersection Capacity Utilization	37.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	195	0	60	45	0	0
Future Volume (Veh/h)	195	0	60	45	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	212	0	65	49	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			84			105
pX, platoon unblocked						
vC, conflicting volume	90	90			114	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	90	90			114	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	77	100			100	
cM capacity (veh/h)	911	968			1475	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	212	114	0
Volume Left	212	0	0
Volume Right	0	49	0
cSH	911	1700	1700
Volume to Capacity	0.23	0.07	0.00
Queue Length 95th (m)	7.2	0.0	0.0
Control Delay (s)	10.1	0.0	0.0
Lane LOS	B		
Approach Delay (s)	10.1	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	6.6		
Intersection Capacity Utilization	23.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	350	0	45	185	0	185
Future Volume (Veh/h)	350	0	45	185	0	185
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	380	0	49	201	0	201
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	70			80		
pX, platoon unblocked						
vC, conflicting volume			380		679	380
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			380		679	380
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		100	70
cM capacity (veh/h)			1178		400	667

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	380	250	201
Volume Left	0	49	0
Volume Right	0	0	201
cSH	1700	1178	667
Volume to Capacity	0.22	0.04	0.30
Queue Length 95th (m)	0.0	1.0	10.1
Control Delay (s)	0.0	1.9	12.7
Lane LOS		A	B
Approach Delay (s)	0.0	1.9	12.7
Approach LOS			B

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	535	0	40	230	0	130
Future Volume (Veh/h)	535	0	40	230	0	130
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	582	0	43	250	0	141
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	75			323		
pX, platoon unblocked						
vC, conflicting volume			582		918	582
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			582		918	582
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		100	73
cM capacity (veh/h)			992		288	513

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	582	293	141
Volume Left	0	43	0
Volume Right	0	0	141
cSH	1700	992	513
Volume to Capacity	0.34	0.04	0.27
Queue Length 95th (m)	0.0	1.1	8.9
Control Delay (s)	0.0	1.7	14.7
Lane LOS		A	B
Approach Delay (s)	0.0	1.7	14.7
Approach LOS			B

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	130	270	45	155	30	5
Future Volume (Veh/h)	130	270	45	155	30	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	141	293	49	168	33	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				87	96	
pX, platoon unblocked						
vC, conflicting volume	302	36	38			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	302	36	38			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	79	72	97			
cM capacity (veh/h)	669	1037	1572			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	434	217	38
Volume Left	141	49	0
Volume Right	293	0	5
cSH	880	1572	1700
Volume to Capacity	0.49	0.03	0.02
Queue Length 95th (m)	22.3	0.8	0.0
Control Delay (s)	13.0	1.9	0.0
Lane LOS	B	A	
Approach Delay (s)	13.0	1.9	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	8.8		
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	160	5	5	15	255	30
Future Volume (Veh/h)	160	5	5	15	255	30
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	174	5	5	16	277	33
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				81	89	
pX, platoon unblocked						
vC, conflicting volume	320	294	310			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	320	294	310			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	74	99	100			
cM capacity (veh/h)	671	746	1250			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	179	21	310
Volume Left	174	5	0
Volume Right	5	0	33
cSH	673	1250	1700
Volume to Capacity	0.27	0.00	0.18
Queue Length 95th (m)	8.5	0.1	0.0
Control Delay (s)	12.3	1.9	0.0
Lane LOS	B	A	
Approach Delay (s)	12.3	1.9	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	4.4		
Intersection Capacity Utilization	31.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	230	10	15	140	15
Future Volume (Veh/h)	0	230	10	15	140	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	250	11	16	152	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		62	66			
pX, platoon unblocked						
vC, conflicting volume	27				144	14
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	27				144	14
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				82	98
cM capacity (veh/h)	1585				834	1063

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	83	167	7	20	168
Volume Left	0	0	0	0	152
Volume Right	0	0	0	16	16
cSH	1585	1700	1700	1700	851
Volume to Capacity	0.00	0.10	0.00	0.01	0.20
Queue Length 95th (m)	0.0	0.0	0.0	0.0	5.8
Control Delay (s)	0.0	0.0	0.0	0.0	10.3
Lane LOS					B
Approach Delay (s)	0.0		0.0		10.3
Approach LOS					B

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	21.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	103	119	330	851	155	294	330	1861	964	134	1325	119
v/c Ratio	0.39	0.63	0.97	0.90	0.28	0.54	0.98	0.88	0.94	0.67	0.78	0.21
Control Delay	33.9	76.1	65.6	61.9	40.2	18.1	63.1	13.5	17.2	43.8	45.7	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.7	0.0	0.0	0.0
Total Delay	33.9	76.1	65.6	61.9	40.2	18.1	63.1	13.5	36.9	43.8	45.7	1.4
Queue Length 50th (m)	18.4	34.3	~45.0	121.2	34.9	22.9	72.8	126.2	248.1	20.0	127.1	0.0
Queue Length 95th (m)	31.4	#63.9	#108.8	147.9	56.2	55.1	m52.5	m77.4	m63.6	43.6	146.1	1.6
Internal Link Dist (m)		361.1			497.8			251.4			315.2	
Turn Bay Length (m)	80.0			165.0		15.0				85.0		80.0
Base Capacity (vph)	296	190	341	993	555	546	336	2116	1022	216	1703	555
Starvation Cap Reductn	0	0	0	0	0	0	0	0	92	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	0.35	0.63	0.97	0.86	0.28	0.54	0.98	0.88	1.04	0.62	0.78	0.21

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	115	320	825	150	285	320	1805	935	130	1285	115
Future Volume (vph)	100	115	320	825	150	285	320	1805	935	130	1285	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.8	5.8	4.7	5.8	5.8	3.0	5.1	5.1	3.0	5.1	5.1
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.86	1.00	1.00	0.95	1.00	1.00	0.81
Flpb, ped/bikes	0.93	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	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)	1685	1881	1599	3467	1881	1388	1787	5136	1525	1805	5085	1300
Flt Permitted	0.66	1.00	1.00	0.95	1.00	1.00	0.08	1.00	1.00	0.09	1.00	1.00
Satd. Flow (perm)	1168	1881	1599	3467	1881	1388	151	5136	1525	162	5085	1300
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	103	119	330	851	155	294	330	1861	964	134	1325	119
RTOR Reduction (vph)	0	0	180	0	0	137	0	0	394	0	0	79
Lane Group Flow (vph)	103	119	150	851	155	157	330	1861	570	134	1325	40
Confl. Peds. (#/hr)	55					55	80		15	15		80
Confl. Bikes (#/hr)						5						
Heavy Vehicles (%)	0%	1%	1%	1%	1%	0%	1%	1%	1%	0%	2%	0%
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8		8			4	6		6	2		2
Actuated Green, G (s)	23.4	13.2	13.2	37.3	40.3	40.3	70.9	56.7	56.7	56.1	45.9	45.9
Effective Green, g (s)	25.4	14.2	14.2	38.3	41.3	41.3	71.9	57.7	57.7	58.1	46.9	46.9
Actuated g/C Ratio	0.18	0.10	0.10	0.27	0.29	0.29	0.51	0.41	0.41	0.42	0.33	0.33
Clearance Time (s)	5.7	6.8	6.8	5.7	6.8	6.8	4.0	6.1	6.1	4.0	6.1	6.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	253	190	162	948	554	409	334	2116	628	198	1703	435
v/s Ratio Prot	0.03	0.06		c0.25	0.08		c0.15	0.36		0.05	0.26	
v/s Ratio Perm	0.04		c0.09			0.11	c0.35		0.37	0.23		0.03
v/c Ratio	0.41	0.63	0.93	0.90	0.28	0.38	0.99	0.88	0.91	0.68	0.78	0.09
Uniform Delay, d1	50.0	60.4	62.4	49.0	37.9	39.2	44.5	37.9	38.7	31.3	41.9	31.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.31	0.33	1.23	1.00	1.00	1.00
Incremental Delay, d2	1.1	6.3	49.4	11.1	0.3	0.6	12.0	0.6	2.4	8.8	3.6	0.4
Delay (s)	51.0	66.7	111.8	60.0	38.2	39.8	70.5	13.1	50.0	40.1	45.4	32.4
Level of Service	D	E	F	E	D	D	E	B	D	D	D	C
Approach Delay (s)		90.7			52.9			30.4			44.0	
Approach LOS		F			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	43.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	90.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	27	298	377	383	362	3202	1649	16
v/c Ratio	0.08	0.44	0.99	1.09	0.56	1.29	0.66	0.02
Control Delay	23.1	30.2	88.0	115.0	32.2	163.7	46.1	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.1	30.2	88.0	115.0	32.2	163.7	46.1	0.6
Queue Length 50th (m)	4.4	58.8	~128.0	~140.1	70.7	~434.5	167.3	0.0
Queue Length 95th (m)	10.5	85.8	#196.7	#208.8	105.9	#458.0	m183.8	m0.0
Internal Link Dist (m)		327.0		348.8		26.7	251.4	
Turn Bay Length (m)								
Base Capacity (vph)	318	682	380	352	652	2489	2482	741
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	4	27	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.44	0.99	1.09	0.56	1.30	0.66	0.02

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	5	275	710	5	340	0	2680	330	0	1550	15
Future Volume (vph)	25	5	275	710	5	340	0	2680	330	0	1550	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00		0.91			0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	0.94
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	0.85		1.00	1.00	0.85		0.98			1.00	0.85
Flt Protected	0.95	1.00		0.95	0.95	1.00		1.00			1.00	1.00
Satd. Flow (prot)	1805	1604		1715	1720	1615		5027			5036	1437
Flt Permitted	0.31	1.00		0.56	0.52	1.00		1.00			1.00	1.00
Satd. Flow (perm)	598	1604		1006	932	1615		5027			5036	1437
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)	27	5	293	755	5	362	0	2851	351	0	1649	16
RTOR Reduction (vph)	0	6	0	0	0	42	0	11	0	0	0	8
Lane Group Flow (vph)	27	292	0	377	383	320	0	3191	0	0	1649	8
Confl. Peds. (#/hr)							15		10	10		15
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	0%	1%	1%	0%	3%	6%
Turn Type	pm+pt	NA		Perm	NA	Perm		NA			NA	Perm
Protected Phases	3	8			4			2			6	
Permitted Phases	8			4		4						6
Actuated Green, G (s)	59.8	59.8		52.0	52.0	52.0		66.2			66.2	66.2
Effective Green, g (s)	60.8	60.8		53.0	53.0	53.0		67.2			67.2	67.2
Actuated g/C Ratio	0.43	0.43		0.38	0.38	0.38		0.48			0.48	0.48
Clearance Time (s)	4.5	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	296	696		380	352	611		2412			2417	689
v/s Ratio Prot	0.00	c0.18						c0.63			0.33	
v/s Ratio Perm	0.04			0.37	c0.41	0.20						0.01
v/c Ratio	0.09	0.42		0.99	1.09	0.52		1.32			0.68	0.01
Uniform Delay, d1	24.6	27.4		43.3	43.5	33.7		36.4			28.1	19.0
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.68	1.00
Incremental Delay, d2	0.1	0.4		43.9	73.6	0.8		148.3			0.8	0.0
Delay (s)	24.8	27.8		87.2	117.1	34.5		184.7			48.2	19.0
Level of Service	C	C		F	F	C		F			D	B
Approach Delay (s)		27.6			80.4			184.7			47.9	
Approach LOS		C			F			F			D	

Intersection Summary			
HCM 2000 Control Delay	122.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	112.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1058	558	2142	2305
v/c Ratio	0.84	0.97	0.76	0.82
Control Delay	48.3	74.4	36.3	29.0
Queue Delay	0.0	0.0	0.5	0.0
Total Delay	48.3	74.4	36.7	29.0
Queue Length 50th (m)	144.7	158.1	198.2	195.6
Queue Length 95th (m)	173.6	#236.6	m182.6	216.7
Internal Link Dist (m)	190.2		56.8	39.3
Turn Bay Length (m)				
Base Capacity (vph)	1262	578	2805	2805
Starvation Cap Reductn	0	0	254	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.84	0.97	0.84	0.82

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.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1005	530	0	2035	2190	0
Future Volume (vph)	1005	530	0	2035	2190	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	1.00		0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3467	1583		5085	5085	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3467	1583		5085	5085	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1058	558	0	2142	2305	0
RTOR Reduction (vph)	0	2	0	0	0	0
Lane Group Flow (vph)	1058	556	0	2142	2305	0
Confl. Peds. (#/hr)			25			25
Heavy Vehicles (%)	1%	2%	0%	2%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Actuated Green, G (s)	49.8	49.8		76.2	76.2	
Effective Green, g (s)	50.8	50.8		77.2	77.2	
Actuated g/C Ratio	0.36	0.36		0.55	0.55	
Clearance Time (s)	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1258	574		2804	2804	
v/s Ratio Prot	0.31			0.42	c0.45	
v/s Ratio Perm		c0.35				
v/c Ratio	0.84	0.97		0.76	0.82	
Uniform Delay, d1	40.9	43.8		24.3	25.8	
Progression Factor	1.00	1.00		1.44	1.00	
Incremental Delay, d2	5.2	29.4		0.8	2.9	
Delay (s)	46.1	73.3		35.8	28.6	
Level of Service	D	E		D	C	
Approach Delay (s)	55.5			35.8	28.6	
Approach LOS	E			D	C	

Intersection Summary			
HCM 2000 Control Delay	38.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	130	0	0	0	0	2215	360	0	1745	965
Future Volume (Veh/h)	0	0	130	0	0	0	0	2215	360	0	1745	965
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	0	0	138	0	0	0	0	2356	383	0	1856	1027
Pedestrians		20			10							
Lane Width (m)		3.6			0.0							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		2			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								198			81	
pX, platoon unblocked	0.69	0.69	0.62	0.69	0.69	0.86	0.62			0.86		
vC, conflicting volume	3175	5138	1152	2985	5269	795	2903			2749		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1204	4043	0	930	4231	185	1929			2460		
tC, single (s)	7.5	6.5	7.1	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	79	100	100	100	100			100		
cM capacity (veh/h)	95	2	651	121	1	714	189			165		

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3
Volume Total	138	785	785	785	383	742	742	1398
Volume Left	0	0	0	0	0	0	0	0
Volume Right	138	0	0	0	383	0	0	1027
cSH	651	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.21	0.46	0.46	0.46	0.23	0.44	0.44	0.82
Queue Length 95th (m)	6.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B							
Approach Delay (s)	12.0	0.0				0.0		
Approach LOS	B							

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1325	227	67	191	253	263	1067	155	1768
v/c Ratio	1.30	0.41	0.25	1.18	0.86	1.16	0.54	0.60	0.99
Control Delay	181.5	32.4	31.0	180.2	48.3	136.6	34.5	28.9	56.3
Queue Delay	1.4	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	182.9	33.3	31.0	180.2	48.3	136.6	34.5	28.9	56.3
Queue Length 50th (m)	~254.0	41.3	11.4	~66.3	23.7	~75.3	69.3	22.4	154.3
Queue Length 95th (m)	#297.9	67.6	21.5	#117.1	#72.9	m#96.8	m79.4	m30.0	m#213.8
Internal Link Dist (m)		97.1		158.4			292.1		174.2
Turn Bay Length (m)	130.0		50.0			120.0		55.0	
Base Capacity (vph)	1020	551	274	162	293	227	1979	264	1785
Starvation Cap Reductn	236	138	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.69	0.55	0.24	1.18	0.86	1.16	0.54	0.59	0.99

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1285	90	130	65	185	245	255	1000	35	150	1275	440
Future Volume (vph)	1285	90	130	65	185	245	255	1000	35	150	1275	440
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	6.0	4.0	6.0		3.0	6.0	
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.97		1.00	1.00	1.00	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.98	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	1616		1768	1900	1599	1719	5098		1750	4878	
Flt Permitted	0.95	1.00		0.62	1.00	1.00	0.08	1.00		0.18	1.00	
Satd. Flow (perm)	3400	1616		1148	1900	1599	138	5098		337	4878	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	1325	93	134	67	191	253	263	1031	36	155	1314	454
RTOR Reduction (vph)	0	35	0	0	0	155	0	2	0	0	45	0
Lane Group Flow (vph)	1325	192	0	67	191	98	263	1065	0	155	1723	0
Confl. Peds. (#/hr)			20	20			15		15	15		15
Heavy Vehicles (%)	3%	0%	6%	0%	0%	1%	5%	1%	0%	3%	0%	4%
Turn Type	Prot	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8		8	2			6		
Actuated Green, G (s)	41.0	43.8		22.0	12.4	12.4	64.9	51.9		57.3	47.6	
Effective Green, g (s)	42.0	44.8		24.0	13.4	13.4	66.6	52.9		59.3	48.6	
Actuated g/C Ratio	0.30	0.32		0.17	0.10	0.10	0.48	0.38		0.42	0.35	
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	5.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.5	4.0	4.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1020	517		243	181	153	223	1926		250	1693	
v/s Ratio Prot	c0.39	0.12		0.02	c0.10		c0.12	0.21		0.05	0.35	
v/s Ratio Perm				0.03		0.06	c0.44			0.21		
v/c Ratio	1.30	0.37		0.28	1.06	0.64	1.18	0.55		0.62	1.02	
Uniform Delay, d1	49.0	36.7		49.9	63.3	61.0	43.9	34.2		26.5	45.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.44	1.02		1.20	0.98	
Incremental Delay, d2	141.8	0.5		0.7	82.3	9.9	99.5	0.5		2.7	21.4	
Delay (s)	190.8	37.2		50.7	145.6	70.9	162.7	35.5		34.4	66.2	
Level of Service	F	D		D	F	E	F	D		C	E	
Approach Delay (s)		168.4			96.2			60.7			63.7	
Approach LOS		F			F			E			E	

Intersection Summary			
HCM 2000 Control Delay	96.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	113.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	335	686	46	82	639	691	62	686	557	593	309
v/c Ratio	0.84	0.97	0.07	0.44	0.54	0.90	0.32	0.90	0.83	0.86	0.44
Control Delay	79.4	69.2	0.2	28.1	40.2	33.8	28.2	68.6	69.4	77.0	38.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.4	69.2	0.2	28.1	40.2	33.8	28.2	68.6	69.4	77.0	38.0
Queue Length 50th (m)	50.0	194.0	0.0	12.4	79.9	91.0	10.0	102.5	87.1	168.3	54.4
Queue Length 95th (m)	#73.9	#287.4	0.0	22.8	100.1	#178.2	19.1	#145.2	m90.3	m174.8	m58.3
Internal Link Dist (m)		551.4			604.3			115.4		292.1	
Turn Bay Length (m)	85.0			85.0		75.0	40.0		85.0		
Base Capacity (vph)	403	709	703	361	1176	765	217	759	725	687	695
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.97	0.07	0.23	0.54	0.90	0.29	0.90	0.77	0.86	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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	325	665	45	80	620	670	60	545	120	540	575	300
Future Volume (vph)	325	665	45	80	620	670	60	545	120	540	575	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.4	5.4	4.0	5.4	5.4	3.0	5.9		4.0	5.9	5.9
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.93	1.00	0.99		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1863	1547	1805	3539	1470	1769	3490		3433	1881	1516
Flt Permitted	0.95	1.00	1.00	0.09	1.00	1.00	0.18	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1863	1547	163	3539	1470	337	3490		3433	1881	1516
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	335	686	46	82	639	691	62	562	124	557	593	309
RTOR Reduction (vph)	0	0	28	0	0	277	0	13	0	0	0	143
Lane Group Flow (vph)	335	686	18	82	639	414	62	673	0	557	593	166
Confl. Peds. (#/hr)	45		10	10		45	10		20	20		10
Heavy Vehicles (%)	1%	2%	0%	0%	2%	2%	2%	0%	0%	2%	1%	4%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases			8	4		4	2					6
Actuated Green, G (s)	15.1	52.3	52.3	54.7	45.6	45.6	35.8	28.9		26.4	49.4	49.4
Effective Green, g (s)	16.1	53.3	53.3	56.7	46.6	46.6	37.8	29.9		27.4	50.4	50.4
Actuated g/C Ratio	0.12	0.38	0.38	0.41	0.33	0.33	0.27	0.21		0.20	0.36	0.36
Clearance Time (s)	5.7	6.4	6.4	5.0	6.4	6.4	4.0	6.9		5.0	6.9	6.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	398	709	588	184	1177	489	171	745		671	677	545
v/s Ratio Prot	c0.10	c0.37		0.03	0.18		0.02	0.19		c0.16	c0.32	
v/s Ratio Perm			0.01	0.15		0.28	0.08					0.11
v/c Ratio	0.84	0.97	0.03	0.45	0.54	0.85	0.36	0.90		0.83	0.88	0.31
Uniform Delay, d1	60.7	42.5	27.2	32.4	38.0	43.4	39.9	53.6		54.1	41.9	32.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.19	1.71	3.68
Incremental Delay, d2	14.8	25.7	0.0	1.7	0.5	12.8	1.3	16.3		3.7	6.8	0.6
Delay (s)	75.5	68.2	27.2	34.1	38.5	56.2	41.2	70.0		68.2	78.4	119.2
Level of Service	E	E	C	C	D	E	D	E		E	E	F
Approach Delay (s)		68.7			46.9			67.6			83.2	
Approach LOS		E			D			E			F	

Intersection Summary			
HCM 2000 Control Delay	66.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	101.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	176	94	382	653
v/c Ratio	0.35	0.43	0.19	0.26
Control Delay	29.1	22.4	3.1	2.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	29.1	22.4	3.1	2.1
Queue Length 50th (m)	12.2	7.0	5.1	5.4
Queue Length 95th (m)	20.2	16.3	10.7	11.6
Internal Link Dist (m)	146.6	179.3	180.3	263.4
Turn Bay Length (m)				
Base Capacity (vph)	1491	613	2029	2471
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.12	0.15	0.19	0.26

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	70	0	65	0	15	70	210	45	20	295	240
Future Volume (vph)	80	70	0	65	0	15	70	210	45	20	295	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5			3.5			3.5			3.5	
Lane Util. Factor		0.95			1.00			0.95			0.95	
Frt		1.00			0.97			0.98			0.94	
Flt Protected		0.97			0.96			0.99			1.00	
Satd. Flow (prot)		3516			1751			3431			3370	
Flt Permitted		0.81			0.65			0.77			0.94	
Satd. Flow (perm)		2936			1180			2659			3162	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	94	82	0	76	0	18	82	247	53	24	347	282
RTOR Reduction (vph)	0	0	0	0	23	0	0	9	0	0	75	0
Lane Group Flow (vph)	0	176	0	0	71	0	0	373	0	0	578	0
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	3%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		8.0			8.0			43.0			43.0	
Effective Green, g (s)		9.0			9.0			44.0			44.0	
Actuated g/C Ratio		0.15			0.15			0.73			0.73	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		440			177			1949			2318	
v/s Ratio Prot												
v/s Ratio Perm		0.06			c0.06			0.14			c0.18	
v/c Ratio		0.40			0.40			0.19			0.25	
Uniform Delay, d1		23.1			23.1			2.5			2.6	
Progression Factor		1.27			1.00			1.00			1.00	
Incremental Delay, d2		0.6			1.5			0.2			0.3	
Delay (s)		30.0			24.6			2.7			2.9	
Level of Service		C			C			A			A	
Approach Delay (s)		30.0			24.6			2.7			2.9	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	46.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	506	79	124	1090	169	174
v/c Ratio	0.40	0.07	0.18	0.75	0.57	0.42
Control Delay	8.6	1.9	3.5	11.1	39.3	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.6	1.9	3.5	11.1	39.3	8.1
Queue Length 50th (m)	37.3	0.0	4.0	81.5	26.8	0.0
Queue Length 95th (m)	63.0	4.9	9.9	169.6	43.0	15.1
Internal Link Dist (m)	228.8			1140.2	151.2	
Turn Bay Length (m)		100.0	100.0		100.0	
Base Capacity (vph)	1263	1079	671	1447	409	500
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	0.07	0.18	0.75	0.41	0.35

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	450	70	110	970	150	155
Future Volume (vph)	450	70	110	970	150	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	2.0	3.0	3.0	3.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1881	1568	1805	1900	1787	1599
Flt Permitted	1.00	1.00	0.39	1.00	0.95	1.00
Satd. Flow (perm)	1881	1568	750	1900	1787	1599
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	506	79	124	1090	169	174
RTOR Reduction (vph)	0	26	0	0	0	145
Lane Group Flow (vph)	506	53	124	1090	169	29
Heavy Vehicles (%)	1%	3%	0%	0%	1%	1%
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	55.5	55.5	63.7	63.7	13.3	13.3
Effective Green, g (s)	56.5	56.5	64.7	64.7	14.3	14.3
Actuated g/C Ratio	0.66	0.66	0.76	0.76	0.17	0.17
Clearance Time (s)	4.0	4.0	3.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1250	1042	647	1446	300	269
v/s Ratio Prot	0.27		0.01	c0.57	c0.09	
v/s Ratio Perm		0.03	0.13			0.02
v/c Ratio	0.40	0.05	0.19	0.75	0.56	0.11
Uniform Delay, d1	6.5	4.9	3.3	5.7	32.5	30.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	0.1	0.1	3.7	2.4	0.2
Delay (s)	7.5	5.0	3.4	9.4	34.9	30.1
Level of Service	A	A	A	A	C	C
Approach Delay (s)	7.2			8.8	32.5	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	383	660	64	941	138	197	138	122	170
v/c Ratio	0.78	0.29	0.19	0.61	0.52	0.50	0.63	0.32	0.38
Control Delay	23.6	5.8	14.5	16.1	32.1	26.0	38.8	25.4	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.6	5.8	14.5	16.1	32.1	26.0	38.8	25.4	6.5
Queue Length 50th (m)	21.2	16.6	5.4	47.7	17.6	21.9	18.0	14.8	0.0
Queue Length 95th (m)	#65.1	28.8	13.1	65.0	32.3	38.1	34.0	26.8	13.6
Internal Link Dist (m)		585.1		130.4		189.6		92.5	
Turn Bay Length (m)	45.0		30.0				25.0		25.0
Base Capacity (vph)	494	2266	339	1562	331	495	275	482	525
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.29	0.19	0.60	0.42	0.40	0.50	0.25	0.32

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	360	530	90	60	660	225	130	140	45	130	115	160
Future Volume (vph)	360	530	90	60	660	225	130	140	45	130	115	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.5	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.96		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1769	3452		1798	3387		1761	1817		1805	1827	1517
Flt Permitted	0.19	1.00		0.40	1.00		0.68	1.00		0.55	1.00	1.00
Satd. Flow (perm)	353	3452		759	3387		1258	1817		1045	1827	1517
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)	383	564	96	64	702	239	138	149	48	138	122	170
RTOR Reduction (vph)	0	16	0	0	47	0	0	17	0	0	0	134
Lane Group Flow (vph)	383	644	0	64	894	0	138	180	0	138	122	36
Confl. Peds. (#/hr)	5		5	5		5	5					5
Confl. Bikes (#/hr)												5
Heavy Vehicles (%)	2%	2%	1%	0%	2%	1%	2%	1%	0%	0%	4%	4%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	45.9	45.9		30.6	30.6		14.1	14.1		14.1	14.1	14.1
Effective Green, g (s)	46.9	46.9		31.6	31.6		15.1	15.1		15.1	15.1	15.1
Actuated g/C Ratio	0.65	0.65		0.44	0.44		0.21	0.21		0.21	0.21	0.21
Clearance Time (s)	3.5	6.0		6.0	6.0		6.0	6.0		6.0	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
Lane Grp Cap (vph)	481	2248		333	1486		263	381		219	383	318
v/s Ratio Prot	c0.14	0.19			0.26			0.10			0.07	
v/s Ratio Perm	c0.38			0.08			0.11			c0.13		0.02
v/c Ratio	0.80	0.29		0.19	0.60		0.52	0.47		0.63	0.32	0.11
Uniform Delay, d1	10.2	5.4		12.4	15.4		25.3	25.0		25.9	24.1	23.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	8.9	0.3		1.3	1.8		1.9	0.9		5.8	0.5	0.2
Delay (s)	19.1	5.7		13.7	17.2		27.2	25.9		31.7	24.6	23.2
Level of Service	B	A		B	B		C	C		C	C	C
Approach Delay (s)		10.6			17.0			26.4			26.3	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	85.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	5	1049	126	720	5	132	324	198	637	38
v/c Ratio	0.01	0.72	0.77	0.49	0.01	0.85	0.40	0.27	0.88	0.05
Control Delay	7.8	12.6	48.6	10.9	0.0	63.5	11.0	5.5	30.2	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	7.8	12.6	48.6	10.9	0.0	63.5	11.0	5.5	30.2	3.7
Queue Length 50th (m)	0.1	29.6	8.3	21.2	0.0	9.2	17.4	4.4	45.2	0.0
Queue Length 95th (m)	0.8	47.8	#32.8	32.9	0.0	#35.3	32.7	13.8	#99.5	3.7
Internal Link Dist (m)		208.7		203.3			1140.2		129.5	
Turn Bay Length (m)	125.0		145.0		55.0	15.0		40.0		
Base Capacity (vph)	482	1455	164	1479	702	155	802	735	722	693
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	0.01	0.72	0.77	0.49	0.01	0.85	0.40	0.27	0.88	0.05

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	680	275	115	655	5	120	295	180	0	580	35
Future Volume (vph)	5	680	275	115	655	5	120	295	180	0	580	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	3502	3241		1752	3505	1615	1656	1900	1599		1712	1591
Flt Permitted	0.31	1.00		0.21	1.00	1.00	0.21	1.00	1.00		1.00	1.00
Satd. Flow (perm)	1141	3241		388	3505	1615	367	1900	1599		1712	1591
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	5	747	302	126	720	5	132	324	198	0	637	38
RTOR Reduction (vph)	0	87	0	0	0	3	0	0	61	0	0	22
Lane Group Flow (vph)	5	962	0	126	720	2	132	324	137	0	637	16
Confl. Bikes (#/hr)												5
Heavy Vehicles (%)	0%	6%	8%	3%	3%	0%	9%	0%	1%	0%	11%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	18.0	18.0		18.0	18.0	18.0	18.0	18.0	18.0		18.0	18.0
Effective Green, g (s)	19.0	19.0		19.0	19.0	19.0	19.0	19.0	19.0		19.0	19.0
Actuated g/C Ratio	0.42	0.42		0.42	0.42	0.42	0.42	0.42	0.42		0.42	0.42
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lane Grp Cap (vph)	481	1368		163	1479	681	154	802	675		722	671
v/s Ratio Prot		0.30			0.21			0.17			c0.37	
v/s Ratio Perm	0.00			c0.32		0.00	0.36		0.09			0.01
v/c Ratio	0.01	0.70		0.77	0.49	0.00	0.86	0.40	0.20		0.88	0.02
Uniform Delay, d1	7.5	10.7		11.2	9.5	7.5	11.8	9.1	8.2		12.0	7.6
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	0.0	3.1		29.2	1.1	0.0	42.3	1.5	0.7		14.6	0.1
Delay (s)	7.6	13.7		40.4	10.6	7.5	54.1	10.6	8.9		26.6	7.7
Level of Service	A	B		D	B	A	D	B	A		C	A
Approach Delay (s)		13.7			15.0			18.8			25.5	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	80	0	0	190	0	0
Future Volume (Veh/h)	80	0	0	190	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	87	0	0	207	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	287					
pX, platoon unblocked						
vC, conflicting volume			87		294	87
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			87		294	87
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1509		697	971

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	87	207	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.05	0.12	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	80	0	0	190	0	30
Future Volume (Veh/h)	80	0	0	190	0	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	87	0	0	207	0	33
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	402			296		
pX, platoon unblocked						
vC, conflicting volume			87		294	87
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			87		294	87
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	97
cM capacity (veh/h)			1509		697	971

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	87	207	33
Volume Left	0	0	0
Volume Right	0	0	33
cSH	1700	1700	971
Volume to Capacity	0.05	0.12	0.03
Queue Length 95th (m)	0.0	0.0	0.8
Control Delay (s)	0.0	0.0	8.8
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.8
Approach LOS			A

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	20.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	245	0	165	710	0	95
Future Volume (Veh/h)	245	0	165	710	0	95
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	266	0	179	772	0	103
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				253		
pX, platoon unblocked					0.68	
vC, conflicting volume			266		1396	266
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			266		1346	266
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			86		100	87
cM capacity (veh/h)			1298		97	773

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	266	951	103
Volume Left	0	179	0
Volume Right	0	0	103
cSH	1700	1298	773
Volume to Capacity	0.16	0.14	0.13
Queue Length 95th (m)	0.0	3.8	3.7
Control Delay (s)	0.0	3.2	10.4
Lane LOS		A	B
Approach Delay (s)	0.0	3.2	10.4
Approach LOS			B

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Volume (veh/h)	0	70	0	0	0	0	0	0	0	0	0	0
Future Volume (Veh/h)	0	70	0	0	0	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	76	0	0	0	0	0	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		203			262							
pX, platoon unblocked												
vC, conflicting volume	0			76			76	76	76	76	76	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			76			76	76	76	76	76	0
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 %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1623			1523			914	814	985	914	814	1085

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	76	0	0	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1623	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS			A	A
Approach Delay (s)	0.0	0.0	0.0	0.0
Approach LOS			A	A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	7.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	40	0	0	0	290	0	0	0	45	75	0
Future Volume (Veh/h)	30	40	0	0	0	290	0	0	0	45	75	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	43	0	0	0	315	0	0	0	49	82	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		313			152							
pX, platoon unblocked												
vC, conflicting volume	315			43			150	424	43	266	266	158
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	315			43			150	424	43	266	266	158
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 %	97			100			100	100	100	93	87	100
cM capacity (veh/h)	1245			1566			721	508	1027	672	622	888

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	33	43	0	315	0	131
Volume Left	33	0	0	0	0	49
Volume Right	0	0	0	315	0	0
cSH	1245	1700	1700	1700	1700	640
Volume to Capacity	0.03	0.03	0.00	0.19	0.00	0.20
Queue Length 95th (m)	0.7	0.0	0.0	0.0	0.0	6.1
Control Delay (s)	8.0	0.0	0.0	0.0	0.0	12.1
Lane LOS	A				A	B
Approach Delay (s)	3.5		0.0		0.0	12.1
Approach LOS					A	B

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	37.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	54	38	310	5	76	146
v/c Ratio	0.07	0.03	0.22	0.01	0.34	0.25
Control Delay	5.3	5.0	3.3	19.2	25.5	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.3	5.0	3.3	19.2	25.5	14.8
Queue Length 50th (m)	2.6	1.8	8.0	0.3	7.9	4.8
Queue Length 95th (m)	7.2	5.4	19.4	1.4	17.3	11.0
Internal Link Dist (m)		128.4	106.7	150.5		264.2
Turn Bay Length (m)	50.0				50.0	
Base Capacity (vph)	816	1429	1400	1268	503	1233
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	0.07	0.03	0.22	0.00	0.15	0.12

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	35	0	0	240	45	0	5	0	70	85	50
Future Volume (vph)	50	35	0	0	240	45	0	5	0	70	85	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5			3.5			3.5		3.5	3.5	
Lane Util. Factor	1.00	1.00			1.00			0.95		1.00	0.95	
Frt	1.00	1.00			0.98			1.00		1.00	0.94	
Flt Protected	0.95	1.00			1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863			1819			3539		1770	3343	
Flt Permitted	0.57	1.00			1.00			1.00		0.75	1.00	
Satd. Flow (perm)	1065	1863			1819			3539		1405	3343	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	38	0	0	261	49	0	5	0	76	92	54
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	0	0	46	0
Lane Group Flow (vph)	54	38	0	0	304	0	0	5	0	76	100	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	43.4	43.4			43.4			7.6		7.6	7.6	
Effective Green, g (s)	44.4	44.4			44.4			8.6		8.6	8.6	
Actuated g/C Ratio	0.74	0.74			0.74			0.14		0.14	0.14	
Clearance Time (s)	4.5	4.5			4.5			4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	788	1378			1346			507		201	479	
v/s Ratio Prot		0.02			c0.17			0.00			0.03	
v/s Ratio Perm	0.05									c0.05		
v/c Ratio	0.07	0.03			0.23			0.01		0.38	0.21	
Uniform Delay, d1	2.1	2.1			2.4			22.0		23.3	22.7	
Progression Factor	1.64	1.63			1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.0			0.4			0.0		1.2	0.2	
Delay (s)	3.7	3.4			2.8			22.1		24.5	22.9	
Level of Service	A	A			A			C		C	C	
Approach Delay (s)		3.6			2.8			22.1			23.4	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	40.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	20	45	0	220	140	35	75	0	0	240	30
Future Volume (Veh/h)	40	20	45	0	220	140	35	75	0	0	240	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	43	22	49	0	239	152	38	82	0	0	261	33
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		131										
pX, platoon unblocked												
vC, conflicting volume	391			71			535	524	46	464	472	315
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	391			71			535	524	46	464	472	315
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 %	96			100			84	81	100	100	45	95
cM capacity (veh/h)	1168			1529			239	442	1023	424	472	725

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	43	71	0	391	120	294
Volume Left	43	0	0	0	38	0
Volume Right	0	49	0	152	0	33
cSH	1168	1700	1700	1700	348	491
Volume to Capacity	0.04	0.04	0.00	0.23	0.34	0.60
Queue Length 95th (m)	0.9	0.0	0.0	0.0	12.0	30.9
Control Delay (s)	8.2	0.0	0.0	0.0	20.7	22.6
Lane LOS	A				C	C
Approach Delay (s)	3.1		0.0		20.7	22.6
Approach LOS					C	C

Intersection Summary			
Average Delay	10.3		
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	0	360	20	35	0
Future Volume (Veh/h)	20	0	360	20	35	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	0	391	22	38	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				280	175	
pX, platoon unblocked						
vC, conflicting volume	842	38	38			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	842	38	38			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	100	75			
cM capacity (veh/h)	251	1034	1572			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	22	413	38
Volume Left	22	391	0
Volume Right	0	0	0
cSH	251	1572	1700
Volume to Capacity	0.09	0.25	0.02
Queue Length 95th (m)	2.3	7.9	0.0
Control Delay (s)	20.7	7.7	0.0
Lane LOS	C	A	
Approach Delay (s)	20.7	7.7	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	7.7		
Intersection Capacity Utilization	37.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	50	20	90	70	0	5
Future Volume (Veh/h)	50	20	90	70	0	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	22	98	76	0	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		182	224			
pX, platoon unblocked						
vC, conflicting volume	174				266	136
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	174				266	136
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				100	99
cM capacity (veh/h)	1403				695	913

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	76	174	5
Volume Left	54	0	0
Volume Right	0	76	5
cSH	1403	1700	913
Volume to Capacity	0.04	0.10	0.01
Queue Length 95th (m)	1.0	0.0	0.1
Control Delay (s)	5.5	0.0	9.0
Lane LOS	A		A
Approach Delay (s)	5.5	0.0	9.0
Approach LOS			A

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	26.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	20	160	0	0	0
Future Volume (Veh/h)	0	20	160	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	22	174	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			252			
pX, platoon unblocked						
vC, conflicting volume	174				196	174
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	174				196	174
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1403				793	869

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	0	22	174	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.00	0.01	0.10	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				A
Approach Delay (s)	0.0		0.0	0.0
Approach LOS				A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	11.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	20	160	0	75	0
Future Volume (Veh/h)	0	20	160	0	75	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	22	174	0	82	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		111	141			
pX, platoon unblocked						
vC, conflicting volume	174				196	174
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	174				196	174
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				90	100
cM capacity (veh/h)	1403				793	869

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	0	22	174	0	82
Volume Left	0	0	0	0	82
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	793
Volume to Capacity	0.00	0.01	0.10	0.00	0.10
Queue Length 95th (m)	0.0	0.0	0.0	0.0	2.8
Control Delay (s)	0.0	0.0	0.0	0.0	10.1
Lane LOS					B
Approach Delay (s)	0.0		0.0		10.1
Approach LOS					B

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	19.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	95	0	0	75	5	0	0	0	0	0	85
Future Volume (Veh/h)	0	95	0	0	75	5	0	0	0	0	0	85
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	103	0	0	82	5	0	0	0	0	0	92
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					373							
pX, platoon unblocked												
vC, conflicting volume	87			103			236	190	52	136	188	44
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	87			103			236	190	52	136	188	44
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
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 %	100			100			100	100	100	100	100	91
cM capacity (veh/h)	1507			1487			635	704	1005	822	706	1017

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	0	52	52	0	55	32	0	0	0	0	92
Volume Left	0	0	0	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	5	0	0	0	0	92
cSH	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1017
Volume to Capacity	0.00	0.03	0.03	0.00	0.03	0.02	0.00	0.00	0.00	0.00	0.09
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.9
Lane LOS							A	A	A	A	A
Approach Delay (s)	0.0			0.0			0.0		8.9		
Approach LOS							A		A		

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	140	120	60	120	40
Future Volume (Veh/h)	0	140	120	60	120	40
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	152	130	65	130	43
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		127	245			
pX, platoon unblocked						
vC, conflicting volume	195				238	98
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	195				238	98
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				82	95
cM capacity (veh/h)	1375				729	940

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	51	101	87	108	173
Volume Left	0	0	0	0	130
Volume Right	0	0	0	65	43
cSH	1375	1700	1700	1700	772
Volume to Capacity	0.00	0.06	0.05	0.06	0.22
Queue Length 95th (m)	0.0	0.0	0.0	0.0	6.9
Control Delay (s)	0.0	0.0	0.0	0.0	11.0
Lane LOS					B
Approach Delay (s)	0.0		0.0		11.0
Approach LOS					B

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	21.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	20	240	145	360	0	35
Future Volume (vph)	20	240	145	360	0	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	261	158	391	0	38

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total (vph)	22	261	549	38
Volume Left (vph)	22	0	158	0
Volume Right (vph)	0	261	0	38
Hadj (s)	0.53	-0.67	0.09	-0.57
Departure Headway (s)	6.5	5.3	4.8	4.9
Degree Utilization, x	0.04	0.39	0.74	0.05
Capacity (veh/h)	515	633	727	672
Control Delay (s)	8.6	10.4	20.0	8.1
Approach Delay (s)	10.3		20.0	8.1
Approach LOS	B		C	A

Intersection Summary			
Delay	16.3		
Level of Service	C		
Intersection Capacity Utilization	43.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	120	0	30	290	0	0
Future Volume (Veh/h)	120	0	30	290	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	130	0	33	315	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			84			105
pX, platoon unblocked						
vC, conflicting volume	190	190			348	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	190	190			348	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	84	100			100	
cM capacity (veh/h)	798	851			1211	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	130	348	0
Volume Left	130	0	0
Volume Right	0	315	0
cSH	798	1700	1700
Volume to Capacity	0.16	0.20	0.00
Queue Length 95th (m)	4.6	0.0	0.0
Control Delay (s)	10.4	0.0	0.0
Lane LOS	B		
Approach Delay (s)	10.4	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	32.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	110	0	315	190	0	90
Future Volume (Veh/h)	110	0	315	190	0	90
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	120	0	342	207	0	98
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	70			80		
pX, platoon unblocked						
vC, conflicting volume			120		1011	120
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			120		1011	120
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			77		100	89
cM capacity (veh/h)			1468		204	931

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	120	549	98
Volume Left	0	342	0
Volume Right	0	0	98
cSH	1700	1468	931
Volume to Capacity	0.07	0.23	0.11
Queue Length 95th (m)	0.0	7.2	2.8
Control Delay (s)	0.0	5.9	9.3
Lane LOS		A	A
Approach Delay (s)	0.0	5.9	9.3
Approach LOS			A

Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	46.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	200	0	205	505	0	45
Future Volume (Veh/h)	200	0	205	505	0	45
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	217	0	223	549	0	49
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	75			323		
pX, platoon unblocked					0.81	
vC, conflicting volume			217		1212	217
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			217		1146	217
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			84		100	94
cM capacity (veh/h)			1353		150	823

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	217	772	49
Volume Left	0	223	0
Volume Right	0	0	49
cSH	1700	1353	823
Volume to Capacity	0.13	0.16	0.06
Queue Length 95th (m)	0.0	4.7	1.5
Control Delay (s)	0.0	3.8	9.7
Lane LOS		A	A
Approach Delay (s)	0.0	3.8	9.7
Approach LOS			A

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	40	115	200	55	155	10
Future Volume (Veh/h)	40	115	200	55	155	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	43	125	217	60	168	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				87	96	
pX, platoon unblocked						
vC, conflicting volume	668	174	179			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	668	174	179			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	86	84			
cM capacity (veh/h)	358	870	1397			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	168	277	179
Volume Left	43	217	0
Volume Right	125	0	11
cSH	637	1397	1700
Volume to Capacity	0.26	0.16	0.11
Queue Length 95th (m)	8.4	4.4	0.0
Control Delay (s)	12.7	6.6	0.0
Lane LOS	B	A	
Approach Delay (s)	12.7	6.6	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	6.3		
Intersection Capacity Utilization	42.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	70	15	20	40	140	145
Future Volume (Veh/h)	70	15	20	40	140	145
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	16	22	43	152	158
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				81	89	
pX, platoon unblocked						
vC, conflicting volume	318	231	310			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	318	231	310			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	98	98			
cM capacity (veh/h)	663	808	1250			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	92	65	310
Volume Left	76	22	0
Volume Right	16	0	158
cSH	685	1250	1700
Volume to Capacity	0.13	0.02	0.18
Queue Length 95th (m)	3.7	0.4	0.0
Control Delay (s)	11.1	2.8	0.0
Lane LOS	B	A	
Approach Delay (s)	11.1	2.8	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	31.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	75	0	85	45	5
Future Volume (Veh/h)	0	75	0	85	45	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	82	0	92	49	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		62	66			
pX, platoon unblocked						
vC, conflicting volume	92				87	46
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	92				87	46
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				95	100
cM capacity (veh/h)	1501				904	1014

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	27	55	0	92	54
Volume Left	0	0	0	0	49
Volume Right	0	0	0	92	5
cSH	1501	1700	1700	1700	913
Volume to Capacity	0.00	0.03	0.00	0.05	0.06
Queue Length 95th (m)	0.0	0.0	0.0	0.0	1.5
Control Delay (s)	0.0	0.0	0.0	0.0	9.2
Lane LOS					A
Approach Delay (s)	0.0		0.0		9.2
Approach LOS					A

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	103	216	330	851	278	294	330	3304	964	134	2273	119
v/c Ratio	0.40	1.14	0.97	0.90	0.50	0.59	0.98	1.56	1.13	0.67	1.33	0.21
Control Delay	34.4	160.7	65.8	61.9	45.1	28.4	62.6	273.3	76.1	43.8	192.1	1.4
Queue Delay	0.0	0.0	48.9	53.0	0.0	0.0	0.0	0.0	0.4	0.0	0.2	0.0
Total Delay	34.4	160.7	114.8	114.8	45.1	28.4	62.6	273.3	76.5	43.8	192.3	1.4
Queue Length 50th (m)	18.4	~80.3	~45.5	121.2	67.4	40.5	73.3	~497.8	~253.6	20.0	~314.7	0.0
Queue Length 95th (m)	31.4	#134.1	#109.3	147.9	98.9	74.8	m27.1	m136.1	m16.2	43.6	#343.8	1.6
Internal Link Dist (m)		361.1			497.8			251.4			315.2	
Turn Bay Length (m)	80.0			165.0		15.0				85.0		80.0
Base Capacity (vph)	285	190	341	993	555	501	336	2116	850	216	1703	555
Starvation Cap Reductn	0	0	0	0	0	0	0	0	57	0	0	0
Spillback Cap Reductn	0	0	179	562	0	0	0	0	0	0	100	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	1.14	2.04	1.97	0.50	0.59	0.98	1.56	1.22	0.62	1.42	0.21

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰↰	↑	↱	↰	↑↑↑	↱	↰	↑↑↑	↱
Traffic Volume (vph)	100	210	320	825	270	285	320	3205	935	130	2205	115
Future Volume (vph)	100	210	320	825	270	285	320	3205	935	130	2205	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.8	5.8	4.7	5.8	5.8	3.0	5.1	5.1	3.0	5.1	5.1
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.86	1.00	1.00	0.95	1.00	1.00	0.81
Flpb, ped/bikes	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	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)	1716	1881	1599	3467	1881	1388	1787	5136	1525	1805	5085	1300
Flt Permitted	0.59	1.00	1.00	0.95	1.00	1.00	0.08	1.00	1.00	0.09	1.00	1.00
Satd. Flow (perm)	1063	1881	1599	3467	1881	1388	151	5136	1525	162	5085	1300
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	103	216	330	851	278	294	330	3304	964	134	2273	119
RTOR Reduction (vph)	0	0	179	0	0	92	0	0	222	0	0	79
Lane Group Flow (vph)	103	216	151	851	278	202	330	3304	742	134	2273	40
Confl. Peds. (#/hr)	55					55	80		15	15		80
Confl. Bikes (#/hr)						5						
Heavy Vehicles (%)	0%	1%	1%	1%	1%	0%	1%	1%	1%	0%	2%	0%
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8		8			4	6		6	2		2
Actuated Green, G (s)	23.4	13.2	13.2	37.3	40.3	40.3	70.9	56.7	56.7	56.1	45.9	45.9
Effective Green, g (s)	25.4	14.2	14.2	38.3	41.3	41.3	71.9	57.7	57.7	58.1	46.9	46.9
Actuated g/C Ratio	0.18	0.10	0.10	0.27	0.29	0.29	0.51	0.41	0.41	0.42	0.33	0.33
Clearance Time (s)	5.7	6.8	6.8	5.7	6.8	6.8	4.0	6.1	6.1	4.0	6.1	6.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	245	190	162	948	554	409	334	2116	628	198	1703	435
v/s Ratio Prot	0.03	c0.11		c0.25	0.15		c0.15	c0.64		0.05	0.45	
v/s Ratio Perm	0.04		0.09			0.15	0.35		0.49	0.23		0.03
v/c Ratio	0.42	1.14	0.93	0.90	0.50	0.49	0.99	1.56	1.18	0.68	1.33	0.09
Uniform Delay, d1	49.9	62.9	62.4	49.0	40.8	40.7	45.6	41.1	41.1	32.9	46.5	31.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.30	0.39	0.41	1.00	1.00	1.00
Incremental Delay, d2	1.2	106.9	51.1	11.1	0.7	0.9	12.0	252.9	83.2	8.8	154.7	0.4
Delay (s)	51.1	169.8	113.5	60.0	41.6	41.7	71.2	268.8	100.0	41.8	201.3	32.4
Level of Service	D	F	F	E	D	D	E	F	F	D	F	C
Approach Delay (s)		122.3			52.6			219.2			184.9	
Approach LOS		F			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	177.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	120.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	27	298	556	567	665	5043	3931	16
v/c Ratio	0.17	0.46	1.57	1.72	1.07	1.91	1.52	0.02
Control Delay	26.9	33.9	300.8	364.8	93.2	435.0	269.4	0.6
Queue Delay	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0
Total Delay	26.9	33.9	300.8	364.8	94.5	435.0	269.4	0.6
Queue Length 50th (m)	4.6	63.5	~251.1	~265.3	~208.7	~824.4	~576.8	0.0
Queue Length 95th (m)	11.0	91.7	#331.8	#345.8	#290.7	#830.8	m#458.2	m0.0
Internal Link Dist (m)		327.0		348.8		26.7	251.4	
Turn Bay Length (m)								
Base Capacity (vph)	190	642	355	330	622	2641	2589	773
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	2	45	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.46	1.57	1.72	1.07	1.94	1.52	0.02

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	5	275	1045	10	625	0	4740	0	0	3695	15
Future Volume (vph)	25	5	275	1045	10	625	0	4740	0	0	3695	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00		0.91			0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	0.94
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	0.85		1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected	0.95	1.00		0.95	0.95	1.00		1.00			1.00	1.00
Satd. Flow (prot)	1805	1604		1715	1721	1615		5136			5036	1437
Flt Permitted	0.08	1.00		0.57	0.53	1.00		1.00			1.00	1.00
Satd. Flow (perm)	145	1604		1027	955	1615		5136			5036	1437
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)	27	5	293	1112	11	665	0	5043	0	0	3931	16
RTOR Reduction (vph)	0	0	0	0	0	63	0	0	0	0	0	8
Lane Group Flow (vph)	27	298	0	556	567	602	0	5043	0	0	3931	8
Confl. Peds. (#/hr)							15		10	10		15
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	0%	1%	1%	0%	3%	6%
Turn Type	pm+pt	NA		Perm	NA	Perm		NA			NA	Perm
Protected Phases	3	8			4			2			6	
Permitted Phases	8			4		4						6
Actuated Green, G (s)	57.0	57.0		47.5	47.5	47.5		69.0			69.0	69.0
Effective Green, g (s)	58.0	58.0		48.5	48.5	48.5		70.0			70.0	70.0
Actuated g/C Ratio	0.41	0.41		0.35	0.35	0.35		0.50			0.50	0.50
Clearance Time (s)	5.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	125	664		355	330	559		2568			2518	718
v/s Ratio Prot	0.01	c0.19						c0.98			0.78	
v/s Ratio Perm	0.08			0.54	c0.59	0.37						0.01
v/c Ratio	0.22	0.45		1.57	1.72	1.08		1.96			1.56	0.01
Uniform Delay, d1	31.3	29.5		45.8	45.8	45.8		35.0			35.0	17.6
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.53	1.00
Incremental Delay, d2	0.9	0.5		268.1	335.7	60.2		435.1			252.7	0.0
Delay (s)	32.2	30.0		313.9	381.5	106.0		470.1			306.2	17.6
Level of Service	C	C		F	F	F		F			F	B
Approach Delay (s)		30.2			258.0			470.1			305.0	
Approach LOS		C			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	364.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.80		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	162.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1947	879	3653	3695
v/c Ratio	1.54	1.53	1.31	1.32
Control Delay	280.6	278.1	168.3	176.4
Queue Delay	0.0	0.0	0.1	0.0
Total Delay	280.6	278.1	168.4	176.4
Queue Length 50th (m)	~410.0	~357.2	~508.1	~508.6
Queue Length 95th (m)	#452.7	#438.2	m#467.2	#527.9
Internal Link Dist (m)	190.2		56.8	39.3
Turn Bay Length (m)				
Base Capacity (vph)	1262	576	2796	2796
Starvation Cap Reductn	0	0	184	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.54	1.53	1.40	1.32

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.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1850	835	0	3470	3510	0
Future Volume (vph)	1850	835	0	3470	3510	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	1.00		0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3467	1583		5085	5085	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3467	1583		5085	5085	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1947	879	0	3653	3695	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1947	879	0	3653	3695	0
Confl. Peds. (#/hr)			25			25
Heavy Vehicles (%)	1%	2%	0%	2%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Actuated Green, G (s)	50.0	50.0		76.0	76.0	
Effective Green, g (s)	51.0	51.0		77.0	77.0	
Actuated g/C Ratio	0.36	0.36		0.55	0.55	
Clearance Time (s)	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1262	576		2796	2796	
v/s Ratio Prot	c0.56			0.72	c0.73	
v/s Ratio Perm		0.56				
v/c Ratio	1.54	1.53		1.31	1.32	
Uniform Delay, d1	44.5	44.5		31.5	31.5	
Progression Factor	1.00	1.00		0.98	1.00	
Incremental Delay, d2	248.2	245.5		139.4	147.3	
Delay (s)	292.7	290.0		170.3	178.8	
Level of Service	F	F		F	F	
Approach Delay (s)	291.9			170.3	178.8	
Approach LOS	F			F	F	

Intersection Summary			
HCM 2000 Control Delay	207.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.41		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	136.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	170	0	0	0	0	3645	665	0	3105	965
Future Volume (Veh/h)	0	0	170	0	0	0	0	3645	665	0	3105	965
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	0	0	181	0	0	0	0	3878	707	0	3303	1027
Pedestrians		20			10							
Lane Width (m)		3.6			0.0							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		2			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								198			81	
pX, platoon unblocked	0.63	0.63	0.46	0.63	0.63	0.65	0.46			0.65		
vC, conflicting volume	5129	8432	1634	4989	8238	1303	4350			4595		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1752	6994	0	1529	6687	0	4170			4646		
tC, single (s)	7.5	6.5	7.1	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	62	100	100	100	100			100		
cM capacity (veh/h)	34	0	477	32	0	709	18			16		

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3
Volume Total	181	1293	1293	1293	707	1321	1321	1688
Volume Left	0	0	0	0	0	0	0	0
Volume Right	181	0	0	0	707	0	0	1027
cSH	477	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.38	0.76	0.76	0.76	0.42	0.78	0.78	0.99
Queue Length 95th (m)	14.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	17.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	C							
Approach Delay (s)	17.1	0.0				0.0		
Approach LOS	C							

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	99.2%	ICU Level of Service	F
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1325	273	67	247	253	263	1923	155	2789
v/c Ratio	1.30	0.49	0.26	1.52	0.86	1.16	0.97	0.80	1.55
Control Delay	181.5	38.2	31.1	305.9	48.3	123.7	33.7	39.8	280.1
Queue Delay	1.4	1.6	0.0	0.0	19.0	0.0	45.0	0.0	0.0
Total Delay	182.9	39.9	31.1	305.9	67.3	123.7	78.7	39.8	280.1
Queue Length 50th (m)	~254.0	58.3	11.4	~100.1	23.7	~74.9	110.6	31.4	~415.0
Queue Length 95th (m)	#297.9	88.5	21.5	#156.4	#72.9	m#69.8	m100.7	m21.7	m#261.6
Internal Link Dist (m)		97.1		158.4			292.1		174.2
Turn Bay Length (m)	130.0		50.0			120.0		55.0	
Base Capacity (vph)	1020	555	271	162	293	227	1977	194	1803
Starvation Cap Reductn	236	144	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	38	0	1169	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.69	0.66	0.25	1.52	0.99	1.16	2.38	0.80	1.55

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1285	135	130	65	240	245	255	1830	35	150	2265	440
Future Volume (vph)	1285	135	130	65	240	245	255	1830	35	150	2265	440
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	6.0	4.0	6.0		3.0	6.0	
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.97		1.00	1.00	1.00	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.98	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	1661		1772	1900	1599	1719	5115		1752	4990	
Flt Permitted	0.95	1.00		0.59	1.00	1.00	0.08	1.00		0.08	1.00	
Satd. Flow (perm)	3400	1661		1103	1900	1599	138	5115		152	4990	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	1325	139	134	67	247	253	263	1887	36	155	2335	454
RTOR Reduction (vph)	0	24	0	0	0	155	0	1	0	0	21	0
Lane Group Flow (vph)	1325	249	0	67	247	98	263	1922	0	155	2768	0
Confl. Peds. (#/hr)			20	20			15		15	15		15
Heavy Vehicles (%)	3%	0%	6%	0%	0%	1%	5%	1%	0%	3%	0%	4%
Turn Type	Prot	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8		8	2			6		
Actuated Green, G (s)	41.0	43.8		22.0	12.4	12.4	64.7	51.7		57.5	47.6	
Effective Green, g (s)	42.0	44.8		24.0	13.4	13.4	66.6	52.7		59.5	48.6	
Actuated g/C Ratio	0.30	0.32		0.17	0.10	0.10	0.48	0.38		0.42	0.35	
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	5.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.5	4.0	4.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1020	531		239	181	153	223	1925		189	1732	
v/s Ratio Prot	c0.39	0.15		0.02	c0.13		c0.12	0.38		0.06	c0.55	
v/s Ratio Perm				0.03		0.06	0.44			0.28		
v/c Ratio	1.30	0.47		0.28	1.36	0.64	1.18	1.00		0.82	1.60	
Uniform Delay, d1	49.0	38.1		49.9	63.3	61.0	43.9	43.6		33.8	45.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.52	0.73		1.24	1.09	
Incremental Delay, d2	141.8	0.7		0.8	195.4	9.9	85.2	5.8		2.7	269.4	
Delay (s)	190.8	38.7		50.7	258.7	70.9	152.0	37.6		44.5	319.1	
Level of Service	F	D		D	F	E	F	D		D	F	
Approach Delay (s)		164.8			150.3			51.4			304.7	
Approach LOS		F			F			D			F	

Intersection Summary			
HCM 2000 Control Delay	186.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.42		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	135.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	335	1000	46	82	1036	691	62	1083	557	1031	309
v/c Ratio	0.84	1.41	0.07	0.45	0.88	0.91	0.35	1.42	0.83	1.50	0.48
Control Delay	79.4	226.2	0.2	28.2	54.0	35.1	29.8	236.6	67.4	273.3	50.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.4	226.2	0.2	28.2	54.0	35.1	29.8	236.6	67.4	273.3	50.1
Queue Length 50th (m)	50.0	~389.0	0.0	12.4	150.0	93.8	10.0	~229.1	88.0	~413.3	66.9
Queue Length 95th (m)	#73.9	#483.3	0.0	22.8	#180.3	#181.1	19.1	#277.6	m60.0	m#226.5	m41.6
Internal Link Dist (m)		551.4			604.3			115.4		292.1	
Turn Bay Length (m)	85.0			85.0		75.0	40.0		85.0		
Base Capacity (vph)	403	710	703	361	1176	760	197	762	725	687	643
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	1.41	0.07	0.23	0.88	0.91	0.31	1.42	0.77	1.50	0.48

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	325	970	45	80	1005	670	60	930	120	540	1000	300
Future Volume (vph)	325	970	45	80	1005	670	60	930	120	540	1000	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.4	5.4	4.0	5.4	5.4	3.0	5.9		4.0	5.9	5.9
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.93	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1863	1547	1805	3539	1470	1769	3534		3433	1881	1516
Flt Permitted	0.95	1.00	1.00	0.09	1.00	1.00	0.13	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1863	1547	163	3539	1470	249	3534		3433	1881	1516
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	335	1000	46	82	1036	691	62	959	124	557	1031	309
RTOR Reduction (vph)	0	0	28	0	0	272	0	7	0	0	0	90
Lane Group Flow (vph)	335	1000	18	82	1036	419	62	1076	0	557	1031	219
Confl. Peds. (#/hr)	45		10	10		45	10		20	20		10
Heavy Vehicles (%)	1%	2%	0%	0%	2%	2%	2%	0%	0%	2%	1%	4%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases			8	4		4	2					6
Actuated Green, G (s)	15.1	52.4	52.4	54.6	45.6	45.6	35.8	28.9		26.4	49.4	49.4
Effective Green, g (s)	16.1	53.4	53.4	56.6	46.6	46.6	37.8	29.9		27.4	50.4	50.4
Actuated g/C Ratio	0.12	0.38	0.38	0.40	0.33	0.33	0.27	0.21		0.20	0.36	0.36
Clearance Time (s)	5.7	6.4	6.4	5.0	6.4	6.4	4.0	6.9		5.0	6.9	6.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	398	710	590	183	1177	489	153	754		671	677	545
v/s Ratio Prot	c0.10	c0.54		0.03	0.29		0.02	0.30		c0.16	c0.55	
v/s Ratio Perm			0.01	0.15		0.28	0.09					0.14
v/c Ratio	0.84	1.41	0.03	0.45	0.88	0.86	0.41	1.43		0.83	1.52	0.40
Uniform Delay, d1	60.7	43.3	27.1	32.8	44.1	43.6	41.1	55.0		54.1	44.8	33.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.23	1.74	2.63
Incremental Delay, d2	14.8	192.2	0.0	1.7	7.9	13.8	1.8	199.8		0.8	236.0	0.2
Delay (s)	75.5	235.5	27.1	34.5	52.0	57.3	42.9	254.9		67.2	314.0	88.3
Level of Service	E	F	C	C	D	E	D	F		E	F	F
Approach Delay (s)		189.7			53.2			243.4			204.8	
Approach LOS		F			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	164.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.40		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	131.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	176	94	535	930
v/c Ratio	0.35	0.43	0.27	0.37
Control Delay	34.5	22.4	3.5	3.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.5	22.4	3.5	3.5
Queue Length 50th (m)	12.2	7.0	8.2	13.6
Queue Length 95th (m)	20.2	16.3	16.1	25.0
Internal Link Dist (m)	146.6	179.3	180.3	263.4
Turn Bay Length (m)				
Base Capacity (vph)	1491	613	1995	2486
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.12	0.15	0.27	0.37

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	70	0	65	0	15	70	340	45	20	530	240
Future Volume (vph)	80	70	0	65	0	15	70	340	45	20	530	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5			3.5			3.5			3.5	
Lane Util. Factor		0.95			1.00			0.95			0.95	
Frt		1.00			0.97			0.99			0.95	
Flt Protected		0.97			0.96			0.99			1.00	
Satd. Flow (prot)		3516			1751			3452			3441	
Flt Permitted		0.81			0.65			0.75			0.94	
Satd. Flow (perm)		2936			1180			2619			3230	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	94	82	0	76	0	18	82	400	53	24	624	282
RTOR Reduction (vph)	0	0	0	0	23	0	0	6	0	0	35	0
Lane Group Flow (vph)	0	176	0	0	71	0	0	529	0	0	895	0
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	3%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		8.0			8.0			43.0			43.0	
Effective Green, g (s)		9.0			9.0			44.0			44.0	
Actuated g/C Ratio		0.15			0.15			0.73			0.73	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		440			177			1920			2368	
v/s Ratio Prot												
v/s Ratio Perm		0.06			c0.06			0.20			c0.28	
v/c Ratio		0.40			0.40			0.28			0.38	
Uniform Delay, d1		23.1			23.1			2.7			3.0	
Progression Factor		1.53			1.00			1.00			1.00	
Incremental Delay, d2		0.6			1.5			0.4			0.5	
Delay (s)		35.9			24.6			3.0			3.4	
Level of Service		D			C			A			A	
Approach Delay (s)		35.9			24.6			3.0			3.4	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	506	140	124	1180	303	281
v/c Ratio	0.42	0.13	0.20	0.87	0.80	0.50
Control Delay	9.8	1.6	4.5	18.7	47.9	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.8	1.6	4.5	18.7	47.9	7.0
Queue Length 50th (m)	42.3	0.0	5.5	135.2	48.3	0.0
Queue Length 95th (m)	63.0	6.4	10.1	#256.8	#82.9	18.4
Internal Link Dist (m)	228.8			1140.2	151.2	
Turn Bay Length (m)		100.0	100.0		100.0	
Base Capacity (vph)	1198	1050	607	1359	409	583
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	0.42	0.13	0.20	0.87	0.74	0.48

Intersection Summary

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	450	125	110	1050	270	250
Future Volume (vph)	450	125	110	1050	270	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	2.0	3.0	3.0	3.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1881	1568	1805	1900	1787	1599
Flt Permitted	1.00	1.00	0.38	1.00	0.95	1.00
Satd. Flow (perm)	1881	1568	722	1900	1787	1599
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	506	140	124	1180	303	281
RTOR Reduction (vph)	0	52	0	0	0	221
Lane Group Flow (vph)	506	88	124	1180	303	60
Heavy Vehicles (%)	1%	3%	0%	0%	1%	1%
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	52.5	52.5	59.8	59.8	17.2	17.2
Effective Green, g (s)	53.5	53.5	60.8	60.8	18.2	18.2
Actuated g/C Ratio	0.63	0.63	0.72	0.72	0.21	0.21
Clearance Time (s)	4.0	4.0	3.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1183	986	583	1359	382	342
v/s Ratio Prot	0.27		0.01	c0.62	c0.17	
v/s Ratio Perm		0.06	0.14			0.04
v/c Ratio	0.43	0.09	0.21	0.87	0.79	0.18
Uniform Delay, d1	8.0	6.2	4.6	9.1	31.6	27.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1	0.2	0.2	7.7	10.8	0.2
Delay (s)	9.1	6.4	4.8	16.8	42.4	27.5
Level of Service	A	A	A	B	D	C
Approach Delay (s)	8.5			15.7	35.2	
Approach LOS	A			B	D	

Intersection Summary			
HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	383	1112	64	1505	138	266	138	165	170
v/c Ratio	0.97	0.50	0.30	0.97	0.53	0.63	0.78	0.41	0.36
Control Delay	62.3	8.2	17.6	37.5	32.0	30.5	55.4	26.2	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.3	8.2	17.6	37.5	32.0	30.5	55.4	26.2	6.3
Queue Length 50th (m)	~44.7	40.1	5.6	103.1	16.9	31.4	18.0	19.5	0.0
Queue Length 95th (m)	#102.2	58.0	15.0	#155.7	32.9	53.0	#43.2	35.0	13.6
Internal Link Dist (m)		585.1		130.4		189.6		92.5	
Turn Bay Length (m)	45.0		30.0				25.0		25.0
Base Capacity (vph)	393	2235	215	1551	306	495	210	482	525
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.50	0.30	0.97	0.45	0.54	0.66	0.34	0.32

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	360	955	90	60	1190	225	130	205	45	130	155	160
Future Volume (vph)	360	955	90	60	1190	225	130	205	45	130	155	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.5	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3487		1801	3444		1761	1834		1805	1827	1517
Flt Permitted	0.12	1.00		0.26	1.00		0.63	1.00		0.42	1.00	1.00
Satd. Flow (perm)	216	3487		486	3444		1161	1834		798	1827	1517
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)	383	1016	96	64	1266	239	138	218	48	138	165	170
RTOR Reduction (vph)	0	9	0	0	22	0	0	12	0	0	0	132
Lane Group Flow (vph)	383	1103	0	64	1483	0	138	254	0	138	165	38
Confl. Peds. (#/hr)	5		5	5		5	5					5
Confl. Bikes (#/hr)												5
Heavy Vehicles (%)	2%	2%	1%	0%	2%	1%	2%	1%	0%	0%	4%	4%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	45.0	45.0		31.0	31.0		15.0	15.0		15.0	15.0	15.0
Effective Green, g (s)	46.0	46.0		32.0	32.0		16.0	16.0		16.0	16.0	16.0
Actuated g/C Ratio	0.64	0.64		0.44	0.44		0.22	0.22		0.22	0.22	0.22
Clearance Time (s)	3.5	6.0		6.0	6.0		6.0	6.0		6.0	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
Lane Grp Cap (vph)	386	2227		216	1530		258	407		177	406	337
v/s Ratio Prot	c0.16	0.32			0.43			0.14			0.09	
v/s Ratio Perm	c0.48			0.13			0.12			c0.17		0.02
v/c Ratio	0.99	0.50		0.30	0.97		0.53	0.62		0.78	0.41	0.11
Uniform Delay, d1	20.9	6.9		12.8	19.5		24.7	25.3		26.3	23.9	22.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	43.5	0.8		3.5	16.8		2.1	3.0		19.2	0.7	0.1
Delay (s)	64.4	7.7		16.3	36.3		26.8	28.3		45.6	24.6	22.5
Level of Service	E	A		B	D		C	C		D	C	C
Approach Delay (s)		22.2			35.5			27.8			30.0	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	96.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	5	1654	126	1302	5	132	335	198	670	38
v/c Ratio	0.02	1.15	0.77	0.88	0.01	0.85	0.42	0.28	0.93	0.05
Control Delay	7.8	94.0	48.6	21.6	0.0	63.5	11.2	8.3	36.5	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.8	94.0	48.6	21.6	0.0	63.5	11.2	8.3	36.5	3.9
Queue Length 50th (m)	0.1	~88.6	8.3	48.5	0.0	9.2	18.1	8.1	49.1	0.1
Queue Length 95th (m)	0.8	#126.2	#32.8	#87.4	0.0	#35.3	33.9	18.5	#106.7	3.8
Internal Link Dist (m)		208.7		203.3			1140.2		129.5	
Turn Bay Length (m)	125.0		145.0		55.0	15.0		40.0		
Base Capacity (vph)	328	1436	164	1479	702	155	802	695	722	692
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	0.02	1.15	0.77	0.88	0.01	0.85	0.42	0.28	0.93	0.05

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1230	275	115	1185	5	120	305	180	0	610	35
Future Volume (vph)	5	1230	275	115	1185	5	120	305	180	0	610	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	3502	3301		1752	3505	1615	1656	1900	1599		1712	1591
Flt Permitted	0.21	1.00		0.21	1.00	1.00	0.21	1.00	1.00		1.00	1.00
Satd. Flow (perm)	776	3301		388	3505	1615	367	1900	1599		1712	1591
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	5	1352	302	126	1302	5	132	335	198	0	670	38
RTOR Reduction (vph)	0	42	0	0	0	3	0	0	21	0	0	21
Lane Group Flow (vph)	5	1612	0	126	1302	2	132	335	177	0	670	17
Confl. Bikes (#/hr)												5
Heavy Vehicles (%)	0%	6%	8%	3%	3%	0%	9%	0%	1%	0%	11%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	18.0	18.0		18.0	18.0	18.0	18.0	18.0	18.0		18.0	18.0
Effective Green, g (s)	19.0	19.0		19.0	19.0	19.0	19.0	19.0	19.0		19.0	19.0
Actuated g/C Ratio	0.42	0.42		0.42	0.42	0.42	0.42	0.42	0.42		0.42	0.42
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lane Grp Cap (vph)	327	1393		163	1479	681	154	802	675		722	671
v/s Ratio Prot		c0.49			0.37			0.18			c0.39	
v/s Ratio Perm	0.01			0.32		0.00	0.36		0.11			0.01
v/c Ratio	0.02	1.16		0.77	0.88	0.00	0.86	0.42	0.26		0.93	0.03
Uniform Delay, d1	7.6	13.0		11.2	12.0	7.5	11.8	9.1	8.4		12.3	7.6
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	0.1	79.2		29.2	7.8	0.0	42.3	1.6	0.9		19.9	0.1
Delay (s)	7.6	92.2		40.4	19.8	7.5	54.1	10.7	9.4		32.3	7.7
Level of Service	A	F		D	B	A	D	B	A		C	A
Approach Delay (s)		91.9			21.5			18.9			30.9	
Approach LOS		F			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	48.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	101.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	210	0	0	425	0	0
Future Volume (Veh/h)	210	0	0	425	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	228	0	0	462	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	287					
pX, platoon unblocked						
vC, conflicting volume			228		690	228
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			228		690	228
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1340		411	811

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	228	462	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.13	0.27	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	25.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	Y	
Traffic Volume (veh/h)	210	0	0	425	0	30
Future Volume (Veh/h)	210	0	0	425	0	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	228	0	0	462	0	33
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	402			296		
pX, platoon unblocked						
vC, conflicting volume			228		690	228
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			228		690	228
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	96
cM capacity (veh/h)			1340		411	811

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	228	462	33
Volume Left	0	0	0
Volume Right	0	0	33
cSH	1700	1700	811
Volume to Capacity	0.13	0.27	0.04
Queue Length 95th (m)	0.0	0.0	1.0
Control Delay (s)	0.0	0.0	9.6
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.6
Approach LOS			A

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	32.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	375	0	165	945	0	95
Future Volume (Veh/h)	375	0	165	945	0	95
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	408	0	179	1027	0	103
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				253		
pX, platoon unblocked					0.42	
vC, conflicting volume			408		1793	408
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			408		2190	408
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			84		100	84
cM capacity (veh/h)			1151		18	643

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	408	1206	103
Volume Left	0	179	0
Volume Right	0	0	103
cSH	1700	1151	643
Volume to Capacity	0.24	0.16	0.16
Queue Length 95th (m)	0.0	4.4	4.5
Control Delay (s)	0.0	4.2	11.7
Lane LOS		A	B
Approach Delay (s)	0.0	4.2	11.7
Approach LOS			B

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	94.5%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	70	0	0	0	0	0	0	0	0	0	0
Future Volume (Veh/h)	0	70	0	0	0	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	76	0	0	0	0	0	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		203			262							
pX, platoon unblocked												
vC, conflicting volume	0			76			76	76	76	76	76	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			76			76	76	76	76	76	0
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 %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1623			1523			914	814	985	914	814	1085

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	76	0	0	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1623	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS			A	A
Approach Delay (s)	0.0	0.0	0.0	0.0
Approach LOS			A	A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	7.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	40	0	0	0	290	0	0	0	45	75	0
Future Volume (Veh/h)	30	40	0	0	0	290	0	0	0	45	75	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	43	0	0	0	315	0	0	0	49	82	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		313			152							
pX, platoon unblocked												
vC, conflicting volume	315			43			150	424	43	266	266	158
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	315			43			150	424	43	266	266	158
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 %	97			100			100	100	100	93	87	100
cM capacity (veh/h)	1245			1566			721	508	1027	672	622	888

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	33	43	0	315	0	131
Volume Left	33	0	0	0	0	49
Volume Right	0	0	0	315	0	0
cSH	1245	1700	1700	1700	1700	640
Volume to Capacity	0.03	0.03	0.00	0.19	0.00	0.20
Queue Length 95th (m)	0.7	0.0	0.0	0.0	0.0	6.1
Control Delay (s)	8.0	0.0	0.0	0.0	0.0	12.1
Lane LOS	A				A	B
Approach Delay (s)	3.5		0.0		0.0	12.1
Approach LOS					A	B

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	37.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	54	38	310	5	76	146
v/c Ratio	0.07	0.03	0.22	0.01	0.34	0.25
Control Delay	4.1	3.7	3.3	19.2	25.5	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.1	3.7	3.3	19.2	25.5	14.8
Queue Length 50th (m)	2.1	1.3	8.0	0.3	7.9	4.8
Queue Length 95th (m)	7.6	m4.5	19.4	1.4	17.3	11.0
Internal Link Dist (m)		128.4	106.7	150.5		264.2
Turn Bay Length (m)	50.0				50.0	
Base Capacity (vph)	816	1429	1400	1268	503	1233
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	0.07	0.03	0.22	0.00	0.15	0.12

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	35	0	0	240	45	0	5	0	70	85	50
Future Volume (vph)	50	35	0	0	240	45	0	5	0	70	85	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5			3.5			3.5		3.5	3.5	
Lane Util. Factor	1.00	1.00			1.00			0.95		1.00	0.95	
Frt	1.00	1.00			0.98			1.00		1.00	0.94	
Flt Protected	0.95	1.00			1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863			1819			3539		1770	3343	
Flt Permitted	0.57	1.00			1.00			1.00		0.75	1.00	
Satd. Flow (perm)	1065	1863			1819			3539		1405	3343	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	38	0	0	261	49	0	5	0	76	92	54
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	0	0	46	0
Lane Group Flow (vph)	54	38	0	0	304	0	0	5	0	76	100	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	43.4	43.4			43.4			7.6		7.6	7.6	
Effective Green, g (s)	44.4	44.4			44.4			8.6		8.6	8.6	
Actuated g/C Ratio	0.74	0.74			0.74			0.14		0.14	0.14	
Clearance Time (s)	4.5	4.5			4.5			4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	788	1378			1346			507		201	479	
v/s Ratio Prot		0.02			c0.17			0.00			0.03	
v/s Ratio Perm	0.05									c0.05		
v/c Ratio	0.07	0.03			0.23			0.01		0.38	0.21	
Uniform Delay, d1	2.1	2.1			2.4			22.0		23.3	22.7	
Progression Factor	1.24	1.21			1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.0			0.4			0.0		1.2	0.2	
Delay (s)	2.8	2.5			2.8			22.1		24.5	22.9	
Level of Service	A	A			A			C		C	C	
Approach Delay (s)		2.7			2.8			22.1			23.4	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	10.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	40.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	20	45	0	220	140	35	75	0	0	240	30
Future Volume (Veh/h)	40	20	45	0	220	140	35	75	0	0	240	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	43	22	49	0	239	152	38	82	0	0	261	33
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		131										
pX, platoon unblocked												
vC, conflicting volume	391			71			535	524	46	464	472	315
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	391			71			535	524	46	464	472	315
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 %	96			100			84	81	100	100	45	95
cM capacity (veh/h)	1168			1529			239	442	1023	424	472	725

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	43	71	0	391	120	294
Volume Left	43	0	0	0	38	0
Volume Right	0	49	0	152	0	33
cSH	1168	1700	1700	1700	348	491
Volume to Capacity	0.04	0.04	0.00	0.23	0.34	0.60
Queue Length 95th (m)	0.9	0.0	0.0	0.0	12.0	30.9
Control Delay (s)	8.2	0.0	0.0	0.0	20.7	22.6
Lane LOS	A				C	C
Approach Delay (s)	3.1		0.0		20.7	22.6
Approach LOS					C	C

Intersection Summary			
Average Delay	10.3		
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	0	360	20	35	0
Future Volume (Veh/h)	20	0	360	20	35	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	0	391	22	38	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				280	175	
pX, platoon unblocked						
vC, conflicting volume	842	38	38			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	842	38	38			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	100	75			
cM capacity (veh/h)	251	1034	1572			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	22	413	38
Volume Left	22	391	0
Volume Right	0	0	0
cSH	251	1572	1700
Volume to Capacity	0.09	0.25	0.02
Queue Length 95th (m)	2.3	7.9	0.0
Control Delay (s)	20.7	7.7	0.0
Lane LOS	C	A	
Approach Delay (s)	20.7	7.7	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	7.7		
Intersection Capacity Utilization	37.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	50	20	90	70	0	5
Future Volume (Veh/h)	50	20	90	70	0	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	22	98	76	0	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		182	224			
pX, platoon unblocked						
vC, conflicting volume	174				266	136
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	174				266	136
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				100	99
cM capacity (veh/h)	1403				695	913

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	76	174	5
Volume Left	54	0	0
Volume Right	0	76	5
cSH	1403	1700	913
Volume to Capacity	0.04	0.10	0.01
Queue Length 95th (m)	1.0	0.0	0.1
Control Delay (s)	5.5	0.0	9.0
Lane LOS	A		A
Approach Delay (s)	5.5	0.0	9.0
Approach LOS			A

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	26.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	20	160	0	0	0
Future Volume (Veh/h)	0	20	160	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	22	174	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			252			
pX, platoon unblocked						
vC, conflicting volume	174				196	174
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	174				196	174
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1403				793	869

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	0	22	174	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.00	0.01	0.10	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				A
Approach Delay (s)	0.0		0.0	0.0
Approach LOS				A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	11.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	20	160	0	75	0
Future Volume (Veh/h)	0	20	160	0	75	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	22	174	0	82	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		111	141			
pX, platoon unblocked						
vC, conflicting volume	174				196	174
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	174				196	174
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				90	100
cM capacity (veh/h)	1403				793	869

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	0	22	174	0	82
Volume Left	0	0	0	0	82
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	793
Volume to Capacity	0.00	0.01	0.10	0.00	0.10
Queue Length 95th (m)	0.0	0.0	0.0	0.0	2.8
Control Delay (s)	0.0	0.0	0.0	0.0	10.1
Lane LOS					B
Approach Delay (s)	0.0		0.0		10.1
Approach LOS					B

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	19.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	95	0	0	75	5	0	0	0	0	0	85
Future Volume (Veh/h)	0	95	0	0	75	5	0	0	0	0	0	85
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	103	0	0	82	5	0	0	0	0	0	92
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					373							
pX, platoon unblocked												
vC, conflicting volume	87			103			236	190	52	136	188	44
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	87			103			236	190	52	136	188	44
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
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 %	100			100			100	100	100	100	100	91
cM capacity (veh/h)	1507			1487			635	704	1005	822	706	1017

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	0	52	52	0	55	32	0	0	0	0	92
Volume Left	0	0	0	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	5	0	0	0	0	92
cSH	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1017
Volume to Capacity	0.00	0.03	0.03	0.00	0.03	0.02	0.00	0.00	0.00	0.00	0.09
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.9
Lane LOS							A	A	A	A	A
Approach Delay (s)	0.0			0.0			0.0		8.9		
Approach LOS							A		A		

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	140	120	60	120	40
Future Volume (Veh/h)	0	140	120	60	120	40
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	152	130	65	130	43
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		127	245			
pX, platoon unblocked						
vC, conflicting volume	195				238	98
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	195				238	98
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				82	95
cM capacity (veh/h)	1375				729	940

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	51	101	87	108	173
Volume Left	0	0	0	0	130
Volume Right	0	0	0	65	43
cSH	1375	1700	1700	1700	772
Volume to Capacity	0.00	0.06	0.05	0.06	0.22
Queue Length 95th (m)	0.0	0.0	0.0	0.0	6.9
Control Delay (s)	0.0	0.0	0.0	0.0	11.0
Lane LOS					B
Approach Delay (s)	0.0		0.0		11.0
Approach LOS					B

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	21.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	240	145	360	0	35
Future Volume (Veh/h)	20	240	145	360	0	35
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	261	158	391	0	38
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				116	339	
pX, platoon unblocked	0.98					
vC, conflicting volume	726	19	38			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	708	19	38			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	75	90			
cM capacity (veh/h)	353	1059	1572			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	22	261	549	38
Volume Left	22	0	158	0
Volume Right	0	261	0	38
cSH	353	1059	1572	1700
Volume to Capacity	0.06	0.25	0.10	0.02
Queue Length 95th (m)	1.6	7.8	2.7	0.0
Control Delay (s)	15.9	9.5	2.9	0.0
Lane LOS	C	A	A	
Approach Delay (s)	10.0		2.9	0.0
Approach LOS	B			

Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	43.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	120	0	30	290	0	0
Future Volume (Veh/h)	120	0	30	290	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	130	0	33	315	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			84			105
pX, platoon unblocked						
vC, conflicting volume	190	190			348	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	190	190			348	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	84	100			100	
cM capacity (veh/h)	798	851			1211	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	130	348	0
Volume Left	130	0	0
Volume Right	0	315	0
cSH	798	1700	1700
Volume to Capacity	0.16	0.20	0.00
Queue Length 95th (m)	4.6	0.0	0.0
Control Delay (s)	10.4	0.0	0.0
Lane LOS	B		
Approach Delay (s)	10.4	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	32.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	240	0	315	425	0	90
Future Volume (Veh/h)	240	0	315	425	0	90
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	261	0	342	462	0	98
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	70			80		
pX, platoon unblocked						
vC, conflicting volume			261		1407	261
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			261		1407	261
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			74		100	87
cM capacity (veh/h)			1303		113	778

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	261	804	98
Volume Left	0	342	0
Volume Right	0	0	98
cSH	1700	1303	778
Volume to Capacity	0.15	0.26	0.13
Queue Length 95th (m)	0.0	8.5	3.4
Control Delay (s)	0.0	5.5	10.3
Lane LOS		A	B
Approach Delay (s)	0.0	5.5	10.3
Approach LOS			B

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	330	0	205	740	0	45
Future Volume (Veh/h)	330	0	205	740	0	45
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	359	0	223	804	0	49
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	75			323		
pX, platoon unblocked					0.57	
vC, conflicting volume			359		1609	359
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			359		1691	359
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			81		100	93
cM capacity (veh/h)			1200		48	685

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	359	1027	49
Volume Left	0	223	0
Volume Right	0	0	49
cSH	1700	1200	685
Volume to Capacity	0.21	0.19	0.07
Queue Length 95th (m)	0.0	5.4	1.8
Control Delay (s)	0.0	4.3	10.7
Lane LOS		A	B
Approach Delay (s)	0.0	4.3	10.7
Approach LOS			B

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	81.0%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	40	115	200	55	155	10
Future Volume (Veh/h)	40	115	200	55	155	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	43	125	217	60	168	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				87	96	
pX, platoon unblocked						
vC, conflicting volume	668	174	179			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	668	174	179			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	86	84			
cM capacity (veh/h)	358	870	1397			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	168	277	179
Volume Left	43	217	0
Volume Right	125	0	11
cSH	637	1397	1700
Volume to Capacity	0.26	0.16	0.11
Queue Length 95th (m)	8.4	4.4	0.0
Control Delay (s)	12.7	6.6	0.0
Lane LOS	B	A	
Approach Delay (s)	12.7	6.6	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	6.3		
Intersection Capacity Utilization	42.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	70	15	20	40	140	145
Future Volume (Veh/h)	70	15	20	40	140	145
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	16	22	43	152	158
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				81	89	
pX, platoon unblocked						
vC, conflicting volume	318	231	310			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	318	231	310			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	98	98			
cM capacity (veh/h)	663	808	1250			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	92	65	310
Volume Left	76	22	0
Volume Right	16	0	158
cSH	685	1250	1700
Volume to Capacity	0.13	0.02	0.18
Queue Length 95th (m)	3.7	0.4	0.0
Control Delay (s)	11.1	2.8	0.0
Lane LOS	B	A	
Approach Delay (s)	11.1	2.8	0.0
Approach LOS	B		

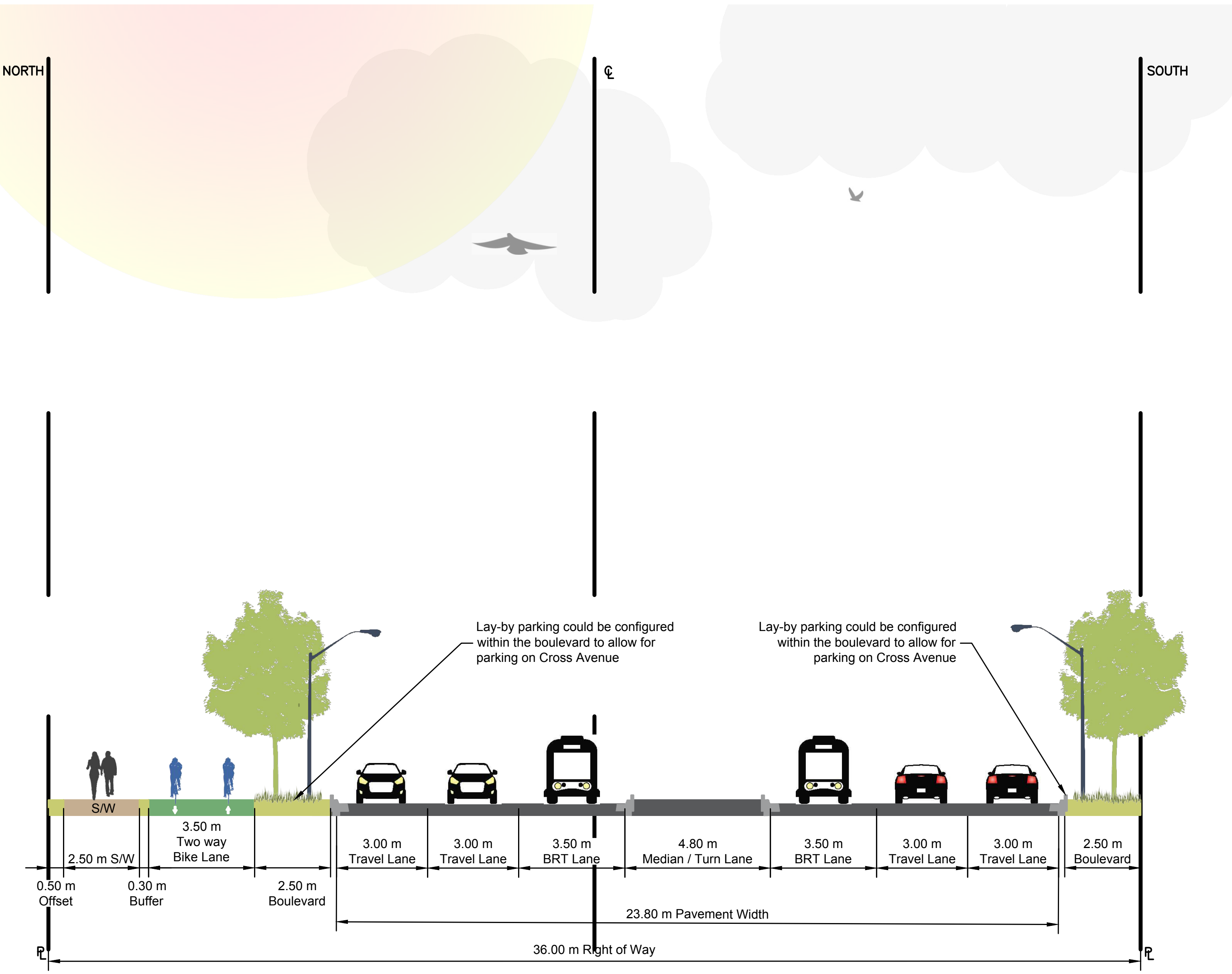
Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	31.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	75	0	85	45	5
Future Volume (Veh/h)	0	75	0	85	45	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	82	0	92	49	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		62	66			
pX, platoon unblocked						
vC, conflicting volume	92				87	46
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	92				87	46
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				95	100
cM capacity (veh/h)	1501				904	1014

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	27	55	0	92	54
Volume Left	0	0	0	0	49
Volume Right	0	0	0	92	5
cSH	1501	1700	1700	1700	913
Volume to Capacity	0.00	0.03	0.00	0.05	0.06
Queue Length 95th (m)	0.0	0.0	0.0	0.0	1.5
Control Delay (s)	0.0	0.0	0.0	0.0	9.2
Lane LOS					A
Approach Delay (s)	0.0		0.0		9.2
Approach LOS					A

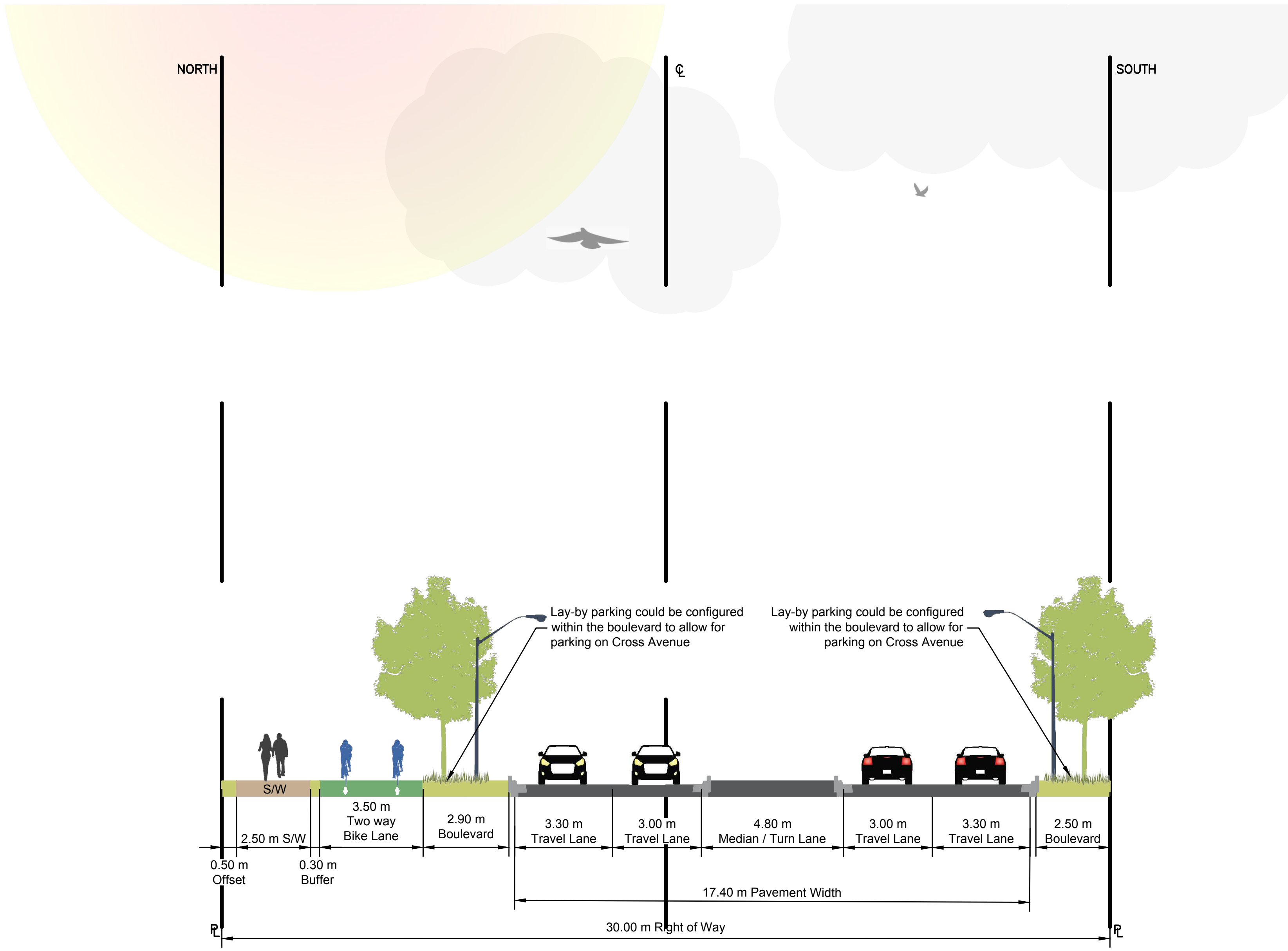
Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix D:
Midtown Oakville (East of Trafalgar Road) Public Street Cross-sections – Adjacent to Rose Corp Master Plan Area, BA Group, November 2024

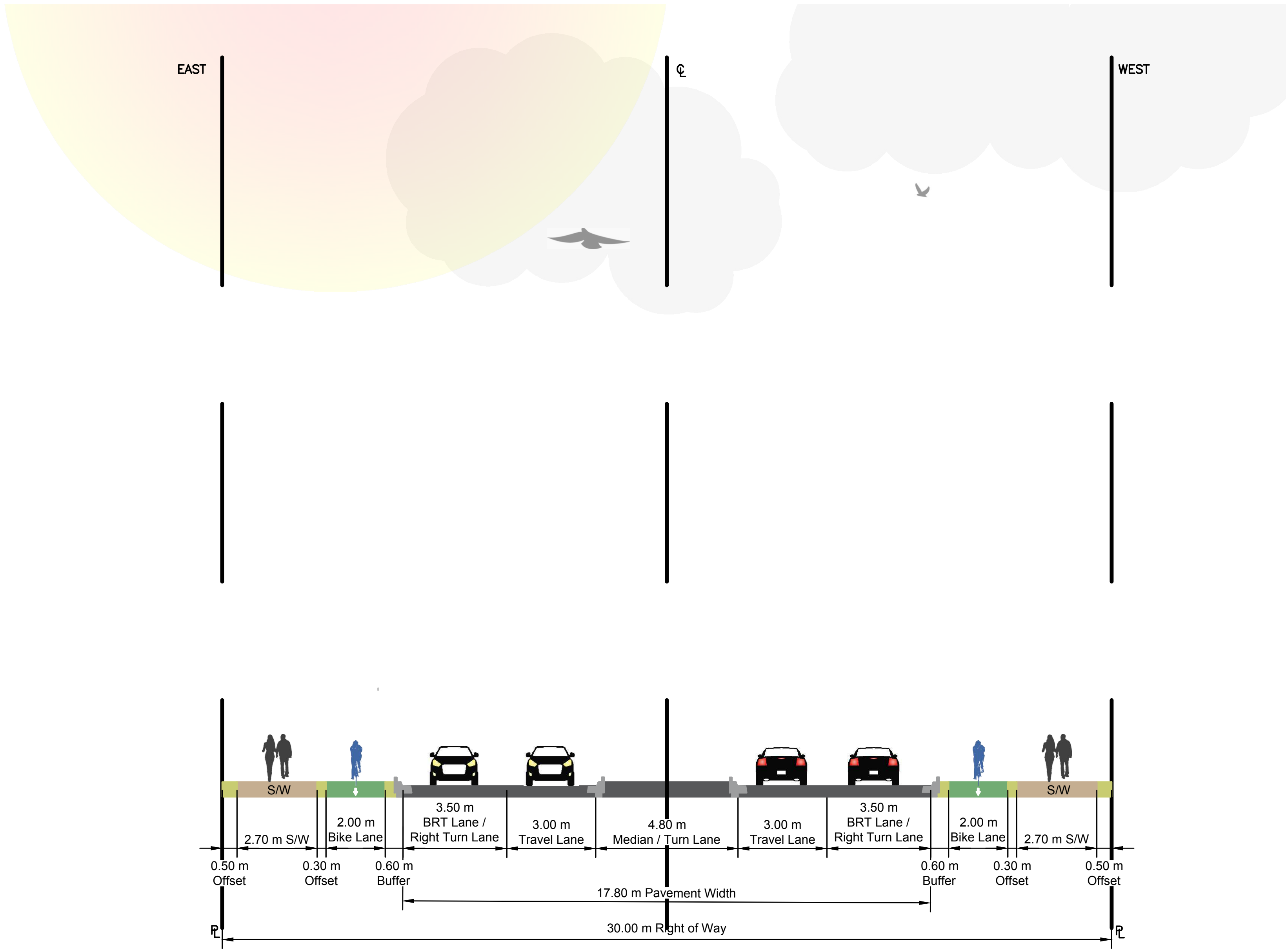


Date Plotted: November 1, 2024 Filename: J:\6931-03\BA\Functional Plan\3. October 28-2024 - Cross Sections\ba-Cross Section Elements-Oct31-2024.dwg

CROSS AVENUE - 36M ROW - MIDBLOCK WEST OF N-S MINOR ARTERIAL



CROSS AVENUE - 30M ROW - MIDBLOCK EAST OF N-S MINOR ARTERIAL



N-S- ARTERIAL ROAD - 30M ROW

BA GROUP 6931-03

420-468 SOUTH SERVICE ROAD EAST

Date Plotted: November 1, 2024 Filename: J:\6931-03\BA\Functional Plan\3. October 28-2024 - Cross Sections\ba-Cross Section Elements-Oct31-2024.dwg

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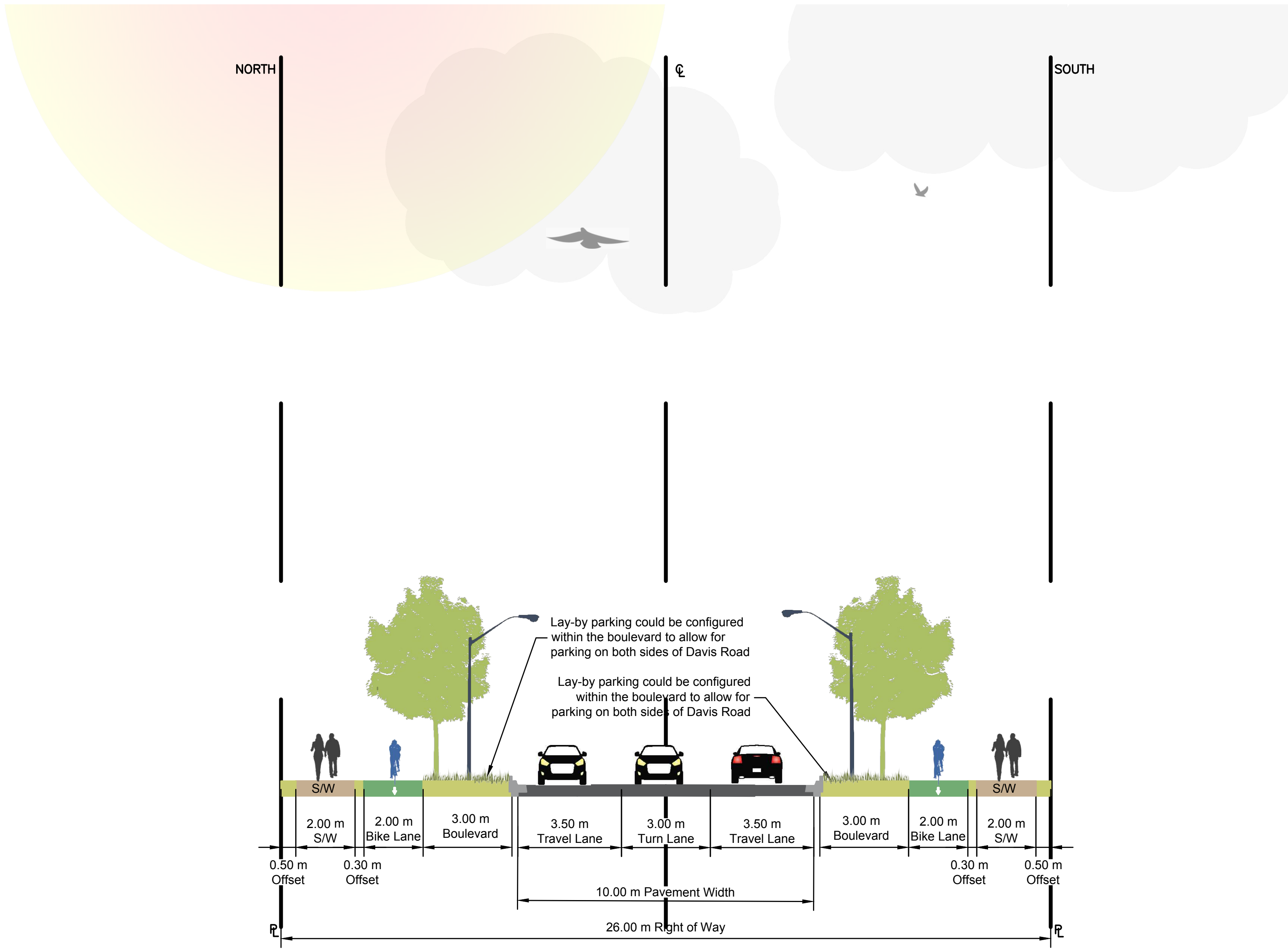
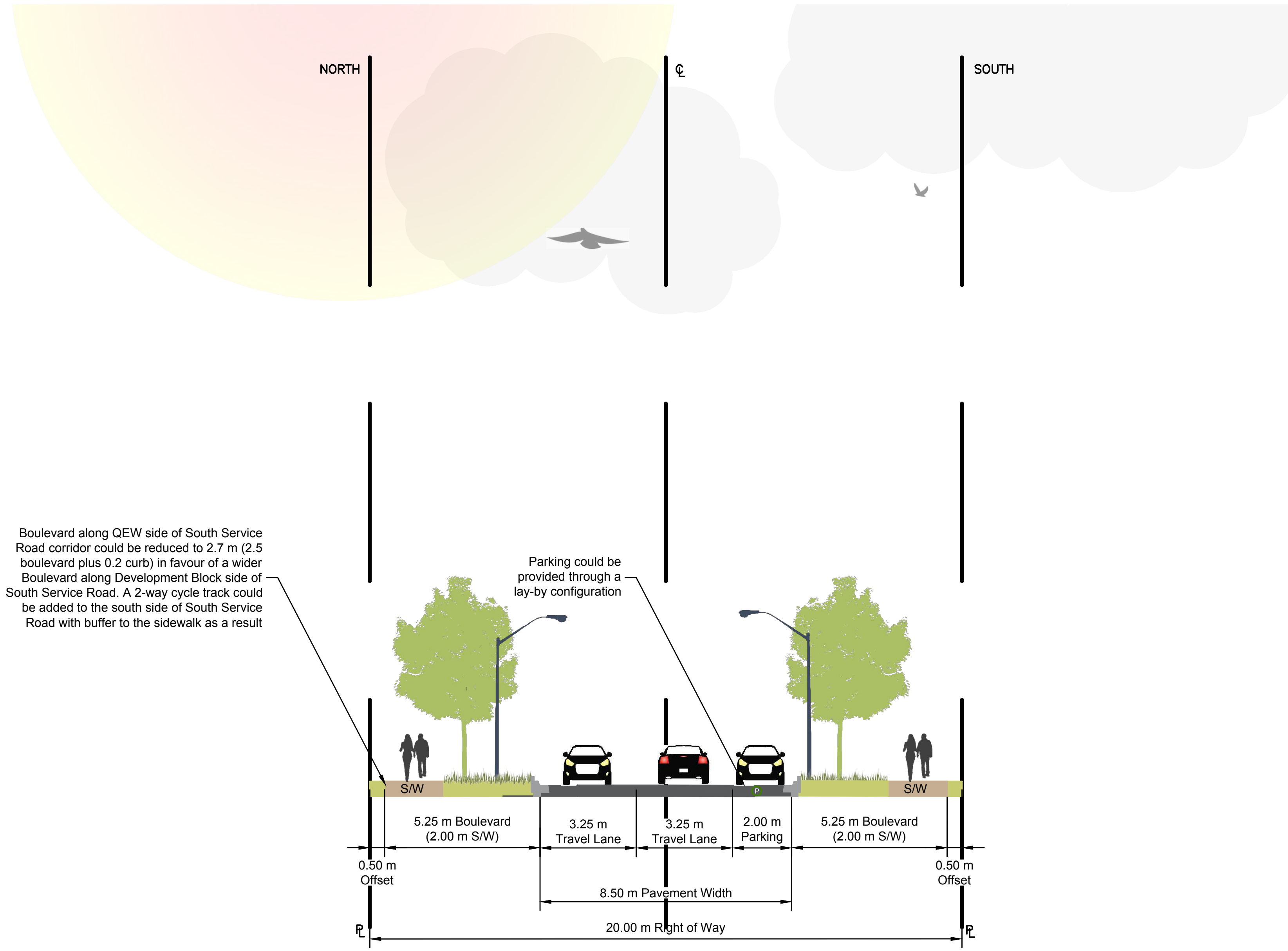


DAVIS ROAD - 26M ROW

Date Plotted: November 1, 2024 Filename: J:\6931-03\BA\Functional Plan\3. October 28-2024 - Cross Sections\ba-Cross Section Elements-Oct31-2024.dwg

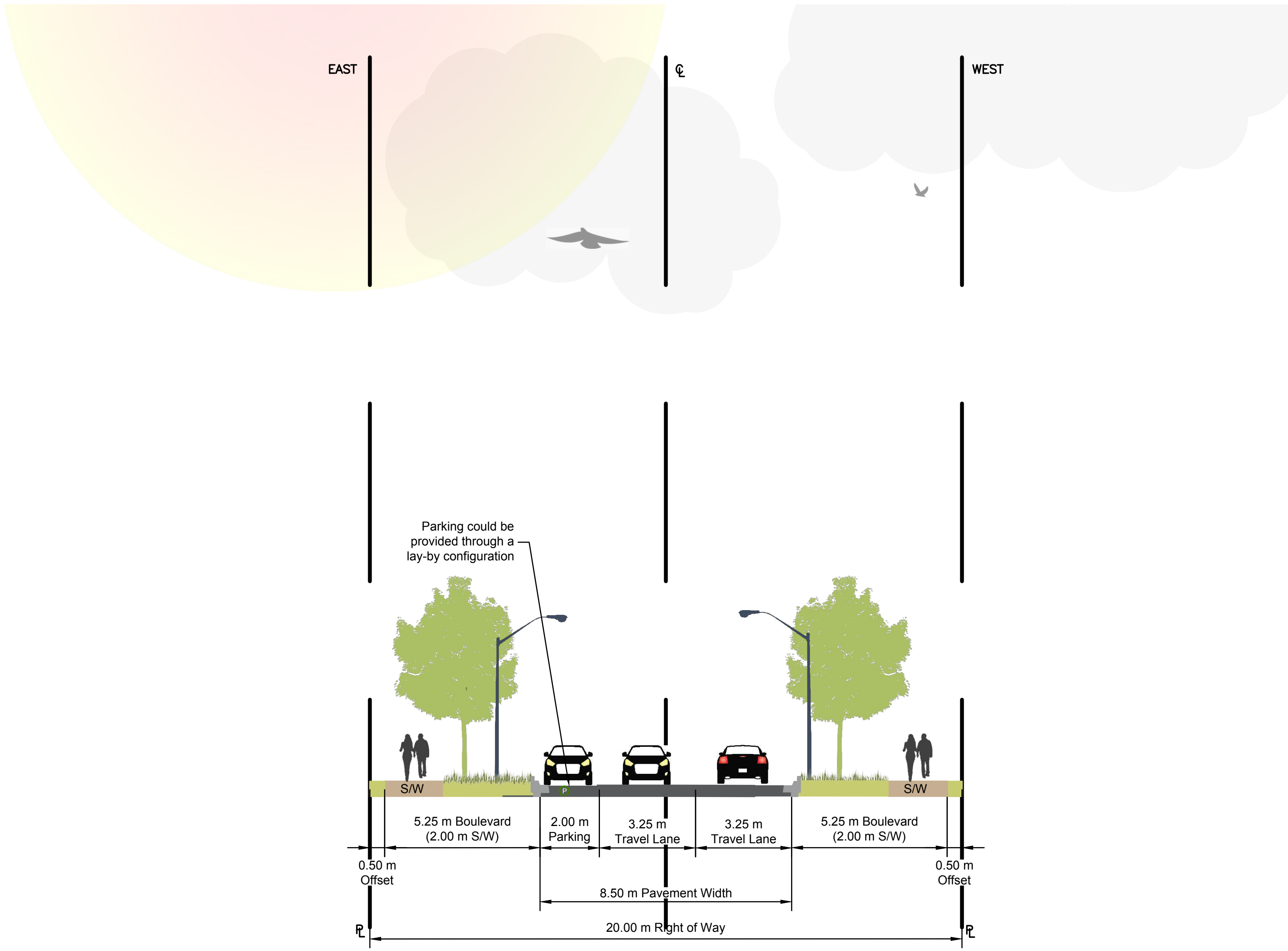


SOUTH SERVICE ROAD EAST - 20M ROW

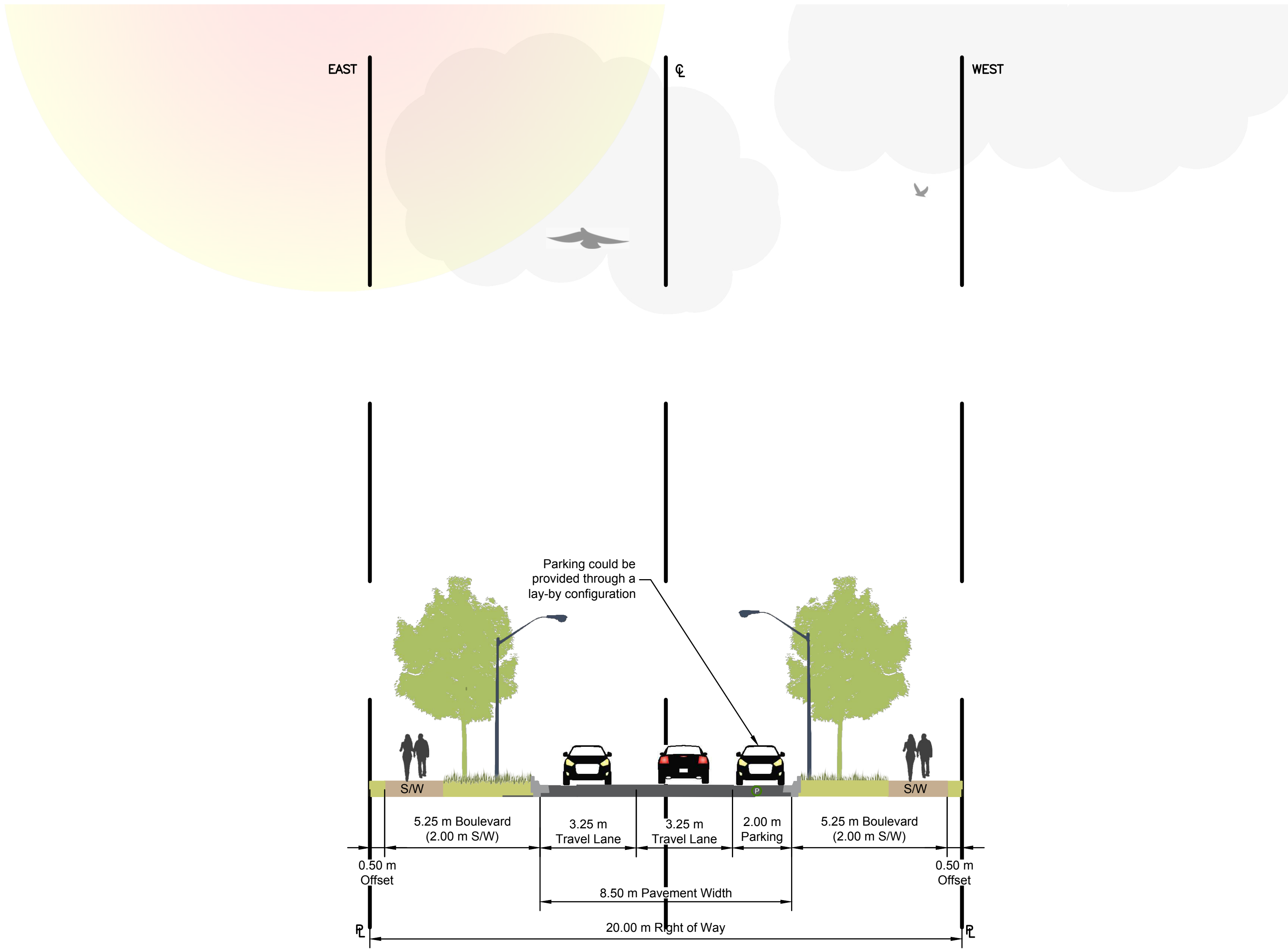
BA GROUP 6931-03

420-468 SOUTH SERVICE ROAD EAST

Date Plotted: November 1, 2024 Filename: J:\6931-03\BA\Functional Plan\3. October 28-2024 - Cross Sections\ba-Cross Section Elements-Oct31-2024.dwg



EAST LOCAL STREET - 20M ROW



WEST LOCAL STREET - 20M ROW