1095 KINGSTON ROAD
PROPOSED RESIDENTIAL DEVELOPMENT

Zoning By-law Amendment Application
City of Pickering



Prepared For: 1095 Kingston Road Ltd. C/O Resident

March 2025

BA Group

© BA Consulting Group Ltd.
95 St. Clair Avenue West, Suite 1000
Toronto, ON M4V 1N6
www.bagroup.com

AUTHORSHIP

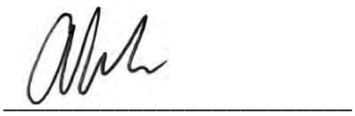
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PREPARED BY



Co-Lead Author

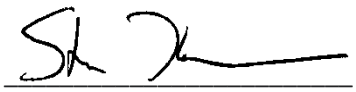
Monica Miranda
Lead Transportation Analyst



Co-Lead Author

Alisha Ma
Transportation Analyst

REVIEWED BY



Project Manager

Steven X. Kwan, P.Eng.
Senior Associate

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1.0 INTRODUCTION

BA Group has been retained by 1095 Kingston Road Ltd. C/O Resident (herein referred to as the "applicant") to provide transportation advisory services for the proposed redevelopment of the lands located at 1095 Kingston Road (herein referred to as the "site") in the City of Pickering (the "City") and Region of Durham (the "Region"). This report has been prepared as part of an initial Zoning By-law Amendment ("ZBA") application being made to the City and Region.

1.1 Site Location and Context

The site is located within the Liverpool neighbourhood and is bounded by Kingston Road to the north, Highway 401 to the south, Dixie Road to the east, and the CN railway to the west.

The surrounding uses of the site include low-density residential uses and retail / commercial uses along the north and south sides of the Kingston Road corridor, respectively. Notably, Kingston Road will undergo a transformation near the site given the planned Durham-Scarborough Bus Rapid Transit line ("Durham-Scarborough BRT" or "DSBRT"), as further discussed in **Section 4.2.2**, and other provincial and municipal policies and initiatives, as further discussed in **Section 3.0**.

The site location is illustrated on **Figure 1**.

1.2 Existing Zoning and Site Conditions

The site is currently occupied by a single-storey building, with a gross floor area ("GFA") of approximately 86,782 ft^2 (or approximately 8,062 m^2), that operates a sports complex and a variety of commercial stores. There are approximately 275 surface parking spaces provided to support the existing building. Existing loading facilities are located to the rear of the building.

Vehicle access to the property is currently provided by three driveways with all-moves accesses along Dixie Road. The intersection of Kingston Road and Dixie Road is signalized with a designated northbound left-turn lane.

In addition, the existing uses currently have access to bus services operated by Durham Region Transit ("DRT") and GO Metrolinx Transit ("GO"), with nearby bus stops located at the intersection of Kingston Road and Dixie Road. Pedestrian access is provided by sidewalks along Dixie Road (i.e., along the west side south of Kingston Road and along both sides north of Kingston Road), which connects to a concrete bus pad with an enclosed bus shelter. Additional sidewalks are provided along Kingston Road, on both sides, east of Dixie Road.

The site is currently subject to the as-of-right permissions and transportation standards per City of Pickering Zoning By-law 3036 (as amended). The updated standards of City of Pickering's Comprehensive Zoning By-law will be incorporated into various transportation-related elements of the development proposal.

The proposed development aims to maintain or improve the existing conditions while considering subject policies per the City of Pickering Official Plan's Mixed-Use Area (Mixed Corridors) designation, Official Plan Amendment 38 ("OPA 38"), and Kingston Road Corridor and Specialty Retailing Node Intensification Plan ("Kingston Corridor Intensification Plan"), which collectively present a strong redevelopment opportunity given the site's proximity to existing and new transit services and key destinations accessible by bike ride or on-foot in the area.

The transportation-related aspects of the proposed development are presented throughout the following report sections.

1.3 Study Scope

On October 23, 2024, a Pre-Consultation Meeting (PRE 35/24) was held virtually between the applicant, City, Region, and Ministry of Transportation Ontario ("MTO"), to discuss the development proposal concept and submission requirements. City, Region, and MTO staff provided comments following their review in the form of a memorandum, which has been addressed within this report. The consolidated Pre-Consultation Meeting comment summary is provided in **Appendix A**.

On January 10, 2025, BA Group circulated a Transportation Impact Study Terms of Reference document to City, Region, and MTO staff for review. Since that time, the Region provided comments, which has also been addressed within this report. The Terms of Reference and correspondences are provided in **Appendix B** and Durham Region's Traffic Impact Study Guidelines are provided in **Appendix C**.

The following outlines the scope of the study:

Development Proposal

- A summary of the development proposal.
- An overview of the site and the surrounding transportation system that provides for automobiles but encourages a shift towards non-automobile travel from prospective residents and visitors while still being able to meet the practical and operational needs of the development proposal.
- A review of the transportation elements of the proposed development plan that includes vehicle access and circulation, loading, and parking facilities.

Area Context

- A review of the evolving planning context including key provincial and municipal policies, plans, and programs subject to the proposed development.
- A review of existing and future transportation context including key municipal road, transit, pedestrian and cycling changes and other non-automobile dependent travel options in the area.

Site Planning

- A review of the vehicle parking supply requirements and provisions for the proposed development plans.
- A review of the bicycle parking supply requirements and provisions for the proposed development plans.
- A review of the loading space requirements and provisions for the proposed development plans.
- A review of the functionality and appropriateness of the proposed facilities incorporated into the site plan, as applicable, including loading / garbage collection and pick-up / drop-off facility arrangements.
- A review of the functionality of the new public road as part of the proposed development plans.

Transportation Demand Management

- A review of Transportation Demand Management ("TDM") measures to encourage, facilitate, and support non-automobile travel to/from the site.

Multi-modal Travel Demand Forecasting

- An outline of travel characteristics and travel demand projections for pedestrians, cyclists, transit users and automobile users of the proposed development.
- An assessment of the site-related traffic forecasts for the transit, pedestrians, and cyclists of the proposed development.
- An assessment of the existing vehicle traffic activity patterns and volumes in the study area during the key weekday morning and afternoon peak periods.
- A comprehensive review of the vehicle traffic changes that may occur in the area in the future with the development of several other area development projects.
- A review of existing vehicle site-related traffic activity levels that will be eliminated as part of the proposed development.
- A comparison of the proposed vehicle site-related traffic forecasts to the existing vehicle site-related traffic activity levels generated by the existing site uses today.
- An assessment of the vehicle traffic and other trip generation characteristics of the proposed development.

Traffic Volume and Forecasting Operations Analysis

- A detailed review of the traffic operations at intersections in the area under existing and future traffic conditions including an assessment of the operational impacts of the proposed development.

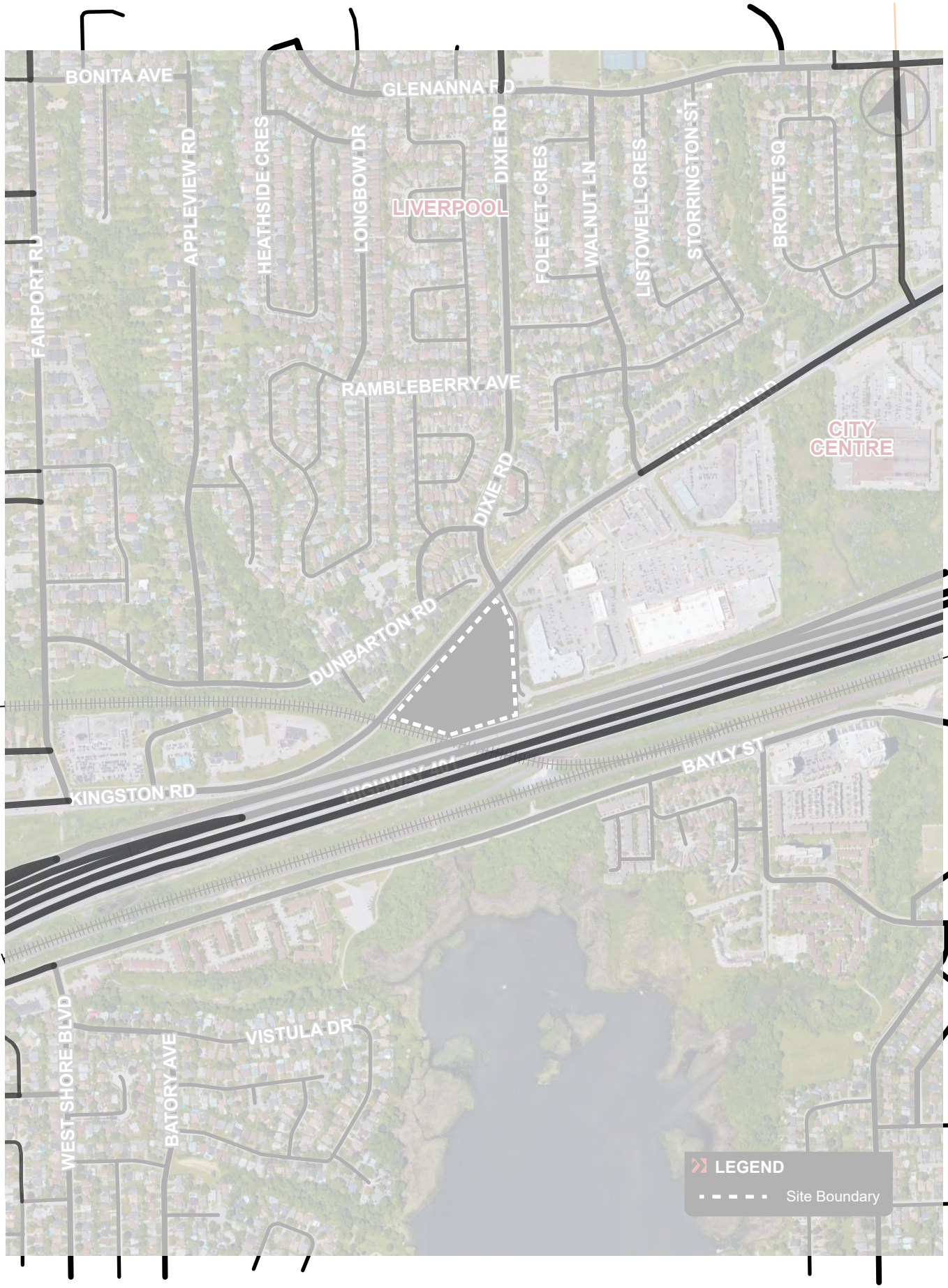


FIGURE 1 SITE LOCATION

2.0 DEVELOPMENT PROPOSAL

The development proposal includes a residential development with two buildings comprising a total of 1,492 residential units. The breakdown of proposed uses, per building, are as follows:

- Building 1 (including podium): 721 residential units
- Building 2 (including podium): 771 residential units

It is proposed to demolish the existing building and surface parking as part of the redevelopment. All existing accesses will be removed and three new driveway accesses are proposed:

- One right-in / right-out only driveway access along Kingston Road;
- One northern all-moves driveway access along Dixie Road; and
- One southern all-moves driveway access along Dixie Road.

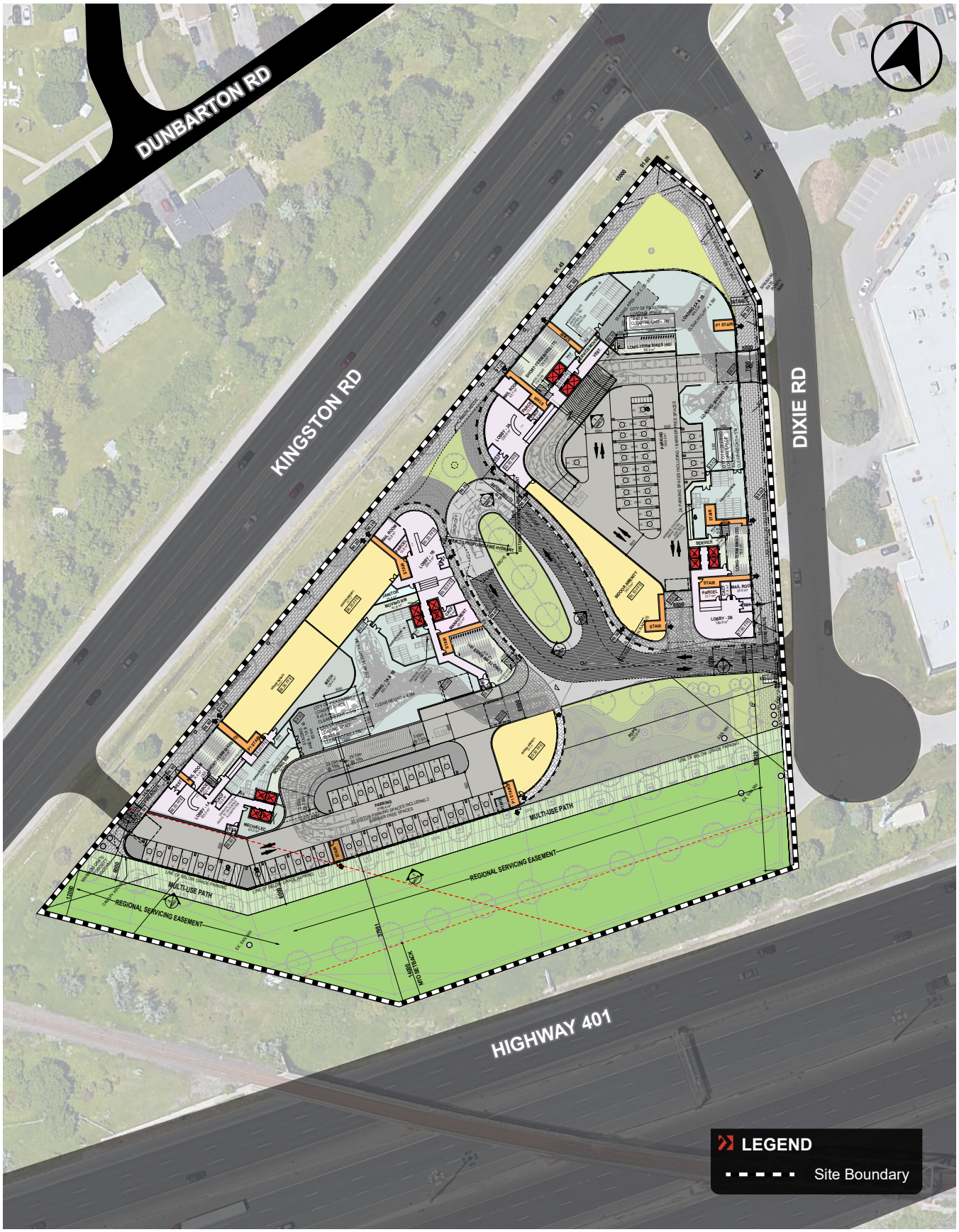
Moreover, updated vehicle parking, bicycle parking, and loading strategies for the new buildings are proposed as part of the redevelopment.

The development proposal, including the land use and transportation elements of the site, are outlined in **Table 1**. The current site plan is illustrated on **Figure 2** and reduced scale architectural plans are provided in **Appendix D**.

Table 1 Development Proposal Summary

Type	
Residential Units	1,492 units
Site Driveway	1 access from Kingston Road (right-in / right-out only) 2 accesses from Dixie Road (all-moves) 3 total driveway accesses
Vehicle Parking Supply	920 resident spaces (including 16 accessible spaces) 223 residential visitor spaces (including 7 accessible spaces) 1,143 total vehicle parking spaces (including 23 accessible spaces)
Vehicle Parking Access	At-grade parking area and parking ramps from accesses along Dixie Road and Kingston Road
Bicycle Parking Supply	746 long-term spaces 149 short-term spaces 895 total bicycle parking spaces
Bicycle Parking Access	At-grade bicycle facilities along Dixie Road, Kingston Road, and/or site internal pathway, and below-grade bicycle facilities from elevators at buildings lobbies
Pedestrian Access	Building entrances along Dixie Road, Kingston Road, and internal pathways
Loading Supply	2 loading spaces at Building 1 2 loading spaces at Building 2 4 total loading spaces
Loading Access	At-grade loading area from accesses along Dixie Road
Pick-up / Drop-off Supply	12 layby spaces
Pick-up / Drop-off Access	At-grade pick-up / drop-off loop near building entrances from southern access along Dixie Road

Notes:
1. Site statistics received from BDP Quadrangle Architects Ltd. dated March 20, 2025.



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Aerial maps provided courtesy of: Esri, DigitalGlobe, GeoEye, Earthstar Geographies, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, the GIS User Community and/or Google Earth/Maps.

FIGURE 2 SITE PLAN

3.0 PLANNING AND POLICY CONTEXT

3.1 Provincial and Regional Policies

There are several provincial and regional policies and plans relevant to the site from a transportation perspective, including the following:

- Cutting Red Tape To Build More Homes Act, 2024 (Bill 185);
- Provincial Planning Statement (2024);
- Metrolinx 2041 Regional Transportation Plan (2018);
- Envision Durham (2024);
- Durham Regional Transportation Master Plan (2017) and
- Durham Regional Cycling Plan (2021).

The key transportation details of these policy documents are summarized below.

3.1.1 Cutting Red Tape to Build More Homes Act, 2024 (Bill 185)

On April 10, 2024, the Provincial government introduced the *Cutting Red Tape to Build More Homes Act, 2024* – known as Bill 185 – as new legislation with the goal of increasing housing and infrastructure development in Ontario. Bill 185 introduced several changes to Provincial Acts, including the Planning Act. One key change includes prohibiting and /or limiting 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 ("PMTSAs") and areas around most major transit stations. A Major Transit Station Area ("MTSA") is defined within the Provincial Planning Statement, discussed further in **Section 3.1.2**, as the area generally within an approximate 500 - 800 metre radius of a transit station. PMTSAs are a subset of MTSAs where specific Official Plan policies may be applied.

Bill 185 received Royal Assent on June 6, 2024, and is now in-force and in effect in MTSAs approved by the Province.

Municipalities in Durham Region have identified MTSAs, currently awaiting ministerial approval, but they are limited to areas surrounding existing GO stations. The closest MTSA to the site is the Pickering GO PMTSA, which is located 750 metres or a 9-minute bus ride from the site. Although the site is not located within the Pickering GO PMTSA, there is potential for the City to expands its MTSA zones to consider areas with future rapid transit access. The site is located adjacent to a stop along the future Durham-Scarborough BRT corridor which resembles the Provincially defined characteristics of an MTSA (i.e., walking distance to a transit station).

3.1.2 Provincial Planning Statement (2024)

The Provincial Planning Statement ("PPS 2024") provides a set of adapted and integrated land use planning policies from the former Provincial Policy Statement ("PPS 2020") and the former Growth Plan for the GGH ("Growth Plan"), ultimately replacing both documents to form a new provincial planning policy tool. The PPS 2024 came into force and effect on October 20, 2024.

As it relates to transportation, the PPS 2024 emphasizes the importance of supporting existing and future transit and active transportation facilities. Chapter 2 notes the Province's focus on accommodating multi-modal access, requiring transit-supportive development, planning for intensification adjacent to existing and planned frequent transit corridors, and reducing greenhouse gas emissions through transit-supportive communities and active transportation. Further, Chapter 3 contains several policies related to providing safe and energy-efficient transportation systems that can appropriately address projected needs in the Province. Policies therein focus on promoting healthy and active communities through facilitating active transportation, planning public streets to meet the needs of all ages and abilities, and making efficient use of existing and planning infrastructure through TDM strategies.

The site development as planned, aligns with the policy directions of the PPS 2024 from a transportation perspective by virtue of the site location relative to existing higher-order and surface transit infrastructure / services, and the proposed transportation elements of the plan (e.g., reduced parking standards and active transportation connections / facilities). Moreover, the proposed on-site TDM strategies, including the provision of a multi-use path and bicycle parking, strongly supports the PPS 2024 goals of creating healthy and active communities with energy-efficient transportation systems.

3.1.3 Metrolinx 2041 Regional Transportation Plan (2018)

The Metrolinx 2041 Regional Transportation Plan ("2041 RTP"), adopted in 2018 as an update to The Big Move (2008), directs the continued development of the Greater Toronto and Hamilton Area's transportation network with the goals of creating a sustainable system that provides strong connections, complete travel experiences, and healthy and complete communities.

A key strategy of the 2041 RTP is the integration of transit and land use by promoting high-density development along major transit corridors. As well, embedding TDM strategies in land use planning and development to prioritize cycling, walking, and transit use is highlighted in the Plan. The current development programme aligns with the strategies of the 2041 RTP as it proposes increased residential density along a rapid transit corridor and various TDM strategies, discussed in **Section 9.0**, which seek to increase encourage travel via transit and active transportation over private automobile.

Beyond these strategies, the 2041 RTP also identifies various transportation improvement projects adjacent to the site that will directly benefit future site users. The 2041 RTP acknowledges that planning is currently underway for the Durham-Scarborough BRT, an upgrade of the existing DRT Pulse bus service along Highway 2 (including Kingston Road).

3.1.4 Envision Durham (2024)

Envision Durham, the new Regional Official Plan ("new ROP"), is aimed at effectively managing the growth and development of Durham Region to accommodate 1.3 million residents and 460,000 jobs by the year 2051. The Minister of Municipal Affairs and Housing approved Envision Durham, fully, on December 13, 2024.

Map 1 (Regional Structure - Urban & Rural Systems) of the new ROP indicates that the site is located along a Rapid Transit Corridor (Kingston Road), the highest order Regional Corridor. A Rapid Transit Corridor is a type of Strategic Growth Area identified by the Region which represent optimal locations for prioritizing intensification and higher density development. Generally, development along these corridors should be multi-storey, compact, pedestrian-friendly, and transit supportive, similar to the current development proposal.

In Map 3A (Transit Priority Network) of the new ROP, Kingston Road is also identified as part of the Region's Rapid Transit Spine, wherein an ultimate width of 45 metres is reserved to accommodate the Region's future Rapid Transit Spine (i.e., DSBRT) as per Map 3E (Regional Right-of-Way Requirements). In addition, according to Map 3D (Active Transportation Network), Kingston Road and Liverpool Road are also expected to provide a future primary cycling network ("PCN") facility in the Region. Further details regarding the future transit and cycling improvement projects are provided in **Section 4.2.2** and **Section 4.4.2**, respectively. Overall, these findings suggest that the site location is a strong candidate for the proposed transit-supportive, high-density development programme.

Generally, as it relates to transportation, the new ROP seeks to support and increase the use of non-auto modes of travel throughout the Region. The new ROP includes policies which direct municipalities to encourage walkable, transit-oriented communities where active forms of mobility are safe, viable, and comfortable so residents have a range of transportation options to meet their daily needs. Moreover, the new ROP emphasizes the importance of locating high-density, compact development near existing and future transit services and investing in facilities for non-automobile uses (e.g., trails, walkways, pick-up/drop-off facilities). In addition, the new ROP supports the use of TDM strategies to reduce single-occupant vehicle travel, including but not limited to reduced parking standards in appropriate locations. For example, municipalities may consider minimum and maximum parking requirements that reflect the walking distance to transit and complementary uses. The site's location along a future rapid transit corridor and reduced parking supply, supported by a comprehensive TDM plan, align with the transportation-related goals of the new ROP.

3.1.5 Durham Region Transportation Master Plan (2017)

Durham Region's current Transportation Master Plan ("TMP") was completed in 2017 to serve as a strategic planning document to manage Durham's anticipated transportation demands beyond the year 2031. The TMP plays a crucial role in supporting the development initiatives specified in the ROP. Specifically, the TMP is a multi-modal plan that looks at all modes of transportation, including walking, cycling, public transit, auto, and goods movement.

The TMP is anchored by seven (7) key directions, including direction to strengthen the bond between land use and transportation and direction to promote sustainable travel choices such as walking and cycling. Overall, these guidelines aim to enhance connectivity within the Region's transportation network and provide improved options for transit, walking, and cycling.

The TMP highlights various transportation initiatives within the vicinity of the site. Notably, the TMP recognizes that the DRT's current PULSE rapid, high-frequency service on Highway 2 has been very successful, and sets the stage for further BRT investments. As such, Highway 2, including Kingston Road adjacent to the site, is proposed as a Rapid Transit corridor with exclusive lanes from the Toronto-Pickering boundary to Simcoe Street in Downtown Oshawa, with protection for future extensions to Highway 418.

The recommended approach for the corridor is to implement DSBRT in dedicated median lanes, however, the ultimate configuration and phasing of the DSBRT on Highway 2 will require further study. Additionally, headways of approximately 5 minutes could be achieved by 2031. Overall, the Highway 2 Rapid Transit corridor will be an important anchor of the Region's Higher Order Transit Network by 2031.

3.1.6 Durham Regional Cycling Plan (2021)

In October 2021, Region of Durham Council approved the Regional Cycling Plan 2021 ("RCP 2021"), a strategic document designed to facilitate a comprehensive cycling network in the Region of Durham. Within this framework, a "Primary Cycling Network" is defined along with a set of recommended infrastructure improvements, timeline considerations, and design applications. Durham Region's Primary Cycling Network ("PCN") represents a focused and refined system of cycling routes within the Region, with a specific emphasis on serving key travel destinations.

In the RCP 2021, Kingston Road (i.e., the site's adjacent roadway) plays an integral role as a planned component of the PCN, as depicted on Figure 4-3 (Existing, Planned and Revised PCN Routes). Overall, the RCP 2021 showcases the Region's plans to improve cycling connections across Durham Region, including connectivity to / from the proposed development.

3.2 Local Municipal Policies

There are several current and proposed local municipal policy documents applicable to the site, including the following:

- City of Pickering Official Plan, Edition 9 (2022) and Official Plan Amendment 38 (2022);
- Kingston Road Corridor and Specialty Retailing Node Intensification Plan (2019) and Draft Urban Design Guidelines (2019);
- City of Pickering Integrated Transportation Master Plan (2021); and
- City of Pickering Integrated Sustainable Design Standards (2022).

3.2.1 City of Pickering Official Plan, Edition 9 (2022)

The City of Pickering Official Plan ("OP") aims to implement provincial and regional directions, as identified above, and lays out the foundation for community building in the City of Pickering. The OP intends to implement the vision for Pickering, ensuring the City is built in a manner that meets the evolving needs of its people, sustains healthy settings, and creates a well-connected social and physical environment.

The latest consolidation of the Pickering Official Plan (Edition 9) is dated March 2022. It is noted that the City is in the process of reviewing and updating their OP. Currently, the City is in Phase 2 of this process, drafting the Official Plan and conducting community engagement. As such, at this time, the 2022 OP is considered in force and effect.

As per the OP, Kingston Road (i.e., the roadway adjacent to the site), is intended to be developed and promoted as the "main street" of Pickering. In specific neighbourhoods in the City, outside of the City Centre, there are guidelines which apply to the development of the Kingston Road Corridor known as the "Kingston Road Corridor Development Guidelines", discussed further in **Section 3.2.2**. Furthermore, a series of land use designations are provided in Schedule I (Land Use Structure Maps), wherein the site is designated as part of the "Mixed Corridors" area, a subcategory of the "Mixed Use Areas" land use designation. According to the OP, development in Mixed Corridors should be designed to be pedestrian and transit friendly from the outset, promoting a vibrant and safe street-life to support the early provision of transit.

Furthermore, as it relates to transportation, the OP includes policies that emphasize the City's intention to reduce reliance on private automobiles in favour of other modes of travel, including walking, cycling and using public transit. For example, the OP states that land use development in the City should support compact urban form, active transportation, and public transit, including consideration for a reduction in vehicular parking spaces where TDM strategies are provided. Overall, TDM initiatives, such as those proposed for the site in **Section 9.0**, should reduce traffic peaks and shift modes away from single occupancy vehicles. Overall, the proposed development aligns with the goals of the Pickering OP as it locates new residential density along a future transit corridor and reduces auto-dependency through an appropriate vehicular parking supply and a TDM plan intended to improve pedestrian and cycling connectivity.

3.2.2 Official Plan Amendment 38 (2022)

The City of Pickering has adopted an amendment to its Official Plan, OPA 38, which revises and adds new policies and maps to implement the Council-endorsed Kingston Road Corridor and Specialty Retailing Node Intensification Plan and Urban Design Guidelines, discussed further in **Section 3.2.3 and Section 3.2.4**, respectively. Overall, OPA 38 ensures the Pickering OP includes the most up-to-date vision and guidelines to support the anticipated population and employment growth within this area. This amendment generally applies to lands located along the Kingston Road Corridor, excluding the City Centre.

OPA 38 was granted Regional approval in November 2022. All appeals have since been resolved at the Ontario Land Tribunal on December 19, 2024, other than the lands and aspects of OPA 38 that are the subject of the site-specific appeals. The remaining site-specific appeals may be scheduled for a Case Management Conference in the future. The site property has been approved without appeals.

As it relates to the site, OPA 38 includes a new chapter into the Pickering OP, Chapter 11A, dedicated to the Kingston Mixed Corridor and Brock Mixed Node Intensification Areas and includes designations for various precincts. The site is located within the Dunbarton / Liverpool Precinct Intensification Area. Within the Dunbarton / Liverpool Precinct Intensification Area, a "Gateway" is proposed at the intersection of Kingston Road and Dixie Road. In line with this designation, the current development plan has proposed a gateway plaza at the northeast corner of the site, described further in **Section 4.3.2.2**. A raised cycle track on both sides of Kingston Road is also proposed with an enhanced tree and landscaped planting area, wherever possible. Notably, OPA 38 proposes a public east-west road adjacent to the site which has been considered as part of this proposed development.

3.2.3 Kingston Road Corridor and Specialty Retailing Node Intensification Plan (2019)

The Kingston Corridor Intensification Plan was endorsed in principle by City Council in 2019 following extensive consultation and studies involving City and Regional staff and relevant stakeholders. The purpose of this Plan was to provide a guiding vision and framework for intensification and redevelopment along the Kingston Road Corridor as a sustainable, walkable, livable, and transit-supportive corridor with a high-density mix of uses.

As identified in the Plan, the site is located within the Dunbarton / Liverpool Precinct. Within this Precinct, an extension of Walnut Lane is proposed. It is recommended for Walnut Lane to include a comfortable pedestrian sidewalk and cycling facility, which can take the form of a multi-use path to connect the new development to Liverpool Road. In addition, a new east-west connection is proposed to connect the future Walnut Lane extension to Dixie Road. This new connection will be pedestrian friendly, promote active frontages in the core of the Precinct, and is encouraged to be multi-modal (as is encouraged for all proposed roads in the Precinct area). A summary of these roadway changes is provided in **Section 4.1.2**.

In addition, a new active transportation connection is proposed using the existing rail bridge over Highway 401, that would provide the site with a connection to the neighbourhood to the south, ultimately connecting to the waterfront trail. Importantly, the Plan acknowledges strategic capital projects, such as the Durham-Scarborough BRT, as instrumental in enhancing connectivity across the Corridor and reducing auto travel within the designated Precincts.

The Intensification Plan informs the policy and land use designation changes reflected in OPA 38, discussed in **Section 3.2.2**.

3.2.4 Kingston Road Corridor and Specialty Retailing Node Draft Urban Design Guidelines (2019)

The Kingston Corridor Intensification Plan, as discussed in **Section 3.2.3**, is supported by a set of Urban Design Guidelines referred to as the Kingston Road Corridor and Specialty Retailing Node Draft Urban Design Guidelines ("UDG"). The purpose of the UDG is to set out specific design considerations for the Kingston Road Corridor, including built form elements, place-making principles, and transportation (e.g., street) design.

The Dunbarton / Liverpool Precinct is centered around the gateway intersection of Kingston Road and Dixie Road, and is envisioned as a high-density area, complete with pedestrian-oriented public realm improvements. Importantly, the UDG supports the integration of transit into the surrounding streetscape. The guidelines explicitly acknowledge the future Durham-Scarborough BRT stop on Kingston Road at Dixie Road (adjacent to the site), emphasizing the need for the protection of these designated stop locations. As well, it is proposed for all of Kingston Road, within the study area, to include cycling infrastructure along both sides of the roadway.

The Draft Urban Design Guidelines informs the policy and land use designation changes reflected in OPA 38, discussed in **Section 3.2.2**.

3.2.5 City of Pickering Integrated Transportation Master Plan (2021)

The City of Pickering's Integrated Transportation Master Plan ("ITMP") was completed in 2021 to serve as a roadmap for establishing a well-balanced transportation system for the future needs and development in the City to 2031. As Pickering's first comprehensive transportation plan, the ITMP represents a long-term, strategic framework that guides the transportation policies, programs, and infrastructure within the City based on four pillars: a safe, well-connected transportation system, inclusive mobility, complete and sustainable communities, and economic growth. Specifically, the ITMP ensures the City's transportation system can meet the needs of all road users, including pedestrians, cyclists, transit users, and motorists, applying a "Complete Streets" approach.

A key component of the ITMP focuses on growing active transportation in the City to alleviate pressure on the existing transportation network. Three major objectives are identified for active transportation planning in the City, including connecting, upgrading, and expanding the network as well as creating pedestrian- and cyclist-friendly destinations. Map 3 (Long-Term Cycling Network) of the ITMP identifies new cycling infrastructure along Kingston Road, Dixie Road, and the Walnut Lane extension, near the site, discussed further in **Section 4.4**.

Furthermore, to realize the transportation vision of the ITMP, the City has identified supporting strategies including greater focus on TDM measures to reduce travel by single-occupancy vehicles and right-sizing parking. The ITMP acknowledges that Pickering's parking supply is already abundant, which, left unmanaged, will make it more challenging to encourage the use of transit and active transportation.

The ITMP additionally recognizes the critical role of public transit in the City's overall transportation system. In Pickering, bus rapid transit is underway on Kingston Road adjacent to the site. As such, Map 1 (Long-Term Road Network) highlights road widening initiatives for bus only lanes on Kingston Road.

Additionally, the ITMP recommends the following actions:

- Planning for higher-density and transit-supportive land uses areas well-served by transit;
- Prioritizing the infill of sidewalk gaps and safe crossing opportunities along transit corridors; and
- Reduced parking rates for development in proximity to higher-order transit.

In summary, the proposed development considers the existing and future transportation conditions within the immediate area and helps the City achieve the goals set out in the ITMP by integrating transit-supportive design principles in the site design that reflect its context within the City's transportation network.

3.2.6 City of Pickering Integrated Sustainable Design Standards (2022)

The City of Pickering introduced the Integrated Sustainable Design Standards ("ISDS") in 2022, replacing the previous 2007 Sustainable Development Guidelines. These newly adopted standards are now mandatory for Draft Plans of Subdivision, Site Plans, and Rezoning applications, and include specific criteria for different development types. The "Mid to High-Rise Residential & Non-Residential Checklist" is applicable to the site. Among its requirements are transportation-related measures, such as requirements for EV rough-in and EV ready charging infrastructure and bicycle parking and storage facilities. There are two tiers of Performance Criteria in the ISDS, with Tier 1 being mandatory for all development application, including the site.

4.0 AREA TRANSPORTATION CONTEXT

4.1 Road Network

4.1.1 Existing Road Context

The site is currently served by major roadway connections extending across the City and the Region. Highway 401 and Kingston Road provide the site with strong east-west connectivity, while Dixie Road provides the site with strong north-south connectivity.

The area street network within the site vicinity is summarized in **Table 2** and illustrated on **Figure 3**. As well, the existing lane control and traffic configuration for the site area is illustrated on **Figure 4**.

Table 2 Existing Road Network

Road	Road	Cross-Section Near Site	Parking	Description
Highway 401	Expressway	12-lane to 14-lane cross-section (6 to 7 lanes in each direction)	Parking is not permitted on either side of the roadway.	Highway 401, governed by the MTO, extends east-west between Windsor in the west and the Ontario-Quebec border in the east. The posted speed limit is 100 km/h.
Kingston Road	Type B Arterial	4-lane cross-section (2 lanes in each direction with dedicated turn lanes at key intersections)	Parking is not permitted on either side of the roadway.	Kingston Road, under the jurisdiction of Durham Region, extends east-west throughout the City of Pickering, between the Toronto border in the west to the Ajax border in the east. The posted speed limit is 60 km/h. **Exhibit 1** illustrates the existing condition of Kingston Road, dated February 12, 2025. **Exhibit** 2 illustrates the existing condition at the intersection of Kingston Road and Dixie Road, dated February 12, 2025.
Dixie Road	Type C Arterial	2-lane cross-section (1 lane in each direction with auxiliary left turn lanes at Kingston Road)	Parking is not permitted on either side of the roadway.	Dixie Road, under the jurisdiction of the City of Pickering, extends north-south throughout the City of Pickering, between Third Concession Road in the north to a cul-de-sac in the south, approximately 195 metres south of Kingston Road. The posted speed limit is 60 km/h. **Exhibit 3** illustrates the existing condition of Dixie Road dated February 12, 2025.

Road Name	Road Type	Cross-Section Near Site	Parking Regulations Near Site	Description
Fairport Road	Type C Arterial	2-lane cross-section (1 lane in each direction with an auxiliary left turn lane at Kingston Road)	Parking is not permitted on either side of the roadway.	Fairport Road, under the jurisdiction of the City of Pickering, extends north-south through the City of Pickering, between Third Concession Road in the north to Kingston Road in the south. The posted speed limit is 40 km/h.
Liverpool Road	Type B Arterial	4-lane cross-section (2 lanes in each direction with dedicated turn lanes at key intersections)	Parking is not permitted on either side of the roadway.	Liverpool Road, under the jurisdiction of the Durham Region, extends north-south through the City of Pickering, between Finch Avenue in the north to the waterfront in the south. The posted speed limit is 50 km/h.
Walnut Lane	Collector Road	4-lane cross-section (2 lanes in each direction with dedicated left turn lanes at Kingston Road)	South of Kingston Road, parking is permitted on the west side of the roadway. North of Kingston Road, parking is permitted on the east side of the roadway.	Walnut Lane, under the jurisdiction of the City of Pickering, extends north-south through the City of Pickering, between Glenanna Road in the north to a point approximately 115 metres south of Kingston Road in the south. The posted speed limit is 40 km/h. An extension of Walnut Lane is proposed in the future as per OPA 38, discussed further in **Section 4.1.2**.



Exhibit 1. Kingston Road at Dixie Road (Facing South-West)
Source: BA Group (February 12, 2025)



Exhibit 2. Kingston Road and Dixie Road Intersection (Facing South-West)
Source: BA Group (February 12, 2025)



Exhibit 3. Dixie Road at Kingston Road (Facing South)
Source: BA Group (February 12, 2025)

4.1.2 Proposed Road Network

New public and private roadway connections are proposed east of the site, south of Kingston Road. The proposed road network near the site vicinity is illustrated on **Figure 3**.

4.1.2.1 NEW ROADWAY CONNECTIONS (AS PER PICKERING OPA 38)

As identified in OPA 38 (informed by the Kingston Corridor Intensification Plan), the following new roadways are proposed near the site and have been considered as part of this proposal:

- New east-west public roadway with a proposed 20-metre right-of-way, south of Kingston Road, extending from Dixie Road in the west to the Walnut Lane extension in the east;
- Southern extension of Walnut Lane from Kingston Road in the north to the City Centre neighbourhood boundary in the south, discussed further in **Section 4.1.2.2**;
- New L-shaped private roadway, south of Kingston Road, extending from Dixie Road in the west to the Walnut Lane extension in the north.

4.1.2.2 WALNUT LANE EXTENSION

As per OPA 38, Walnut Lane is proposed to be extended from its current terminus at Kingston Road to connect to the Pickering City Centre neighbourhood at Liverpool Road, with the intersection aligned with the Highway 401 westbound off-ramp. It is anticipated that this extension will be completed by the 2032 study horizon. Traffic volumes for the post-opening of the Walnut Lane extension were obtained from the EA completed by AECOM, dated March 2023. Overall, this extension will provide new pedestrian and cycling connections from the site to Pickering City Centre.

Upon review of the EA, the preferred alternative is understood to be Alternative #2 presented in the report. A 3.0 metre asphalt-paved multi-use path ("MUP") will be provided on the north side of Walnut Lane, and a 1.5 metre concrete sidewalk will be provided on the south side.

Lane configurations and volumes for Alternative #2 were assumed for the future conditions. It is noted that the EA only considered weekday PM peak hour; as such, the weekday AM peak hour volumes were derived based on the comparison of the existing AM and PM peak hour volumes for each individual movement.

4.1.2.3 CHANGES TO KINGSTON ROAD

Beyond the development boundaries of the site, area network roadway improvements are also proposed or underway. As such, roadway changes along the entirety of Kingston Road are expected as part of the future DSBRT, discussed further in **Section 4.2.2**. These changes include accommodating dedicated bus lanes along Kingston Road, as per Pickering's ITMP, and improvements to the pedestrian and cycling infrastructure along the corridor.

4.1.2.4 LIVERPOOL ROAD WIDENING

As per the Durham TMP, a widening of Liverpool Road is being considered near the site. Between Highway 401 and Kingston Road, it is proposed to widen Liverpool Road to 6 lanes. It is noted that no EA has been initiated, and the timing of the widening is unknown at this time.



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Aerial maps provided courtesy of: Esri, DigitalGlobe, GeoEye, Earthstar Geographies, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, the GIS User Community and/or Google Earth/Maps.

FIGURE 3 AREA ROAD NETWORK

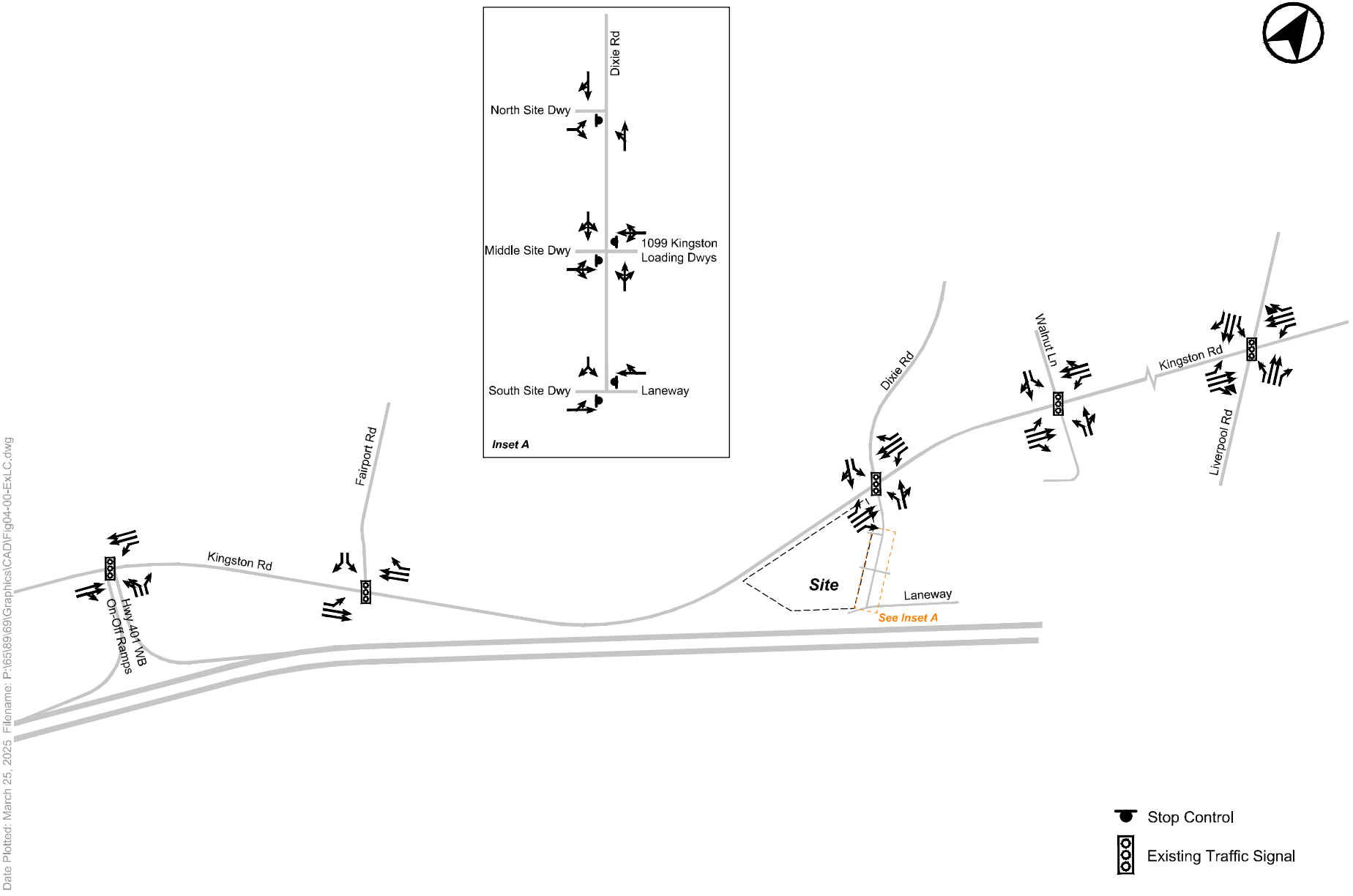


FIGURE 4 EXISTING LANE CONFIGURATION AND TRAFFIC CONTROL

4.2 Area Transit Network

4.2.1 Existing Transit Context

The site is currently served by local and regional transit services operated by GO Transit and DRT, including DRT PULSE express bus service. DRT PULSE corridors typically feature dedicated lanes or priority transit measures, such as high-occupancy vehicle ("HOV") lanes, queue jump lanes or signal priority.

Bus stops, located within walking distance of the site, provide direct connections to key local and regional transit destinations, including the Pickering Town Centre (or "Pickering Parkway Terminal"), and the Pickering GO Station along the Lakeshore East GO Line. Notably, an eastbound DRT and DRT PULSE bus stop is located on Kingston Road at Dixie Road, abutting the site's northern property line.

An overview of the existing area transit services is summarized in **Table 3** and illustrated on **Figure 5**.

Table 3 Existing Transit Network

Route	Transit	Closest Stop	Approximate	Route Description
41 / 41A: Hamilton / Pickering	GO Transit Bus	Kingston Road at Walnut Lane (~500 metres / 7-minute walk)	10 - 30 minutes	The 41 Hamilton/Pickering GO bus route operates in an east-west direction between Pickering GO and Hamilton GO Centre in the City of Hamilton. Key destinations on this route include the University of Toronto Scarborough, Centennial College, Scarborough Town Centre, Highway 407 Bus Terminal, Bramalea GO, Square One, and McMaster University. The 41A GO bus route is a shortened variant of the 41 GO bus route which operates in an east-west direction between Pickering GO and Square One in the City of Mississauga.
92 / 92A: Oshawa / Yorkdale	GO Transit Bus	Kingston Road at Walnut Lane (~500 metres / 7-minute walk)	~20 minutes – 1 hour	The 92 Oshawa/Pickering GO bus route operates in an east-west direction between Oshawa GO and Yorkdale Bus Terminal in the City of Toronto. Key destinations on this route include York Mills Bus Terminal and Scarborough Town Centre. The 92A branch is a shortened variant of the 92 GO bus route which operates in an east-west direction between Dundas at Highway 412 in the City of Whitby and Yorkdale Bus Terminal in the City of Toronto.

Route	Transit	Closest Stop	Approximate	Route Description
PULSE 900	DRT Bus	Kingston Road at Dixie Road (adjacent to site)	~30 minutes	The PULSE 900 DRT bus route operates in an east-west direction between King Street / Bond Street at Ritson Road in the City of Oshawa and Centennial Circle in the City of Toronto.
PULSE 920	DRT Bus	Kingston Road at Dixie Road (adjacent to site)	~15 minutes	The PULSE 920 DRT bus route operates in an east-west direction between Harmony Terminal in the City of Oshawa and Scarborough Centre in the City of Toronto.
118	DRT Bus	Kingston Road at Dixie Road (adjacent to site)	~30 minutes	The DRT 118 bus route operates in a north-south between the Pickering Parkway Terminal and the area of Burkholder Drive and Belcourt Street.

4.2.2 Planned Transit Context

While the existing DRT and GO bus stops adjacent to the site provide good connectivity across the City of Pickering and adjacent municipalities, planned investments in rapid transit will significantly improve the transit options and transit accessibility for future site users. Most notably, the site's transit connectivity will benefit from improvements planned and under construction by Metrolinx (e.g., Durham-Scarborough BRT).

An overview of planned transit improvements near the site is summarized below and illustrated on **Figure 5**.

4.2.2.1 DURHAM-SCARBOROUGH BUS RAPID TRANSIT

Metrolinx is working with Durham Region and DRT, amongst other stakeholders, on the planning and design of a rapid transit corridor extending from Scarborough Centre to Downtown Oshawa, along the Highway 2-Ellesmere corridor (including Kingston Road in the City of Pickering). The DSBRT proposes approximately 49 BRT stops that would serve as a continuous 36-kilometre corridor connecting five municipalities, Oshawa, Whitby, Ajax, Pickering and Scarborough, and their Regional Centres and major employment, institutional, and population nodes. This project builds upon the existing DRT PULSE express bus service which currently runs between downtown Oshawa and the University of Toronto Scarborough Campus. As such, the closest stop to the site will be located at Kingston Road and Dixie Road, adjacent to the site.

Key features and benefits of the future DSBRT include the following:

- 15-minute or better service (all day, everyday), with a bus every five minutes or less during rush hours;
- Dedicated bus lanes and signal priority measures;
- 10-to-20-minute time savings for transit trips along the corridor; and
- Efficient transfers between routes, allow for more convenient and reliable travel across the Greater Toronto and Hamilton Area ("GTHA").

The DSBRT was identified as the preferred transit technology to link Durham and Scarborough through Metrolinx's 2041 Regional Transportation Plan and the DSBRT Initial Business Case completed in January 2019. Following numerous public engagement sessions, the Transit Project Assessment Process ("TPAP") was completed on March 20, 2022, and a Minister's Notice to Proceed on the project was issued on March 28, 2022.

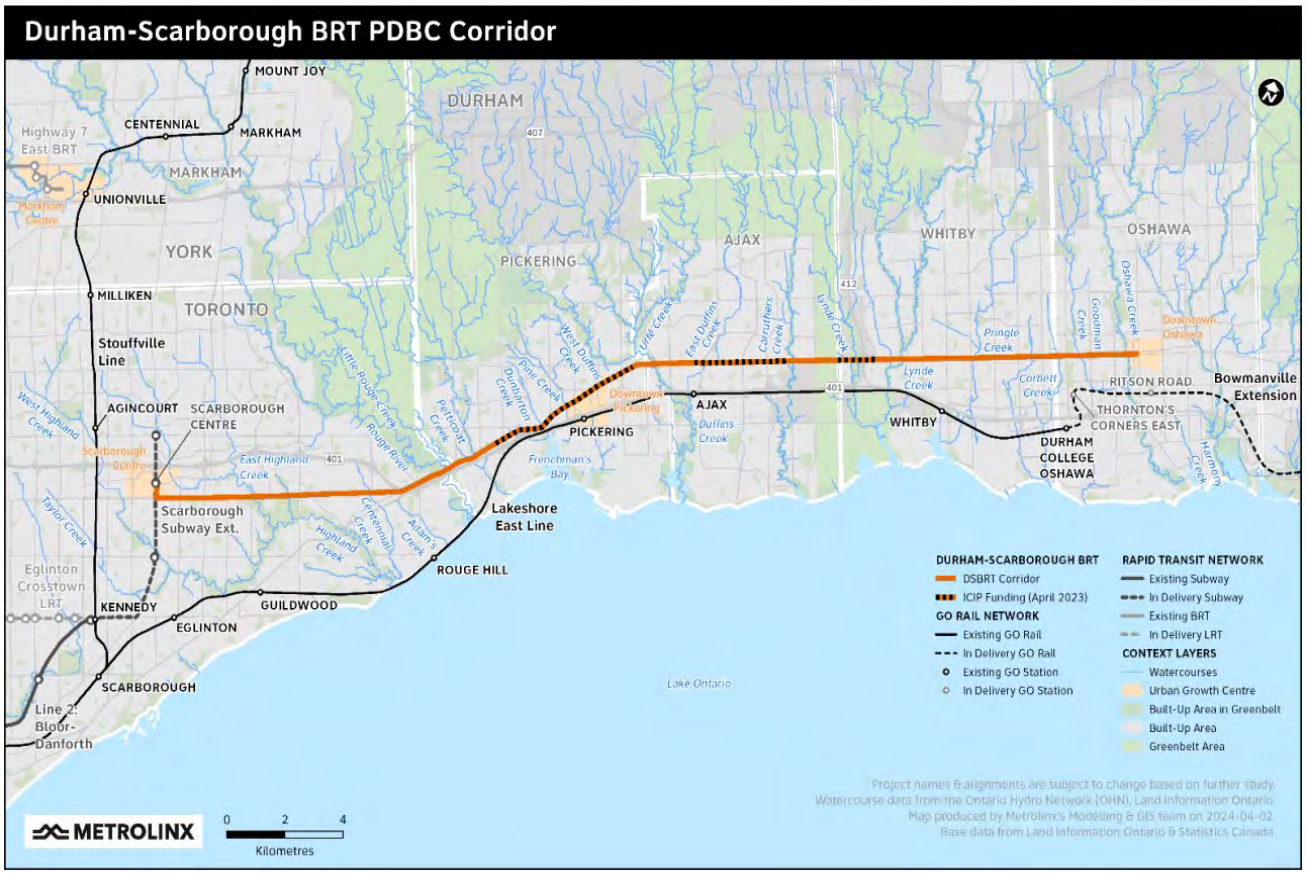
As part of the Environmental Project Report ("EPR"), which was approved in January 2022 following the TPAP completion, preliminary designs were developed which generally included dedicated centre-median bus lanes, some segments with dedicated curbside bus lanes, and some short segments with no dedicated infrastructure where buses would operate in mixed traffic with transit priority measures and curbside stops. Segment 3 of the EPR (Kingston Road from Altona Road to west of Elizabeth Street), which captures the site, is proposed to be widened to six (6) lanes to accommodate centre-median rapid transit lanes while maintaining two general traffic lanes in each direction. In particular, Appendix A1.2 of the EPR provides a high-level 2D conceptual plan for the design of the BRT, including the portion between Dixie Road and Merritton Road, directly adjacent to the site, discussed further in **Section 10.1**.

In June 2024, Metrolinx released the findings of their DSBRT Preliminary Design Business Case ("PDBC") which advances the planning, refinement, and optimization of the DSBRT. It is noted that funding has already been secured along core segments of the DSBRT corridor within Pickering, Ajax, and Whitby, including the segment near the site, as illustrated on **Exhibit 4**. As such, the PDBC evaluates three potential investment options developed based on the EPR's preliminary design, all of which include the segments of the BRT that have secured federal funding. The major difference between the three options is the timing of full BRT implementation with different criteria for the prioritization or deferral of various segments of the transit corridor. As per the 2024 PDBC, the revised opening year of the DSBRT is expected to be in 2033.

With the completion of the DSBRT, future site users will have more flexibility and choice for travel within the GTHA, providing an alternative to trips that would otherwise be taken by automobile. The project will allow for seamless connections between various local transit networks and will provide the residents of Durham Region and the City of Toronto with faster and more reliable transit accessibility across the Region.

Overall, the proposed design of the DSBRT provides exclusive bus lanes along Kingston Road at the location of the site, which presents a significant opportunity to build a truly transit-oriented development with high density. This type of development and transit accessible location is an appropriate setting to provide reduced parking at the site.

Exhibit 4. Metrolinx Durham-Scarborough BRT PDBC Corridor (Source: Metrolinx)

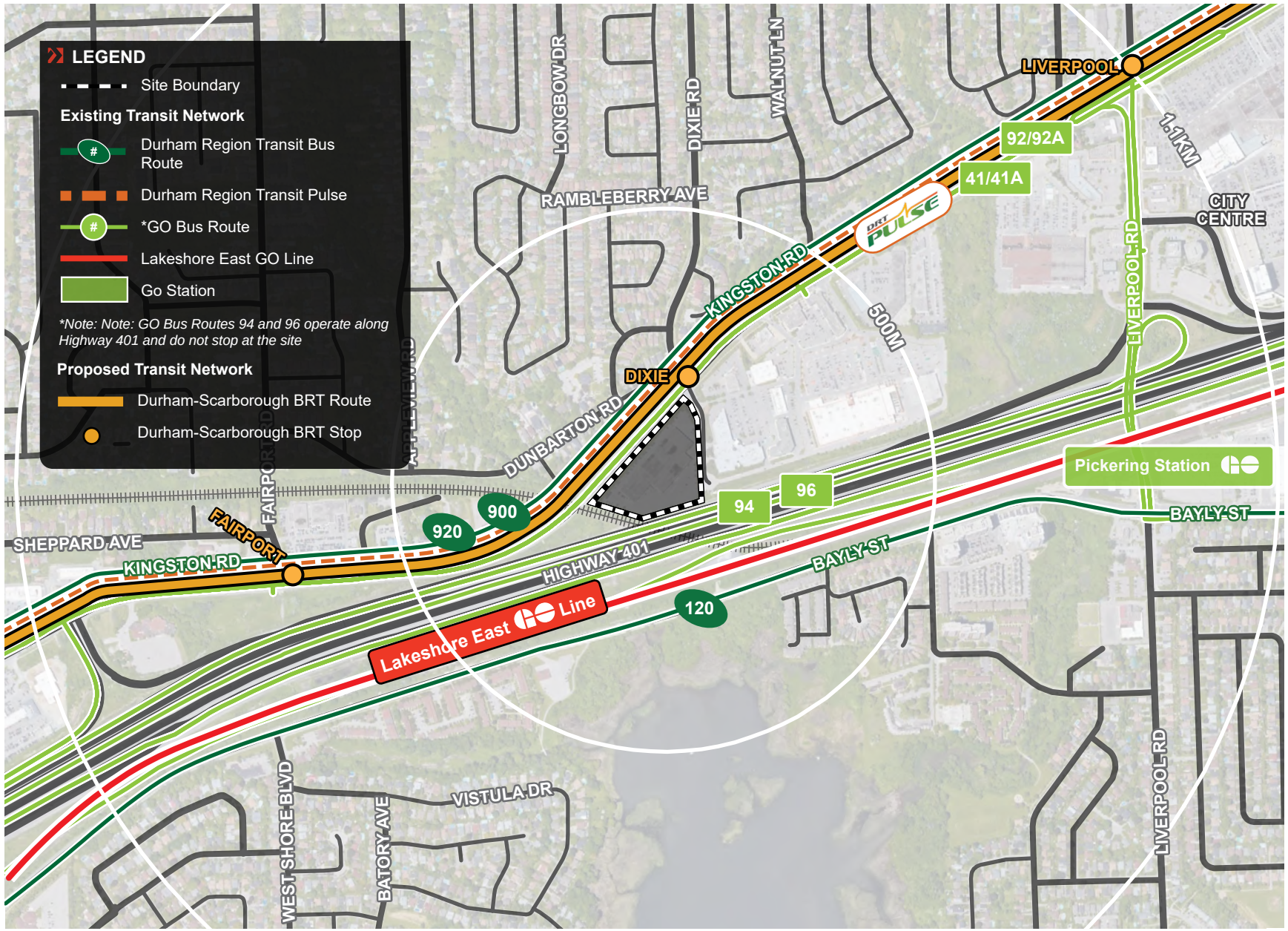


4.2.2.2 METROLINX GO EXPANSION

Metrolinx is undertaking a "GO Expansion" project that seeks to increase GO regional passenger rail service through expansion and the electrification of the GO Transit rail network. As per the November 2018 "GO Expansion Full Business Case" published by Metrolinx, "GO Expansion is an investment program that will transform GO Rail into a Rapid Rail System that provides the expanded mobility the GTHA needs to accommodate growth and maintain a high quality of life and prosperous economy".

A key benefit of rail electrification is quicker acceleration / deceleration (up to 30% faster), resulting in faster travel times and, therefore, unlocking the potential to add more stations to existing rail lines. Along the Lakeshore East Line, accessible from the site via Pickering GO Station, an extension of the rail service further east into Bowmanville is currently being planned. Furthermore, the proposed improvements and expansions to the GO rail network will enable all-day, two-way service with significantly increased service frequencies (every 15 minutes or better) on most of GO's lines, including the Lakeshore East Line. Overall, the GO Expansion will provide future site residents and visitors with enhanced regional transit access and faster travel times across municipalities, further reducing reliance on the private automobile.

The GO Expansion is currently underway with incremental improvements to service beginning in 2025-2026 and expected to continue to completion in 2032.



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FIGURE 5 AREA TRANSIT NETWORK

4.2.3 Transit Reach Assessment

4.2.3.1 EXISTING TRANSIT TRAVEL REACH

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

Transit reach analyses were conducted to and from the site in 15, 30, and 45-minute intervals during the weekday morning travel period. Transit travel times include walking time to and from transit stop, as well as existing transit schedules during peak hour (i.e., service frequency and wait times), all of which are based on the existing transit service. Transit reach assessments were conducted traveling away from (outbound) the site and traveling towards (inbound) the site to represent the typical travel patterns of residents and visitors.

The existing transit travel reach traveling away from the site, and travelling towards the site are illustrated on **Figure 6** and **Figure 7**, respectively**.**

4.2.3.2 FUTURE TRANSIT TRAVEL REACH

A review of projected transit travel times assumed the various public transit network improvements that were discussed in **Section 4.2.2** and illustrated on **Figure 5**.

The future transit travel reach traveling away from the site, and travelling towards the site are illustrated on **Figure 8** and **Figure 9**, respectively. A comparison of areas that are reachable is provided in **Table 4** below.

Table 4 Existing and Future Transit Service Area Analysis Comparison

Transit	15-minute Reach	30-minute Reach	45-minute Reach
Existing Conditions (Travel Away From Site)	• North along Valley Farm Rd to Finch Ave; • South along Whites Rd past Highway 401; • East along Kingston Rd to Church St; and • West along Kingston Rd to Altona Rd.	• North along Brock Rd to Concession Rd 3; • South along Whites Rd to the waterfront; • East along Dundas St W to Highway 412; and • West along Sheppard Ave E to Morningside Ave, to Neilson Rd, along Lakeshore East Line to Rouge Hill GO.	• North along Westney Rd to Taunton Rd W; • South along Whites Rd to the waterfront; • East along Dundas St/King St W to Stevenson Rd; and • West along Ellesmere Rd to Brimley Rd, along Lakeshore East Line to Eglinton GO.
Existing Conditions (Travel Towards Site)	• North along Valley Farm Rd to Finch Ave; • South along Whites Rd past Highway 401; • East along Kingston Rd to Church St; and • West along Kingston Rd to Sheppard Ave E/Port Union Rd.	• North along Brock Rd to Concession Rd 3; • South along Whites Rd to the waterfront; • East along Dundas St W to Highway 412; and • West along Sheppard Ave E to Morningside Ave, to Neilson Rd, along Lakeshore East Line to Rouge Hill GO.	• North along Westney Rd to Taunton Rd W; • South along Whites Rd to the waterfront; • East along Dundas St/King St W to Thornton Rd, along Lakeshore East Line to Oshawa GO; and • West along Ellesmere Rd to Kennedy Rd, along Lakeshore East Line to Eglinton GO.

	15-minute Reach	30-minute Reach	45-minute Reach
Future Conditions (Travel Away From Site) *With the Addition of the Durham-Scarborough BRT, GO Expansion, etc..*	• North along Valley Farm Rd to Finch Ave; • South along Whites Rd to Oklahoma Dr; • East along Kingston Rd to Westney Rd; and • West along Kingston Rd to Sheppard Ave E/Port Union Rd.	• North along Brock Rd past Concession Rd 3; • South along Whites Rd to the waterfront; • East along Dundas St W to McQuay Blvd/Jeffery St, along Lakeshore East Line to Whitby GO; and • West along Ellesmere Rd to Scarborough Golf Club Rd, along Lakeshore East Line to Eglinton GO.	• North along Brock Rd to Taunton Rd; • South along Liverpool Rd to the waterfront; • East along Dundas St/King St W to Stevenson Rd, along Lakeshore East Line to Oshawa GO; and • West along Eglinton Ave E to Kennedy Rd, along Lakeshore East Line to Danforth go and surrounding area.
Future Conditions (Travel Towards Site) *With the addition of the Durham-Scarborough BRT, GO Expansion, etc.*	• North along Valley Farm Rd to Finch Ave; • South along Whites Rd to Oklahoma Dr; • East along Kingston Rd to Westney Rd; and • West along Kingston Rd to Sheppard Ave E/Port Union Rd.	• North along Brock Rd past Concession Rd 3; • South along Whites Rd to the waterfront; • East along Dundas St W to McQuay Blvd/Jeffery St, along Lakeshore East Line to Oshawa GO; and • West along Ellesmere Rd nearly to Markham Rd, along Lakeshore East Line to Guildwood GO.	• North along Brock Rd to Taunton Rd, along Baldwin St nearly to Highway 407; • South along Liverpool Rd to the waterfront; • East along Dundas St/King St W to Stevenson Rd, along Lakeshore East Line to Oshawa GO; and • West along Eglinton Ave E to Kennedy Rd, along Lakeshore East Line to Union Station.

Notable findings include:

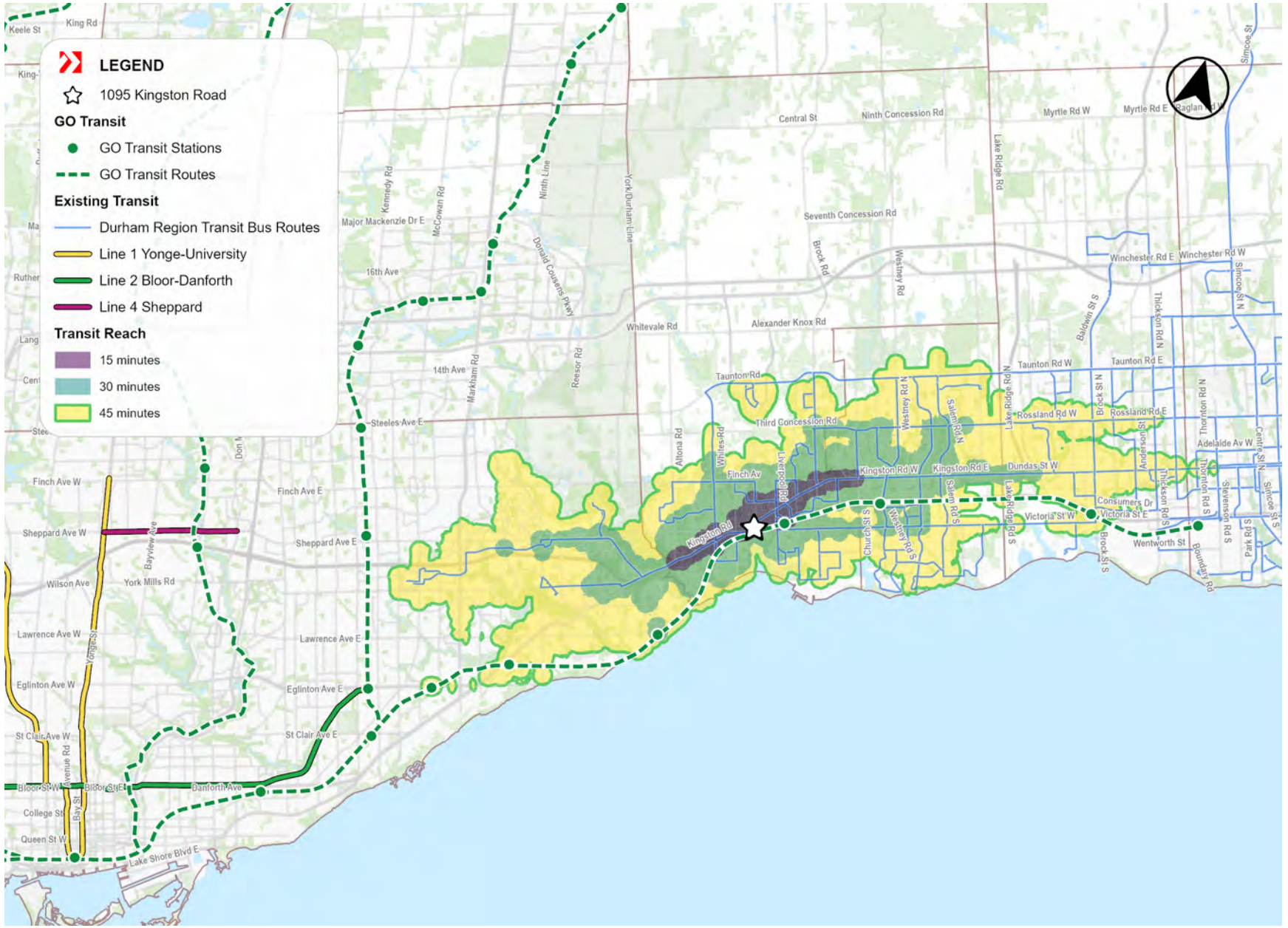
- Within 15 minutes of the site, existing condition transit access is primarily along the Kingston Road corridor with access to Pickering GO Station. Under Future Conditions, there are some improvements to the travel reach along the Kingston Road corridor as a result of the DSBRT.

- Within 30 minutes of the site, under existing conditions, transit is accessible as far west as central Scarborough and as far east as central Whitby. North transit access is somewhat limited by the lack of transit routes directly north of the site, while, south of the site, transit access reaches the waterfront. Pickering GO, Rouge Hill GO, and Ajax GO Stations are accessible within a 30-minute transit travel from the site. Under future conditions, westbound transit access has a noticeable improvement extending further into Scarborough south of Highway 401, with eastbound transit access extending into central Whitby. Additionally, GO transit access increases to Eglinton GO Station and Whitby GO Station.

- Within 45 minutes of the site, existing condition transit access remains primarily east-west focused, with access to areas as far north as Taunton Road through Pickering and Ajax. Significant amounts of Scarborough are within westbound transit reach, while eastbound transit reach extends just into Oshawa. Under future conditions there is some increase in transit access east and west in comparison to the existing conditions. Westbound transit reach improvements primarily provide increased transit access throughout Scarborough. There are improvements to access along the GO Transit Lakeshore East Line, reaching as far west as Danforth GO and as far east and Oshawa GO as a result of the GO Regional Rail Expansion ("GO RER").

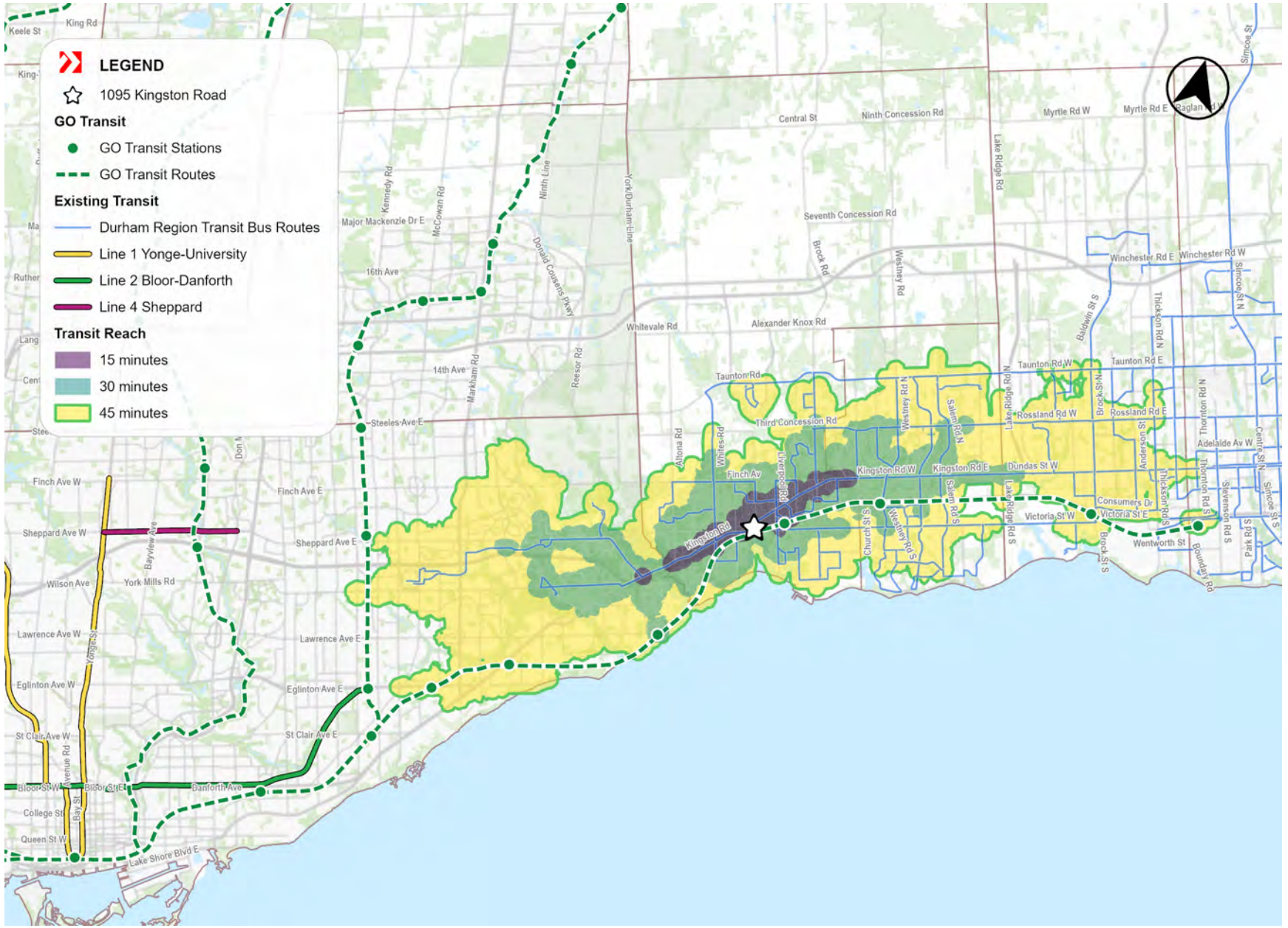
Based on the foregoing, the site is reasonably accessible by transit under existing conditions with most travel possibilities being east-west oriented. Westbound travel reaches into Scarborough while eastbound provides access through Ajax and into Whitby. Northbound travel is limited to infrequent bus service serving primarily low-density residential developments and southbound travel extends to the waterfront, providing access to GO Stations along the Lakeshore East Line. Under future conditions, with the addition of the Durham-Scarborough BRT, there is improvement to the east-west travel potential along the Ellesmere Road / Kingston Road / Dundas Street West corridor. The future GO RER will provide an increase to the potential transit reach both east and west.

Overall, the evolving transportation network visualised in this analysis indicates that, at a local level, there are suitable alternatives to travel by personal vehicle. The existing transit services provide reasonable access along developed corridors and into neighbouring municipalities. The future context will provide enhanced regional transportation options as well as more frequent bus rapid transit east and west for future site users.



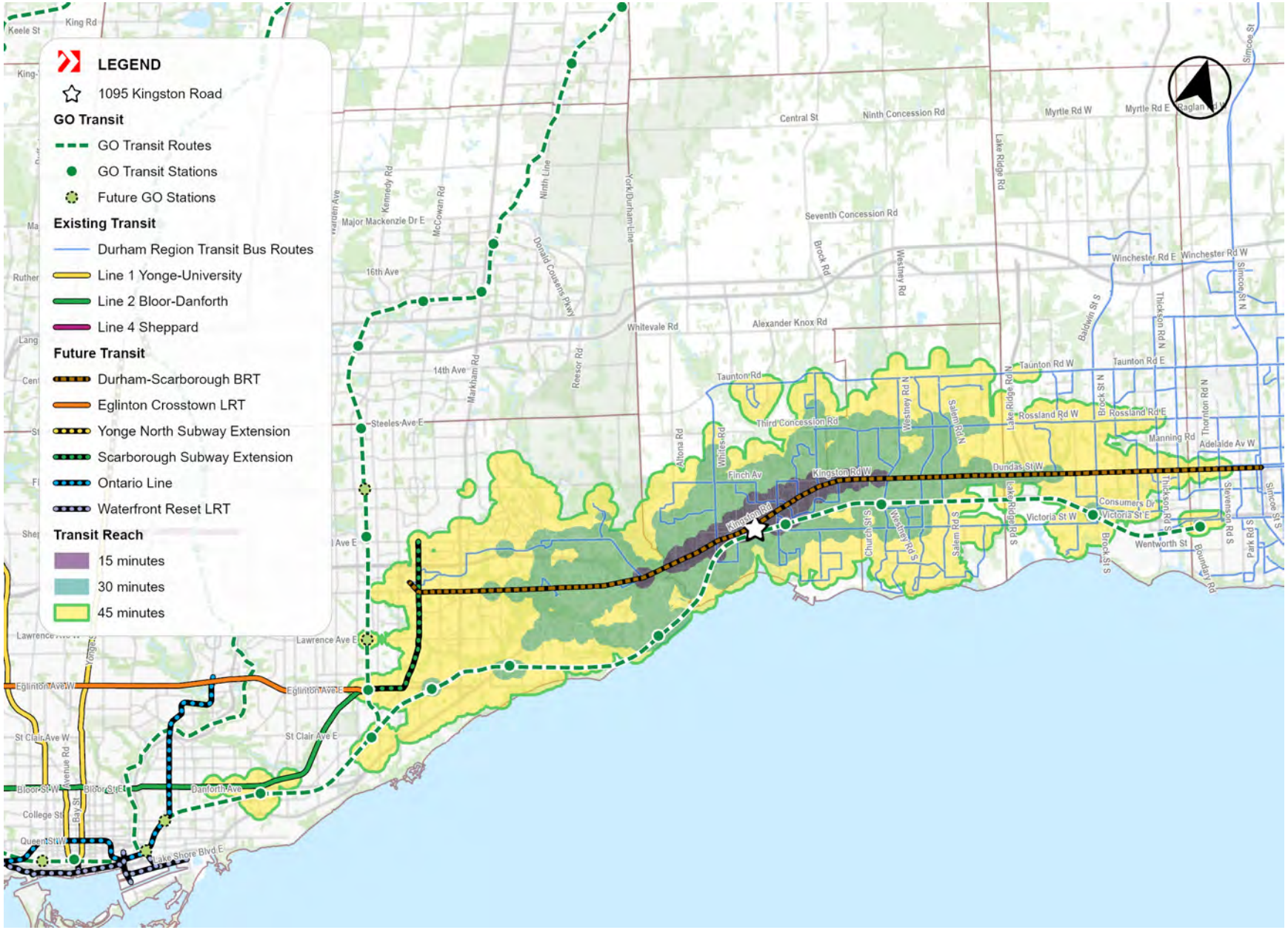
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FIGURE 6 EXISTING TRANSIT REACH - MORNING PEAK (AWAY FROM SITE)



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FIGURE 7 EXISTING TRANSIT REACH - MORNING PEAK (TOWARDS SITE)



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FIGURE 8 FUTURE TRANSIT REACH - MORNING PEAK (AWAY FROM SITE)

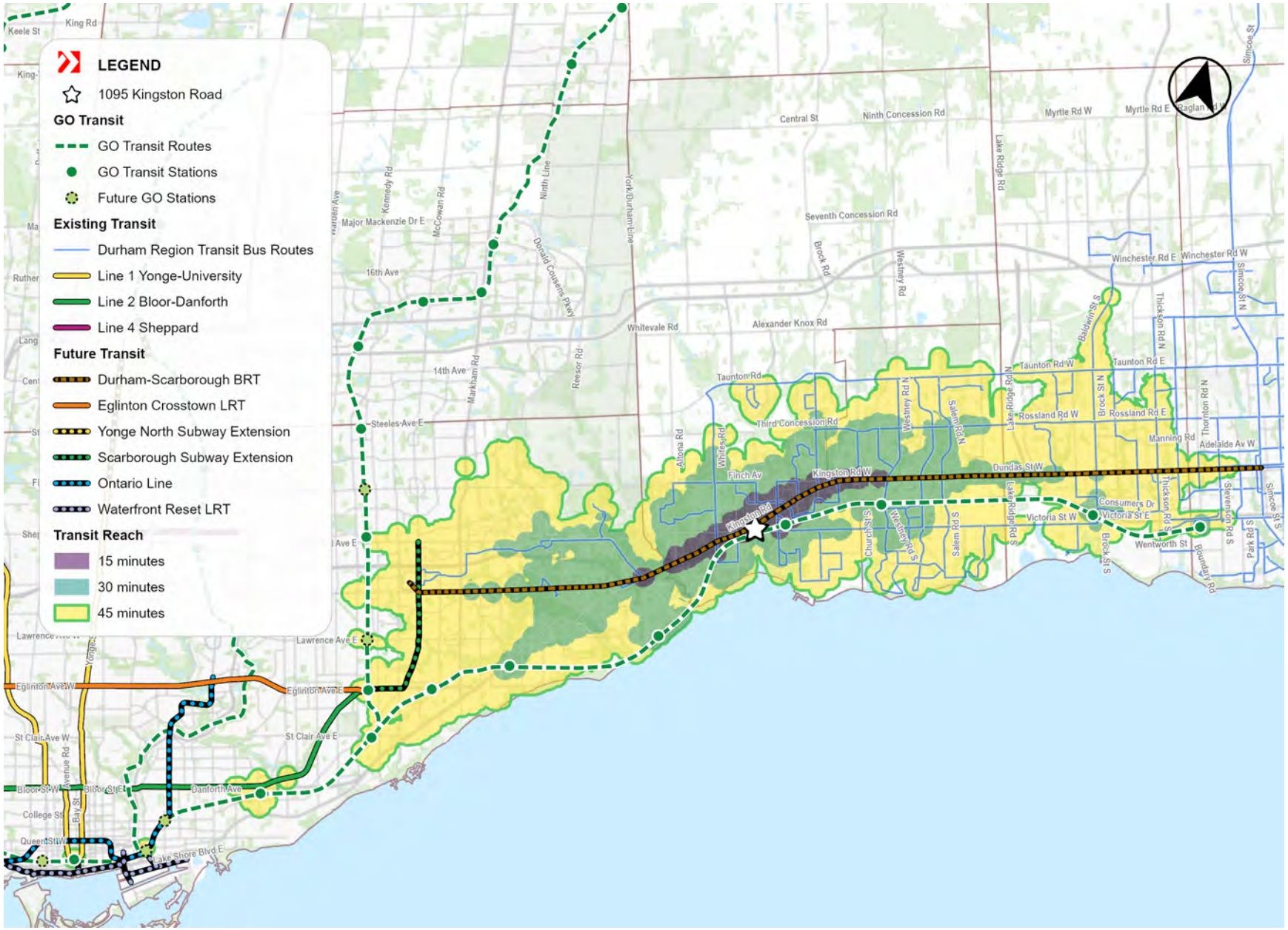


FIGURE 9 FUTURE TRANSIT REACH - MORNING PEAK (TOWARDS SITE)

4.3 Pedestrian Context

4.3.1 Existing Pedestrian Network

The site is located along the Kingston Road corridor, just outside (to the west) of the City Centre. There are a mix of uses along this corridor that can be accessed on-foot, however, the vehicle-oriented design of the area (i.e., large surface parking lots, wide streets, and lack of continuous sidewalks and crossings) currently does not prioritize pedestrian travel.

4.3.1.1 PEDESTRIAN FACILITIES

Overall, sidewalks are generally provided east and north of the site, providing access to commercial uses along Kingston Road and the residential neighbourhood and school to the north. In the immediate site area, sidewalks are provided along both sides of Dixie Road, generally with a landscaped buffer, north of Kingston Road. South of Kingston Road, adjacent to the site, sidewalks are provided only along the west side of Dixie Road and they terminate approximately 60 metres north of the roadway's southern terminus (measured from edge of sidewalk to centre of cul-de-sac). Along Kingston Road, sidewalks are not provided west of Dixie Road, near the site. East of Dixie Road, sidewalks are provided intermittently along both sides of Kingston Road, generally where there are commercial uses fronting the roadway. Additionally, along Kingston Road, there is generally a landscaped buffer provided between the sidewalk and vehicular traffic lanes.

Pedestrian crossing opportunities are provided at major intersections within the site vicinity, including the signalized intersection adjacent to the site at Kingston Road / Dixie Road and at Kingston Road / Walnut Lane, both of which provide marked crosswalks and pedestrian signal heads in all directions. It is noted that there are limited mid-block crossings along Kingston Road, west of Dixie Road, which hinders pedestrian mobility in the area.

The area pedestrian network is illustrated on **Figure 10**.

4.3.1.2 PEDESTRIAN AMENITIES

The site's location at the key Kingston Road / Dixie Road intersection is walkable to retail, recreational, and institutional services and amenities, such as restaurants / food establishments, healthcare services and pharmacies, banks, grocery stores, parks, and schools. Namely, the site is located approximately 500 metres (i.e., an approximate 6-minute walk) from the Brookdale Shopping Centre. Overall, the pedestrian amenities within walking distance of the site are generally located north of Highway 401. Due to the current car-oriented design of the built form (e.g., building setbacks) within the immediate area, sidewalks are primarily provided along the major roadways and have limited permeability to and from internal building entrances (i.e., pedestrians are to walk across parking lots or have limited midblock crossing / entrance opportunities).

Overall, daily errands and leisurely activities, inclusive of recreational, retail, and institutional uses, may be undertaken without the use of a personal vehicle, minimizing automobile travel to / from the site.

The existing area pedestrian destinations are illustrated on **Figure 11**.

4.3.2 Pedestrian Improvements

4.3.2.1 EXTERNAL (AREA) IMPROVEMENTS

The Kingston Road Corridor and Specialty Retailing Node Intensification Plan, as introduced in **Section 3.2.3**, proposes numerous improvements for the pedestrian realm in the site area.

Numerous POPS, public green spaces, and a public park are proposed within the Dunbarton / Liverpool Precinct area, both east and west of the site. Furthermore, the removal of large surface parking lots in the Dunbarton / Liverpool Precinct area, as intended by the Intensification Plan, creates an opportunity for improved pedestrian interaction along Kingston Road and will improve the public realm of the general site area.

In addition to pedestrian amenities, new multi-modal roadway connections are proposed near the site. The three new roadway connections proposed east of the site, as part of OPA 38, are intended to be multi-modal, wherein the Walnut Lane extension in particular will provide a comfortable pedestrian sidewalk and cycling facility. A 3.0 metre asphalt-paved multi-use path ("MUP") will be provided on the north side of Walnut Lane, and a 1.5 metre concrete sidewalk will be provided on the south side as per the Aecom EA published in 2023. This MUP will provide an improved connection from the site to the Pickering City Centre.

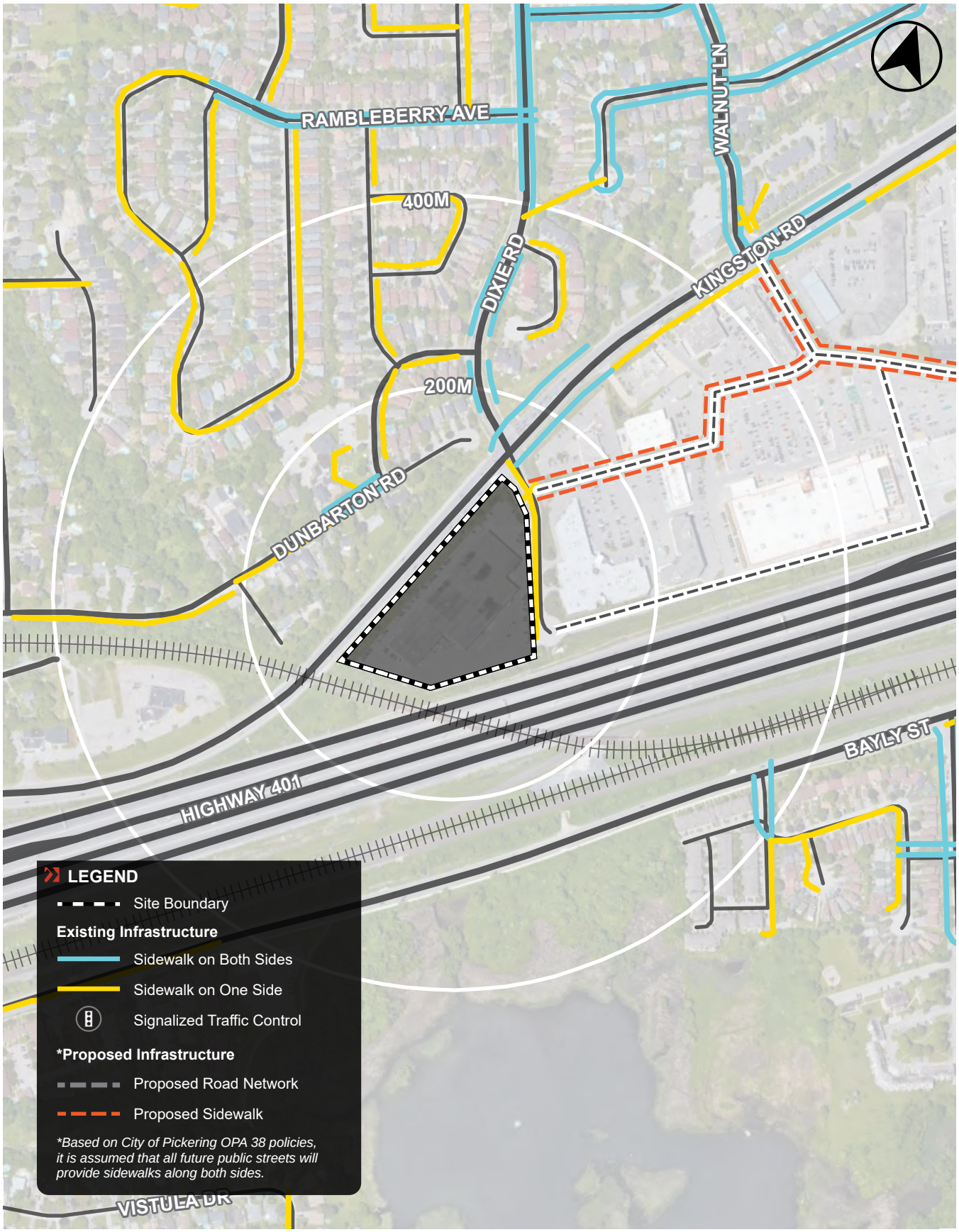
Furthermore, an active transportation bridge is proposed south of the site, over Highway 401, by utilizing the existing rail bridge over the highway. This bridge will allow future site users to access the neighbourhoods and pedestrian amenities south of the site that currently cannot be reached easily across the highway.

4.3.2.2 INTERNAL (ON-SITE) PEDESTRIAN IMPROVEMENTS

In addition to the area pedestrian improvements, improvements to the on-site pedestrian context are also proposed, including the following:

- A multi-use path is proposed along the southern edge of the site, providing convenient connections between the existing or planned pedestrian facilities along Kingston Road, Dixie Road, and the proposed site;
- A privately-owned public space ("POPS") is proposed at the south of the site, between the two proposed residential podiums, offering a new pedestrian amenity for site users;
- A gateway plaza is proposed at the northeast corner of the site that offers a distinct arrival point into the site and frames / activates the street corner along the Kingston Road Corridor;
- An internal pedestrian path with connections to both Kingston Road and Dixie Road is proposed in the centre of the site, providing connectivity / increased permeability to the proposed residential lobbies.

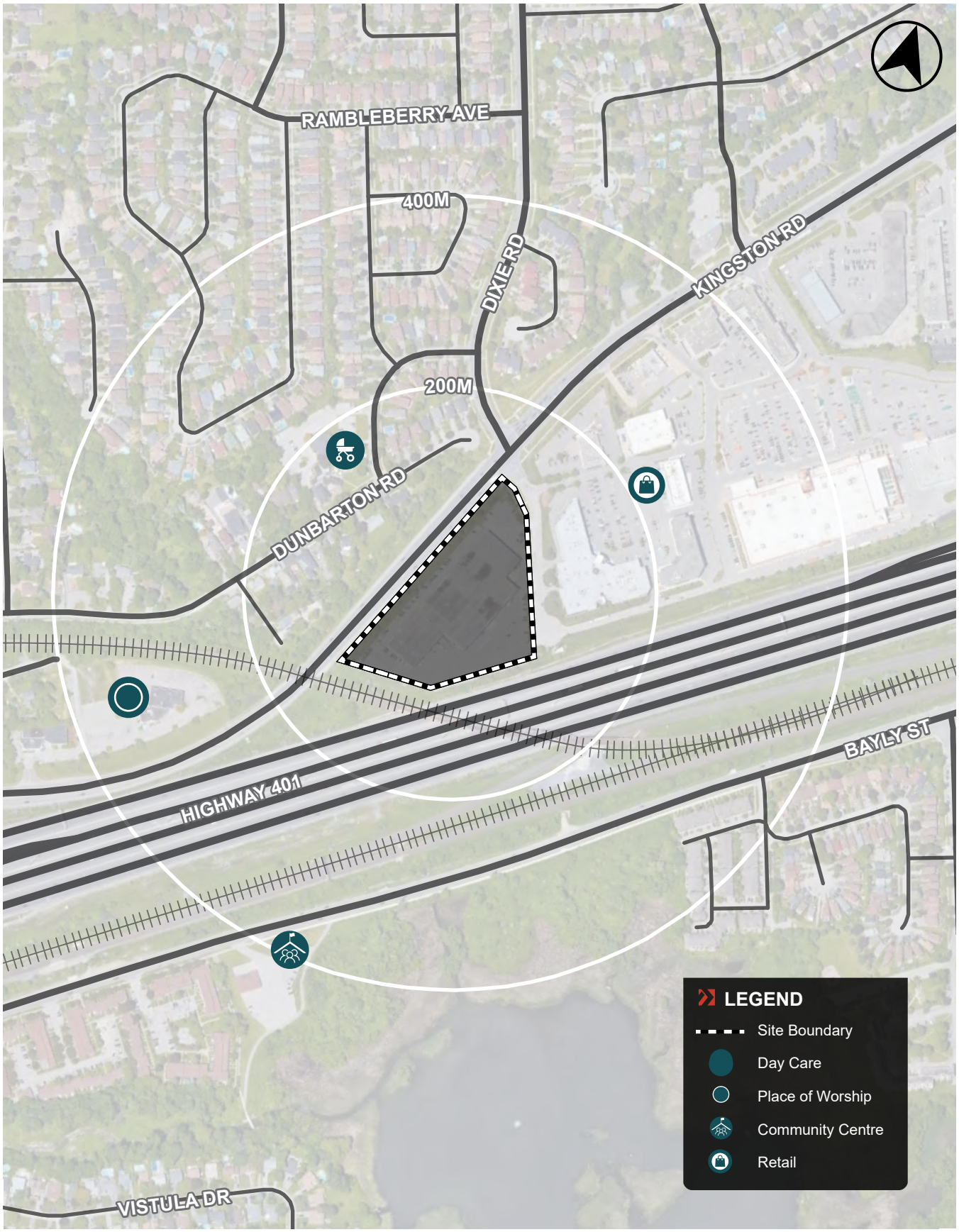
Further details on the proposed on-site pedestrian improvements are provided in **Appendix D**.



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Aerial maps provided courtesy of: Esri, DigitalGlobe, GeoEye, Earthstar Geographies, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, the GIS User Community and/or Google Earth/Maps.

FIGURE 10 AREA PEDESTRIAN CONTEXT



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Aerial maps provided courtesy of: Esri, DigitalGlobe, GeoEye, Earthstar Geographies, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, the GIS User Community and/or Google Earth/Maps.

FIGURE 11 AREA PEDESTRIAN DESTINATIONS

4.4 Area Cycling Context

4.4.1 Existing Cycling Network

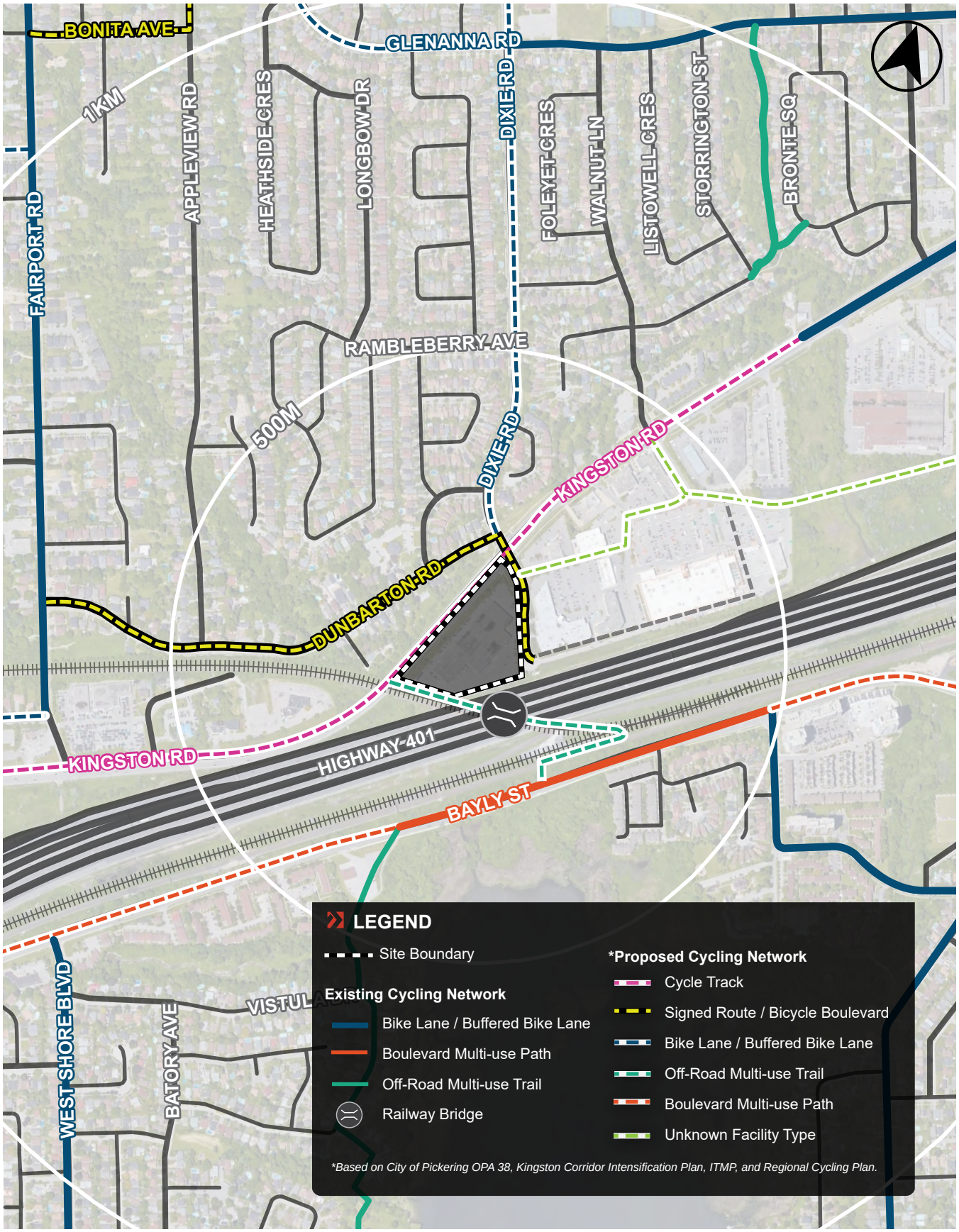
The site is currently served by limited cycling infrastructure. Within 800 metres of the site, on-road bike lanes are generally provided along both sides of Fairport Road from Sheppard Avenue in the south to Finch Avenue in the north. In addition, bike lanes are provided approximately 815 metres east of the site, along Kingston Road.

4.4.2 Planned Cycling Network Improvements

The City and Region includes plans for the City's long-term cycling network. Consistent with OPA 38, Kingston Corridor Intensification Plan and Urban Design Guidelines, ITMP, and RCP, future cycling infrastructure and routes near the site vicinity include the following:

- Kingston Road: Cycling infrastructure on Kingston Road is proposed to be continuous, extending from the City of Pickering's western boundary to Highway 412 in the east, beyond the City's eastern boundary, where the route will continue into the rest of Durham Region along Dundas Street. Within the site vicinity, this route is expected to be delivered as a cycle track, as referenced in the DSBRT 30% preliminary design concept, OPA 38, ITMP, and RCP.
- New East-West Connection: Cycling infrastructure is proposed along both sides of the new east-west public road planned as part of the Kingston Corridor Intensification Plan and Urban Design Guidelines.
- Walnut Lane Extension: Cycling infrastructure is proposed along the Walnut Lane extension south of Kingston Road. A 3.0 metre asphalt-paved multi-use path (MUP) will be provided on the north side of Walnut Lane, as per the Walnut Lane Extension EA published in 2023, consistent with the Intensification Plan and ITMP.
- Dixie Road: Cycling infrastructure is being contemplated along Dixie Road, extending from its southern terminus, south of Kingston Road, to Third Concession Road in the north. Near the site, the ITMP identifies that this route proposes bike lane, north of Kingston Road, and a signed route, south of Kingston Road. Contrary to this, for the portion south of Kingston Road, the Kingston Intensification UDG identifies proposed cycling facilities on the west side of Dixie Road and a multi-path on the east side of Dixie Road. As it relates to the site (i.e., portion south of Kingston Road), Dixie Road will include pedestrian facilities based on City feedback and will be further reviewed throughout the zoning and approvals process.
- Active Transportation Bridge and MUP: An active transportation connection is proposed south of the site, over Highway 401, by utilizing the existing rail bridge over the highway. This bridge will ultimately connect to the waterfront trail.
- Rail Corridor MUP: A multi-use path is proposed from Kingston Road to Bayly Street, crossing the proposed Active Transportation Bridge over Highway 401. The proposed development plans incorporate this MUP along the southern edge of the site.

The existing and planned cycling infrastructure network is illustrated on **Figure 12**.



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Aerial maps provided courtesy of: Esri, DigitalGlobe, GeoEye, Earthstar Geographies, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, the GIS User Community and/or Google Earth/Maps.

FIGURE 12 AREA CYCLING CONTEXT

5.0 VEHICLE PARKING

5.1 Subject Zoning By-law Vehicle Parking Requirements

5.1.1 City of Pickering Zoning By-law 3036

The site is primarily subject to the City of Pickering Zoning By-law 3036 vehicle parking standards, as amended by Site-specific Zoning By-law 2324/86. A summary of the minimum vehicle parking requirements for the site, as per Zoning By-law 3036, is provided in **Table 5**.

Table 5 City of Pickering Zoning By-law 3036 Minimum Parking Requirements

Use	Units[1]	Minimum Rate	Minimum Requirement[2]
Apartment Dwelling	1,492 units	1.75 spaces / unit	2,611 spaces
Residential Visitor	1,492 units	Inclusive of minimum resident rate	--
Total Vehicle Parking	--	--	**2,611 spaces**

Notes:
1. Site statistics received from BDP Quadrangle Architects Ltd. dated March 20, 2025.
2. City of Pickering Zoning By-law 3036 does not provide rounding rules for the calculation of vehicle parking requirements. As such, parking calculations resulting in a fraction have been rounded to the nearest whole number (i.e., greater than or equal to 0.5 will be rounded up and calculations resulting in a fraction less than 0.5 will be rounded down).

Application of the subject vehicle parking requirements results in a minimum of 2,611 vehicular parking spaces, inclusive of resident and residential visitor parking spaces.

Accessible parking is required in accordance with the City of Pickering Traffic and Parking By-law 6604/05, as amended, which calculates the number of accessible parking spaces based on the proposed parking supply. As such, the accessible parking requirement for the site is discussed in **Section 5.3**.

5.2 Latest Vehicle Parking Standards

5.2.1 City of Pickering Zoning By-law 8149/24

The City of Pickering Comprehensive Zoning By-law 8419/24 became in force and effect as of December 16, 2024, which amalgamated and updated the City's existing six parent Zoning By-laws, including Zoning By-law 3036.

Zoning By-law 8419/24 proposes minimum vehicle parking standards for "City Centre" and "Other Areas of the City". Although the site is not included in Zoning By-law 8419/24 and is to be further reviewed throughout the zoning process following OPA 38, the latest city-wide standards are being considered as reference for the proposed development. In addition, as part of the proposed parking supply, at least 50% of the provided resident parking is required to provide Electric Vehicle ("EV") parking spaces (i.e., 40% EV rough-ins and 10% EV-ready) in accordance with the City's ISDS.

A summary of the minimum vehicle parking requirements for the site, as per the City's latest Comprehensive Zoning By-law (i.e., Zoning By-law 8419/24) for the "All Other Zones" area is provided in **Table 6**.

Table 6 City of Pickering Zoning By-law 8149/24 "All Other Zones" Minimum Parking Requirements

Use	Units[1]	Minimum Rate	Minimum Requirement[2]
Apartment Dwelling	1,492 units	1.25 spaces / unit	1,865 spaces
Residential Visitor	1,492 units	0.25 spaces / unit	373 spaces
Total Vehicle Parking	--	--	**2,238 spaces**

Notes:
1. Site statistics received from BDP Quadrangle Architects Ltd. dated March 20, 2025.
2. As per Section 5.3.1 of the City of Pickering Zoning By-law 8419/24, parking calculations resulting in a fraction shall be rounded down to the nearest whole number.

Application of the City of Pickering Comprehensive Zoning By-law 8419/24 for "All Other Zones" results in a total requirement of 2,238 vehicle parking spaces, inclusive of 1,865 resident parking spaces and 373 residential visitor parking spaces.

Accessible parking is required in accordance with the City of Pickering Traffic and Parking By-law 6604/05, as amended, which calculates the number of accessible parking spaces based on the proposed parking supply. As such, the accessible parking requirement for the site is discussed in **Section 5.3**.

5.3 Proposed Vehicle Parking Standards

Given the significant transit and active transportation-related improvements anticipated within the immediate area and along the Kingston Road corridor, it is proposed to adopt reduced minimum vehicle parking standards to the site. A summary of the proposed (recommended) minimum parking standards is provided in **Table 5**.

Table 7 Proposed Minimum Parking Requirements

Use	Units[1]	Minimum Rate	Minimum Requirement[2]
Apartment Dwelling	1,492 units	0.61 spaces / unit	910 spaces
Residential Visitor	1,492 units	0.15 spaces / unit	223 spaces
Total Vehicle Parking	--	--	**1,133 spaces**

Notes:
1. Site statistics received from BDP Quadrangle Architects Ltd. dated March 20, 2025.
2. As per Section 5.3.1 of the City of Pickering Zoning By-law 8419/24, parking calculations resulting in a fraction shall be rounded down to the nearest whole number.

Application of the proposed minimum standards results in a total requirement of 1,133 vehicle parking spaces, inclusive of 910 resident parking spaces and 223 residential visitor spaces.

5.4 Proposed Vehicle Parking Supply

The architectural plans illustrate the following vehicle parking supply to support the site:

- Resident: 920 spaces (approximately 0.62 spaces per unit), including 16 accessible spaces
- Residential Visitor: 223 spaces (approximately 0.15 spaces per unit), including 7 accessible spaces
- Total: 1,143 spaces (approximately 0.77 spaces per unit)

Overall, the proposed vehicle parking supply meets and exceeds the minimum proposed parking requirements, summarized in **Table 7**.

As part of the proposed parking supply, 460 resident parking are designed to provide Electric Vehicle ("EV") parking spaces, meeting the minimum requirement for 40% EV rough-ins and 10% EV-ready as per the City's ISDS.

The vehicular parking spaces will be located on the P1, Ground Floor, Mezzanine, and Podium Levels 2, 3, 4, 5, 6 of the proposed development. Access to the vehicular parking spaces will be provided via two parking ramps which can both be primarily accessed from three proposed site driveways, including two off Dixie Road and another off Kingston Road.

It is recognized that the in-force minimum parking requirements of the City of Pickering Zoning By-law 3036 and the contemporary City of Pickering comprehensive Zoning By-law 8419/24 overstate the parking needs of contemporary developments in transit-accessible areas of Pickering, such as the site. **Section 5.5** discusses the appropriateness of the proposed (reduced) parking requirements of the site.

5.4.1 Accessible Parking

Accessible parking is required in accordance with the City of Pickering Traffic and Parking By-law 6604/05, as amended, which calculates the required number of accessible parking spaces based on the proposed visitor parking supply. Based on the residential visitor supply indicated in **Section 5.4**, a supply of 7 accessible parking spaces, including 3 Type A and 4 Type B spaces, is required. The minimum accessible parking requirement for the site is summarized in **Table 8**.

Table 8 Minimum Accessible Parking Requirement

Use	Category	Minimum Requirement[1]
Residential Visitor Parking Supply	167 - 250 spaces	7 spaces (3 Type 'A' and 4 Type 'B')

Notes:
1. Type 'A' spaces have a minimum width of 3.4 metres and a Type 'B' space has a minimum width of 2.4 metres.

The architectural plans illustrate a total of 23 accessible parking spaces, inclusive of 7 residential visitor accessible spaces and 16 resident accessible spaces, which are located near the parking elevator lobbies on multiple parking levels. As such, the proposed accessible parking supply exceeds the minimum requirements.

5.5 Appropriateness of the Reduced Minimum Parking Standards

The City of Pickering, Durham Region, and the Province of Ontario actively promote lower levels of auto ownership through several initiatives, both from a policy perspective and through the investment of infrastructure to support alternative modes of transportation. This section summarizes the prevailing policies and site-specific factors which will influence auto ownership and parking demand for the subject site and reviews how the proposed parking standards compare to comparable Zoning By-law standards, proxy demands, and proxy approvals.

5.5.1 Context Considerations (Applicable to Resident and Residential Visitor Uses)

5.5.1.1 PROVINCIAL "CUTTING RED TAPE TO BUILD MORE HOMES ACT" (BILL 185)

As introduced in **Section 3.1.1**, the Provincial Government introduced the Cutting Red Tape to Build More Homes Act, 2024 (Bill 185) on April 10, 2024 which prohibits and / or limits the ability for municipal Official Plans and Zoning By-laws to require an owner to provide parking facilities (other than for bicycle parking) in PMTSAs.

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

Municipalities in Durham Region have identified MTSAs, currently awaiting ministerial approval, but they are limited to areas surrounding existing GO stations. The closest MTSA to the site is the Pickering GO PMTSA, which is located 750 metres or a 9-minute bus ride from the site. Although the site is not located within the Pickering GO PMTSA, the site is located at a major intersection along a future rapid transit corridor, a context that resembles the principles and elements of an MTSA (i.e., walking distance to a transit station). Therefore, while the site does not propose to provide zero vehicular parking, some degree of parking reduction may be considered appropriate for the site considering its location in proximity to the Durham-Scarborough BRT.

5.5.1.2 EVOLVING OVERARCHING POLICY AND PLANNING REGIME

The overarching policy and planning regime, applicable to the site, guides the way in which the Province and its municipalities evolve and respond to changing transportation needs. Namely, they reflect initiatives, standards, and investments that prioritize active mobility and the experience of people over the efficiency of car movement. Recent plans and policies aim to mitigate and significantly reduce vehicle traffic through the promotion and facilitation of non-auto trips and the vast improvement of public transit access. As a result, contemporary planning is needed to reduce and manage parking as a key factor in mitigating challenges of vehicle traffic congestion, automobile dependency / usage, and other indirect (but equally as important) challenges, including the supply and affordability of housing.

Common themes across provincial and regional directives (e.g., 2024 Provincial Planning Statement, Bill 185, Metrolinx RTP, and Envision Durham) as well as municipal plans (e.g., Pickering OP, Kingston Corridor Intensification Plan, and Pickering ITMP) emphasize the following transportation-related implications:

- **Planning transit from a network perspective.**

  Public transit in the site area and surrounding neighbourhood is being enhanced to achieve an interconnected network of high-order public transit service, overall offering a greater range of transportation options for residents and visitors.

- **Designing streets and public realms for people.**

  While the efficient movement of automobiles has previously been the focus in transportation planning, the enjoyment, safety, and efficiency of the pedestrian has become the primary focus of mobility planning throughout the City.

- **Connecting and expanding cycling infrastructure.**

  The City has been undertaking significant expansion of cycling infrastructure as adopted in the City of Pickering ITMP, as well as cycling-supportive amenities (both publicly accessible and integrated with new developments).

- **Reduction of vehicle parking as appropriate.**

  Based on the above, the provincial and municipal governments have taken significant steps to address increasingly immediate housing needs, environmental concerns, and traffic congestion. One way in which the Region and City aim to tackle these concerns is consideration for the significant reduction or complete elimination of vehicle parking for new developments based on their proximity to transit. This approach is expected to better facilitate development approvals, reduce greenhouse gas emissions and single occupancy vehicle trips, and relieve congestion along major corridors with support through TDM measures.

Overall, the above themes have been fundamental to the development of the Region and City, which have and will continue to guide the planning / design and overall parking needs.

5.5.1.3 EVOLVING TRANSPORTATION CONTEXT

The existing and evolving transportation context of the site area further supports the reduction of private vehicle trips and, therefore, a reduction of parking ownership and usage on-site. While the site is currently served by existing GO and DRT bus service, including DRT PULSE service, the site will see significant improvements to transit accessibility as a result of the proposed Durham-Scarborough BRT, running adjacent to the site, along with significant investments in active transportation infrastructure.

The Durham-Scarborough BRT is a proposed rapid transit service extending from Scarborough Centre in Toronto to Downtown Oshawa, primarily along Kingston Road, with 49 proposed BRT stops across Toronto, Pickering, Oshawa, Whitby, and Ajax. The BRT is planned to include dedicated bus lanes, frequent and reliable bus service, and smart signals along Kingston Road, all of which will provide future site residents and visitors with the ability to travel more efficiently and conveniently across the City and nearby municipalities, whether it be for work or play. Based on discussion with Regional staff, it is anticipated that construction will start in 2025. As such, it is expected that future site users will be able to travel to / from the site via this new rapid transit corridor. It is expected that a future BRT stop will be located adjacent to the site, near the Kingston Road and Dixie Road intersection.

In addition to the proposed BRT, the Metrolinx GO expansion will expand and electrify the GO rail network allowing for faster travel times and all-day, two-way service with significantly increased service frequencies (every 15 minutes or better), on most GO lines, including the Lakeshore East Line accessible from the site via Pickering GO Station. Based on the transit reach analysis, discussed in **Section 4.2.3**, the future transit improvements in the site area (including the DSBRT and GO Expansions), will allow for future site users to travel further in the Region within 15 minutes.

Further to transit improvements, the Durham Region Cycling Plan and Pickering ITMP have ambitious plans to provide a broader, connected cycling network throughout the Region, including cycling infrastructure along major roadways near the site, allowing for daily and / or recreational travel to be taken by bike rather than by private vehicle. Further, the Kingston Corridor Intensification Plan proposes to create a pedestrian-oriented corridor along Kingston Road, focused on animating the public realm and creating more pedestrian destinations and interactions.

Overall, the site's location adjacent to a proposed rapid transit corridor supports a reduction in the site's vehicle parking supply as future site residents and visitors will be able to travel without the need for a private vehicle. Moreover, improvements to the pedestrian and cycling connectivity and experience in the site area will increase the viability and attractiveness of travel by active transportation over auto-travel.

5.5.2 Resident Parking

It is proposed to adopt a minimum resident parking standard of 0.61 spaces per unit for the overall development. As such, the resident parking standards of Zoning By-law 3036 overstate the practical needs of the proposed redevelopment, considering its evolving transportation context and additional site-related factors.

In addition to the several non-auto supportive regional and local plans and policy directives (discussed in **Section 5.5.1**) and evolving area transportation context afforded to the area (discussed in **Section 5.5.1**), a reduced resident parking standard is considered appropriate for the site based upon the following considerations:

- Observed precedence for resident parking reduction approvals in the Greater Toronto and Hamilton Area ("GTHA");
- Review of other residential parking Zoning By-law standards across Ontario;
- Observed parking sales data at condominiums in Pickering; and
- Support from the site's TDM strategy for residents.

5.5.2.1 OBSERVED RESIDENT PARKING REDUCTION APPROVALS

There is a demonstrated trend of resident parking reduction approvals being granted across the Region where developments with a comparable context to the site have sought relief from their as-of-right Zoning By-law requirement.

Table 9 provides a summary of these resident parking reduction approvals, including a summary of decreasing resident parking rate approvals in the GTHA and in the City of Pickering, both outside and within Pickering Town Centre ("PTC"). A detailed analysis of the resident parking reduction approval trends observed is further discussed in the following section.

Table 9 Resident Proxy Parking Reduction Approvals

Address[1]	Nearby Transit Station	Municipality	Approval	Approved
Site	Pickering GO Station	Pickering	--	Proposed Rate:
689 The Queensway	Mimico GO Station (1.5 km walk / 11-min bus)	Etobicoke (Toronto)	Site Specific By-laws 680-2021	0.76 spaces / unit
1197 The Queensway Avenue & 8 Zorra Street	Mimico GO Station (3.0 km walk / 14-min bus)	Etobicoke (Toronto)	Site-specific By-law 886-2021	0.75 spaces / unit
1306-1310 The Queensway Avenue	Mimico GO Station (3.4 km walk/ 20-min bus)	Etobicoke (Toronto)	Site-specific By-laws 198-2022 & 199-2022	0.75 spaces / unit
3051 Cook Street	Cooksville GO Station (850 metres / 13-min walk)	Mississauga	CoA File: "A" 177/23 (August 17, 2023)	0.70 spaces / unit

	Nearby Transit Station	Municipality	Approval	Approved
395 City Centre Drive, 4225 and 4235 Confederation Parkway, and 4220 Living Arts Drive	City Centre Transit Terminal (1.1 km walk / 9-min bus)	Mississauga	CoA File: "A" 423/23 (December 14, 2023)	0.67 spaces / unit
325 Burnhamthorpe Road	City Centre Transit Terminal (1.1 km walk / 8-min bus)	Mississauga	CoA File: "A" 426/23 (November 9, 2023)	0.50 spaces / unit
1550 Kingston Road	Pickering GO Station (1.6 km walk / 10-min bus)	Pickering (Outside of PTC)	Site-specific By-law 7553/17 (OMB) File PL 170549	0.80 spaces / unit
Lots 1, 2, 43 & 46, Plan 316 & Part of Lot 20, Concession 1 (Knob Hill Farms)	Pickering GO Station (2.1 km walk / 15-min bus)	Pickering (Outside of PTC)	Site-specific By-law 7860/21	0.80 spaces / unit
Universal City 2 & 3 (Bayly St / Liverpool Rd)	Pickering GO Station (650 m walk / 9-min walk)	Pickering (Within PTC)	CoA Decision - P/CA 60/19	0.74 spaces / unit
Universal City 6 (Bayly St / Liverpool Rd)	Pickering GO Station (650 m walk / 9-min walk)	Pickering (Within PTC)	City of Pickering Zoning By-law No. 7810/21	0.71 spaces / unit
Universal City 4 & 5 (Bayly St / Liverpool Rd)	Pickering GO Station (650 m walk / 9-min walk)	Pickering (Within PTC)	City of Pickering Zoning By-law No. 7936/22	0.65 spaces / unit
Universal City 7 (Bayly St / Liverpool Rd)	Pickering GO Station (650 m walk / 9-min walk)	Pickering (Within PTC)	City of Pickering Zoning By-law No. 7924/22	0.65 spaces / unit
1786-1790 Liverpool Road	Pickering GO Station (650 m walk / 9-min walk)	Pickering (Within PTC)	Site specific By-law 8023/23	0.55 spaces / unit
1355 Kingston Road	Pickering GO Station (650 m walk / 9-min walk)	Pickering (Within PTC)	OLT Case Number: OLT-24-000150	0.50 spaces / unit
Observed Parking	--	--	--	**0.50 spaces / unit -**

Notes:
1. The residential buildings in this table include both apartment and condominium buildings.
2. The bus travel times are approximate, based on the available service during the weekday peak period, and include the travel time of the entire bus journey (i.e., bus and walk).

The observed range and trends of resident parking approvals in comparable or slightly more progressive site locations indicate that the proposed resident rate for the site (0.61 spaces per unit) is generally suitable. The following presents the key themes derived from the resident approvals.

Parking Trends Within MTSAs Across the GTHA

BA Group reviewed regional parking reduction approvals for recently built or approved residential developments across the GTHA with comparable contexts to the site. Specifically, sites were observed in Etobicoke (western end of Toronto) and Mississauga (outside of the City Centre) as the transportation and development / urban context is comparable to that of the site's location in Pickering (i.e., area that is at least a 10-minute bus journey from the nearest GO rail station and currently undergoing intensification / urbanization).

Overall, it is evident that resident parking rate approvals have continued to trend downwards as Etobicoke and Mississauga's population continues to grow and as the transit services levels continue to improve to support this recent urbanization. In Mississauga, between mid-2023 and late-2023, resident parking rate approvals were observed to decrease rapidly from 0.70 spaces per unit to 0.50 spaces per unit, largely due to reduced demand for parking in newly built residential developments within MTSAs. The proposed site resident rate of 0.61 spaces per unit falls within this range.

In Etobicoke, between 2019 and 2022, a resident parking rate reduction from 1.00 spaces per unit to 0.75 spaces unit was observed. It is anticipated that this trend will continue with progressively lower rates, particularly with the introduction of future transit and active transportation improvements including the GO expansion. Moreover, it is noted that new developments in Etobicoke today would be permitted to provide zero resident parking, as-of-right, as a result of City-wide parking policy changes to their comprehensive Zoning By-law. As such, the resident parking rate proposed for the subject site (0.61 spaces per unit) can be supported by the trends in regional parking approvals.

Rapidly Evolving Policy Context in the City of Pickering (Within Areas Outside of the City Centre)

For context, BA Group reviewed approved parking standards in the City of Pickering, located outside of the City Centre. There are limited resident parking reduction approvals, especially recent approvals, due to the overall limited residential intensification thus far outside of the City Centre. Between 2017 and 2021, reduced resident parking rate approvals were granted at 0.80 spaces per unit, which represents significant relief from its subject Zoning By-law requirement of over 1.00 space per unit. While these parking rates are higher than that proposed for the site (i.e., 0.61 spaces per unit), the proposed resident parking standard presents an opportunity to set a new precedent as most of these approvals are considered outdated. In addition, more recent policies dated 2022 and later provide significant support for reduced vehicle parking rates, such as the Kingston Road Corridor and Specialty Retailing Node Intensification Plan, based on the area's rapidly transforming high-density and transit-oriented urban form.

Proposed Resident Parking Standard Relative to Parking Trends Within the Pickering Town Centre

Finally, BA Group reviewed parking approvals within the Pickering Town Centre and areas closer to the Pickering GO Station to understand the reduction in resident parking approvals over time as a result of improvements to transit service and growth in the City Centre. A review of these approvals shows a significant decline in resident parking rates over the last 4 years.

From 2019 to 2023, there has been a rapid resident parking rate decline from 0.74 spaces per unit to 0.50 spaces unit. It is anticipated that this trend will continue with progressively lower rates, particularly with the future operation of the Durham-Scarborough BRT providing additional east-west rapid transit capacity, which conveniently extends past the site. The most recent reduced parking rate in PTC was approved in 2024 at 0.50 spaces per unit for a site (i.e., 1355 Kingston Road) located within a 10-minute walk of the Pickering GO Station. Given this approval, the proposed resident parking rate for the site (0.61 spaces per unit) should be considered appropriate considering its slightly greater distance from the Pickering Town Centre and GO Station (i.e., a 10-minute bus ride). Albeit the 2024 approval is now outdated considering recent provincial policy changes to vehicle parking requirements for MTSAs in mid-2024 (i.e., Royal Assent of Bill 185).

5.5.2.2 RESIDENT BY-LAW STANDARDS

In addition to reductions in resident parking requirements from their applicable Zoning by-laws, BA Group has also conducted a review of the evolving resident parking requirements observed in other municipalities across the GTHA. This review was undertaken to analyze the similarities of parking standards and urban contexts adopted in several municipalities across the GTHA with comparable urban contexts and (future) rapid transit accessibility to the site in the City of Pickering. Municipalities were selected based on key characteristics including density / intensification patterns and access to surface (i.e., bus or higher order) transit services.

Table 10 summarizes the review of resident parking standards by municipality. It is noted that the timing of each municipality's Zoning By-law review / update differs, and the latest existing or proposed (if supported by municipal staff) parking policies / standards have been considered in recognition of rapidly evolving mobility trends and objectives.

Table 10 Resident Parking Zoning By-law Standards

Municipality	Zoning By-law / Policy	Zone / Area	Parking Rate[3]
City of Pickering	Site (Proposed Rate)	--	0.61 spaces / unit
City of Pickering	By-law 3036	--	1.75 spaces / unit *(shared with residential visitor)*
City of Pickering	By-law 8149/24	All Other Zones	1.25 spaces / unit
City of Mississauga	By-law 0225-2007	Precinct 1	0.80 spaces / unit[1,2]
City of Mississauga	Reduced Residential Parking Along Hurontario LRT Corridor Study (Approved by City Staff)	Precinct 1a (Along LRT Corridor)	0.50 spaces / unit[1,2]
City of Brampton	By-law 270-2004	Queen Street / Hurontario-Main Street LRT Corridors	0.00 spaces / unit[1]
City of Toronto	By-law 569-2013	Parking Zone A / B	0.00 spaces / unit[1]
City of Vaughan	By-law 001-2021	MMU, HMU, CMU, GMU, EMU Zones (Along BRT Corridors)	0.80 spaces / unit[1,2]
Hamilton	By-law 05-200	Outside of Downtown	<50 m^2 - 0.30 spaces / unit >50 m^2 - 1.00 space / unit
Observed Zoning By-law Standards (Excluding Pickering)	--	--	**0.00 spaces / unit - 1.00 spaces / unit**

Notes:
1. Recognized as a suitable proxy for intensification areas in the City of Pickering with access to the future Durham-Scarborough BRT.
2. The royal passing of Bill 185 in June 2024 indicates that no minimum vehicle parking requirements apply within designated and approved Major Transit Station Areas.

The observed range of overall standards, which includes permissions for no minimum resident parking, demonstrates that the proposed resident rate of 0.61 spaces per unit fits well within the region-wide requirements for areas in proximity to rapid transit, namely BRT and LRT. Furthermore, while Mississauga, Vaughan, and Brampton are leading municipalities to the City of Pickering, **Table 10** reports the parking standards applicable in comparable existing and/or future transit contexts to the site that are not necessarily located within the "downtown" or "city centre" areas, as outlined below:

- City of Pickering: Future Durham-Scarborough BRT (Intensification Areas along Kingston Road corridor)
- City of Mississauga: Future Hurontario LRT (Precinct 1 / higher density along Hurontario Street corridor with recognized MTSAs within and outside of the City Centre area)
- City of Vaughan: Existing Viva BRT (Higher density along Highway 7 and Yonge Street corridors with recognized MTSAs within and outside of the Vaughan Metropolitan Centre area)
- City of Brampton: Future Hurontario LRT (Higher density along Queen Street and Main Street corridors with recognized MTSAs within and outside of the Downtown area)

It is further noted that the many of the municipalities reviewed (e.g., Mississauga, Vaughan, and Brampton) are now subject to the changes implemented by Bill 185 as they have designated and approved PMTSAs. Therefore, no minimum parking, including resident parking, is required. Although the site is not located within an MTSA identified by the City, the site is located adjacent to a stop along the future Durham-Scarborough BRT corridor which resembles the Provincially-defined characteristics of an MTSA (i.e., walking distance to a transit station). As such, while the site is not proposing "no minimum" resident parking, this review of comparable resident parking standards indicates that some form of parking reduction is appropriate.

5.5.2.3 PARKING SALES DATA (PICKERING TOWN CENTRE)

By way of comparison, BA Group has also reviewed condominium parking sales information for 5 sites within the PTC area (i.e., Universal City). **Table 11** summarizes this parking sales information for Universal City.

Table 11 Universal City Condominiums Parking Sales Data Summary (March 2023)

Location	% Units Sold	Resident Parking Supply	Current Parking Sold	Current Unsold Parking Spaces
Universal City 1	100% (275 units)	223 spaces (0.81 spaces / unit)	216 spaces (0.79 spaces / unit)	7 spaces
Universal City 2	100% (336 units)	271 spaces (0.81 spaces / unit)	248 spaces (0.74 spaces / unit)	23 spaces
Universal City 3	96% (357 units)	277 spaces (0.78 spaces / unit)	257 spaces (0.72 spaces / unit)	20 spaces
Universal City 6	95% (306 units)	230 spaces (0.72 spaces / unit)	185 spaces (0.58 spaces / unit)	45 spaces
The Grand	44% (211 units)	324 spaces (0.67 spaces / unit)	107 spaces (0.51 spaces / unit)	217 spaces

Notes:
1. Unit and parking spaces sales based on data provided by Unique AT Management Inc. in March 2023.
2. Based on the number of spaces and units sold at the time that the sales data was recorded.

A review of the recorded parking sales information for the first phases of the Universal City development indicates that demand for parking spaces was well below the existing Zoning By-law 3036 combined resident and residential visitor parking requirement of 1.75 spaces / unit and well below the Comprehensive Zoning By-law resident parking requirement of 1.25 spaces per unit. In addition, a declining trend in parking sold is observed from the first few development blocks of Universal City to the most recent development block with an uptake rate of 0.51 spaces per unit. Overall, the rate of sold parking declines from 0.79 spaces per unit to 0.51 spaces per unit.

While the subject site is not located within the PTC area, the decreasing resident parking trends discussed above are still applicable considering the site's location in a fast-growing / fast-developing area with access to a future rapid transit corridor. While the most recent parking sales data for Universal City indicates a rate of 0.51 spaces per unit, the subject site is located approximately 750 metres from the western boundary of the City Centre / Pickering GO station area. We anticipate that parking demand will gradually increase as the distance from the City Centre increase. Therefore, the proposed resident rate of 0.61 spaces per unit considers the site's distance from the City Centre and is considered appropriate.

5.5.2.4 PROPOSED RESIDENT TDM STRATEGIES

As presented in **Section 9.0**, a comprehensive TDM Plan has been developed for the site, which is encouraged to help achieve sustainability goals pertaining to reduced greenhouse gas emissions within the transportation sector. The primary objectives of this strategy, for the purposes of reducing the carbon footprint for the proposed development, include reducing automobile dependence and reliance on single-occupancy vehicle travel, supporting walking and cycling as alternative modes of travel, and promoting transit and active transportation to automobile ownership as viable options for travel.

Key elements of the TDM strategy for residents include (but are not limited to) the following:

- Provision of reduced resident parking with unbundled spaces (i.e., sold separately from new units);
- Provision of enhanced and direct connections between the internal and existing pedestrian network (as well as transit stops);
- Provision of on-site pick-up / drop-off facilities near each proposed building lobby; and
- Provision of on-site bicycle parking and bicycle repair stations.

The proposed development has offered a variety of tools for residents to navigate through the development and explore non-auto trip options to and from the site.

5.5.3 Residential Visitor Parking

It is proposed to provide a residential visitor parking supply of 0.15 spaces per unit. As such, the proposed residential visitor standards of Zoning By-law 3036 overstate the actual parking needs of the proposed redevelopment, considering its evolving transportation context and additional site-related factors.

In addition to the several non-auto supportive regional and local plans and policy directives (discussed in **Section 5.5.1**) and evolving area transportation context afforded to the area (discussed in **Section 5.5.1**), a reduced residential visitor parking standard for the site is considered appropriate based upon the following considerations:

- Observed precedence for reduced resident visitor parking reduction approvals in the GTHA;
- Review of resident visitor parking demands in similar context areas;
- Support from the site's TDM strategy for residential visitor uses.

5.5.3.1 OBSERVED RESIDENTIAL VISITOR PARKING APPROVALS

There is a demonstrated trend of resident visitor parking reduction approvals being granted across the GTHA where developments with a comparable context to the site have sought relief from their as-of-right Zoning By-law requirement.

Table 12 summarizes the resident visitor parking approvals sought by each municipality, including those within the City of Pickering, outside of the PTC.

Table 12 Resident Visitor Proxy Parking Reduction Approvals

Address[1]	Nearby Transit Stop (Approximate Distance from Site)[2]	Municipality	Approval Mechanism	Approved Resident Visitor Rate
Site (1095 Kingston Road)	Pickering GO Station (2.0 km walk / 9-min bus)	Pickering	--	Proposed Rate: 0.15 spaces / unit
1550 Kingston Road	Pickering GO Station (1.6 km walk / 10-min bus)	Pickering (Outside of PTC)	Site-specific By-law 7553/17 (OMB) File PL 170549	0.15 spaces / unit
Lots 1, 2, 43 & 46, Plan 316 & Part of Lot 20, Concession 1 (Knob Hill Farms)	Pickering GO Station (2.1 km walk / 15-min bus)	Pickering (Outside of PTC)	Site-specific By-law 7860/21	0.15 spaces / unit
1899 Brock Road	Pickering GO Station (2.3 km walk / 17-min bus)	Pickering (Outside of PTC)	Planning & Development Committee Report dated June 6, 2022 (Approved by City Staff)	0.15 spaces / unit
1970 Brock Road	Pickering GO Station (2.9 km walk / 11-min bus)	Pickering (Outside of PTC)	Site-specific By-law 8006/23	0.15 spaces / unit
2 & 4 Hanover Road	Bramalea GO Station (4.4 km walk / 20-min bus)	Brampton	Site-specific By-law 048-2020	0.14 spaces / unit
499 Main Street South	Bramalea GO Station (3.8 km walk / 17-min bus)	Brampton	Site-specific By-law 228-2020	0.15 spaces / unit
70 Mississauga Road South	Port Credit GO Station (1.4 km walk / 12-min bus)	Mississauga	CoA Decision A226.21 (June 24, 2021)	0.15 spaces / unit
180 Rutledge Road	Streetsville GO Station (1.1 km walk / 15-min walk)	Mississauga	CoA Decision A185.23 (June 22, 2023)	0.15 spaces / unit
1381 Lakeshore Road East	Long Branch GO Station (1.2 km walk / 7-min bus)	Mississauga	CoA Decision A401.23 (November 16, 2023)	0.15 spaces / unit
21-51 Queen Street North	Streetsville GO Station (2.1 km walk / 14-min bus)	Mississauga	OLT Case OLT-22-004676 (OLT Order: April 12, 2024)	Greater of: 0.13 spaces / unit or 4.3 spaces / 100 m^2
784 The Queensway Avenue	Mimico GO Station (1.5 km walk / 12-min bus)	Etobicoke (Toronto)	Site-specific By-law 312-2018	0.15 spaces / unit
225 Birmingham Street	Mimico GO Station (2.7 km walk / 25-min bus)	Etobicoke (Toronto)	Site-specific By-law 1800-2019 & 1801-2019	0.15 spaces / unit
1197 The Queensway Avenue & 8 Zorra Street	Mimico GO Station (3.0 km walk / 14-min bus)	Etobicoke (Toronto)	Site-specific By-law 886-2021	0.15 spaces / unit

Address[1]	Nearby Transit Stop (Approximate Distance from Site)[2]	Municipality	Approval Mechanism	Approved Resident Visitor Rate
1001, 1007, 1011 & 1037 The Queensway Avenue	Mimico GO Station (2.4 km walk / 12-min bus)	Etobicoke (Toronto)	Site-specific By-law 212-2022(OLT) OLT Case PL171317	0.15 spaces / unit
1306-1310 The Queensway Avenue	Mimico GO Station (3.4 km walk / 20-min bus)	Etobicoke (Toronto)	Site-specific By-laws 198-2022 & 199-2022	0.15 spaces / unit
Observed Parking Approvals Range	--	--	--	**0.13 spaces / unit - 0.15 spaces / unit**

Notes:
1. The residential buildings in this table include both apartment and condominium buildings.
2. The bus travel times are approximate, based on the available service during the weekday peak period, and include the travel time of the entire bus journey (i.e., bus and walk).

The recent, observed residential visitor parking approvals in comparable site locations range from 0.13 spaces per unit to 0.15 spaces per unit. It is noted that the observed developments in Pickering, outside of the City Centre, have been approved for residential visitor parking rates of 0.15 spaces per unit as well.

Overall, the site proposes to provide a residential visitor parking rate of 0.15 spaces per unit, aligning with the observed resident visitor approvals above.

Residential Visitor Parking Standards Within the Pickering Town Centre

In addition to observed approvals supporting a parking rate of 0.15 visitor spaces per unit, a minimum residential visitor parking requirement of 0.15 spaces per unit is already permitted in the Pickering City Centre Zone, as per the contemporary City-wide Zoning By-law 8149/24. While the site is not located within the City Centre Zone boundaries, the site's evolving transportation context adjacent to a future BRT line will provide an increasingly similar transit accessibility as sites in the City Centre. Moreover, the site is currently located just outside (to the west) of the City Centre boundaries.

5.5.3.2 OBSERVED RESIDENTIAL VISITOR PARKING DEMAND

In comparison to the City of Pickering Zoning By-law 3036, recent residential visitor parking demands have been observed for other municipalities across the GTHA with comparable urban contexts and (future) rapid transit accessibility to the City of Pickering along the Kingston Road corridor. Municipalities were selected based on key characteristics including density / intensification patterns, access to surface (i.e., bus or higher order) transit services, and non-downtown locations.

Table 13 summarizes the resident visitor parking demand survey results by municipality.

Table 13 Resident Visitor Proxy Parking Demand

Address	Municipality	Survey Details[1]	Units	Peak Resident Visitor Demand	Peak Resident Visitor Demand Rate
2570-2590 Argyle Road	Mississauga (Outside City Centre)	October 2019	253 units	34 spaces	0.14 spaces / unit
1840-1850 Bloor Street	Mississauga (Outside City Centre)	October 2019	334 units	32 spaces	0.10 spaces / unit
5023 & 5025 Four Springs Avenue	Mississauga (Outside City Centre)	February 2020	438 units	57 spaces	0.13 spaces / unit
55 & 75 Eglinton Avenue West	Mississauga (Outside City Centre)	February 2020	461 units	54 spaces	0.12 spaces / unit
2645 Battleford Road	Mississauga (Outside City Centre)	October - November 2023	139 units	18 spaces	0.13 spaces / unit
1185 The Queensway Avenue	Etobicoke (Toronto)	September 2019	303 units	39 spaces	0.13 spaces / unit
Observed Parking Demand Range	--	--	--	--	**0.10 spaces / unit - 0.14 spaces / unit**

Notes:
1. The residential buildings in this table include both apartment and condominium buildings.

The observed peak residential visitor parking demands in comparable site locations range from 0.10 spaces per unit to 0.14 spaces per unit.

Overall, the site proposes to provide a residential visitor parking rate of 0.15 spaces per unit. This proposed parking rate is considered suitable as it exceeds the visitor parking demand observed recently in areas of similar context.

5.5.3.3 PROPOSED RESIDENTIAL VISITOR TDM STRATEGIES

Similar to the resident use, a variety of TDM measures have been offered for prospective visitors of the site. The following strategies have been proposed, including but not limited to the following:

- Provision on-site pick-up / drop-off facilities near each proposed building;
- Provision of an on-site bicycle parking supply that exceeds the minimum as-of-right Zoning By-law requirements; and
- Provision and maintenance of safe and convenient pedestrian facilities along the frontages of the site to increase access to services, amenities, and transit (e.g., Dixie Road).

The proposed development has offered a variety of tools for all types of users to navigate through the development and explore non-auto trip options to and from the site. The site's optimal location is a leading factor in which can drive travel behavior towards alternative, sustainable modes of transportation.

5.6 Vehicle Parking Summary

Based on a review of the as-of-right and evolving vehicle parking standards for the resident and resident visitor uses, it is evident that the site area within the City of Pickering has the opportunity to reduce the minimum standards and supply. As such, the following minimum vehicle parking rates are proposed:

- Resident: 0.61 spaces per unit
- Residential Visitor: 0.15 spaces per unit

Recognizing the rapidly evolving policy and transportation contexts, observed widespread parking standards, parking demands, and approvals associated with suitable proxy sites across the Region (all of which are gradually declining over time), it is considered appropriate to adopt progressive standards that support the broad direction of other municipalities with respect to planned higher-order transit access and intensification. **Table 14** provides a summary of key parking findings as a result of the parking assessment. Overall, the proposed parking supply is considered appropriate for the site.

Table 14 Appropriateness of the Proposed Parking Standards – Assessment Summary

Category	Resident	Resident Visitor
Proposed Standard	**0.61 spaces / unit**	**0.15 spaces / unit**
Pickering Zoning By-law 3036 Standard	1.75 spaces / unit	Inclusive of resident standard
Pickering Zoning By-law 8149/24 Standard	1.25 spaces / unit	0.25 spaces / unit
Observed Region-wide Proxy Zoning By-law Standards / Policies	0.00 - 1.00 spaces / unit	--[1]
Observed Region-wide Proxy Parking Demands	--[1]	0.10 - 0.14 spaces / unit
Observed Region-wide Proxy Parking Approvals	0.50 - 0.80 spaces / unit	0.13 - 0.15 spaces / unit
Observed Pickering Parking Sales Data	0.51 - 0.79 spaces / unit	--[1]

Category	Resident	Resident Visitor
Additional Considerations	• Evolving policy and transportation context in support of reduced parking through TDM, transit-oriented development, complete street design, and transit and active transportation infrastructure • Observed decline in Region-wide parking approvals, demand, and sales over time • Proposed TDM measures, such as unbundled parking, pre-loaded transit passes, enhanced pedestrian and cycling connections, bicycle parking and amenities, pick-up / drop-off facilities	• Evolving policy and transportation context in support of reduced parking through TDM, transit-oriented development, complete street design, and transit and active transportation infrastructure • Observed decline in Region-wide parking approvals, demand, and sales over time • Proposed TDM measures, such as enhanced pedestrian and cycling connections, bicycle parking and amenities, pick-up / drop-off facilities

Notes:
1. Information not applicable or observed.

6.0 BICYCLE PARKING

6.1 Subject Zoning By-law Bicycle Parking Requirements

6.1.1 City of Pickering Zoning By-law 3036

The site is primarily subject to City of Pickering Zoning By-law 3036 (as amended) which does not specify minimum bicycle parking requirements.

6.2 Proposed Bicycle Parking Standards

6.2.1 City of Pickering Zoning By-law 8149/24 and Integrated Sustainable Design Standards

The City of Pickering Comprehensive Zoning By-law 8149/24 provides city-wide bicycle parking standards that are consistent with the latest bicycle parking standards in the City's ISDS for Tier 1. Although the site is not included in the Comprehensive Zoning By-law and is to be further reviewed throughout the zoning process following OPA 38, the latest city-wide standards are currently being considered for the proposed development. **Table 15** summarizes the proposed minimum bicycle parking requirements for the site.

Table 15 City of Pickering Zoning By-law 8149/24 and Integrated Sustainable Design Standards (Tier 1) Minimum Bicycle Parking Requirements

Use	Units[1]	Minimum Rate	Minimum Requirement[2]
Apartment Dwelling (Long-term)	1,492 units	0.50 spaces / unit	746 spaces
Apartment Dwelling (Short-term)	1,492 units	0.10 spaces / unit	149 spaces
Total Bicycle Parking Requirement	--	--	**895 spaces**
Total Electric Bicycle Parking Requirement (Apartment Dwellings)[3]	--	**Greater of 1 space or 15% of required long-term spaces**	**111 spaces**

Notes:

1. Site statistics received from BDP Quadrangle Architects Ltd. dated March 20, 2025.
2. City of Pickering Zoning By-law 8149/24 Section 5.3.1.1 states that where parking spaces are calculated by gross leasable area, or similar calculation, and the required parking is a fraction, the number of parking spaces shall be rounded down to the nearest whole number.
3. City of Pickering Zoning By-law 8149/24 Section 5.13.1.7 states that for Apartment Dwellings, a minimum of 15% of the required long-term bicycle parking spaces, or 1.0 parking space, whichever is greater, shall include an energized 120-volt outlet adjacent to the bicycle rack or parking space.

Application of Zoning By-law 8149/24 and Integrated Sustainable Development Guidelines (Tier 1) standards to the proposed development results in a minimum bicycle parking requirement of 746 spaces for the long-term use and 149 spaces. As part of this requirement, 15% of the long-term resident bicycle spaces are to be designated as electric.

City of Pickering Zoning By-law 8149/24 Section 5.13.1 states that where the number of bicycle parking spaces exceeds 50 spaces, a minimum of 25% of the total required must be located within a building or structure, secure area, or bicycle lockers. All required bicycle parking should be provided on the same lot or may be located off-site within 100 metres from the building. In addition, a maximum of 50% of the bicycle parking requirement may be vertical spaces and the remaining required spaces are to be horizontal spaces.

In addition, City of Pickering Zoning By-law 8149/24 Section 5.13.2 states the following minimum bicycle parking dimensions:

- Horizontal bicycle parking spaces: length of 1.8 metres and width of 0.6 metres
- Vertical bicycle parking spaces: length of 1.5 metres and width of 0.5 metres

6.3 Proposed Bicycle Parking Supply and Facilities

The architectural plans illustrate a total supply of 895 bicycle parking spaces, including 746 long-term spaces and 149 short-term spaces. In addition, 111 of the long-term resident bicycle spaces will be designated as electric, meeting the minimum 15% EV requirement as per the City's ISDS .

The long-term resident bicycle parking spaces are provided on the Ground Floor and Mezzanine Level of the proposed development. These spaces may be accessed from the publicly accessible building entrances and building elevators located off Kingston Road, Dixie Road, and the site's internal pathways. The short-term resident bicycle parking is provided on the Ground Floor and may be accessed from the publicly accessible building entrances. These spaces may be accessed from the publicly accessible building entrances and building elevators located off Kingston Road and the site's internal pathways.

The proposed bicycle parking supply meets the minimum recommended requirements and provides ample opportunities for future cyclists of the proposed development.

7.0 LOADING

7.1 Subject Zoning By-law Loading Requirements

7.1.1 City of Pickering Zoning By-law 3036

The site is primarily subject to the City of Pickering Zoning By-law 3036 (as amended) loading standards, which result in no minimum requirement.

7.2 Proposed Loading Standards

7.2.1 City of Pickering Comprehensive Zoning By-law 8149/24

The City of Pickering Comprehensive Zoning By-law 8149/24 provides city-wide loading standards. Although the site is not included in the Comprehensive Zoning By-law and is to be further reviewed throughout the zoning process following OPA 38, for comparison purposes, there are no minimum requirements for the proposed development. However, City of Pickering By-law 8149/24 Section 5.14.1 states that loading activity shall be provided and maintained on the same lot of the principal use. City of Pickering By-law 8149/24 Section 5.14.2 further states the following minimum dimensions:

- Width of 3.5 metres
- Length of 12.0 metres
- Vertical clearance of 4.2 metres

The minimum vertical clearance shall be 7.0 metres for garbage collection vehicles, as governed by Durham Region Waste Collection By-law 46-2011.

It is proposed to adopt the minimum dimensions stated by the City of Pickering's Comprehensive Zoning By-law for garbage collection purposes.

7.2.2 City of Toronto Comprehensive Zoning By-law 569-2013

Since the City's Comprehensive Zoning By-law currently does not indicate any specific minimum loading requirements, it is appropriate to consider the practical needs of the site based upon a review of a nearby municipality with progressive loading standards within an urban context. For comparison purposes, **Table 16** summarizes the current City of Toronto Comprehensive Zoning By-law 569-2013 loading standards applied to the proposed development, per building.

Table 16 Toronto Zoning By-law 569-2013 Loading Requirements

Building	Use	Units[1]	Category	Minimum Requirement[2]
Building 1	Residential	721 units	400+ units	1 Type G, 1 Type C
Building 2	Residential	771 units	400+ units	1 Type G, 1 Type C
Total Loading Requirement	--	--	--	**2 Type G, 2 Type C**

Notes:
1. Site statistics received from BDP Quadrangle Architects Ltd. dated March 20, 2025.
2. City of Toronto Comprehensive Zoning By-law 569-2013 Section 220.5.1.10 (8) states that Type G spaces typically facilitate garbage/refuse collection and require a minimum length of 13.0 metres, minimum width of 4.0 metres, and minimum vertical clearance of 6.1 metres. Type C spaces typically facilitate residential move-in/out activity require a minimum length of 6.0 metres, minimum width of 3.5 metres, and minimum vertical clearance of 3.0 metres.

Application of the City of Toronto Comprehensive Zoning By-law standards results in a minimum loading requirement of 2 Type G spaces (used for waste / garbage collection purposes) and 2 Type C spaces (used for residential moving purposes).

As a practical and conservative approach, it is proposed to adopt the minimum number of spaces required by the City of Toronto.

7.3 Proposed Loading Supply and Facilities

The architectural plans illustrate a loading supply of 4 loading spaces, including 2 loading spaces for residential garbage collection purposes (1 per building) and 2 loading spaces for residential moving purposes (1 per building).

Appropriate bin staging areas are proposed at the loading facilities of the buildings based on the Region of Durham's Waste Management Guidelines, entitled *"Technical and Risk Management Guidelines for Municipal Waste Collection Services on Private Property and for New Residential Developments in Durham Region"*, dated July 2024.

The proposed waste collection loading spaces meet the minimum dimensions outlined by the City of Pickering and Durham Region Waste Collection By-law 46-2011 (i.e., 3.5 metre width by 12.0 metre length by 7.0 metre vertical clearance). The additional residential move-in and move-out loading spaces meet and exceed the minimum dimensions outlined by the City of Toronto (i.e., 3.5 metre width by 6.0 metre length by 3.0 metre vertical clearance).

Appendix E illustrates the vehicle maneuvering diagrams for the front-end waste collection and cube van vehicles entering and exiting the site in an acceptable manner for the proposed loading areas.

The proposed loading supply and arrangements meet the recommended minimum requirements and accommodates the expected moving and refuse collection activity for the new buildings, and therefore, is considered appropriate for the site.

8.0 PICK-UP AND DROP-OFF

The emergence and convenience of auto-based shared mobility services, including car-share, taxi, and ride-hailing services (e.g., Uber and Lyft), and general carpooling, have rapidly grown in recent years and are being utilized as an increasingly suitable alternative for private vehicle ownership or single-occupancy vehicle travel. Furthermore, the increased use in auto-based shared mobility services is often being observed in more central urbanized areas, including evolving intensification areas or mixed-use corridors in the City of Pickering (e.g., along several major intersections and corridors with frequent heavy traffic).

While not required by the Zoning By-law, passenger pick-up / drop-off facilities are proposed on the site in the form of a central pick-up / drop-off loop central to the site, providing direct access to the proposed residential lobbies. This loop can be accessed from the proposed southern site driveway off Dixie Road. The facility can support a total accumulation of 12 vehicles (i.e., approximately 1 pick-up / drop-off space for every 125 units), which is anticipated to accommodate the proposed residential use of the site.

Moreover, due to the site's evolving location within the City (i.e., Kingston Road corridor with bus and cycling facilities and future BRT service), it is anticipated that an increasing number of users will arrive to and from the site using alternative means of transportation.

The proposed pick-up / drop-off facilities are expected to serve as a convenient short-term parking strategy for day-to-day activities (i.e., pizza delivery, passenger pick-up / drop-off, ride-sharing services). As mentioned, while not formally required from a Zoning By-law perspective, it is anticipated that these will benefit future residents and visitors and meet the practical needs of the site while limiting vehicular impacts on the area road network.

Appendix D illustrates the location of the proposed pick-up / drop-off facility on-site.

9.0 TRANSPORTATION DEMAND MANAGEMENT

9.1 Framework and Objectives

Based upon the Durham Region's Traffic Impact Study Guidelines and Draft Transportation Demand Management Guidelines for New Developments (2021), a TDM Plan is required to support the proposed development. The City of Pickering's Integrated Transportation Master Plan defines TDM as a set of policies, programs, services, and initiatives that aim to reduced single-occupant vehicles by influencing how or how much, when, where, and why people travel.

The City of Pickering outlines key TDM opportunities / objectives that the proposed development has considered in developing the TDM Plan, including improving transit and active mode access to the Pickering GO station.

In addition, the TDM Plan provides a mix of infrastructure-based and program-based / operational strategies, which are implemented once the use is constructed and occupied.

9.2 Proposed TDM Strategies

The TDM Plan has been developed with consideration to the following categories:

- Reduced car ownership and vehicle parking management;
- Encourage and facilitate transit use;
- Encourage and facilitate bicycle use;
- Enhance pedestrian access and walkability; and
- Land use within site context.

Table 17 summarizes the TDM strategies being considered based on the site's high density development. It is noted that the strategies are to be further refined and discussed with the City and Region throughout the ZBA and SPA processes.

Table 17 Proposed On-site TDM Strategies

Category	Intent and Outcome	Responsibility	Estimated Timeline	Proposed TDM Strategy
Reduced Car Ownership and Vehicle Parking Management	Reduce single-occupancy and / or privately-owned vehicle use for daily travel, particularly during peak periods.	Applicant	Construction of Development	1. Provide a reduced vehicle parking supply relative to the minimum as-of-right Zoning By-law requirements.
Reduce Car Ownership and Vehicle Parking Management	Reduce single-occupancy and / or privately-owned vehicle use for daily travel, particularly during peak periods.	Applicant	Construction of Development	2. Provide on-site pick-up / drop-off facility near each proposed building to support ride-sharing activities.
Reduce Car Ownership and Vehicle Parking Management	Reduce single-occupancy and / or privately-owned vehicle use for daily travel, particularly during peak periods.	Marketing / Sales	Construction of Development	3. Provide unbundled vehicle parking for each new residential unit.
Transit Use	Encourage increased transit use and provide access to transit infrastructure and facilities near the site.	Applicant	Construction of Development	4. Provide a transportation information package, including existing and planned transit services and schedules, for each new residential unit.
Transit Use	Encourage increased transit use and provide access to transit infrastructure and facilities near the site.	Applicant	Construction of Development	5. Provide enhanced active transportation connections (i.e., internal paths and multi-use trail) to transit stops within and around the site.
Bicycle Use	Encourage increased bicycle use, provide operational cycling infrastructure and facilities on-site, enhance bicycle service on-site and within the external network.	Applicant	Construction of Development	6. Provide bicycle parking that exceeds the minimum as-of-right Zoning By-law requirements (i.e., also meets City of Pickering Zoning By-law 8149/24 requirements).
Bicycle Use	Encourage increased bicycle use, provide operational cycling infrastructure and facilities on-site, enhance bicycle service on-site and within the external network.	Applicant	Construction of Development	7. Provide 15% required long-term bicycle parking spaces with energized outlets.
Bicycle Use	Encourage increased bicycle use, provide operational cycling infrastructure and facilities on-site, enhance bicycle service on-site and within the external network.	Applicant	Construction of Development	8. Provide on-site bicycle repair stations.

Category	Intent and Outcome	Responsibility	Estimated Timeline	Proposed TDM Strategy
Bicycle Use	Encourage increased bicycle use, provide operational cycling infrastructure and facilities on-site, enhance bicycle service on-site and within the external network.	Building Management	Building Occupancy	9. Provide opportunities for primary site users to attend events and participate in Smart Mobility Durham Programs (e.g., Smart Commute Durham, Cycle Durham, and Active and Sustainable School Travel Program).
Bicycle Use	Encourage increased bicycle use, provide operational cycling infrastructure and facilities on-site, enhance bicycle service on-site and within the external network.	Applicant	Construction of Development	10. Provide a transportation information package, including existing and planned cycling facilities and on-site amenities, for each new residential unit.
Pedestrian Access and Walkability	Enhance walkability to and from the site, create high quality and safe pedestrian linkages, increase access to key destinations and transit stops.	Applicant	Construction of Development	11. Provide continuous and widened pedestrian connections between the site and public sidewalk network.
Land Use within Site Context	Reduce length or frequency of travel and encourage internal site trips.	Applicant	Construction of Development	12. Provide a transit-oriented development with nearby and on-site services and amenities.

10.0 FUNCTIONAL ROAD PLAN

10.1 Kingston Road Improvements

As discussed in **Section 4.2.2**, Metrolinx is working with Region, DRT, City of Toronto, and the TTC to plan and design the future 36-kilometre DSBRT along the Kingston Road corridor, extending from Downtown Oshawa in the east to Scarborough Centre in the west.

The DSBRT was identified as the preferred transit technology to link Durham and Scarborough through Metrolinx's 2041 Regional Transportation Plan and the DSBRT Initial Business Case completed in January 2019. The DSBRT plans to include dedicated bus lanes, enhanced bus service, and smart signals along Kingston Road and greater connections to other transit modes. In addition to these transit-related improvements, this portion of the Kingston Road corridor near the site is planned to provide expanded cycling (i.e., cycle tracks on both sides) and pedestrian (i.e., sidewalks on both sides) facilities.

The DSBRT was further assessed under the Transit Project Assessment Process through Ontario Regulation 231/08. In March 2022, the Minister of Environment, Conservation and Parks issued a Notice to Proceed with the transit project. The TPAP, in collaboration with Metrolinx and Durham Region, later issued a Statement of Completion.

To assist in the development of the functional road plan at the site, Metrolinx has provided a high-level 2D conceptual plan for the design of the DSBRT, between Dixie Road and Merritton Road, as an output from the ongoing process (i.e., TPAP approved 30% preliminary design in 2022). In addition, the Region has provided additional 2D signage and pavement marking drawings reflecting the interim condition of the DSBRT along Kingston Road at the site. Reduced scale excerpts of these drawings near the site are provided in **Appendix F** for further details.

Appendix G provides the interim and ultimate functional design conditions of Kingston Road (i.e. 45-metre right-of-way) in conjunction with the proposed development. It is noted that the functional design plans provided as part of this study are conceptual at this stage and are prepared for discussion purposes with the City and Region.

10.2 Proposed Site Accesses

As part of the proposed development, three driveway accesses will be provided, including the following:

- All-moves access (north) along Dixie Road for passenger vehicle and loading activity;
- All-moves access (south) along Dixie Road for passenger vehicle and loading activity; and
- Right-in / right-out access along Kingston Road for passenger vehicle activity.

Dixie Road Access (North)

The design of the northern Dixie Road driveway permits all-moves traffic and provides primary access to the loading and parking facility for the eastern building. It is noted that the above-grade ramp near this driveway provides access to parking levels 2-4 within the eastern building only and the below-grade ramp near this driveway provides access to parking level P1 that is shared / connected across both buildings.

This access provides appropriate curb radii (i.e., 7.5 metres) and driveway width (i.e., 7.5 metres for two-way configuration) based on City of Pickering Standard Drawing P-605 (Medium to High Density Residential, Commercial, and Industrial Driveway Access).

Dixie Road Access (South)

The design of the southern Dixie Road driveway permits all-moves traffic and provides primary access to the loading and parking facility for the western building, as well as the pick-up / drop-off loop for both buildings. It is noted that the above-grade ramp near this driveway provides access to parking levels 2-6 within the western building only and the below-grade ramp near this driveway provides access to parking level P1 that is shared / connected across both buildings.

This access provides appropriate curb radii (i.e., 7.5 metres) and driveway width (i.e., 6.5 metres for two-way configuration) based on City of Pickering Standard Drawing P-605 (Medium to High Density Residential, Commercial, and Industrial Driveway Access).

Kingston Access

The design of the Kingston Road driveway permits right-in / right-out only traffic and will serve as an additional access for residents and visitors (i.e., passenger vehicles only) of the larger western building. While not restricted to the use of residents and visitors of the western building, this access provides greater flexibility and convenience for vehicle traffic arriving to / from the west approach along Kingston Road. The provision of this additional access provides a more efficient and organized site design from a transportation planning perspective (i.e., optimal route and circulation), which offers greater travel opportunities to / from and throughout the site.

From a traffic operations perspective, this access is supported by a right-turn only lane with a taper from the structure of the existing CN rail bridge. The provision of a right-turn lane is considered appropriate given the following:

- The right-turn lane meets the threshold for a Type B Arterial (i.e., 50 vehicles for a 4-lane road) based on the Durham Region's *Design Specifications For Roads and Entranceways* guidelines, dated April 2023.
- Conflicts with eastbound through traffic will be minimized with the presence of a supporting taper for the right-turn only lane. In addition, a proposed median along Kingston Road is provided in the interim functional design condition to restrict any westbound left traffic at this access, which will further minimize impacts to the operations of Kingston Road. Notably, in the ultimate functional design condition of Kingston Road, eastbound and westbound traffic will be fully separated to accommodate the complete DSBRT design and operations. Further details on the interim and ultimate functional road plan of Kingston Road is illustrated in **Appendix G**.

In addition, potential queues formed by the right-out only lane / movement from this access may be accommodated on-site and will limit any conflict with eastbound through traffic along the Kingston Road corridor.

The design of this access provides appropriate curb radii (i.e., 7.5 metres) and driveway width (i.e., 6.5 metres for two-way configuration) based on City of Pickering Standard Drawing P-605 (Medium to High Density Residential, Commercial, and Industrial Driveway Access).

Based on the considerations above, the provision of a right-in / right-out only access along Kingston Road is appropriate, results in minimal impacts to the future operations of Kingston Road, and therefore, is considered beneficial for the proposed development.

11.0 MULTIMODAL TRAVEL DEMAND FORECASTING

Given the location of the site along the planned Durham-Scarborough Bus Rapid Transit corridor, the site's residents and visitors are provided with reliable non-automobile travel alternatives. The target mode shares provided by the DSBRT Study, conducted by IBI Group in Spring of 2018, will be considered in the forecasting of multimodal trip generation in each horizon year. The continued evolution of selected travel modes to be less auto dependent in the Pickering area, and in the site vicinity, is in line with the City and Region's planning policies that were previously discussed in **Section 3.0**.

11.1 Person Site Travel Demand

The residential travel demand was forecast based on person trip surveys conducted at developments with similar travel contexts to the site. A summary of the collected trip generation data and the resulting trip rate is provided in **Table 18**.

The site is expected to generate in the order of 670 person trips in the weekday peak hours.

Table 18 Residential Proxies and Gross Residential Site Travel Demand

Address *Date of Survey*	AM In	AM Out	AM Total	PM In	PM Out	PM Total
1215-1235 Bayly Street (SF1&2), Pickering *Tuesday, March 28, 2023*	0.06	0.16	0.22	0.15	0.11	0.26
1215-1235 Bayly Street (SF1&2), Pickering *Wednesday, May 10, 2023*	0.06	0.19	0.25	0.19	0.10	0.29
1245-1255 Bayly Street (SF3), Pickering *Tuesday, March 28, 2023*	0.11	0.26	0.37	0.19	0.19	0.38
1245-1255 Bayly Street (SF3), Pickering *Wednesday, May 3, 2023*	0.08	0.22	0.30	0.22	0.15	0.37
200 Burnhamthorpe Road East, Mississauga *Thursday, November 29, 2022*	0.30	0.12	0.42	0.22	0.07	0.29
25 Fairview Road West, Mississauga *Wednesday, November 9, 2022*	0.16	0.40	0.56	0.35	0.12	0.47
2081 & 2087 & 2093 Fairview Street, Burlington *Tuesday, July 25, 2022*	0.06	0.25	0.31	0.27	0.19	0.46
Average	*0.12*	*0.23*	*0.35*	*0.23*	*0.13*	*0.36*
Selected Person Trip Rate	**0.10**	**0.35**	**0.45**	**0.25**	**0.20**	**0.45**
Gross Residential Trips (1,492 units)	**150**	**520**	**670**	**370**	**300**	**670**

Notes:
1. All trip rates are in trips per unit.
2. All proxy surveys were conducted on weekdays between Wednesday, November 9, 2022 and Wednesday, May 10, 2023.
3. All site trips are rounded to the nearest five (5).

11.2 Multimodal Trips

Residential mode split data for the year 2016 was determined based on the Transportation of Tomorrow Survey (TTS). The 2016 data is the most recent set of TTS data that was available at the time of this study. The 2016 data demonstrates that a large proportion of home-based trips in the area rely on auto modes (78% during peak hours), with only 14% of all trips using transit.

IBI Group's *Final Report Durham-Scarborough Bus Rapid Transit Study* provided a future target transit mode share of 33% for the Downtown Pickering area with BRT along the centre median, which represents a 19% increase in transit mode share (or a 19% transit mode shift) relative to 2016 conditions. This 19% transit mode shift also results in the decrease in the auto mode shares (auto driver and auto passenger) by the same percentage.

Given that this report analyzes the 2030, 2035, and 2040 horizon years, the transit mode split increases and respective auto mode split decreases in each of the horizon years was interpolated based on the 2016 mode splits and the 2041 targets.

The 2016 TTS mode splits, the 2041 target mode splits, and the applied mode splits for each horizon year are all summarized in **Table 19**.

Table 19 Future Residential Mode Splits

Travel Mode	2016 Mode Splits[1]	2030 Applied Mode Splits[3]	2035 Applied Mode Splits[3]	2040 Applied Mode Splits[3]	DSBRT 2041 Mode Splits[2]
Auto Driver	62%	54%	51%	48%	47%
Auto Passenger	16%	14%	13%	12%	12%
Auto	**78%**	**68%**	**64%**	**60%**	**59%**
Transit	14%	24%	28%	32%	33%
Cycling	0%	1%	1%	1%	1%
Walking	8%	7%	7%	7%	7%
Non-Auto	**22%**	**32%**	**36%**	**40%**	**41%**
Total	**100%**	**100%**	**100%**	**100%**	**100%**

Notes:

1. Travel modes are based on home-based trips within TTS zones 1038, 1040, 1041 and 1048. The TTS data outputs are provided in **Appendix H**.
2. The target mode splits are obtained from the Durham-Scarborough BRT Study by IBI Group in Spring of 2018. The transit mode increase is assumed alongside an auto mode decrease (including both drivers and passengers).
3. The 2030, 2035 and 2040 applied mode splits are used to forecast multimodal travel demand in each of the respective horizon years.

Residential multimodal trip forecasts are then calculated based on the external person trip generation and the future residential area mode splits. These forecasts are provided in **Table 20** (2030 horizon), **Table 21** (2035 horizon) and **Table 22** (2040 horizon).

The residential uses of the site are expected to generate in the order of 670 two-way person trips in each of the weekday morning and afternoon peak hours.

In the 2030 horizon year, the residential uses will generate 360 and 360 auto driver trips in the peak hours, and 165 and 160 transit trips in the peak hours.

In the 2035 horizon year, the residential uses will generate 340 and 335 auto driver trips in the peak hours, and 190 and 190 transit trips in the peak hours.

In the 2040 horizon year, the residential uses will generate 320 and 320 auto driver trips in the peak hours, and 220 and 215 transit trips in the peak hours.

Table 20 Multimodal Residential Site Trips (2030 Horizon Year)

Travel Mode	AM In	AM Out	AM Total	PM In	PM Out	PM Total
Person Site Trips	**150**	**520**	**670**	**370**	**300**	**670**
Auto Driver	80	280	360	200	160	360
Auto Passenger	20	75	95	50	40	90
Transit	40	125	165	90	70	160
Cycle	0	5	5	5	10	15
Walk	10	35	45	25	20	45

Notes:
1. All site trips are rounded to the nearest five (5).

Table 21 Multimodal Residential Site Trips (2035 Horizon Year)

Travel Mode	AM In	AM Out	AM Total	PM In	PM Out	PM Total
Person Site Trips	**150**	**520**	**670**	**370**	**300**	**670**
Auto Driver	75	265	340	185	150	335
Auto Passenger	20	70	90	50	40	90
Transit	45	145	190	105	85	190
Cycle	0	5	5	5	5	10
Walk	10	35	45	25	20	45

Notes:
1. All site trips are rounded to the nearest five (5).

Table 22 Multimodal Residential Site Trips (2040 Horizon Year)

Travel Mode	AM In	AM Out	AM Total	PM In	PM Out	PM Total
Person Site Trips	**150**	**520**	**670**	**370**	**300**	**670**
Auto Driver	70	250	320	175	145	320
Auto Passenger	20	60	80	45	35	80
Transit	50	170	220	120	95	215
Cycle	0	5	5	5	5	10
Walk	10	35	45	25	20	45

Notes:
1. All site trips are rounded to the nearest five (5).

12.0 TRAFFIC VOLUME FORECASTING

12.1 Baseline Existing Traffic Volumes

Turning movement counts ("TMC") were conducted by Spectrum Traffic Inc. on behalf of BA Group for the study area intersections in May 2024. The counts were completed during the weekday morning and afternoon peak periods (the busiest hours of traffic on weekdays are generally between 7:00 a.m. to 10:00 a.m. and 4:00 p.m. to 7:00 p.m.).

The list of study area intersections and respective data collection information is provided in **Table 23**. All collected turning movement count data is provided in **Appendix I**.

Table 23 Data Collection Information

Intersection	Date of Count	Source
Kingston Road / Highway 401 Ramps	Tuesday, May 14, 2024	Spectrum Traffic Data
Kingston Road / Fairport Road	Tuesday, May 14, 2024	Spectrum Traffic Data
Kingston Road / Dixie Road	Tuesday, May 14, 2024	Spectrum Traffic Data
Kingston Road / Walnut Lane	Tuesday, May 14, 2024	Spectrum Traffic Data
Dixie Road / Existing Site Driveways	Tuesday, May 14, 2024	Spectrum Traffic Data
Dixie Road / 1099 Kingston Driveways	Tuesday, May 14, 2024	Spectrum Traffic Data

Existing turning movement volumes were rounded to the nearest five vehicles and reviewed in detail to ensure a general consistency in the traffic volumes on links between intersections. The resultant baseline existing traffic volumes for the weekday morning and afternoon peak hours adopted for the purposes of this analysis are illustrated on **Figure 13**.

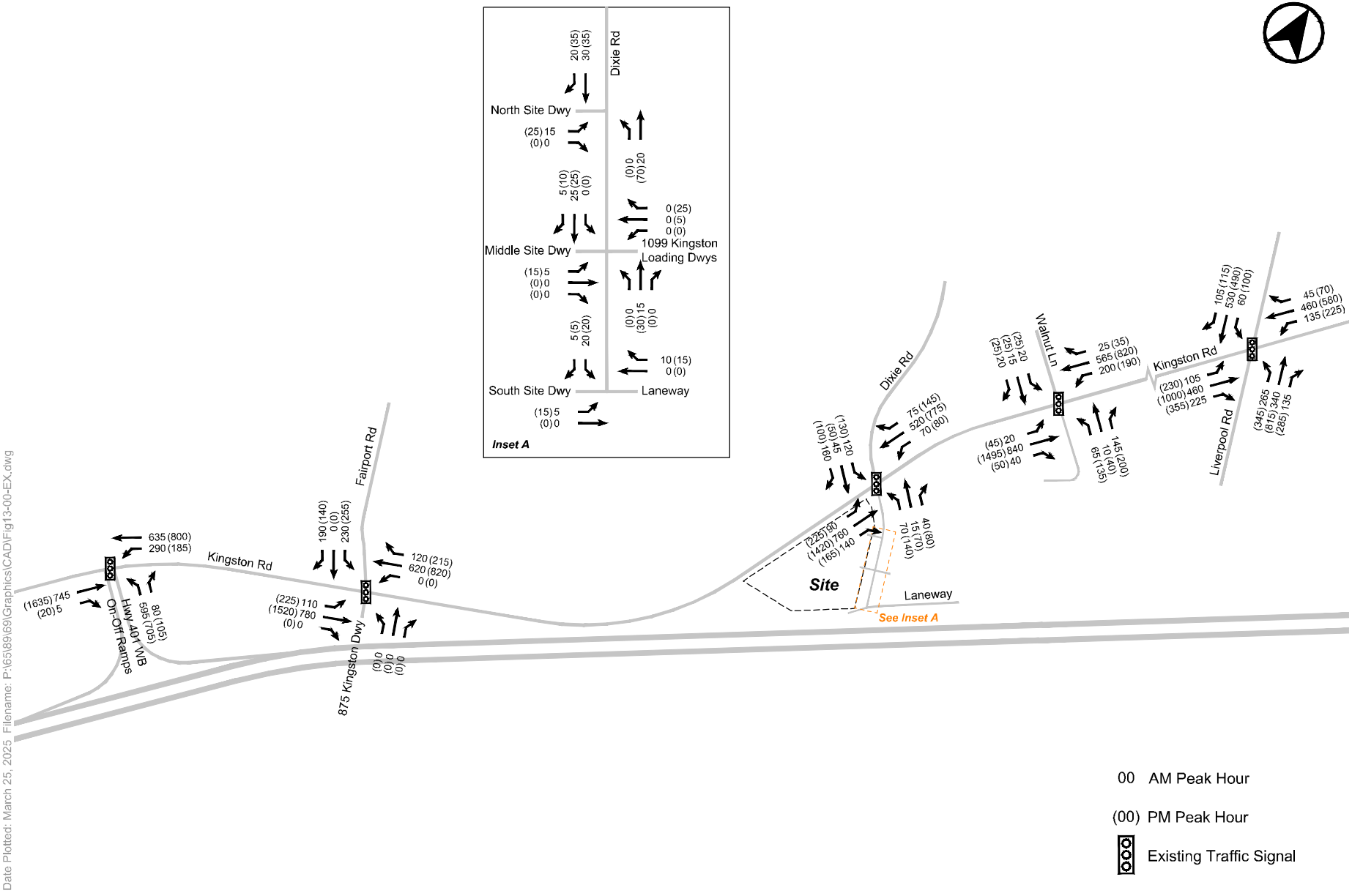


FIGURE 13 BASELINE EXISTING TRAFFIC VOLUMES

12.2 Future Background Traffic Volumes

12.2.1 Analysis Horizons

Based on discussions with the City of Pickering, Region of Durham and Ministry of Transportation Ontario, the analysis horizons presented in this report include the 2030 year (buildout year that is 5 years from today) and 2035 year (10 years from today) for all study area intersections. Based on the MTO's Traffic Impact Study Guidelines, analysis will be provided for the Highway 401 ramps up to the 2040 year (i.e., 15 years from today).

12.2.2 Background Developments

Allowances were made to account for new traffic generated by other development proposals in the area that are either under construction, approved, being reviewed or for which an application is expected to be submitted to the City of Pickering within the horizons of 2030, 2035, and 2040. Developments that are expected to be built out beyond the site buildout year of 2030 are not included in the analysis.

A total of 13 development proposals are expected to be built, including approximately 23,000 residential units and 50,000 m^2 non-residential GFA. Background developments included in the analysis are summarized in **Table 24.**

Trip generation rates and traffic assignments adopted for each background development are based on information contained in the traffic impact study ("TIS") documents prepared for each project.

Table 24 Area Background Developments

Development	Development Statistics	Trip Generation Source
1101A, 1105 and 1163 Kingston Road[1]	**Phase 1: By 2028** 583 residential units 4,771 m^2 retail GFA **Full Buildout: By 2033** 5,264 residential units 6,585 m^2 retail GFA	WSP Traffic Study (December 2024)
875 Kingston Road	337 residential units 630 m^2 retail GFA	TYLin Traffic Study (September 2022)
720 Granite Court	261 residential units	GHD Traffic Study (April 2023)
1525 Pickering Parkway	538 residential units	WSP Traffic Study (October 2023)
1066 Dunbarton Road	41 residential units 100 m^2 commercial GFA	BA Traffic Study (December 2022)
1755 Pickering Parkway	**Phase 1: By 2026** 630 residential units 1,669 m^2 commercial GFA **Phases 2 to 4: By 2031** 2,558 residential units 2,622 m^2 commercial GFA **Phases 5 to 7: By 2036** 2,062 residential units	RVA Traffic Study (April 2024)

Development	Development Statistics	Trip Generation Source
	22,402 m^2 commercial GFA	
375 Kingston Road	580 residential units 1,532 m^2 retail GFA	Crozier Traffic Study (December 2021)
603-643, 645 and 699 Kingston Road	3,460 residential units 2,474 m^2 retail GFA 3,475 m^2 office GFA	BA Traffic Study (October 2023)
1854 & 1858 Liverpool Road	98 residential units 435 m^2 retail GFA	Trans-Plan Traffic Study (August 2019)
755 Oklahoma Drive	27 residential units	Nextrans Traffic Study (July 2020)
1294 Kingston Road, 1848 & 1852 Liverpool Road	495 residential units 1,332 m^2 retail GFA	LEA Traffic Study (July 2020)
Pickering Town Centre	**Phase 1 Block 1: By 2030** 2,191 residential units 1,013 m^2 retail GFA **Full Phase 1: By 2035** 5,100 residential units 3,148 m^2 retail GFA	BA Traffic Studies dated April 2023 (Block 1) and July 2022 (Full Phase 1)
705 Kingston Road	1,748 residential units 3,922 m^2 retail GFA	BA Traffic Study (October 2024)

Notes:

1. In the full buildout (included in the horizon years of 2035 and 2040 of this study's analysis), the existing traffic volumes pertaining to 1101A, 1105 and 1163 Kingston Road that were counted as part of the May 2024 data collection (**Section 12.1** – **Table 23**) were removed from Dixie Road and Walnut Lane. The *total* site traffic volumes at full buildout (Figure 5-3A and Figure 5-3B of the WSP traffic study dated December 20, 2024) were then added to the study area road network including the trips at Dixie Road and Walnut Lane.

12.2.3 General Corridor Growth

Given the extensive list of background developments, the increasing capacity constraints in the study area and the implementation of the Kingston Road BRT by the year 2025, no further "general" corridor growth allowances are made along the major corridors of Kingston Road and Liverpool Road or at the Highway 401 ramp terminals.

It is expected that as study area intersections approach capacity, the composition of traffic on the road may change, evolving over time to serve more local traffic (including traffic to / from the subject site) rather than pass-through or longer-distance traffic that may be able to use alternate routes.

To further illustrate the impacts of the background development traffic allowances on the study area road network, the volumes resulting from the respective traffic studies are converted into annual growth rates along the Kingston Road and Liverpool Road corridors and the Highway 401 ramp terminals. These resultant growth rates are summarized in **Table 25**.

Table 25 Background Development Volumes as Resultant Corridor Growth Rates

Horizon / Corridor	Travel Direction	Average Growth Rates AM Peak Hour	Average Growth Rates PM Peak Hour
2030 / Kingston Road	Eastbound	2.1%	1.5%
2030 / Kingston Road	Westbound	1.4%	1.5%
2035 / Kingston Road	Eastbound	2.0%	1.7%
2035 / Kingston Road	Westbound	3.1%	1.9%
2030 / Liverpool Road	Northbound	0.0%	0.1%
2030 / Liverpool Road	Southbound	1.8%	0.4%
2035 / Liverpool Road	Northbound	0.0%	0.8%
2035 / Liverpool Road	Southbound	1.9%	0.8%
2030 / Highway 401 Ramps	On and Off-Ramps	1.5%	0.3%
2035 / Highway 401 Ramps	On and Off-Ramps	0.6%	2.1%
2040 / Highway 401 Ramps	On and Off-Ramps	0.5%	1.4%

The additional background development volumes considered on the study area road network would represent a substantial amount of corridor growth even to the 2040 horizon year if considered relative to baseline existing traffic volumes. Based on the foregoing, no further corridor growth was added.

12.2.4 Future Mode Shift to Bus Rapid Transit

As per IBI Group's *Final Report Durham-Scarborough Bus Rapid Transit Study* dated the Spring of 2018, the presence of the Kingston Road BRT is expected to encourage a travel mode shift towards transit in future conditions, especially as area development progresses and the Kingston Road arterial continues to approach capacity.

According to the Transportation Tomorrow Survey Data previously summarized in **Table 19** in Section **11.2**, the transit mode share in the site vicinity in 2016 was in the order of 14%. In the DSBRT Study, the target mode share for areas with a centre median BRT in Downtown Pickering was estimated to be approximately 33% by the year 2041 (an increase of 19% in transit travel between the 2016 data and the 2041 targets). For the purposes of all future conditions analysis, recognizing the increasing attractiveness of the transit travel mode as the area continues to develop, existing Kingston Road corridor volumes are reduced by 10% in each horizon year. Other background growth traffic volumes were not further adjusted given that a majority of the traffic studies already incorporate a similar reduction in their respective trip generation forecasts.

12.2.5 Background Growth Traffic Redistribution

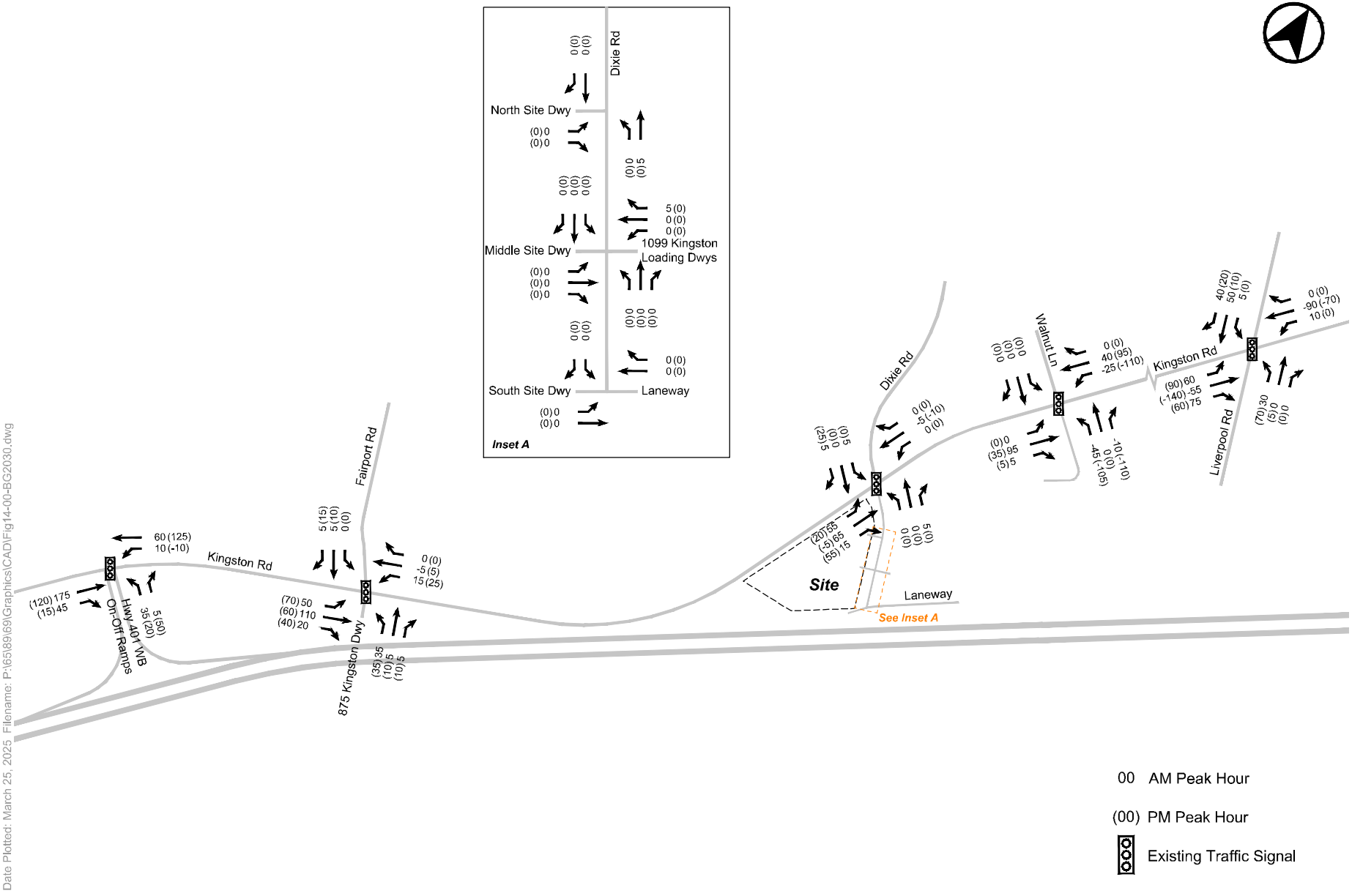
Other potential changes to the current area transportation network operations in the study area have been considered based upon:

- Changes to intersection configurations along the Kingston Road corridor to accommodate the BRT, including the prohibition of turns onto Kingston Road at unsignalized intersections as a result of the BRT median. This also includes the addition of U-turns at proximate signalized intersections to compensate for the loss of left turns.
- Signal timings have also been revised to include fully protected left turns instead of protected and permitted left turns. North-south pedestrian crossing times (including “walk” and “flash-don’t-walk” times) have also been increased where the width of the intersection has increased.

12.2.6 Total Background Growth

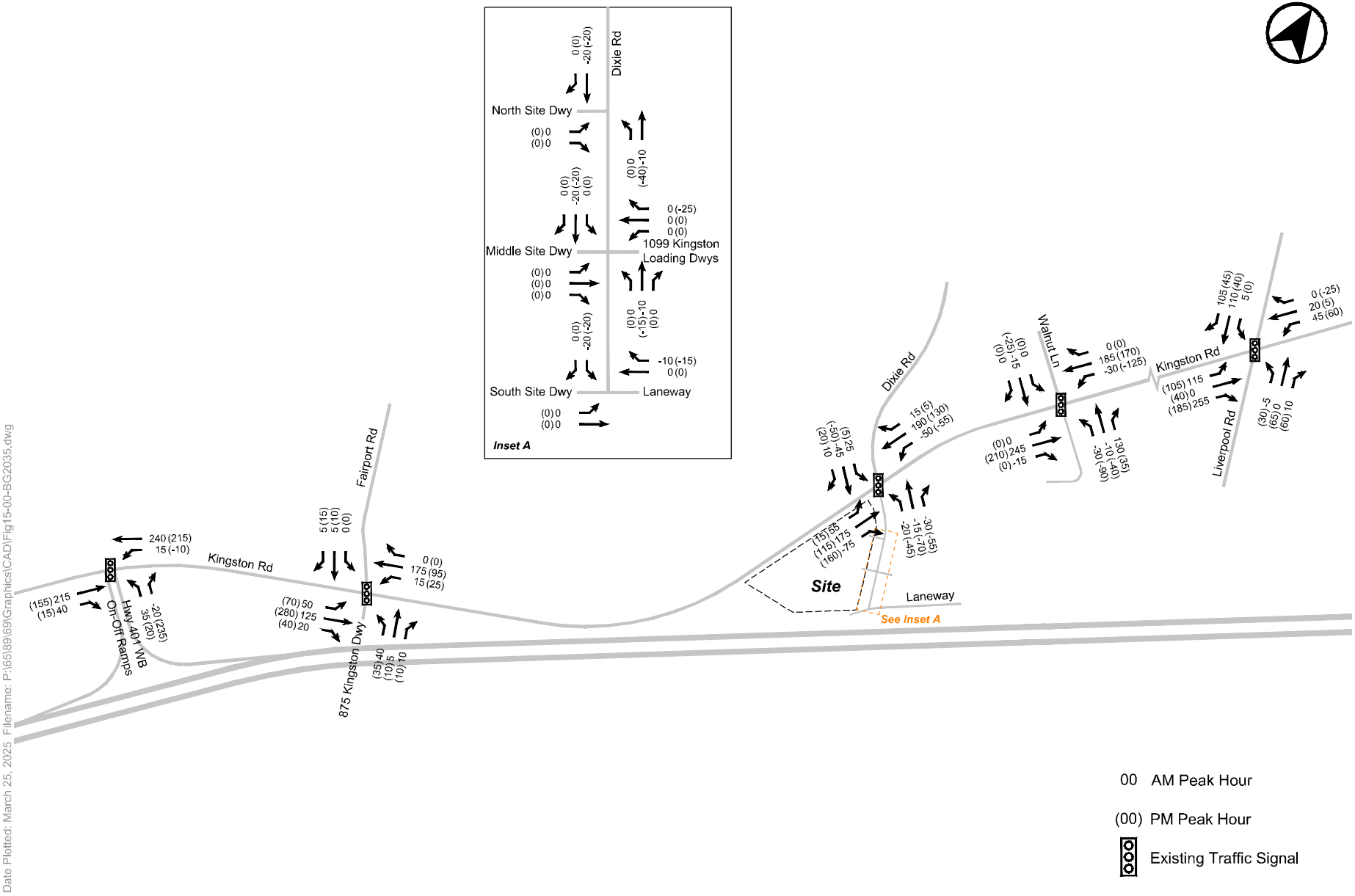
The total background growth traffic volumes (inclusive of the background development traffic volumes, the transit shift reduction, and other redistributed traffic volumes) for the 2030, 2035, and 2040 horizon years are illustrated on **Figure 14**, **Figure 15** and **Figure 16**, respectively.

Future background traffic volumes (consisting of the established baseline existing traffic volumes and background growth traffic volumes) for the 2030, 2035, and 2040 horizon years are illustrated on **Figure 17**, **Figure 18** and **Figure 19**, respectively.



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FIGURE 14 BACKGROUND GROWTH TRAFFIC VOLUMES (2030 HORIZON YEAR)



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FIGURE 15 BACKGROUND GROWTH TRAFFIC VOLUMES (2035 HORIZON YEAR)

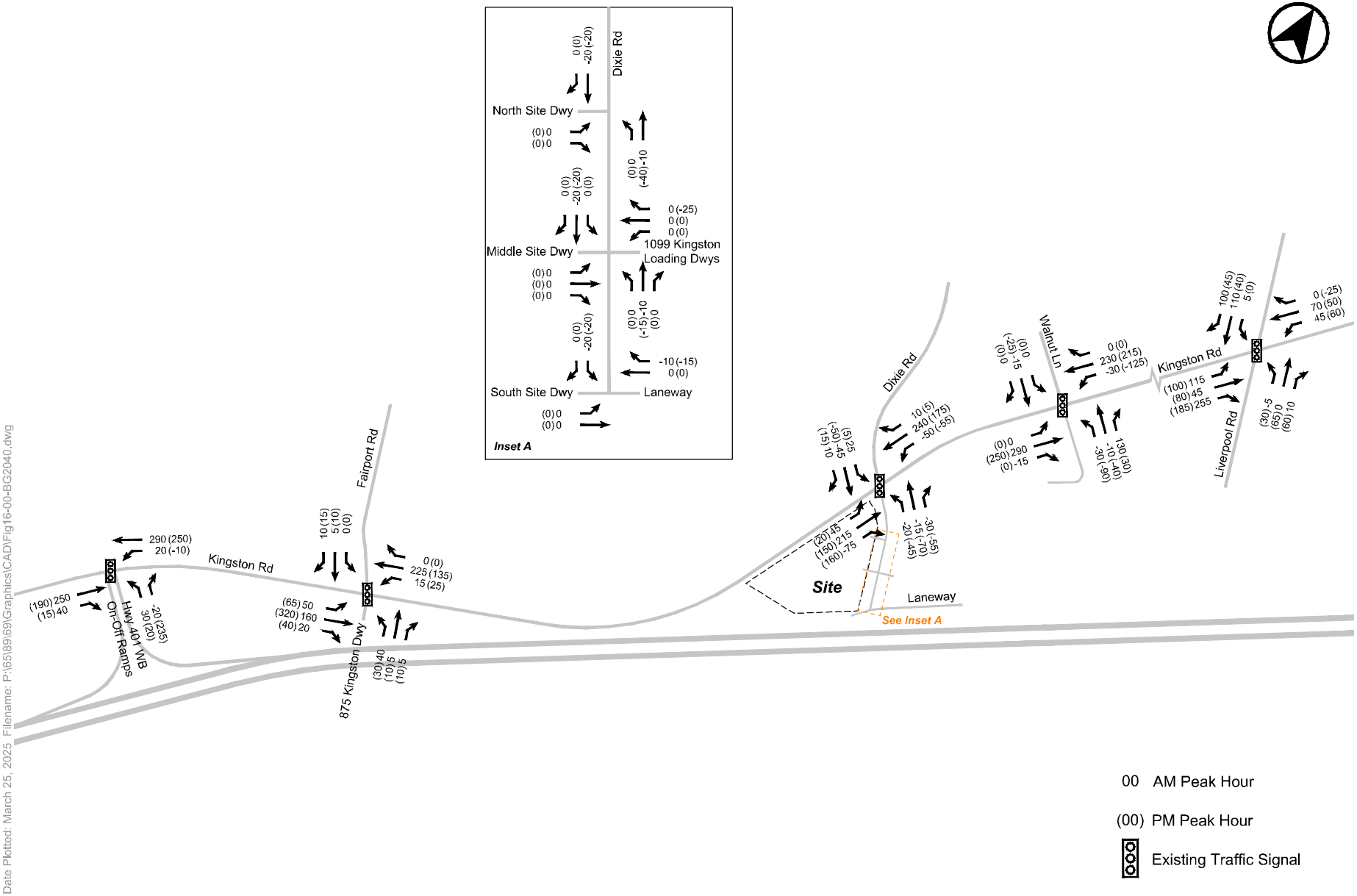


FIGURE 16 BACKGROUND GROWTH TRAFFIC VOLUMES (2040 HORIZON YEAR)

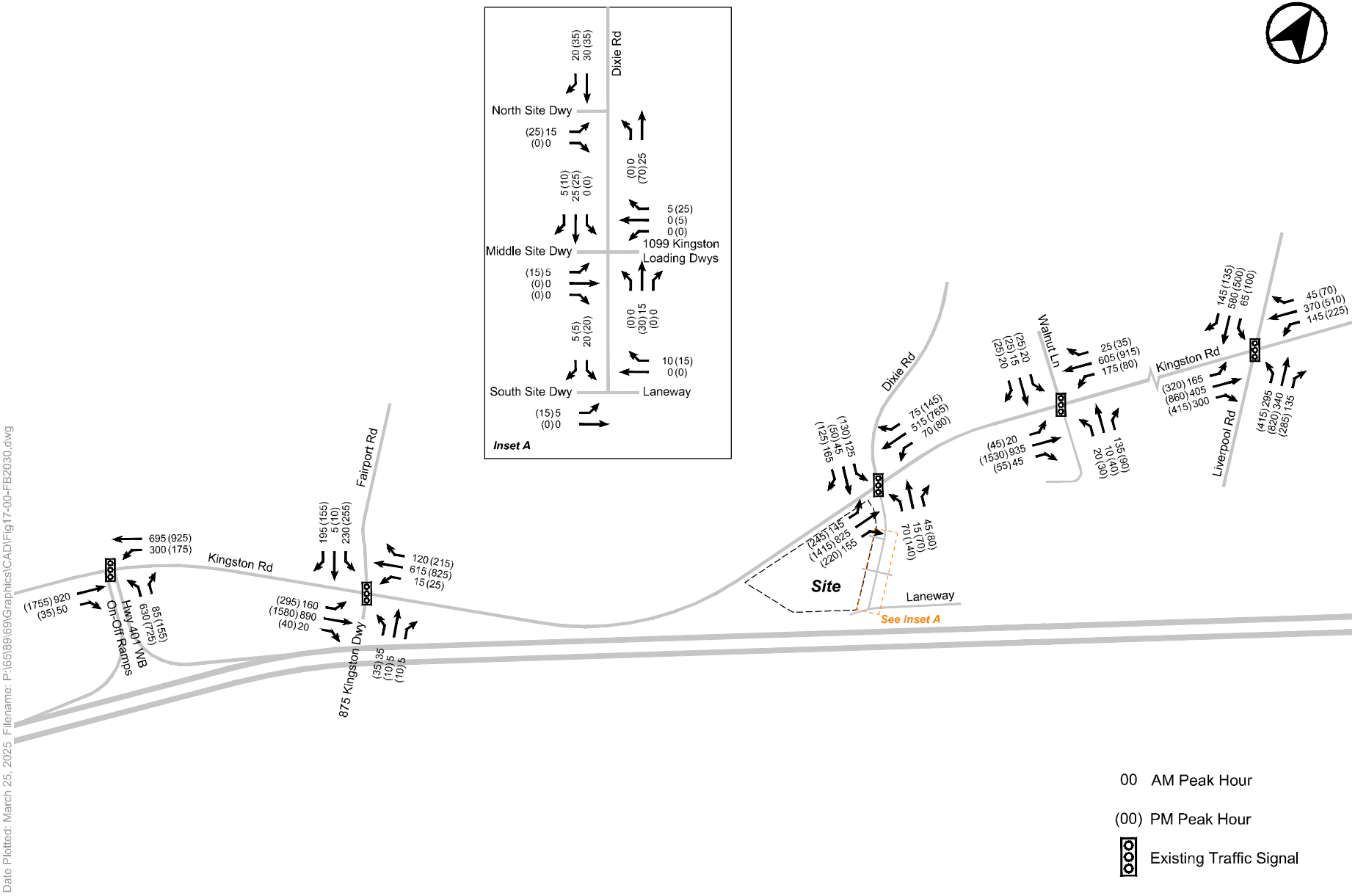


FIGURE 17 FUTURE BACKGROUND TRAFFIC VOLUMES (2030 HORIZON YEAR)

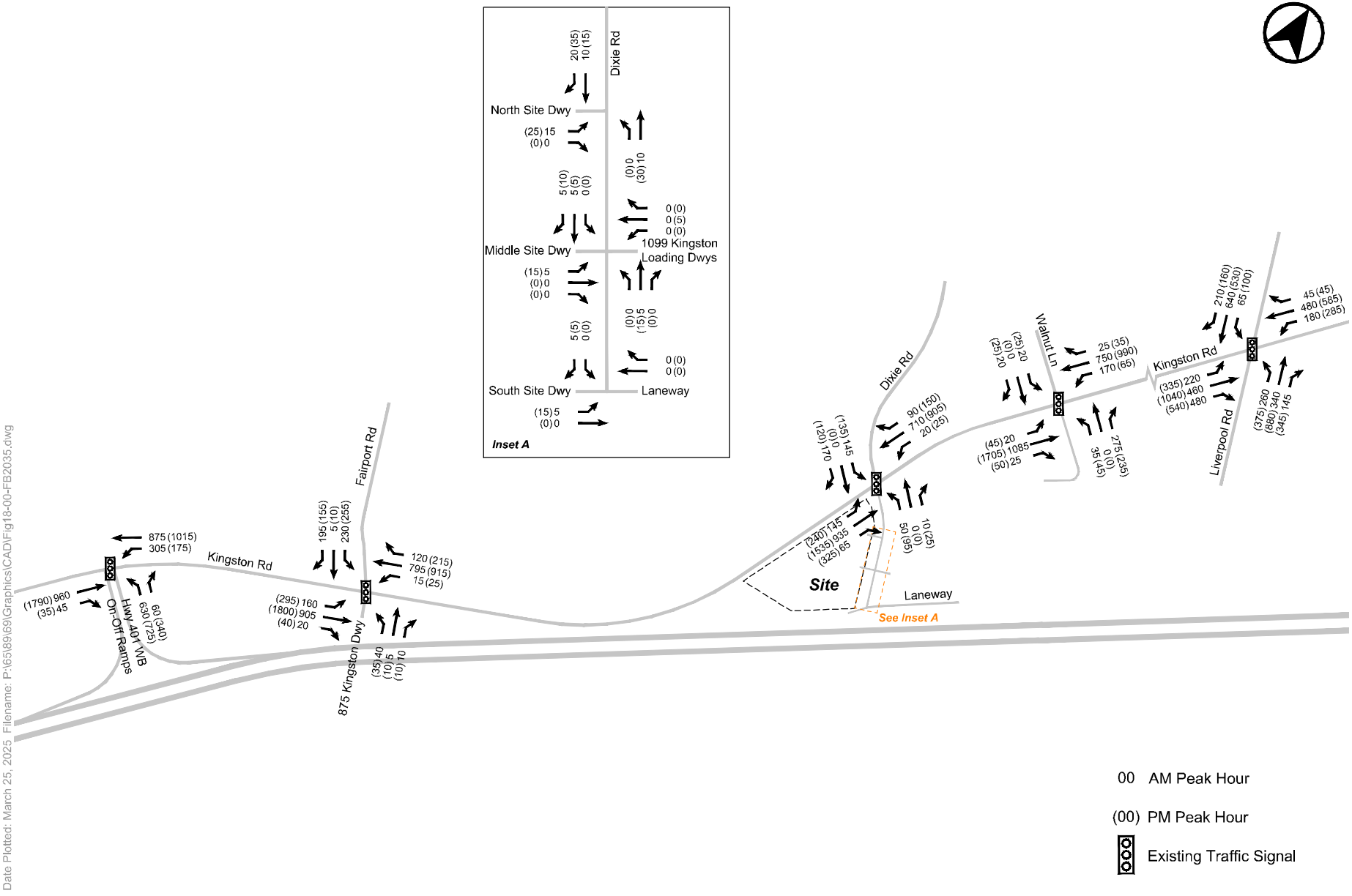
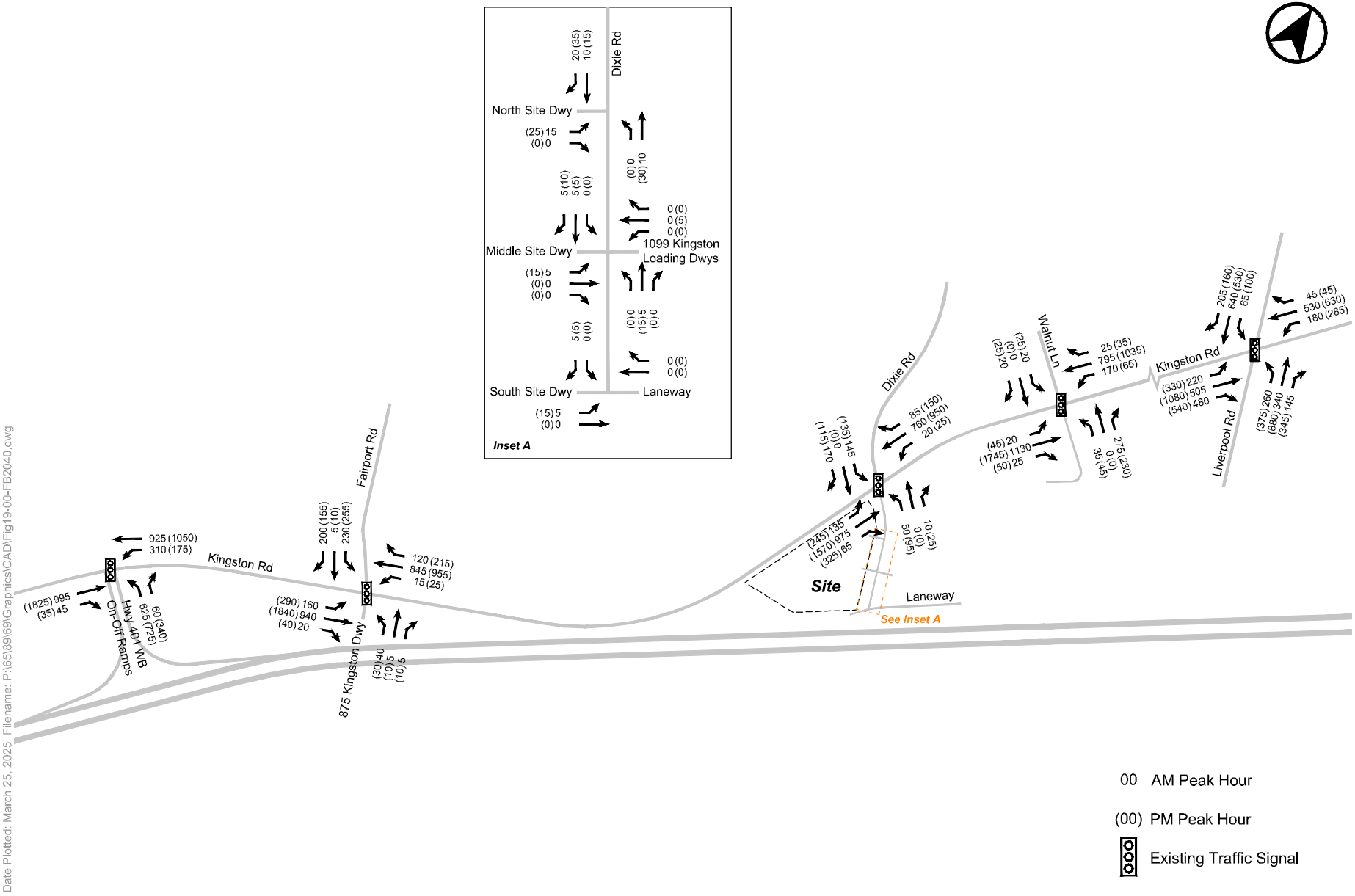


FIGURE 18 FUTURE BACKGROUND TRAFFIC VOLUMES (2035 HORIZON YEAR)



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FIGURE 19 FUTURE BACKGROUND TRAFFIC VOLUMES (2040 HORIZON YEAR)

12.3 Site Traffic Volumes

12.3.1 New Site Trip Assignment

Residential vehicle site trips were assigned onto the area road network based upon a review of travel information provided by the Transportation Tomorrow Survey ("TTS") for home-based trips in the site environs. The TTS queries are provided in **Appendix H**. The residential site traffic distribution is summarized in **Table 26**. The residential site traffic volumes for the 2030, 2035, and 2040 horizon years are illustrated on **Figure 21**, **Figure 22** and **Figure 23**, respectively.

Table 26 Residential Site Traffic Distribution

To / From Cardinal Direction	Corridor	Inbound	Outbound
North	Whites Road North	15%	15%
North	Fairport Road	5%	5%
North	Dixie Road	10%	10%
North	Liverpool Road	5%	5%
South	Whites Road North	0%	0%
South	Liverpool Road	5%	5%
East	Kingston Road	10%	10%
East	Highway 401	10%	10%
West	Kingston Road	10%	10%
West	Highway 401	30%	30%
Total	--	**100%**	**100%**

Notes:
1. 2006 TTS zones include 1038 and 1040.

12.3.2 Existing Site Trip Generation

The site is currently occupied by various commercial uses totalling in the order of approximately 8,062 m^2 GFA and surface parking. Based on the vehicle traffic observed at the site driveway in May of 2024, the site's current vehicular trip generation during the weekday morning and afternoon peak hours is summarized in **Table 27**.

The existing site generates approximately 55 and 110 two-way vehicle trips in the weekday morning and afternoon peak hours, respectively. With the redevelopment, the existing site traffic volumes will be removed from the study area road network (illustrated on **Figure 20**) and replaced with the future site traffic volumes.

Table 27 Existing Site Vehicle Trip Generation

	AM In	AM Out	AM Total	PM In	PM Out	PM Total
Existing Site Trips (8,062 m^2 commercial GFA)	30	25	55	55	55	110
Existing Commercial Trip Rate (Trips / 100 m^2 GFA)	*0.37*	*0.31*	*0.68*	*0.68*	*0.68*	*1.36*
Pass-by Trips	0	0	0	15	15	30
Primary Trips	30	25	55	40	40	80

Notes:
1. All existing site trips are rounded to the nearest five (5). The volumes are derived from the May 2024 set of turning movement counts.
2. Existing pass-by trips are estimated from the pass-by percentages provided in the ITE Trip Generation Handbook (3rd Edition) for LUC 820 Shopping Centre (0% in the weekday morning peak hour and 34% in the weekday afternoon peak hour).

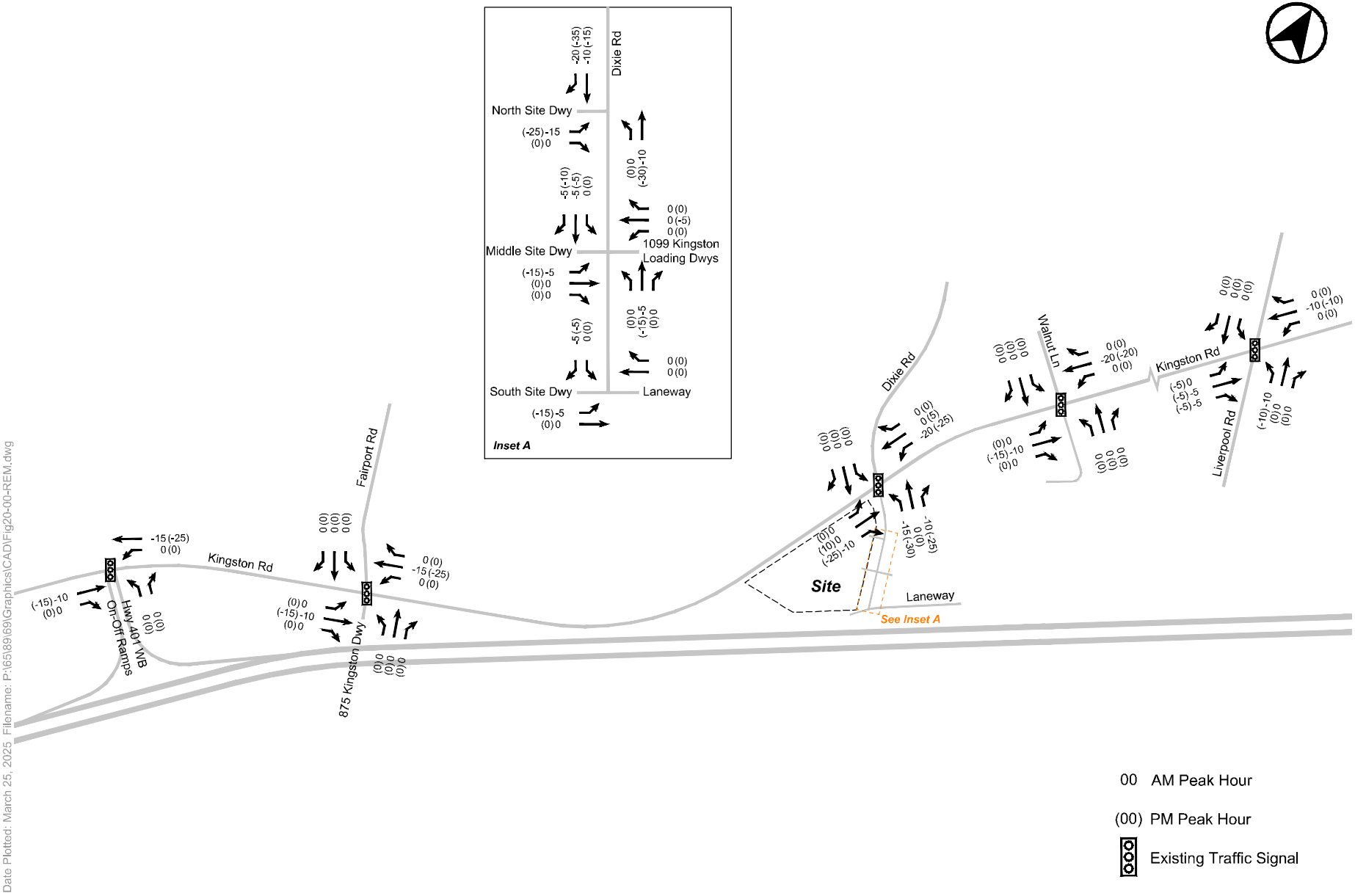


FIGURE 20 EXISTING SITE TRAFFIC VOLUMES (TO BE REMOVED)

12.3.3 New Site Trip Generation

The derivation of the site's vehicle trip generation was previously discussed in **Section 11.2** and summarized in **Table 28**.

In the 2030 horizon year, the site will generate 360 and 360 auto driver trips in the peak hours. In the 2035 horizon year, the site will generate 340 and 335 auto driver trips in the peak hours. In the 2040 horizon year, the site will generate 320 and 320 auto driver trips in the peak hours. The declining site trips in the further horizon years represents the site's increasing use of the transit travel mode, as interpolated from the DSBRT Study mode split forecasts for the 2041 year. The vehicle trips summarized above will be analyzed on the study area road network in **Section 13.0** for each respective horizon year.

Table 28 Total Vehicle Site Trip Generation (2030 Horizon Year)

Land Use	Horizon	AM In	AM Out	AM Total	PM In	PM Out	PM Total
Residential	2030	80	280	360	200	160	360
Residential	2035	75	265	340	185	150	335
Residential	2040	70	250	320	175	145	320

Notes:
1. All site trips are rounded to the nearest five (5).

12.3.4 Net New Site Trip Generation

For comparison purposes, in the 2030 horizon, the site will generate 305 and 250 additional vehicle trips during the weekday morning and afternoon peak hours, respectively, relative to existing conditions. By the 2035 horizon, the site will generate 285 and 225 additional vehicle trips during the weekday morning and afternoon peak hours, respectively, relative to existing conditions. By the 2040 horizon, the site will generate 265 and 210 additional vehicle trips during the weekday morning and afternoon peak hours, respectively, relative to existing conditions.

As previously mentioned, the declining net new trips in the further horizon years represents the site's increasing use of the transit travel mode, as interpolated from the DSBRT Study mode split forecasts for the 2041 year.

Table 29 Net New Vehicle Site Trip Generation (2030 Horizon Year)

Land Use	AM In	AM Out	AM Total	PM In	PM Out	PM Total
Existing Site Trips (To Be Removed)	-30	-25	-55	-55	-55	-110
Total New Site Trips	80	280	360	200	160	360
Net New Site Trips	**50**	**255**	**305**	**145**	**105**	**250**

Notes:
1. All site trips are rounded to the nearest five (5).
2. The existing site traffic that is to be removed is denoted with a minus "-" sign.

Table 30 Net New Vehicle Site Trip Generation (2035 Horizon Year)

Land Use	AM In	AM Out	AM Total	PM In	PM Out	PM Total
Existing Site Trips (To Be Removed)	-30	-25	-55	-55	-55	-110
Total New Site Trips	75	265	340	185	150	335
Net New Site Trips	**45**	**240**	**285**	**130**	**95**	**225**

Notes:
1. All site trips are rounded to the nearest five (5).
2. The existing site traffic that is to be removed is denoted with a minus "-" sign.

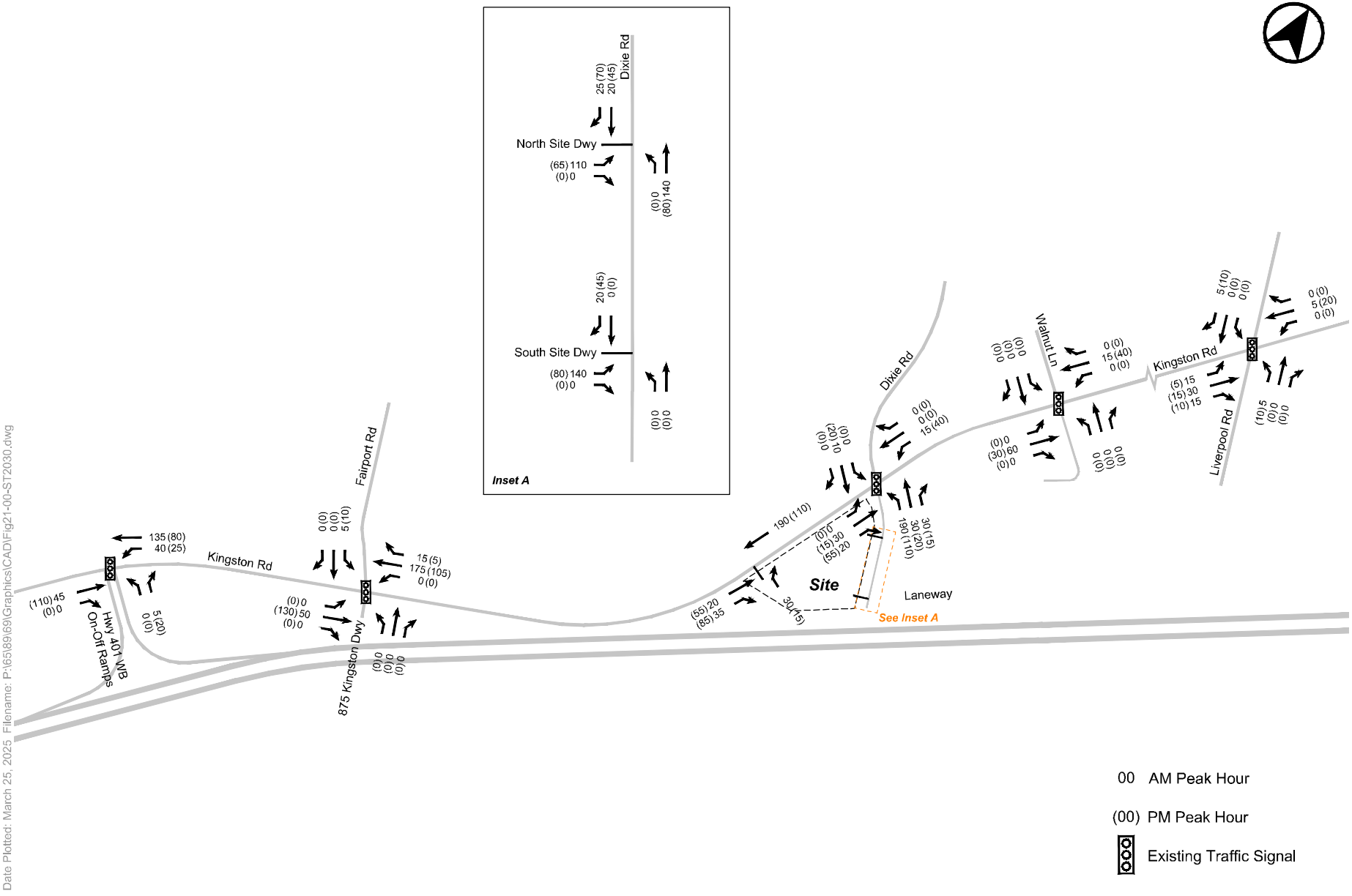
Table 31 Net New Vehicle Site Trip Generation (2040 Horizon Year)

Land Use	AM In	AM Out	AM Total	PM In	PM Out	PM Total
Existing Site Trips (To Be Removed)	-30	-25	-55	-55	-55	-110
Total New Site Trips	70	250	320	175	145	320
Net New Site Trips	**40**	**225**	**265**	**120**	**90**	**210**

Notes:
1. All site trips are rounded to the nearest five (5).
2. The existing site traffic that is to be removed is denoted with a minus "-" sign.

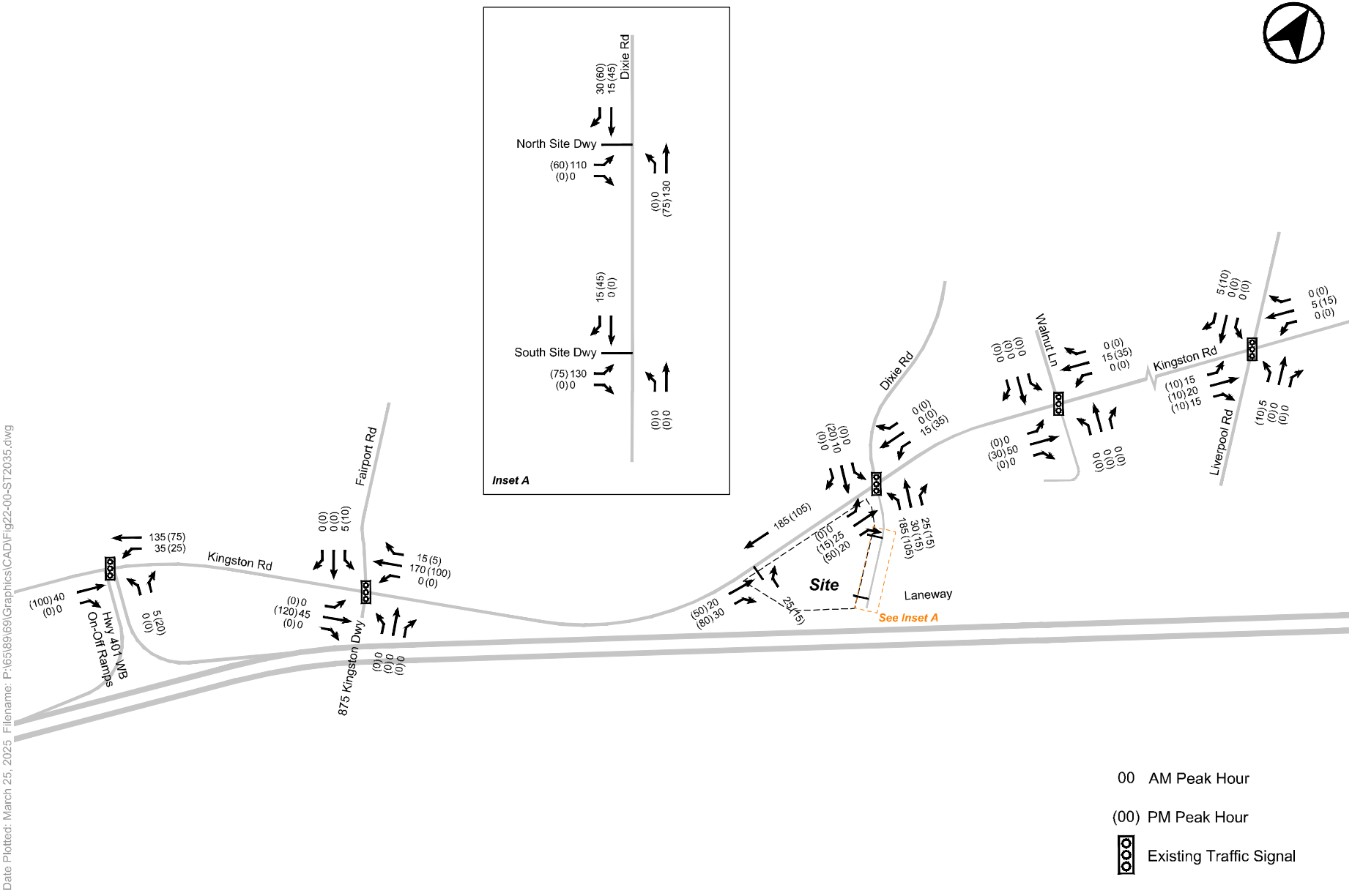
12.4 Future Total Traffic Volumes

The future total traffic volumes on the study area road network represent the summation of future background traffic volumes and site traffic volumes in each respective horizon year. Future total traffic volumes in the 2030, 2035 and 2040 horizon years are illustrated on **Figure 27**, **Figure 28** and **Figure 29**, respectively.



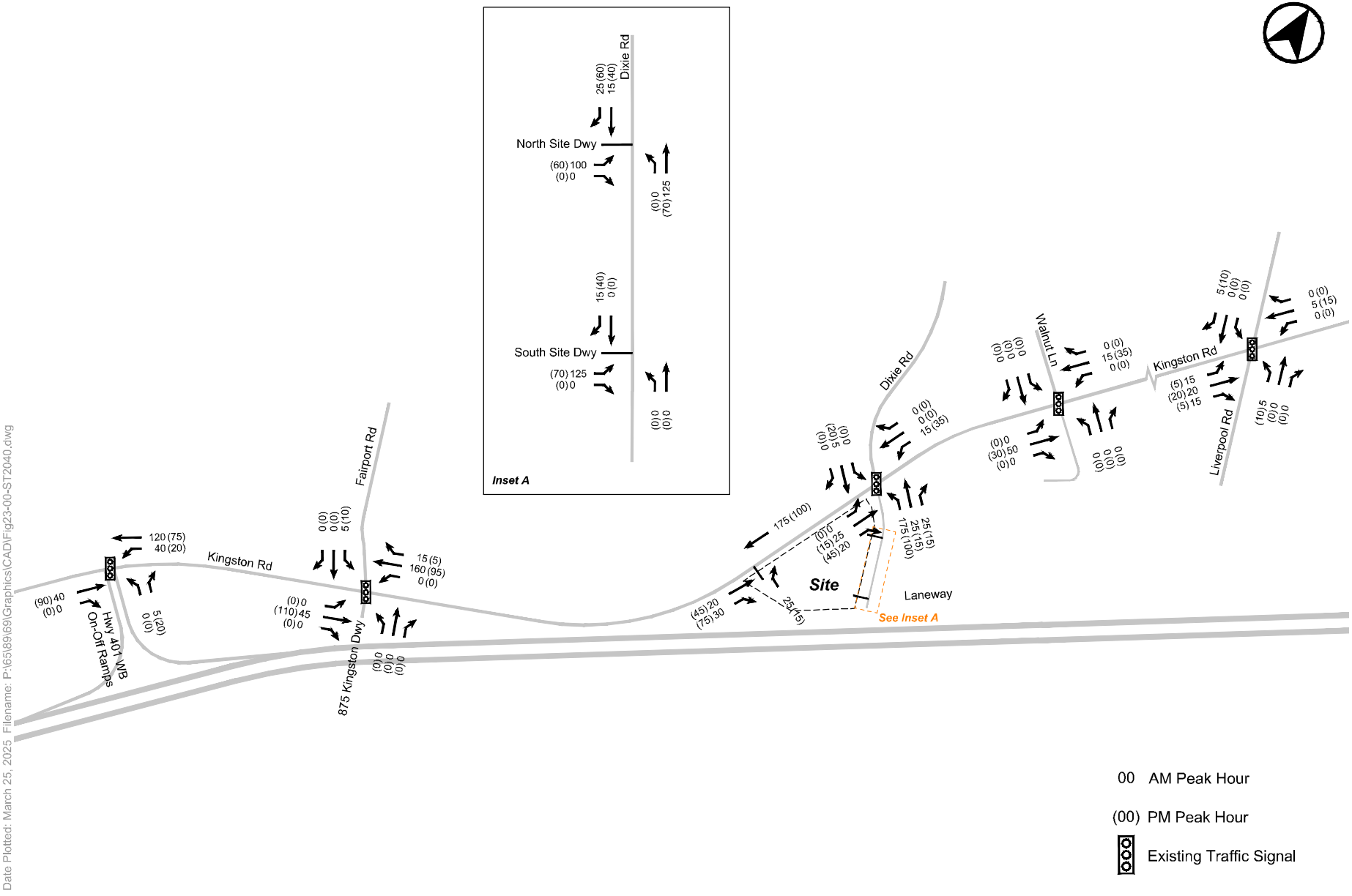
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FIGURE 21 SITE TRAFFIC VOLUMES (2030 HORIZON YEAR)



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FIGURE 22 SITE TRAFFIC VOLUMES (2035 HORIZON YEAR)



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FIGURE 23 SITE TRAFFIC VOLUMES (2040 HORIZON YEAR)

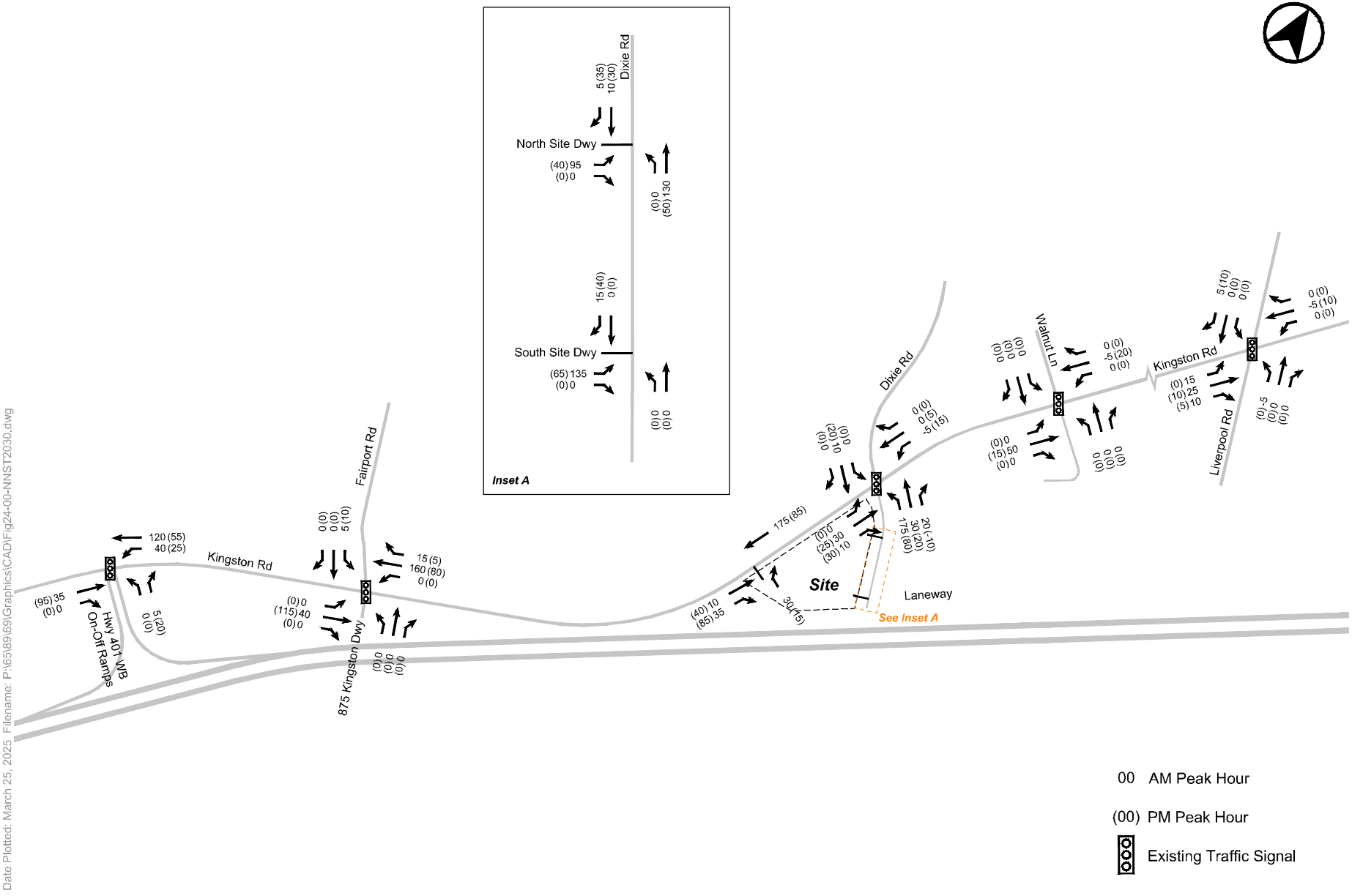
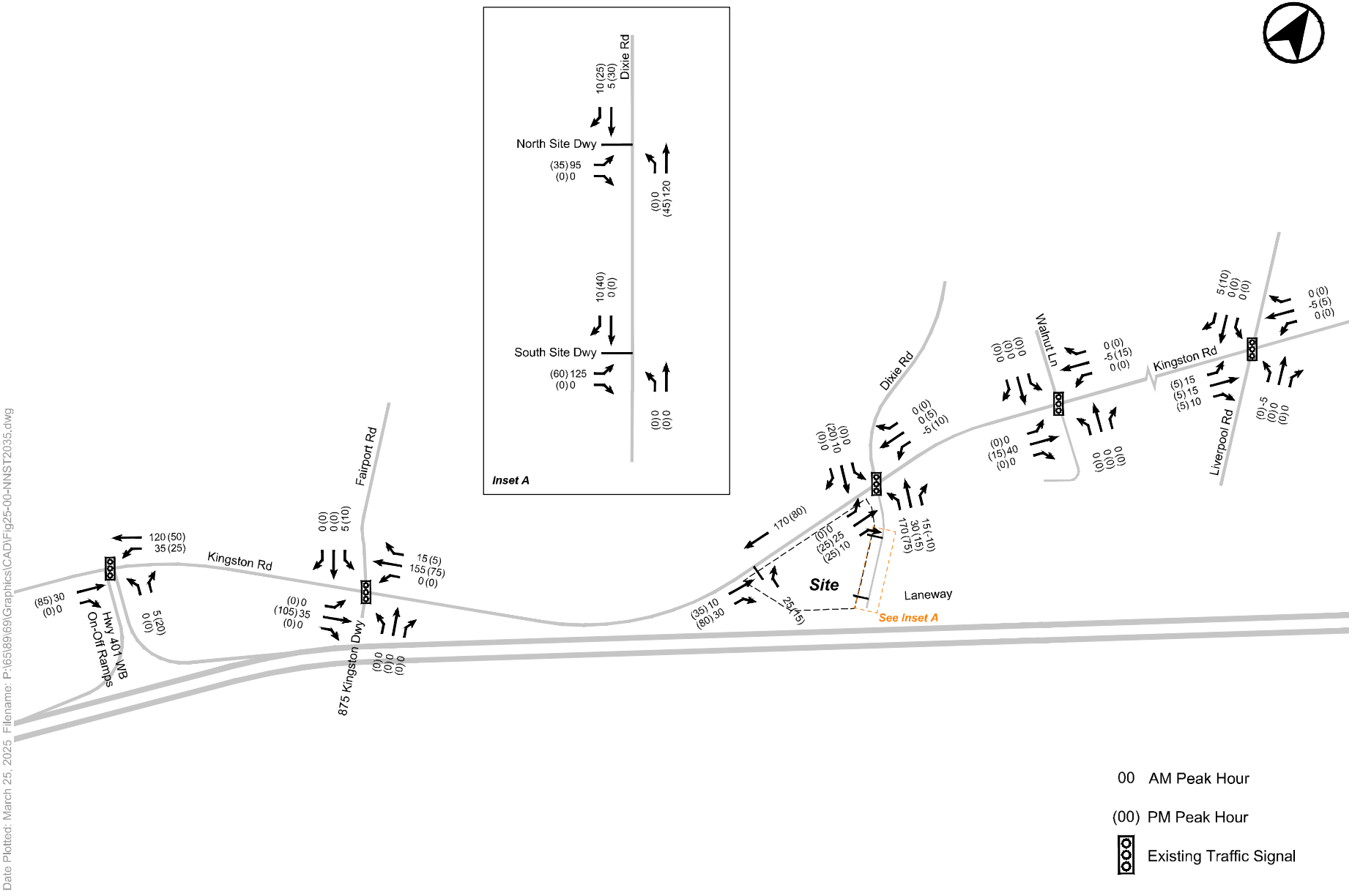


FIGURE 24 NET NEW SITE TRAFFIC VOLUMES (2030 HORIZON YEAR)



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FIGURE 25 NET NEW SITE TRAFFIC VOLUMES (2035 HORIZON YEAR)

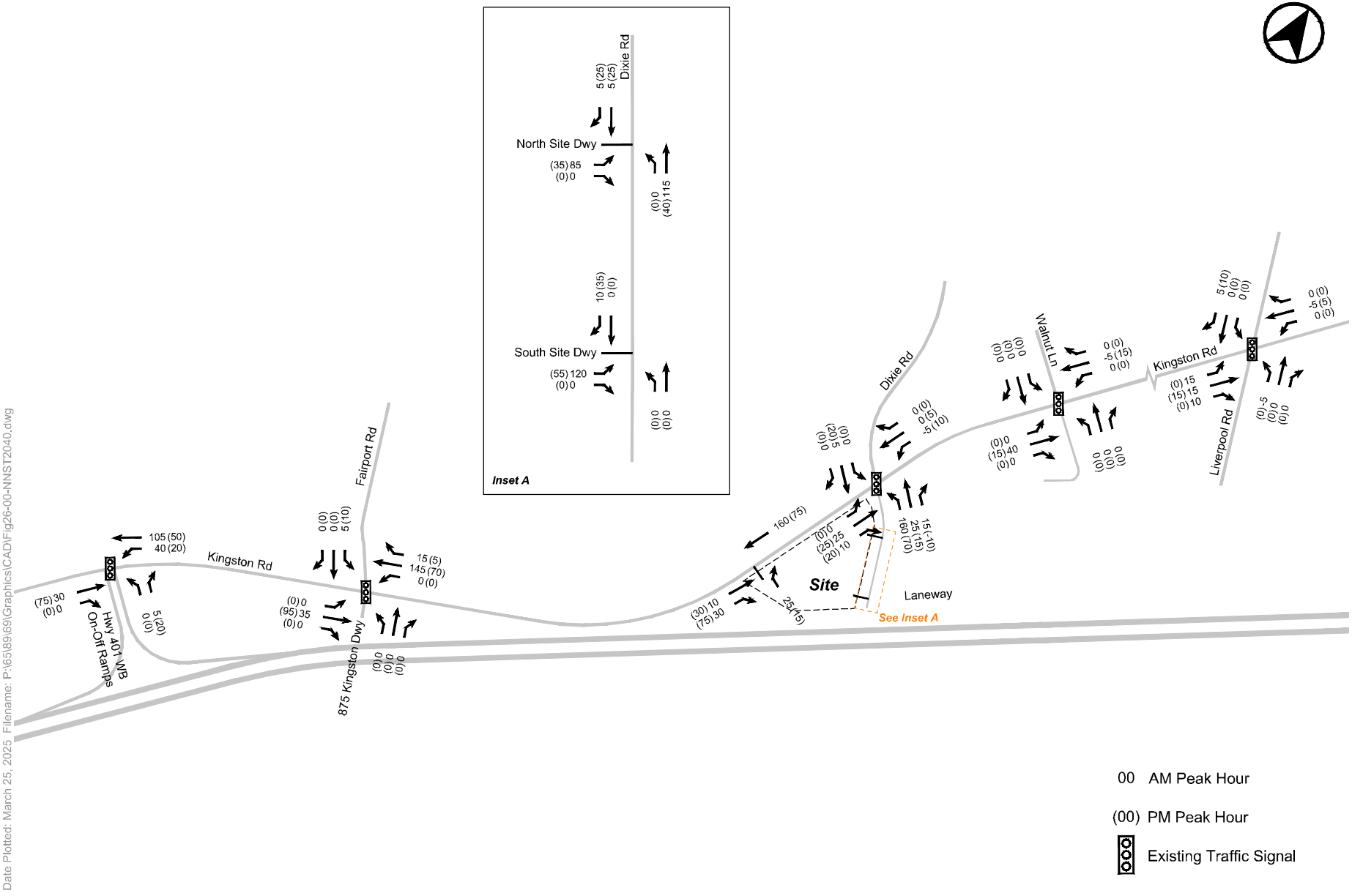
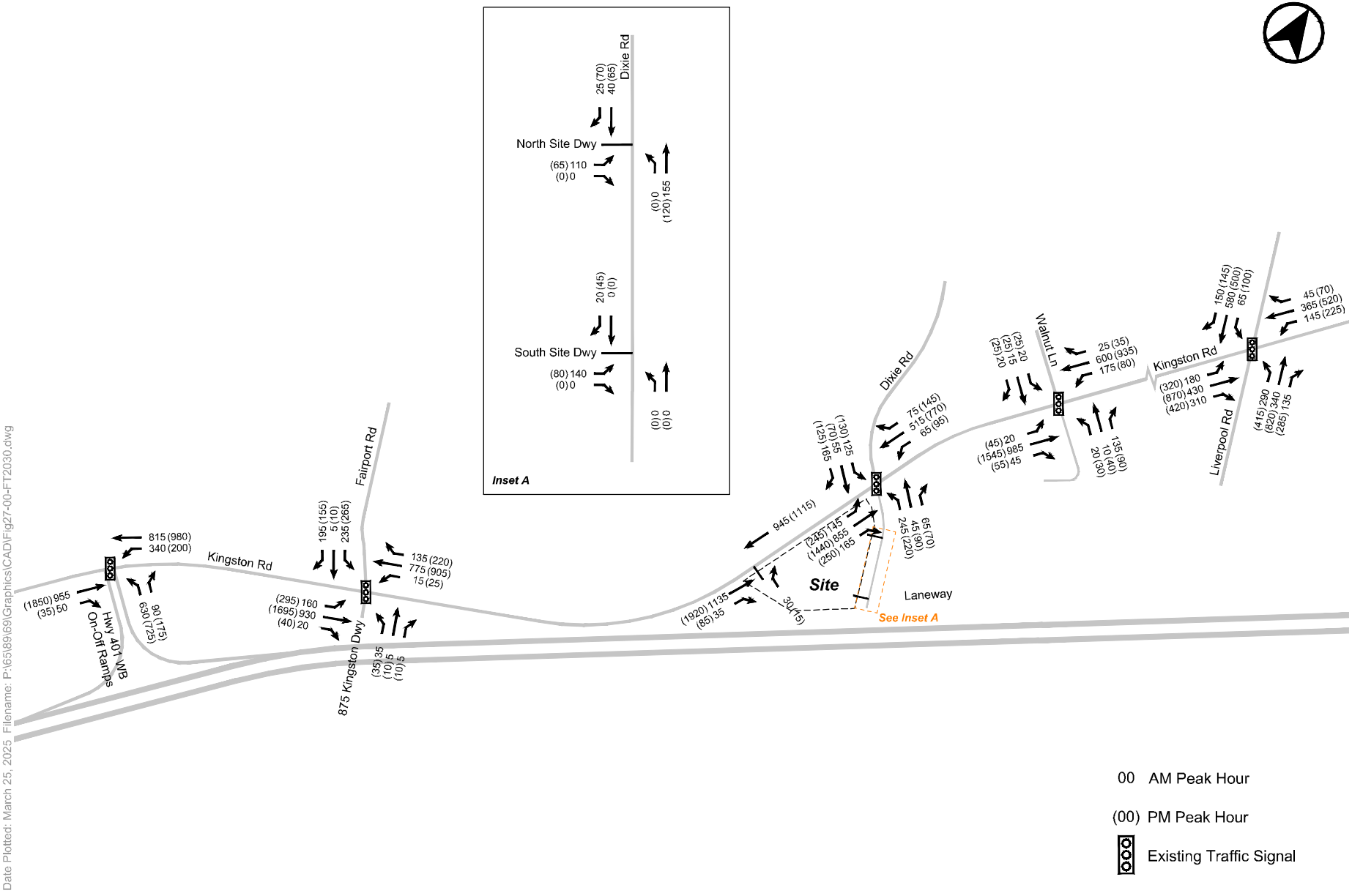
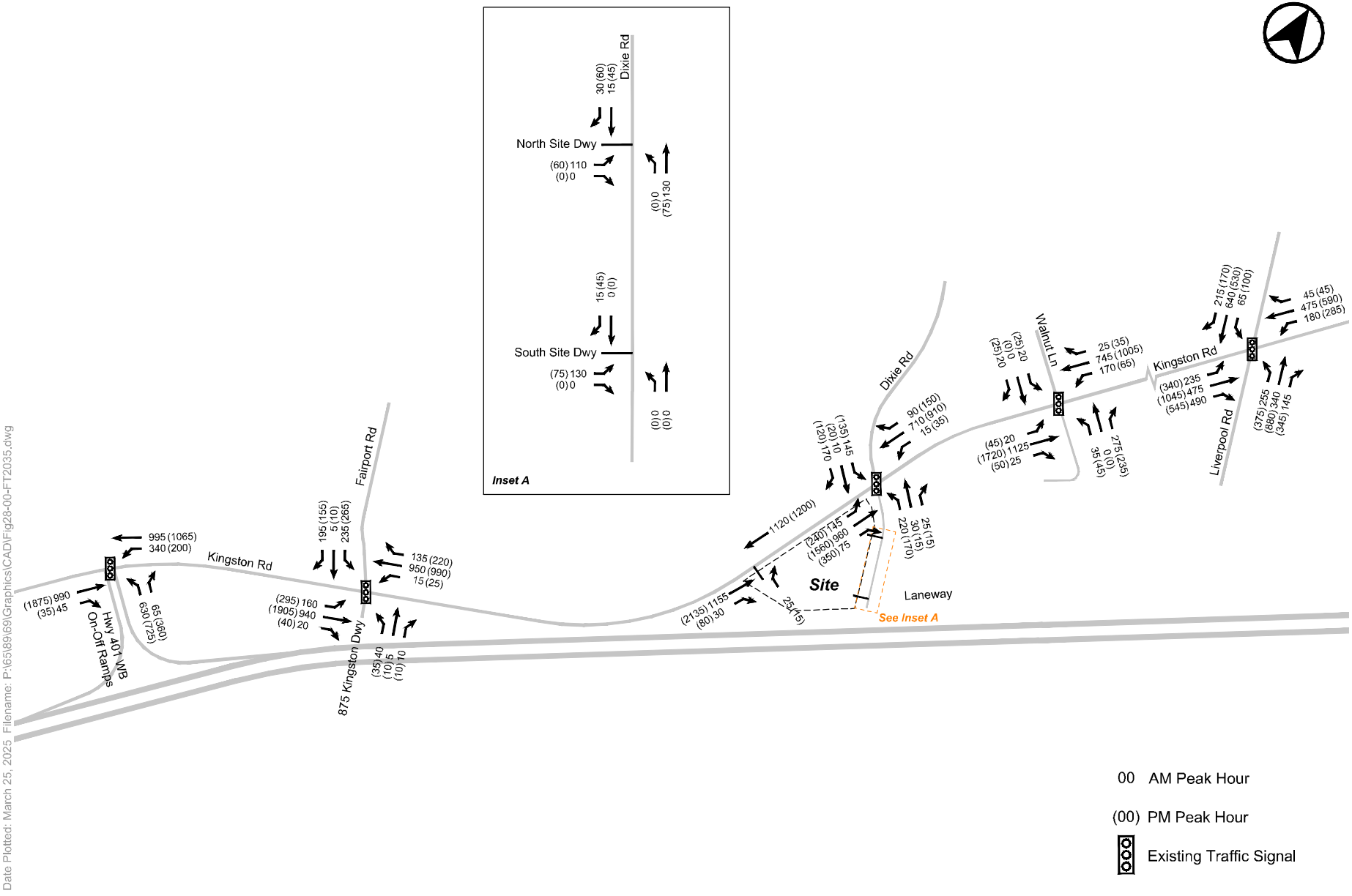


FIGURE 26 NET NEW SITE TRAFFIC VOLUMES (2040 HORIZON YEAR)



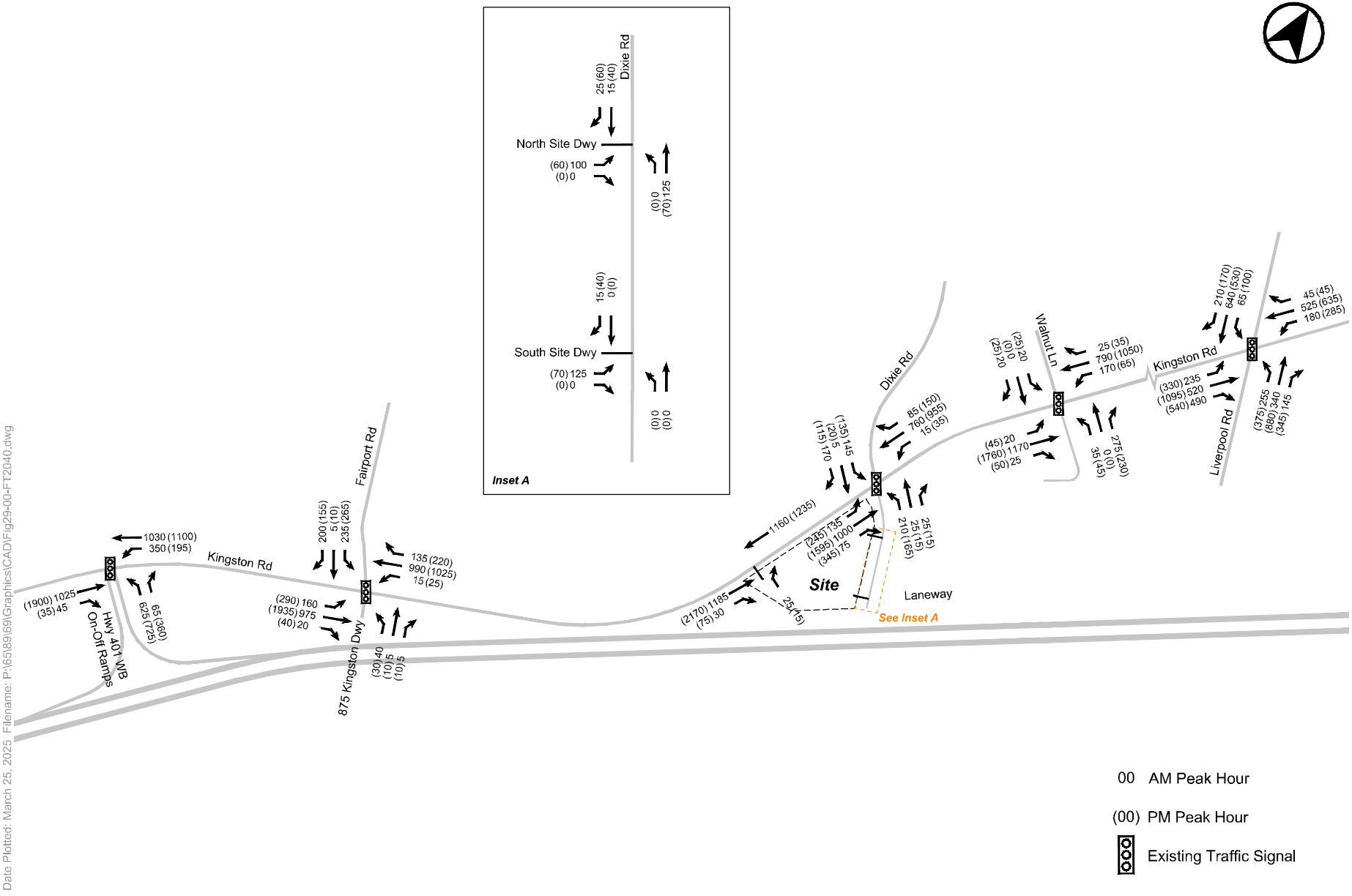
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FIGURE 27 FUTURE TOTAL TRAFFIC VOLUMES (2030 HORIZON YEAR)



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FIGURE 28 FUTURE TOTAL TRAFFIC VOLUMES (2035 HORIZON YEAR)



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FIGURE 29 FUTURE TOTAL TRAFFIC VOLUMES (2040 HORIZON YEAR)

13.0 TRAFFIC OPERATIONS ANALYSIS

13.1 Analysis Methodology

The intersection capacity analysis was completed using Synchro Version 11.0 and the Highway Capacity Manual ("HCM") methodology.

For signalized intersections, the volume-to-capacity ratio ("v/c") is an indicator of the capacity utilization for the key movements in the intersection. A v/c of 1.00 indicates that certain governing traffic movements through the intersection are operating at or near maximum capacity. The primary overall level of service ("LOS") indicator is delay, both on individual 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 represents a good level of service with short delays. LOS F represents a poor level of service with long delays. The volume to capacity ratio ("v/c") is an indicator of the capacity utilization for key movements at the intersection and resultant residual capacity potential.

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

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

13.2 Modelling Input and Calibration Parameters

13.2.1 Road Network Configuration

The existing conditions Synchro models adopt existing lane configurations.

Under future conditions and in each horizon year, based on the design plans from the Region, the centre median BRT and relevant intersection configurations have been revised. This includes the redistribution of all left turn movements onto or from Kingston Road at unsignalized intersections with the presence of the centre median. The incorporated design plans are provided in **Appendix F**.

Additionally, a south leg was added to the Kingston Road / Fairport Road intersection as per the 875 Kingston Road background development. The lane configurations include a northbound left turn as per the Region's direction to the transportation consultant on the file.

Though and turn lane widths are coded as 3.5m and 3.25m as per the Region's *Design Specifications for Traffic Control Devices, Pavement Markings, Signage and Roadside Protection*.

13.2.2 Signal Timing Plans

The existing signal timing plans that were provided by the Region for all signalized intersections were incorporated for existing conditions analysis. Input parameters such as minimum green times, cycle lengths, and pedestrian clearance times were adopted in the Synchro models. The signal timings are attached in **Appendix J**.

Under future conditions with the BRT in operations, the following revisions have been made to the signal timing plans at intersections along Kingston Road:

- Coded fully protected left turns instead of protected and permitted left turns.
- North-south pedestrian crossing times (including "walk" and "flash-don't-walk" times) as well as intergreen times (i.e., amber and all-red) have been increased where the width of the intersection has increased.
- Increased cycle lengths to 140 seconds (instead of the current 120 seconds) at all signalized intersections along Kingston Road to account for the increased intergreen times and pedestrian crossing times. Cycle lengths at intersections of a similar context (such as at intersections along Highway 7 in the City of Markham with VIVA bus rapid transit) are up to 150 seconds.
- Revise the recall mode at study area intersections from Coordinated Maximum (C-Max) to Coordinated Minimum (C-Min), and those coded as Maximum (Max) to Minimum (Min). This provides flexibility to each signal phase from its minimum split time, rather than forcing maximum splits along both the east-west and north-south travel directions at the study area intersections (which would effectively act as fixed timing). From observing the signal timings in the field, it appears as though signal timings are operating under coordinated minimum and minimum times, given that there is fluctuation in split times at the study area's signalized intersections. However, the received Synchro model signal timings provided by the Region all code C-Max and Max recall modes. This does not seem to reflect field conditions.

13.2.3 Other Data Inputs

Heavy vehicle percentages and pedestrian and bicycle crossing volumes were derived from existing traffic counts. Where field data was not available, default values in the Synchro models were adopted.

13.2.4 Lost Time Adjustment

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 especially at busy intersections). It is typical for drivers to continue progressing into the intersection during intergreen times to complete their movements. It is often observed that lost time adjustment values could equal up to the total intergreen time (especially the amber times) since drivers may take the full amber period to advance into the intersection, but this was not assumed for the purposes of conservative analysis. The adoption of an LTA value of -1.0 seconds for all movements is also recommended in the City of Toronto's *Guidelines for Using Synchro 11*.

In addition to the baseline adoption of -1.0 seconds, several intergreen studies were conducted to better represent existing intergreen behaviour at several intersections in the study area.

This includes the northbound and southbound left turn at Kingston Road / Liverpool Road and the northbound and westbound left turns at Kingston Road / Highway 401 E-EW Off-Ramp. The results of the intergreen studies are provided in **Table 32**. To replicate current intergreen behaviour that was observed in the field, in the order of -1.0 seconds of LTA was added for each observed intergreen vehicle.

Table 32 Surveyed Intergreen Behaviour

Intersection	Movement	Observed Number of Sneakers	Applied Lost Time Adjustment (sec.)
Kingston Road / Liverpool Road	Northbound Left Turn	2.64 (1.96)	-2.5 (-2.0)
Kingston Road / Liverpool Road	Westbound Left Turn	0.57 (3.20)	-1.0 (-3.0)
Kingston Road / Highway 401 E-EW Off-Ramp	Northbound Left Turn	1.23 (3.73)	-1.0 (-3.5)
Kingston Road / Highway 401 E-EW Off-Ramp	Westbound Left Turn	1.17 (2.07)	-1.0 (-2.0)

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).
2. The table presents the average number of sneakers observed per cycle over the course of the peak hour.

13.2.5 Protected Left Turn Factor

The protected left turn factor ("LTF") in the Synchro model influences the headways between vehicles making a left turn movement on protected left turn green phases. Values closer to 1.00 represent vehicles making left turns with smaller headways. Drivers are expected modify their behaviour in near-capacity conditions and operate with reduced headways. As such, a protected LTF of 1.00 (rather than a default of 0.95) has been adopted for all protected left turns at the study area intersections.

13.2.6 Peak Hour Factor

Under existing conditions, the peak hour factor ("PHF") at all study area intersections is based on the collected traffic count data. As future travel conditions continue to evolve and adjust to the new study area road network with the BRT along Kingston Road, it is expected that the Kingston Road corridor will continue to approach capacity. Over time, vehicle trips can begin to equalize their distribution across the different peak 15-minute periods within the peak hour, while non-local drivers will be encouraged to use alternative routes outside of the study area road network. This shift would result in an increasingly even distribution of trips over the course of the peak hour as drivers make trips earlier or later to reduce delays. During the data collection process, several peak hour factors in proximity to the site were already observed to be approaching 1.00, including the Kingston Road / Liverpool Road intersection. Given that significant background growth in the area is expected, a peak hour factor of 1.00 is assumed at all intersections to represent the full potential of the road network during peak hours. A similar adjustment is also recommended by the Region of Peel's Synchro Guidelines.

13.3 Analysis Scenarios

The following analysis scenarios were reviewed for the weekday morning and afternoon peak hours:

1. 2025 Baseline existing traffic conditions (as illustrated on **Figure 13**)
2. 2030 Future background traffic conditions (as illustrated on **Figure 17**)
3. 2030 Future total traffic conditions (as illustrated on **Figure 27**)
4. 2035 Future background traffic conditions (as illustrated on **Figure 18**)
5. 2035 Future total traffic conditions (as illustrated on **Figure 28**)
6. 2040 Future background traffic conditions (as illustrated on **Figure 19**)
7. 2040 Future total traffic conditions (as illustrated on **Figure 29**)

All Synchro worksheets for the scenarios are provided in **Appendix K**.

13.4 Signalized Intersection Analysis

13.4.1 Kingston Road / Fairport Road

The Kingston Road / Fairport Road intersection operates under traffic signal control. The results of the traffic analysis are provided in **Table 33**.

Under existing conditions, the intersection operates under capacity at overall v/c ratios of 0.41 and 0.65 during the weekday morning and afternoon peak hours, respectively.

Under all future horizon years, the BRT and its relevant network changes have been considered in the Synchro models. As previously noted, increases to the signal cycle length to 140 seconds and general signal timing optimization is recommended in both peak hours as part of the BRT construction. A fourth leg was also added to the intersection under future background conditions based on the development at 875 Kingston Road. The traffic study for this development was conducted by TYLin and dated September of 2022.

2030 Horizon Year

In future background conditions in the 2030 horizon year, the intersection operates at under capacity conditions at overall v/c ratios of 0.53 and 0.76 during the weekday morning and afternoon peak hours, respectively.

With the site redevelopment, the intersection will continue to operate at under capacity conditions at overall v/c ratios of 0.59 and 0.79 during the weekday morning and afternoon peak hours, respectively.

2035 Horizon Year

In future background conditions in the 2035 horizon year, the intersection operates at under capacity conditions at overall v/c ratios of 0.59 and 0.81 during the weekday morning and afternoon peak hours, respectively.

With the site redevelopment, the intersection will continue to operate at under capacity conditions at overall v/c ratios of 0.65 and 0.84 during the weekday morning and afternoon peak hours, respectively.

Table 33 Kingston Road / Fairport Road – Capacity Analysis Results

Horizon:	2025	2025	2030	2030	2030	2030	2035	2035	2035	2035
Scenario:	E.X.	E.X.	F.B.	F.B.	F.T.	F.T.	F.B.	F.B.	F.T.	F.T.
Parameter:	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.21 (0.46)	A (A)	0.67 (0.82)	D (D)	0.67 (0.85)	E (D)	0.67 (0.84)	E (D)	0.69 (0.85)	E (D)
EBT	0.32 (0.61)	A (A)	0.37 (0.67)	B (C)	0.39 (0.72)	B (C)	0.38 (0.75)	B (C)	0.40 (0.80)	B (C)
WBT (E.X.)	0.29 (0.39)	A (A)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
WBR (E.X.)	0.10 (0.18)	A (A)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
WBL (F.B./F.T.)	-- (--)	-- (--)	0.05 (0.20)	C (D)	0.05 (0.26)	C (D)	0.05 (0.30)	C (D)	0.05 (0.40)	C (E)
WBTR (F.B./F.T.)	-- (--)	-- (--)	0.39 (0.64)	C (D)	0.49 (0.69)	C (D)	0.49 (0.69)	C (D)	0.58 (0.74)	C (D)
NBL (F.B./F.T.)	-- (--)	-- (--)	0.19 (0.15)	D (D)	0.19 (0.15)	D (D)	0.22 (0.16)	D (D)	0.21 (0.15)	D (D)
NBTR (F.B./F.T.)	-- (--)	-- (--)	0.02 (0.03)	D (D)	0.02 (0.03)	D (D)	0.02 (0.03)	D (D)	0.02 (0.03)	D (D)
SBL	0.71 (0.73)	D (D)	0.79 (0.83)	E (E)	0.80 (0.85)	E (E)	0.79 (0.85)	E (E)	0.80 (0.86)	E (E)
SBR (E.X.)	0.13 (0.09)	D (D)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
SBTR (F.B./F.T.)	-- (--)	-- (--)	0.14 (0.13)	D (D)	0.14 (0.13)	D (D)	0.14 (0.13)	D (D)	0.14 (0.13)	D (D)
Overall	**0.41 (0.65)**	**B (A)**	**0.53 (0.76)**	**C (D)**	**0.59 (0.79)**	**C (D)**	**0.59 (0.81)**	**C (D)**	**0.65 (0.84)**	**C (D)**

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).
2. The table headings "E.X." = Existing, "F.B." = Future Background, and "F.T." = Future Total.

13.4.2 Kingston Road / Dixie Road

The Kingston Road / Dixie Road intersection operates under traffic signal control. The results of the traffic analysis are provided in **Table 34**.

Under existing conditions, the intersection operates under capacity at overall v/c ratios of 0.40 and 0.71 during the weekday morning and afternoon peak hours, respectively.

Under all future horizon years, the BRT and its relevant network changes have been considered in the Synchro models. As previously noted, increases to the signal cycle length to 140 seconds and general signal timing optimization is recommended in both peak hours as part of the BRT construction.

2030 Horizon Year

In future background conditions in the 2030 horizon year, the intersection operates at under capacity conditions at overall v/c ratios of 0.51 and 0.78 during the weekday morning and afternoon peak hours, respectively.

With the site redevelopment, the intersection will continue to operate at under capacity conditions at overall v/c ratios of 0.70 and 0.88 during the weekday morning and afternoon peak hours, respectively.

2035 Horizon Year

In future background conditions in the 2035 horizon year, the intersection operates at under capacity conditions at overall v/c ratios of 0.51 and 0.77 during the weekday morning and afternoon peak hours, respectively.

With the site redevelopment, the intersection will continue to operate at under capacity conditions at overall v/c ratios of 0.64 and 0.85 during the weekday morning and afternoon peak hours, respectively.

Table 34 Kingston Road / Dixie Road – Capacity Analysis Results

Horizon:	2025	2025	2030	2030	2030	2030	2035	2035	2035	2035
Scenario:	E.X.	E.X.	F.B.	F.B.	F.T.	F.T.	F.B.	F.B.	F.T.	F.T.
Parameter:	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.15 (0.50)	A (A)	0.64 (0.75)	E (E)	0.66 (0.76)	E (E)	0.64 (0.75)	E (E)	0.64 (0.75)	E (E)
EBT (E.X.)	0.36 (0.72)	B (B)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
EBR (E.X.)	0.10 (0.15)	B (A)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
EBTR (F.B./F.T.)	-- (--)	-- (--)	0.45 (0.76)	A (C)	0.58 (0.86)	B (C)	0.44 (0.81)	A (C)	0.50 (0.87)	B (C)
WBL	0.16 (0.38)	A (C)	0.52 (0.58)	F (E)	0.50 (0.74)	F (F)	0.27 (0.33)	E (E)	0.28 (0.38)	F (E)
WBT (E.X.)	0.25 (0.41)	A (B)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
WBR (E.X.)	0.05 (0.10)	A (A)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
WBTR (F.B./F.T.)	-- (--)	-- (--)	0.29 (0.51)	A (B)	0.36 (0.57)	C (B)	0.40 (0.57)	A (B)	0.45 (0.60)	B (B)
NBL	0.66 (0.74)	E (E)	0.56 (0.80)	E (E)	0.89 (0.94)	E (F)	0.30 (0.48)	D (D)	0.88 (0.79)	E (E)
NBTR	0.09 (0.35)	D (D)	0.09 (0.36)	D (D)	0.15 (0.32)	D (D)	0.01 (0.02)	D (D)	0.09 (0.05)	D (D)
SBL	0.61 (0.69)	D (D)	0.57 (0.68)	E (E)	0.35 (0.50)	D (D)	0.61 (0.58)	E (E)	0.45 (0.52)	D (D)
SBTR	0.36 (0.26)	D (D)	0.34 (0.33)	D (D)	0.29 (0.35)	D (D)	0.11 (0.08)	D (D)	0.13 (0.14)	D (D)
Overall	**0.40 (0.71)**	**B (B)**	**0.51 (0.78)**	**C (C)**	**0.70 (0.88)**	**C (C)**	**0.51 (0.77)**	**B (C)**	**0.64 (0.85)**	**C (C)**

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).
2. The table headings "E.X." = Existing, "F.B." = Future Background, and "F.T." = Future Total.

13.4.3 Kingston Road / Walnut Lane

The Kingston Road / Walnut Lane intersection operates under traffic signal control. The results of the traffic analysis are provided in **Table 35**.

Under existing conditions, the intersection operates under capacity at overall v/c ratios of 0.48 and 0.69 during the weekday morning and afternoon peak hours, respectively.

Under all future horizon years, the BRT and its relevant network changes have been considered in the Synchro models. As previously noted, increases to the signal cycle length to 140 seconds and general signal timing optimization is recommended in both peak hours as part of the BRT construction.

2030 Horizon Year

In future background conditions in the 2030 horizon year, the intersection operates at under capacity conditions at overall v/c ratios of 0.45 and 0.60 during the weekday morning and afternoon peak hours, respectively.

With the site redevelopment, the intersection will continue to operate at under capacity conditions at overall v/c ratios of 0.47 and 0.60 during the weekday morning and afternoon peak hours, respectively.

2035 Horizon Year

In future background conditions in the 2035 horizon year, the intersection operates at under capacity conditions at overall v/c ratios of 0.53 and 0.66 during the weekday morning and afternoon peak hours, respectively.

With the site redevelopment, the intersection will continue to operate at under capacity conditions at overall v/c ratios of 0.54 and 0.66 during the weekday morning and afternoon peak hours, respectively.

Table 35 Kingston Road / Walnut Lane – Capacity Analysis Results

Horizon:	2025	2025	2030	2030	2030	2030	2035	2035	2035	2035
Scenario:	E.X.	E.X.	F.B.	F.B.	F.T.	F.T.	F.B.	F.B.	F.T.	F.T.
Parameter:	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.04 (0.13)	A (B)	0.26 (0.45)	E (E)	0.26 (0.45)	D (E)	0.26 (0.45)	E (E)	0.26 (0.45)	E (E)
EBT (E.X.)	0.33 (0.73)	A (B)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
EBR (E.X.)	0.03 (0.04)	A (C)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
EBTR (F.B./F.T.)	-- (--)	-- (--)	0.46 (0.67)	B (B)	0.49 (0.68)	B (B)	0.52 (0.73)	B (A)	0.54 (0.73)	B (A)
WBL	0.49 (0.68)	A (D)	0.69 (0.49)	E (E)	0.69 (0.49)	E (E)	0.68 (0.50)	E (E)	0.68 (0.50)	E (E)
WBTR	0.23 (0.35)	A (A)	0.25 (0.39)	B (A)	0.25 (0.40)	B (A)	0.31 (0.42)	B (A)	0.31 (0.43)	B (A)
NBL	0.41 (0.61)	D (D)	0.12 (0.17)	D (D)	0.12 (0.17)	D (D)	0.20 (0.25)	D (D)	0.20 (0.25)	D (D)
NBTR	0.17 (0.43)	D (D)	0.14 (0.29)	D (E)	0.14 (0.29)	D (E)	0.33 (0.29)	E (E)	0.35 (0.29)	E (E)
SBL	0.20 (0.25)	D (D)	0.16 (0.18)	D (D)	0.16 (0.18)	D (D)	0.38 (0.44)	E (E)	0.38 (0.44)	E (E)
SBTR	0.09 (0.10)	D (D)	0.08 (0.12)	D (D)	0.08 (0.12)	D (D)	0.01 (0.02)	D (D)	0.01 (0.02)	D (D)
Overall	**0.48 (0.69)**	**A (B)**	**0.45 (0.60)**	**C (B)**	**0.47 (0.60)**	**C (B)**	**0.53 (0.66)**	**C (B)**	**0.54 (0.66)**	**C (B)**

Notes:

1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).
2. The table headings “E.X.” = Existing, “F.B.” = Future Background, and “F.T.” = Future Total.

13.4.4 Kingston Road / Liverpool Road

The Kingston Road / Liverpool Road intersection operates under traffic signal control. The results of the traffic analysis are provided in **Table 36**.

Under existing conditions, the intersection operates under capacity at overall v/c ratios of 0.47 and 0.76 during the weekday morning and afternoon peak hours, respectively.

Under all future horizon years, the BRT and its relevant network changes have been considered in the Synchro models. As previously noted, increases to the signal cycle length to 140 seconds and general signal timing optimization is recommended in both peak hours as part of the BRT construction.

2030 Horizon Year

In future background conditions in the 2030 horizon year, the intersection operates under capacity at overall v/c ratios of 0.55 and 0.80 during the weekday morning and afternoon peak hours, respectively.

With the site redevelopment, the intersection continues to operate under capacity at overall v/c ratios of 0.56 and 0.81 during the weekday morning and afternoon peak hours, respectively.

2035 Horizon Year

In future background conditions in the 2035 horizon year, the intersection operates under capacity conditions at overall v/c ratios of 0.65 and 0.89 during the weekday morning and afternoon peak hours, respectively.

With the site redevelopment, the intersection continues to operate under capacity at overall v/c ratios of 0.66 and 0.89 during the weekday morning and afternoon peak hours, respectively.

Table 36 Kingston Road / Liverpool Road – Capacity Analysis Results

Horizon:	2025	2025	2030	2030	2030	2030	2035	2035	2035	2035
Scenario:	E.X.	E.X.	F.B.	F.B.	F.T.	F.T.	F.B.	F.B.	F.T.	F.T.
Parameter:	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.31 (0.65)	C (B)	0.69 (0.86)	E (E)	0.71 (0.86)	E (E)	0.76 (0.88)	E (E)	0.74 (0.89)	E (E)
EBT	0.44 (0.86)	C (C)	0.34 (0.74)	D (D)	0.36 (0.75)	D (C)	0.39 (0.92)	D (D)	0.40 (0.92)	D (D)
EBR	0.17 (0.38)	E (B)	0.21 (0.49)	F (C)	0.22 (0.51)	F (C)	0.49 (0.74)	E (D)	0.51 (0.75)	E (D)
WBL	0.38 (0.85)	C (D)	0.65 (0.83)	E (E)	0.65 (0.83)	E (E)	0.73 (0.93)	E (F)	0.73 (0.93)	E (F)
WBT	0.43 (0.49)	C (C)	0.32 (0.57)	D (D)	0.32 (0.58)	D (D)	0.44 (0.63)	D (D)	0.46 (0.64)	D (D)
WBR	0.03 (0.05)	C (C)	0.03 (0.05)	C (D)	0.03 (0.05)	C (D)	0.03 (0.03)	C (D)	0.03 (0.03)	C (D)
NBL	0.68 (0.78)	C (C)	0.72 (0.92)	D (D)	0.71 (0.92)	D (D)	0.70 (0.89)	D (D)	0.70 (0.89)	D (D)
NBT	0.27 (0.61)	C (C)	0.29 (0.67)	C (D)	0.29 (0.67)	C (D)	0.29 (0.73)	C (D)	0.29 (0.73)	C (D)
NBR	0.11 (0.28)	C (C)	0.10 (0.35)	C (C)	0.10 (0.35)	C (C)	0.11 (0.45)	C (D)	0.11 (0.45)	C (D)
SBL	0.15 (0.37)	C (C)	0.20 (0.42)	D (D)	0.20 (0.42)	D (D)	0.20 (0.49)	D (D)	0.20 (0.49)	D (D)
SBT	0.47 (0.41)	C (C)	0.69 (0.57)	D (D)	0.69 (0.57)	D (D)	0.73 (0.61)	D (D)	0.73 (0.61)	D (D)
SBR	0.08 (0.08)	C (C)	0.10 (0.09)	D (D)	0.10 (0.10)	D (D)	0.16 (0.11)	D (D)	0.16 (0.12)	D (D)
Overall	**0.47 (0.76)**	**C (C)**	**0.55 (0.80)**	**D (D)**	**0.56 (0.81)**	**E (D)**	**0.65 (0.89)**	**D (D)**	**0.66 (0.89)**	**D (D)**

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).
2. The table headings “E.X.” = Existing, “F.B.” = Future Background, and “F.T.” = Future Total.

13.4.5 Kingston Road / Highway 401 E-EW Off-Ramp

The Kingston Road / Highway 401 E-EW Off-Ramp intersection operates under traffic signal control. The results of the traffic analysis are provided in **Table 37**.

Under existing conditions, the off-ramp operates under capacity at overall v/c ratios of 0.53 and 0.83 during the weekday morning and afternoon peak hours, respectively.

Under all future horizon years, the BRT and its relevant network changes have been considered in the Synchro models. As previously noted, increases to the signal cycle length to 140 seconds and general signal timing optimization is recommended in both peak hours as part of the BRT construction.

2030 Horizon Year

In future background conditions in the 2030 horizon year, the off-ramp operates at near capacity conditions at overall v/c ratios of 0.71 and 0.88 during the weekday morning and afternoon peak hours, respectively. Busy movements include the shared eastbound in the weekday afternoon peak hour.

With the site redevelopment, the off-ramp will continue to operate at near capacity conditions at overall v/c ratios of 0.75 and 0.93 during the weekday morning and afternoon peak hours, respectively. Busy movements include the shared eastbound in the weekday afternoon peak hour.

2035 Horizon Year

In future background conditions in the 2035 horizon year, the off-ramp operates at near capacity conditions at overall v/c ratios of 0.72 and 0.89 during the weekday morning and afternoon peak hours, respectively. Busy movements include the shared eastbound in the weekday afternoon peak hour.

With the site redevelopment, the off-ramp will continue to operate at near capacity conditions at overall v/c ratios of 0.76 and 0.93 during the weekday morning and afternoon peak hours, respectively. Busy movements include the shared eastbound in the weekday afternoon peak hour.

Table 37 Kingston Road / Highway 401 E-EW Off-Ramp – Capacity Analysis Results

Horizon:	2025	2025	2030	2030	2030	2030	2035	2035	2035	2035
Scenario:	E.X.	E.X.	F.B.	F.B.	F.T.	F.T.	F.B.	F.B.	F.T.	F.T.
Parameter:	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBTR	0.42 (0.87)	B (C)	0.61 (0.90)	C (C)	0.65 (0.96)	C (D)	0.63 (0.92)	C (D)	0.67 (0.97)	C (D)
WBL	0.60 (0.76)	B (D)	0.80 (0.79)	F (F)	0.84 (0.88)	F (F)	0.81 (0.79)	E (F)	0.84 (0.88)	E (F)
WBT	0.28 (0.35)	A (B)	0.29 (0.37)	A (A)	0.34 (0.40)	A (A)	0.36 (0.41)	A (A)	0.41 (0.43)	B (A)
NBL	0.77 (0.82)	D (D)	0.83 (0.89)	E (E)	0.84 (0.89)	E (E)	0.84 (0.89)	E (E)	0.84 (0.89)	E (E)
NBR	0.06 (0.13)	D (D)	0.11 (0.24)	D (D)	0.12 (0.27)	D (D)	0.08 (0.57)	D (D)	0.08 (0.63)	D (D)
Overall	**0.53 (0.83)**	**C (C)**	**0.71 (0.88)**	**D (D)**	**0.75 (0.93)**	**D (D)**	**0.72 (0.89)**	**D (D)**	**0.76 (0.93)**	**D (D)**

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).
2. The table headings "E.X." = Existing, "F.B." = Future Background, and "F.T." = Future Total.

2040 Horizon Year

As per the submitted Terms of Reference and the Ministry of Transportation Ontario (MTO)'s Traffic Impact Study Guidelines, capacity analysis was also provided for the Kingston Road / Highway 401 E-EW Off-Ramp intersection in the 2040 horizon year, summarized in **Table 38**. In future background conditions in the 2040 horizon year, the off-ramp operates at near capacity conditions at overall v/c ratios of 0.74 and 0.90 during the weekday morning and afternoon peak hours, respectively. Busy movements continue to include the shared eastbound (v/c of 0.94) in the weekday afternoon peak hour.

With the site redevelopment, the off-ramp will continue to operate at near capacity conditions at overall v/c ratios of 0.77 and 0.94 during the weekday morning and afternoon peak hours, respectively. The shared eastbound is projected to operate near capacity at v/c of 0.98 in the weekday afternoon peak hour, while operating acceptably in the weekday morning peak hour.

Notwithstanding these future conditions, no further mitigation measures are recommended at this time. It is noteworthy that the capacity constraints only occur during the weekday afternoon peak hour, while morning peak hours yield acceptable operations. The eastbound right turn volumes are also relatively low (up to 35-45 vehicles per peak hour, less than 1 vehicle per minute). Given such low volumes, it would not be reasonable to propose any additional intersection improvements (such as an additional eastbound right turn lane, especially since that increases conflicts with pedestrians and cyclists in the study area). Traffic operations in the study area should be monitored especially as the impacts of the Kingston BRT are more fully realized. Should the need arise, other opportunities to enter Highway 401 are provided either along Whites Road (those on-ramps are free-flow) or further westwards. Site-related impacts on the shared eastbound through-right are minimal (in the order of 3%) in the weekday afternoon peak hour.

Table 38 Kingston Road / Highway 401 E-EW Off-Ramp – 2040 Horizon Capacity Analysis Results

Horizon:	2040	2040	2040	2040
Scenario:	Future Background	Future Background	Future Total	Future Total
Parameter:	V/C	LOS	V/C	LOS
EBTR	0.65 (0.94)	C (D)	0.70 (0.98)	C (D)
WBL	0.81 (0.79)	E (F)	0.85 (0.86)	F (F)
WBT	0.38 (0.42)	A (A)	0.42 (0.44)	A (A)
NBL	0.84 (0.89)	E (E)	0.85 (0.89)	E (E)
NBR	0.08 (0.57)	D (D)	0.11 (0.63)	D (D)
Overall	**0.74 (0.90)**	**D (D)**	**0.77 (0.94)**	**D (D)**

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).

13.5 Unsignalized Intersections Analysis

The traffic analysis results of the unsignalized intersections (including the site access) is provided in **Table 39**. Note that along Kingston Road, no left turns are permitted onto or from Kingston Road given the centre median BRT.

Under all future scenarios, all unsignalized intersections operate at acceptable levels-of-service and delays in the weekday peak hours at LOS C or better.

Table 39 Unsignalized Intersections – Capacity Analysis Results

Horizon:	2025	2025	2030	2030	2030	2030	2035	2035	2035	2035
Scenario:	E.X.	E.X.	F.B.	F.B.	F.T.	F.T.	F.B.	F.B.	F.T.	F.T.
Parameter:	LOS	Delays	LOS	Delays	LOS	Delays	LOS	Delays	LOS	Delays
Dixie Road / North Site Driveway / Future North Site Driveway										
EBLR	A (A)	9.0 (9.3)	A (A)	8.9 (9.2)	B (B)	10.3 (10.1)	A (A)	8.7 (8.9)	A (A)	10.0 (9.6)
NBTL	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
SBTR	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
Dixie Road / Middle Site Driveway										
EBTLR	A (A)	8.9 (9.4)	A (A)	8.8 (9.2)	-- (--)	-- (--)	A (A)	8.6 (8.7)	-- (--)	-- (--)
WBTLR	A (A)	0.0 (8.7)	A (A)	8.4 (8.7)	-- (--)	-- (--)	A (A)	0.0 (9.2)	-- (--)	-- (--)
NBTLR	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	-- (--)	-- (--)	A (A)	0.0 (0.0)	-- (--)	-- (--)

Horizon:	2025	2025	2030	2030	2030	2030	2035	2035	2035	2035
Scenario:	E.X.	E.X.	F.B.	F.B.	F.T.	F.T.	F.B.	F.B.	F.T.	F.T.
Parameter:	LOS	Delays	LOS	Delays	LOS	Delays	LOS	Delays	LOS	Delays
SBTLR	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	-- (--)	-- (--)	A (A)	0.0 (0.0)	-- (--)	-- (--)
Dixie Road / South Site Driveway / Future South Site Driveway[4]										
EBTL (E.X.)	A (A)	9.2 (9.0)	A (A)	8.9 (9.0)	-- (--)	-- (--)	A (A)	8.5 (8.6)	-- (--)	-- (--)
EBLR (F.T.)	-- (--)	-- (--)	-- (--)	-- (--)	A (A)	9.1 (8.9)	-- (--)	-- (--)	A (A)	9.1 (8.9)
WBTR (E.X.)	A (A)	8.8 (8.3)	A (A)	8.8 (8.3)	-- (--)	-- (--)	A (A)	0.0 (0.0)	-- (--)	-- (--)
NBTL (F.T.)	-- (--)	-- (--)	-- (--)	-- (--)	A (A)	0.0 (0.0)	-- (--)	-- (--)	A (A)	0.0 (0.0)
SBLR (E.X.)	A (A)	5.8 (5.9)	A (A)	5.8 (5.8)	-- (--)	-- (--)	A (A)	0.0 (0.0)	-- (--)	-- (--)
SBTR (F.T.)	-- (--)	-- (--)	-- (--)	-- (--)	A (A)	0.0 (0.0)	-- (--)	-- (--)	A (A)	0.0 (0.0)
Kingston Road / Future Site Driveway										
EBT (F.T.)	-- (--)	-- (--)	-- (--)	-- (--)	A (A)	0.0 (0.0)	-- (--)	-- (--)	A (A)	0.0 (0.0)
EBR (F.T.)	-- (--)	-- (--)	-- (--)	-- (--)	A (A)	0.0 (0.0)	-- (--)	-- (--)	A (A)	0.0 (0.0)
WBT (F.T.)	-- (--)	-- (--)	-- (--)	-- (--)	A (A)	0.0 (0.0)	-- (--)	-- (--)	A (A)	0.0 (0.0)
NBR (F.T.)	-- (--)	-- (--)	-- (--)	-- (--)	B (C)	13.2 (19.7)	-- (--)	-- (--)	B (C)	13.2 (22.5)

Notes:

1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).
2. The table headings “E.X.” = Existing, “F.B.” = Future Background, and “F.T.” = Future Total.
3. All delays are in seconds (s).
4. The existing south site driveway is adjacent to the existing Tribute lands access and therefore was modelled as a four-legged TWSC intersection under existing and future background conditions. With the site redevelopment, the southern site access will no longer be provided across the future Tribute development access and is modelled as a T-intersection (with Dixie Road as the major street and the site access as the minor street).

13.6 Traffic Operations Analysis Summary

The study area road network is expected to operate at increasingly busy conditions in all future horizon years, especially in the weekday afternoon peak hour. However, all of the analyzed intersections and their movements operate under capacity and at acceptable delays. As the area's transportation context continues to evolve with the completion of the Kingston Road BRT, residents and visitors to and from the site and in the general community will be afforded with viable alternatives to travel without the use of single-occupancy vehicles during weekday peak hours.

Based on the foregoing analysis and the nature of the future area context, it is proposed that no mitigation measures nor improvements are required aside from signal timing changes at intersections along Kingston Road to better serve vehicle travel demand alongside the centre median BRT.

As the area develops, the reviewing agencies including the MTO should continue to monitor the traffic operations of the study area intersections and highway ramps to assess the traffic growth into the future.

14.0 SUMMARY AND CONCLUSIONS

The following outlines the key transportation study findings for the proposed development.

Introduction

1. BA Group has been retained by Resident to provide transportation advisory services in relation to a proposed redevelopment of the lands located at 1095 Kingston Road in the City of Pickering and Region of Durham. This report has been prepared as part of an initial ZBA application being made to the City and Region.

Existing Site

2. The site is currently occupied by a single-storey building, including 86,782 ft^2 (or approximately 8,062 m^2) in gross floor area ("GFA"), that operates a sports complex and miscellaneous commercial stores. There are approximately 275 surface parking spaces provided to support the existing building. Existing loading facilities are located to the rear of the building.

3. Vehicle access to the property is currently provided by three driveways with all-moves accesses along Dixie Road. The intersection of Kingston Road and Dixie Road is signalized with a designated northbound left-turn lane.

4. The site is currently subject to the as-of-right permissions and transportation standards per City of Pickering Zoning By-law 3036 (as amended).

Development Proposal

5. The development proposal includes a residential development with two buildings comprising a total of 1,492 residential units.

6. It is proposed to demolish the existing buildings and surface parking as part of the proposed development. In addition, a new right-in / right-out access along Kingston and two new all-moves accesses along Dixie Road will be provided.

Planning and Policy Context

7. The site is subject to several provincial, regional, and municipal policies and plans relevant to the site from a transportation context. Overall, these documents indicate support for increasing development near existing and future transit corridors, prioritizing transit and active transportation to reduce single-occupant vehicle travel and applying TDM measures to encourage travel through sustainable modes.

8. The Region and City recognize Kingston Road as a key corridor or "main street", expected to deliver future rapid transit and cycling infrastructure.

9. OPA 38 (as approved) incorporates the policies and schedules of the Kingston Mixed Corridor and Brock Mixed Node Intensification Plan and Draft Urban Design Guidelines, which guides intensification and redevelopment along the Kingston Road corridor as a walkable, transit-supportive corridor. The site is located within the Dunbarton / Liverpool Precinct. Within this Precinct, a new east-west public connection is proposed to connect the future Walnut Lane extension to Dixie Road.

Area Transportation Context

10. The site is well-located relative to major roadway connections provided across the City and the Region, including Highway 401, Kingston Road, and Dixie Road. Roadway widenings along Kingston Road are expected to accommodate bus lanes. In addition, new roadways are proposed near the site as identified in OPA 38, including a southern extension of Walnut Lane to the City Centre neighbourhood, a new east-west public roadway (with a 20-metre ROW) extending from Dixie Road to the Walnut Lane extension, and a new L-shaped private roadway, extending from Dixie Road to the Walnut Lane extension.

11. A bus stop, providing transit service via DRT and DRT Pulse Express is located on Kingston Road at Dixie Road, abutting the site's northern property line. In addition, GO Transit service can be accessed east of the site on Kingston Road at Walnut Lane. Overall, these services provide direction connections to key transit destinations including the Pickering Town Centre (Pickering Parkway Terminal) and the Pickering GO Station. In the future, the site's transit connectivity will significantly improve as a result of the planned DSBRT that will extend from Scarborough Centre to Downtown Oshawa and the Metrolinx GO Expansion project that will improve travel times, increase frequency, and expand rail lines.

12. It is noted that the proposed design of the DSBRT provides exclusive bus lanes along Kingston Road at the location of the site, which presents a significant opportunity to build a transit-oriented development with high density. This type of development and transit accessible location is an appropriate setting to provide reduced parking at the site.

13. The site is centrally located along the Kingston Road corridor, just outside (to the west) of the City Centre. There are a mix of uses along this corridor that can be accessed by walking, however, the vehicle-oriented design of the area (i.e. large surface parking lots, wide streets, lack of continuous sidewalks and crossings) does not prioritize pedestrian travel. Sidewalks and pedestrian crossing opportunities are generally provided east and north of the site. Improvements to the pedestrian realm and infrastructure are proposed in the area and along the new east-west public road, east of the site. On-site improvements include a multi-use path, POPS, and gateway plaza surrounding the site.

14. Near the site, cycling infrastructure is currently limited. Future plans for cycling in the Region include extending cycling infrastructure along Kingston Road and along other nearby roadways including the new east-west public connection, Dixie Road, and the Walnut Lane extension. As well, an active transportation bridge is proposed south of the site, over Highway 401, providing improved connectivity to the areas south of the site.

Vehicle Parking

15. The site is primarily subject to the City of Pickering Zoning By-law 3036 vehicle parking standards, as amended by site-specific zoning by-law 2324/86. Application of the subject vehicle parking requirements results in a minimum of 2,611 vehicular parking spaces, combined for both resident and residential visitor parking spaces.

16. Although the site is not included in the City of Pickering Comprehensive Zoning By-law 8419/24 and is to be further reviewed throughout the zoning process following OPA 38, the latest city-wide standards are currently being considered for the proposed development. Application of the Comprehensive Zoning By-law 8419/24 for "All Other Zones" results in a total requirement of 2,238 vehicle parking spaces, inclusive of 1,865 resident parking spaces and 373 residential visitor parking spaces.

17. It is proposed to reduce the minimum vehicle parking standards of the site, including a resident rate of 0.61 spaces per unit and a residential visitor rate of 0.15 spaces per unit. Application of the proposed minimum parking standards results in a requirement 1,133 vehicle parking spaces, inclusive of 910 resident parking spaces and 223 residential visitor parking spaces.

18. The architectural plans illustrate a total vehicular parking supply of 1,143 parking spaces, including 920 resident spaces (approximately 0.62 spaces per unit) and 223 residential visitor spaces (0.15 spaces per unit) to support the site. The vehicular parking spaces will be located on the P1, Ground Floor, Mezzanine, and Podium Levels 2, 3, 4, 5, 6 of the proposed development. Access to the vehicular parking spaces will be provided via two parking ramps which can both be primarily accessed from three proposed site driveways, including two driveways off Dixie Road and another driveway off Kingston Road. In addition, EV (i.e., 40% EV rough-in and 10% EV ready) parking spaces are provided in accordance with the City's ISDS.

19. Accessible parking is required in accordance with the City of Pickering Traffic and Parking By-law 6604/05, as amended, which calculates the required number of accessible parking spaces based on the proposed residential visitor parking supply. As such, a total of 7 accessible parking spaces, consisting of 3 Type A and 4 Type B spaces, are required. The current proposal incorporates a total of 23 accessible parking spaces (7 residential visitor spaces and 16 resident spaces) which are located near the parking elevator lobbies on multiple parking levels, meeting and exceeding the minimum requirements.

20. It is recognized that the in-force minimum parking requirements of the City of Pickering Zoning By-law 3036 and the City of Pickering Zoning By-law 8419/24 standards overstate the parking needs of contemporary developments in transit-accessible areas of Pickering, particularly along the Kingston Road corridor near the Pickering GO and City Centre area. The proposed parking standards are appropriate based on the following:

    - Policy and transportation context (e.g., rapidly evolving transit and active transportation facilities) applicable to the site;
    - Review of supportive parking demand, approvals, and sales data, indicating declining parking needs over time; and
    - Additional support from the site's proposed TDM strategy to reduce single-occupancy vehicle travel for all uses.

21. The proposed vehicle parking supply is considered appropriate and is expected to meet and slightly exceed the anticipated resident and visitor needs of the site.

Bicycle Parking

22. The site is primarily subject to City of Pickering Zoning By-law 3036 (as amended) which does not specify minimum bicycle parking requirements.

23. The City of Pickering Comprehensive Zoning By-law 8149/24 provides city-wide bicycle parking standards that are consistent with the latest bicycle parking standards in the City's Integrated Sustainable Design Standards for Tier 1. Although the site is not included in the Comprehensive Zoning By-law and is to be further reviewed throughout the zoning process following OPA 38, the latest city-wide standards are currently being considered for the proposed development. Application of Zoning By-law 8149/24 and Integrated Sustainable Development Guidelines (Tier 1) standards to the proposed development results in a minimum bicycle parking requirement of 746 spaces for the long-term use and 149 spaces for the short-term use. As part of this requirement, a minimum of 15% long-term resident bicycle spaces are to be designated as electric.

24. The architectural plans illustrate a supply of 895 bicycle parking spaces, including 746 long-term spaces and 149 short-term spaces. The long-term resident bicycle parking spaces are provided on the Ground Floor and Mezzanine Level of the proposed development. These spaces may be accessed from the publicly accessible building entrances and building elevators located off Kingston Road, Dixie Road, and the site's internal pathways. The short-term resident bicycle parking is provided on the Ground Floor and may be accessed from the publicly accessible building entrances. These spaces may be accessed from the publicly accessible building entrances and building elevators located off Kingston Road and the site's internal pathways.

25. In addition, 111 of the long-term resident bicycle spaces will be designated as electric, meeting the minimum 15% EV requirement as per the City's ISDS .

26. The proposed bicycle parking supply meets the minimum recommended requirements and provides ample opportunities for future cyclists of the site.

Loading

27. The site is primarily subject to the City of Pickering Zoning By-law 3036 (as amended) loading standards, which result in no minimum requirement.

28. The City of Pickering Comprehensive Zoning By-law 8149/24 provides city-wide loading standards. Although the site is not included in the Comprehensive Zoning By-law and is to be further reviewed throughout the zoning process following OPA 38, for comparison purposes, there are no minimum requirements for the proposed development. However, City of Pickering Zoning By-law 8149/24 Section 5.14.1 states that loading activity shall be provided and maintained on the same lot of the principal use. The minimum vertical clearance shall be 7.0 metres for garbage collection vehicles, as governed by Durham Region Waste Collection By-law 46-2011. It is proposed to adopt the minimum dimensions for garbage collection purposes, as stated by the City of Pickering's Comprehensive Zoning By-law.

29. Since the City's Comprehensive Zoning By-law currently does not indicate any specific minimum loading requirements, it is appropriate to consider the practical needs of the site based upon a review of a nearby municipality with progressive loading standards within an urban context. Application of the City of Toronto Comprehensive Zoning By-law standards results in a minimum loading requirement of 2 Type G spaces (used for garbage collection purposes) and 2 Type C spaces (used for residential moving purposes). As a practical and conservative approach, it is proposed to adopt the minimum number of spaces required by the City of Toronto.

30. The architectural plans illustrate a loading supply of 4 loading spaces, including 2 loading spaces for residential garbage collection purposes (i.e., 1 per building) and 2 loading spaces for residential moving purposes (i.e., 1 per building). In reference to Durham Region's Waste Management Guidelines, appropriate bin staging areas are proposed at the loading facilities of the buildings.

31. The proposed loading supply and arrangements meet the recommended minimum requirements and accommodates the expected moving and refuse collection activity for the new buildings, and therefore, is considered appropriate for the site.

Pick-up / Drop-off

32. While not required by the Zoning By-law, passenger pick-up / drop-off facilities are proposed on the site in the form of a highly visible pick-up / drop-off loop at the centre of the site, providing access to the proposed residential lobbies. This loop can be accessed from the proposed southern site driveway off Dixie Road. The facility can support a total accumulation of 12 vehicles.

33. The proposed pick-up / drop-off facilities are expected to serve as a convenient short-term parking strategy for day-to-day activities (i.e., pizza delivery, passenger pick-up / drop-off, ride-sharing services).

34. While not formally required from a Zoning By-law perspective, it is anticipated that the proposed pick-up / drop-off facilities will benefit future residents and visitors and meet the practical needs of the site while limiting vehicular impacts on the area road network.

Transportation Demand Management

35. Based upon the Durham Region's Traffic Impact Study Guidelines and Draft TDM Guidelines for New Development (2021), a TDM Plan is required to support the proposed development.

36. Specific TDM strategies proposed include, but are not limited to, the following:

    - Provide a reduced vehicle parking supply;
    - Provide pick-up / drop-off facilities on-site to encourage ride-sharing activities;
    - Provide bicycle parking that exceeds the minimum as-of-right Zoning By-law requirements (i.e., meets City of Pickering Comprehensive Zoning By-law 8149/24);
    - Provide enhanced active transportation connections (i.e., internal paths and multi-use trail) to transit stops within and around the site; and
    - Provide a transit-oriented development with various nearby and on-site services and amenities.

37. It is noted that the strategies are to be further refined and discussed with the City and Region throughout the ZBA and SPA processes.

Functional Road Plan

38. To assist in the development of the functional road plan at the site, Metrolinx has provided a high-level concept plan for the design of the DSBRT between Dixie Road and Merritton Road, as an interim output from its ongoing process (i.e., TPAP approved 30% preliminary design in 2022). As such, the ultimate functional design of Kingston Road (i.e. 45-metre ROW) at the site was prepared for discussion purposes only with the City and Region.

39. As part of the proposed development, three driveway accesses will be provided. A right-in / right-out access off Kingston Road is provided for passenger vehicle activity. Additionally, two all-moves accesses are provided off Dixie Road for passenger vehicle and loading activity.

40. The design of the site accesses provides appropriate curb radii (i.e., 7.5 metres) and driveway widths (i.e., 6.5 or 7.5 metres for two-way configuration), based on City of Pickering Standard Drawing P-605 (Medium to High Density Residential, Commercial, and Industrial Driveway Access).

41. The provision of an additional right-in / right-out only access along Kingston Road provides a flexible, convenient, efficient, and organized site design from a transportation planning perspective, offering greater travel opportunities to / from and throughout the site. The provision of a supporting right-turn only lane from Kingston Road is appropriate from a traffic operations perspective, with respect to the right-turn lane threshold for a 4-lane Type B Arterial roadway, minimized impacts on eastbound through traffic with a median in the interim condition, physical separation of eastbound and westbound through traffic in the ultimate condition (completed DSBRT). For the right-out only lane, space is provided to accommodate of potential queueing on-site and limit impacts on eastbound traffic along Kingston Road.

Multimodal Travel Demand Forecasting

42. The site is expected to generate 670 two-way gross person trips during each of the weekday morning and afternoon peak hours.

Traffic Volume Forecasting

43. Turning movement counts were conducted by Spectrum Traffic Inc. on behalf of BA Group for the study area intersections in May of 2024. The counts were completed during the weekday morning and afternoon peak periods (the busiest hours of traffic on weekdays are generally between 7:00 a.m. to 10:00 a.m. and 4:00 p.m. to 7:00 p.m.).

44. Based on discussions with the City of Pickering, Region of Durham and Ministry of Transportation Ontario, the analysis horizons presented in this report include the 2030 year (buildout year that is 5 years from today) and 2035 year (10 years from today) for all study area intersections. Based on the MTO's Traffic Impact Study Guidelines, analysis will also be provided for the Highway 401 ramps up to the 2040 year (15 years from today).

45. A total of 13 development proposals are expected to be built out, including almost 23,000 residential units and 50,000 m^2 non-residential GFA.

46. The background development volumes considered on the study area road network would represent a substantial amount of corridor and ramp growth even to the furthest 2040 horizon year if considered relative to baseline existing traffic volumes. Based on the foregoing, no additional corridor growth was added.

47. For the purposes of all future conditions analysis, recognizing the increasing attractiveness of the transit travel mode as the area continues to develop, existing Kingston Road corridor volumes are reduced by 10% in each horizon year.

48. Other background growth traffic volumes were not further adjusted given that a majority of the traffic studies already incorporate a similar reduction in their respective trip generation forecasts.

49. Other potential changes to pre-existing network volumes and background development traffic assignments in the study area have been considered based upon:

    - Changes to intersection configurations along the Kingston Road corridor to accommodate the BRT, including the prohibition of turns onto Kingston Road at unsignalized intersections as a result of the BRT median. This also includes the addition of U-turns at proximate signalized intersections to compensate for the loss of left turns.

    - Signal timings have also been revised to include fully protected left turns instead of protected and permitted left turns. North-south pedestrian crossing times (including "walk" and "flash-don't-walk" times) have also been increased where the width of the intersection has increased.

50. The existing site generates approximately 55 and 110 two-way vehicle trips in the weekday morning and afternoon peak hours, respectively. With the redevelopment, the existing site traffic volumes will be removed from the study area road network and replaced with the new site traffic volumes.

51. In the 2030 horizon year, the site will generate 360 and 360 auto driver trips in the peak hours. In the 2035 horizon year, the site will generate 340 and 335 auto driver trips in the peak hours. In the 2040 horizon year, the site will generate 320 and 320 auto driver trips in the peak hours. The declining site trips in the further horizon years represents the site's increasing use of the transit travel mode, as interpolated from the DSBRT Study mode split forecasts for the 2041 year.

52. For comparison purposes, in the 2030 horizon, the site will generate 305 and 250 additional vehicle trips during the weekday morning and afternoon peak hours, respectively, relative to existing conditions. By the 2035 horizon, the site will generate 285 and 225 additional vehicle trips during the weekday morning and afternoon peak hours, respectively, relative to existing conditions. By the 2040 horizon, the site will generate 265 and 210 additional vehicle trips during the weekday morning and afternoon peak hours, respectively, relative to existing conditions.

Traffic Operations Analysis

53. Under future conditions with the BRT in operations, the following revisions have been made to the signal timing plans at intersections along Kingston Road:

    - Coded fully protected left turns instead of protected and permitted left turns.
    - North-south pedestrian crossing times (including "walk" and "flash-don't-walk" times) as well as intergreen times (i.e., amber and all-red) have been increased where the width of the intersection has increased.
    - Increased cycle lengths to 140 seconds (instead of the current 120 seconds) at all signalized intersections along Kingston Road to account for the increased intergreen times and pedestrian crossing times. Cycle lengths at intersections of a similar context (such as at intersections along Highway 7 in the City of Markham with VIVA bus rapid transit) are up to 150 seconds.
    - Revised the recall mode at study area intersections from Coordinated Maximum (C-Max) to Coordinated Minimum (C-Min), and those coded as Maximum (Max) to Minimum (Min). This provides flexibility to each signal phase from its minimum split time, rather than forcing maximum splits along both the east-west and north-south travel directions at the study area intersections (which would effectively act as fixed timing). From observing the signal timings in the field, it appears as though signal timings are operating under coordinated minimum and minimum times, given that there is fluctuation in split times at the study area's signalized intersections. However, the received Synchro model signal timings provided by the Region all code C-Max and Max recall modes. This does not seem to reflect field conditions.

54. The Kingston Road / Fairport Road intersection is expected to operate at under capacity conditions through to the furthest horizon year of 2035, even with the site redevelopment. Overall v/c are up to 0.84.

55. The Kingston Road / Dixie Road intersection is expected to operate at under capacity conditions through to the furthest horizon year of 2035, even with the site redevelopment. Overall v/c are up to 0.88.

56. The Kingston Road / Walnut Lane intersection is expected to operate at under capacity conditions through to the furthest horizon year of 2035, even with the site redevelopment. Overall v/c are up to 0.66.

57. The Kingston Road / Liverpool Road intersection is expected to operate at busy but under capacity conditions through to the furthest horizon year of 2035, even with the site redevelopment. Overall v/c are up to 0.89.

58. The Kingston Road / Highway 401 E-W Off-Ramp intersection is expected to operate at busy but under capacity conditions through to the furthest horizon year of 2035, even with the site redevelopment. The off-ramp movements operate under capacity at v/c of up to 0.89 in the peak hours. In the MTO's horizon year of 2040, the off-ramp movements continue to operate under capacity at v/c of up to 0.89, but the eastbound through movement operates at v/c of 0.98. Notwithstanding these future conditions, no further mitigation measures are recommended at this time. It is noteworthy that the capacity constraints only occur during the weekday afternoon peak hour, while morning peak hours yield acceptable operations. The eastbound right turn volumes are also relatively low (up to 35-45 vehicles per peak hour, less than 1 vehicle per minute). Given such low volumes, it would not be reasonable to propose any additional intersection improvements (such as an additional eastbound right turn lane, especially since that increases conflicts with pedestrians and cyclists in the study area). Traffic operations in the study area should be monitored especially as the impacts of the Kingston BRT are more fully realized. Should the need arise, other opportunities to enter Highway 401 are provided either along Whites Road (those on-ramps are free-flow) or further westwards. Site-related impacts on the shared eastbound through-right are minimal (in the order of 4%) in the weekday afternoon peak hour.

59. Under all future scenarios, all unsignalized intersections operate at acceptable levels-of-service and delays in the weekday peak hours at LOS C or better.

60. The study area road network is expected to operate at increasingly busy conditions in all future horizon years, especially in the weekday afternoon peak hour. However, all of the analyzed intersections and their movements operate under capacity and at acceptable delays. As the area's transportation context continues to evolve with the completion of the Kingston Road BRT, residents and visitors to and from the site and in the general community will be afforded with viable alternatives to travel without the use of single-occupancy vehicles during weekday peak hours. Based on the foregoing analysis and the nature of the future area context, it is proposed that no mitigation measures nor improvements are required aside from signal timing changes at intersections along Kingston Road to better serve vehicle travel demand alongside the centre median BRT. As the area develops, the reviewing agencies including the MTO should continue to monitor the traffic operations of the study area intersections and highway ramps to assess the traffic growth into the future.

Overall

61. Based on a comprehensive review of requirements, applicable standards, and provisions (and any associated justifications), all transportation-related elements (i.e., vehicle parking, bicycle parking, loading, pick-up / drop-off, TDM Plan, and functional road plan) of the development plan remain appropriate and are anticipated to meet the future needs of the site.

62. No mitigation measures nor improvements are required on the external area road network aside from signal timing changes at intersections along Kingston Road to better serve vehicle travel demand alongside the future DSBRT.

Appendix A:
Pre-Consultation Meeting Summary

City of PICKERING

Minutes/Meeting Summary

Pre-Consultation Meeting
October 23, 2024
10:00 am
Microsoft Teams

Subject: 1095 Kingston Road (PRE 35/24)

Applicant: 1095 Kingston Road Ltd.
Ornella Richichi, Resident
Nik Papapetrou, Resident
Tom Bosnjak, Resident
Stephanie Chong, Architect, BDP Quadrangle
Sadaf Rabbani, BDP Quadrangle
Dave Poole, Dillon

Attendees: Mallory Nievas, The Biglieri Group (mnievas@thebiglierigroup.com)
Fedrico Palacios, The Biglieri Group

Peter Castellan, Region of Durham, Works Department
Claire Wallis-South, Region of Durham, Works Department
Peter Deluca, Ministry of Transportation
Alexandre Thibault, WSP on behalf of the Canadian National Railway (CNR)

Nilesh Surti, Division Head, Development Review & Urban Design
Paal Helgesen, Division Head, Water Resources & Development Services
Robert Watson, Fire Prevention Officer
Carl Kolbe, Manager, Building Services & Deputy CBO
Arnold Mostert, Manager, Landscape & Parks Development
Déan Jacobs, Manager, Policy & Geomatics
Nadeem Zahoor, Manager, Transportation & Traffic
Irina Marouchko, Manager, Water Resources
Laura Calvelli, Supervisor, Development Approvals
Lalita Paray, Senior Planner, Sustainability
Bahar Ebrahimi, Senior Zoning Examiner
Amanda Dunn, Principal Planner, Development Review & Urban Design
Tahani Ismael, AMANDA Business Specialist

Item/ Ref #	**Details, Discussion & Conclusion** (summary of discussion)
1.	**Proposal**
	• The subject lands are located at the southwest intersection of Dixie Road and Kingston Road and has a total area of approximately 20,901 square metres with 240 metres of frontage along Kingston Road. The lands are currently occupied by a number of commercial and recreational businesses. The site currently has three vehicular accesses onto Dixie Road.

Item/ Ref #	Details, Discussion & Conclusion (summary of discussion)
	• The applicant is proposing a high-density residential development comprised of four 35-storey towers connected by a single podium ranging in height between 1 and 10 storeys. A total of 1,518 residential units are proposed with a total of 1,213 parking spaces proposed within one level of underground parking and also located on the ground floor, mezzanine and podium levels of floors 2 to 5. Pedestrian open space is proposed on the roof of the one-storey podium structure, and indoor amenity space is conceptualized on the ground, mezzanine and second floor plans.
2.	**Type of Application**
	• **Official Plan Amendment (major), and** • **Zoning By-law Amendment (major)** Note that a separate pre-consultation will be required for a future **Site Plan** application.
3.	**Discussion**
Region of Durham, Planning Department	Detailed comments have not yet been received from the Region of Durham, Planning Department, and will follow in separate cover once received.
Claire Wallis-South Region of Durham, Works Department *(via email)*	**General Comments** Comments provided are based on currently known information and subject to change. **Municipal Servicing** Density: We will require confirmation from the Applicant on the Site's expected sanitary discharge calculated in accordance with the Region's Design Specifications for Sanitary Sewers based on the proposed population once total number of units and number of bedrooms per unit have been established for the site. Note, the Region considers dens, flex spaces, or other similar spaces as an additional bedroom. Sanitary Servicing: Currently the site is serviced via the existing 1,050 mm Trunk Sanitary Sewer (TSS) located within an easement approximately 13.50m wide at the south limits of the site. This existing TSS shall also service the proposed development. Proposed servicing shall be facilitated via an inspection maintenance hole on the private property, offset 1.5m from the existing easement. The Region would prefer that a proposed connection to the existing TSS be made via an existing maintenance hole. The unused, existing service shall be abandoned and plugged at the main.

Item/ Ref #	Details, Discussion & Conclusion (summary of discussion)
	Sanitary Servicing for this and other proposed developments in the greater sanitary drainage area is constrained due to limited capacity in the downstream sanitary sewers to the Liverpool Sanitary Sewage Pumping Station (SSPS) and existing forcemain. The Region is in the process of confirming capacity limitations and working to determine potential upgrades as development proceeds. The Region will continue to monitor and analyze flow in the trunk sanitary sewer and Liverpool SSPS as intensification in this service area moves forward. Projects to increase capacity in the system over time have been identified in the 2023 Development Charge Background Study. Sanitary Capacity is allocated on a first come, first serve basis at the time of signing a development agreement. **Water Supply** The Region expects a significant population increase and demand on the limited distribution of watermains within this service area. The Region recommends that the full build-out of this proposed development, be supported by a looped secondary water supply to further backup domestic water service and fire line. The Applicant shall seek out a potential secondary water supply via extensions of existing or proposed watermains. It is recommended that the Applicant consult with the neighbouring landowners/developers regarding a proposed watermain extension within a future local road allowance from Walnut Lane to Dixie Road. Until a secondary water supply is available to support the full build-out of this proposed development, the Region may limit water servicing on a tower-by-tower basis. The site is within the Zone 1 water pressure district for the City of Pickering. The estimated static water pressure exceeds the maximum allowance of 550 kpa (80 psi); therefore, private pressure reducing valves will be required. The site is currently serviced via the existing 30 mm diameter, dead-ended watermain within the Dixie Road right-of-way. The existing services are as per Region standard S-230.011 – long side, with a 100 mm diameter domestic service and a 200 mm diameter fire line. Due to the height of the proposed towers, it is likely that the existing water services will not be suitable. If required, the Region may permit a single domestic water service and two proposed fire lines with a main line valve between the fire lines for each residential tower. Water services shall be extended directly to the proposed water meter/mechanical room of the proposed tower. Any unused existing water service shall be abandoned and plugged at the main.

Item/ Ref #	Details, Discussion & Conclusion (summary of discussion)
	Transportation A 15m x 9m sight triangle is required at the intersection of Kingston Road and Dixie Road. The sight triangle is to be conveyed to the Region free and clear of any encumbrances. The Region will not support the proposed Kingston Road access. All access to the Site shall be via Dixie Road. The Region will require the submission of a Traffic Impact Study. The applicant's consultant must submit a Terms of Reference to Doug Robertson (doug.robertson@durham.ca) for review and approval prior to preparing the study. A Stormwater Management Report is required. Contact Antony Manoharan (antony.manoharan@durham.ca) for the Region's requirements. **Bus Rapid Transit** The Region does not require any additional widening on Kingston Road. 200m west of Dixie Road to 200m east of Bainbridge Drive is currently undergoing a detailed design for the Kingston Road Bus Rapid Transit (BRT) by the Rapid Transit Office. The proposed design includes a road widening to incorporate dedicated bus lanes and transit infrastructure and upgrades to utilities and pedestrian/active transportation facilities. The Applicant will be responsible for coordinating with the Region of Durham and plans for the Kingston Road BRT project. **Waste** The Region of Durham will provide waste collection service to residential units on private property in the City of Pickering if the site meets the Technical and Risk Management Guidelines for Municipal Waste Collection Services on Private Property and for New Residential Developments in Durham Region (Technical Guidelines for Multi-Residential Service (durham.ca)). Refer to the Region of Durham Waste Management By-law 2024-009. Recycling to all residential homes and apartments is required in Ontario and currently in Durham Region. On June 3, 2021, Ontario filed O.Reg. 391/21 under the *Resource Recovery and Circular Economy Act* made product producers responsible for the Blue Box program. Please see O.Reg. 391/21 for full details. Durham's recycling program is now managed by Circular Materials, the administrator of the common collection system and national not-for-profit organization that is committed to building an efficient and effective recycling system in Ontario. Visit Circular Materials for more information. A Waste Management Plan must be submitted to the Region with the future Site Plan Application if the proponent wishes to receive municipal collection. The plan must present in detail how the site meets Regional

Item/ Ref #	Details, Discussion & Conclusion (summary of discussion)
	guidelines. Commercial waste must be separate from residential waste as per O. Reg 103/94. The Waste Management Plan for multi-storey residential buildings must indicate how residents will dispose of their source separated waste material from their units, and how the property maintenance staff will manage residential waste material prior to collection. This should include dimensions of waste storage rooms in the proposed site, sufficiently sized in a manner that addresses Durham Region's waste diversion programs and ensures sufficient space and movement for all waste bins. A tri-sorter is acceptable and recommended for all multi-storey buildings in Durham Region. Those sites with greater than 30 units must install compactors to properly manage residential waste. If the proposed site has a retail/commercial component, residential waste must be managed in a separate area and not be comingled. Refer to O.Reg 103/94. For multi-storey residential buildings where internal collection by waste vehicles is proposed, overhead clearance to enable tip of front-end bins must be shown on all drawings. Private roadways and driveways must be designed to allow the truck to move into and out of the site without exiting onto a public roadway in a reverse motion. Where trucks travel over underground parking, load weight of a waste vehicle must be confirmed and engineered. **Development Charges/Agreement** In keeping with the Region of Durham Development Charge By-laws, development charges will be applicable prior to the issuance of building permit(s). The applicant shall enter into a Regional Servicing Agreement for all Regional works proposed within the public right-of-way. Development charge credits may be applicable. Refer to the Region of Durham Development Charge By-law. A copy of any/all demolition permit(s) will be required to receive DC credit(s). **Submission Requirements** Should the applicant choose to proceed with this application, the following will be required: • **Traffic Impact Study** • **Site Servicing Plan** • **Site Grading Plan** • **Functional Servicing Report** • **Stormwater Management Report** Contact: Claire.Wallis-South@durham.ca

Item/ Ref #	Details, Discussion & Conclusion (summary of discussion)
Peter DeLuca Senior Project Manager, Ministry of Transportation (*via email*)	Please accept these comments as “preliminary”, as the Ministry reserves the right to provide formal comments, once the full-size plans and required reports are submitted for review. **General Site Plan Comments:** • The subject site is within MTO’s Permit Control Area and as such, MTO Site Plan Approval and an MTO Permit will be required prior to any construction activities • A 14 metre minimum setback is required from the Highway 401 and associated service roads property line. The current ROW as well as a 14 metre MTO setback should be clearly labeled on all drawings that will be provided for the Ministry’s review and comments • Please be aware that no feature, amenity or operational arrangement (such as, but not limited to, fire-routes, emergency access/exits, parking, loading docks, access to loading docks, stormwater management ponds) that is required by the by-law or is essential to the viability of this site, should be located within the setbacks. Furthermore, only the surplus parking (excess of the Municipal’s minimum parking requirement under the Zoning By-law) can be located within the 14 metre MTO setback, but must be setback a minimum of 3 metre from the Highway 401 property line. All required and surplus parking must be clearly indicated on the Site Plan. • Requirements for fencing include (but are not limited to) erecting fencing along the MTO right-of-way at 0.3m into the MTO right-of-way, and an MTO Encroachment permit is required for this work and it should follow OPSD 972.30 (Chain Link Fence with Top-wire). • As part of the review and approval process, the applicant will be required to submit copies of a detailed Site Plan, Master Stormwater Management Report, Site Servicing and Grading Plans prepared by a Licensed Professional Engineer. • Please have the proponent confirm the reports have been carried out by RAQS approved contractors/consultants. All works within the Provincial right-of-way shall be carried out by RAQS qualified contractors. Please note the ministry requires all drainage submissions to be also provided electronically. Regarding acceptable electronic transfer of files to MTO, the following applies; • Format – PDF • Currently electronic files can be sent in: o Using an FTP (File Transfer Protocol) website

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	Using E-mail, if the file is small enough, it can be e-mailed (zipped documents are acceptable). • MTO requires a Brief/Letter from the Traffic Consultant to describe the general criteria of the anticipated traffic. Please be aware that MTO has the right to request a more detailed (Master) Traffic Impact Study should the brief/letter be deemed insufficient upon review. • Any noise mitigation is the responsibility of the land-owner which includes the design and implementation. The Ministry will not be held liable for noise attenuation next to the highway which also includes its maintenance and upkeep • The proponent is required to submit a copy of the Photometric Lighting Plan (in metrix LUX units) for MTO review and approval. The plan must illustrate proposed lighting and any light spillage on Highway 7/12 & associated service roads ROW. • All plans and reports must be stamped and signed and circulated to the MTO through municipal site plan application process for a formal review and comments. • The applicant should be advised that they cannot apply for the MTO permit until the Site Plan has been approved by MTO and the Municipality. • MTO Sign permits will be required for any new signage visible from Highway 401 & associated service roads. • The Applicant must apply online through the link below once clearance letter is issued: https://www.hcms.mto.gov.on.ca/ • Please note, all plans and reports must be stamped and signed. This website has resources for the requested reports: Highway corridor management (gov.on.ca) Contact: peter.deluca@ontario.ca
Alexandre Thibault WSP on behalf of the Canadian National Railway (CNR) (*via email*)	The subject site is adjacent to CN's Main Line. CN has concerns about developing/densifying residential uses in proximity to railing operations. The development of sensitive uses in proximity to railway operations cultivates an environment in which land use compatibility issues are exacerbated. The Guidelines for New Development in Proximity to Railway Operations reinforce the safety and well-being of any existing and future occupants of the area. The applicant is directed to refer to these guidelines for the development of sensitive uses. The policies have been developed by the Railway Association of Canada and the Federation of Canadian

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	Municipalities. The following criteria are recommended as conditions of approval of future development applications: • A setback of 30 metres from the principal buildings to the railway right-of-way in conjunction with a safety berm. The safety berm shall be adjoining and parallel to the railway rights-of-way with returns at the ends, 2.5 metres above grade at the property line, with side slopes not steeper than 2.5 to 1; • If the minimum setback can not be respected, a crash wall must be integrated into the site design. Please note that CN requires third party peer review by AECOM of the crash wall design, at the proponent's expense. The design of the crash wall should be following AECOM standards for crash walls (see document attached); • The Owner shall engage a consultant to undertake an analysis of noise. Subject to the review of the noise report, the Railway may consider other measures recommended by an approved Noise Consultant; • Ground-borne vibration transmission is to be evaluated in a report through site testing to determine if dwellings within 75 metres of the railway rights-of-way will be impacted by vibration conditions in excess of 0.14mm/sec RMS between 4 Hz and 200 Hz. The monitoring system should be capable of measuring frequencies between 4 Hz and 200 Hz, 3 db with an RMS averaging time constraint of 1 second. If in excess, isolation measures will be required to ensure living areas do not exceed 0.14 mm/sec RSM on and above the first floor of the dwelling. • The Owner shall install and maintain a chain link fence a minimum 1.83 metres in height along the entire mutual property line, to be constructed by the Owner entirely on private property. • The following clause should be inserted in all development agreements, offers to purchase, and agreements of Purchase and Sale or Lease of each dwelling unit within 300m of the railway right-of-way: "*Warning: Canadian National Railway Company or its assigns or successors in interest has or have a right-of-way within 300 metres from the land the subject hereof. There may be alterations to or expansions of the railway facilities on such rights-of-way in the future including the possibility that the railway or its assigns or successors as aforesaid may expand its operations, which expansion may affect the living environment of the residents in the vicinity, notwithstanding the inclusion of any noise and vibration attenuating measures in the design of the development and individual dwelling(s). CNR will not be responsible for any complaints or claims arising from use of such facilities and/or operations on, over or under the aforesaid rights-of-way.*" • The storm water management facility must be designed to control storm water runoff to pre-development conditions including the

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	duration and volume of the flow and accordingly have no impacts on CN right of way, including ditches, culverts and tracks. Any proposed alterations to the existing drainage pattern affecting railway property must receive prior occurrence from CNR and be substantiated by a drainage report to the satisfaction of the Railway. • The Owner shall through restrictive covenants to be registered on title and all agreements of purchase and sale or lease provide notice to the public that the safety berm, fencing and vibration isolation measures implemented are not to be tampered with or altered and further that the Owner shall have sole responsibility for and shall maintain these measures to the satisfaction of CN. • The Owner shall enter into an Agreement with CN stipulating how CN's concerns will be resolved and will pay CN's reasonable costs in preparing and negotiating the agreement. • The Owner shall be required to grant CN an environmental easement for operational noise and vibration emissions, registered against the subject property in favour of CN. • Any work performed on CN's property must be arranged through a work permit. A work permit ensures that the proponents of the work, its authorized employees, servants, agents or contractors comply with CN's instructions and will take any safety precautions that CN may deem necessary in order to ensure that railway operations remain safe. • Should the applicant choose to proceed with the development, CN will require the following as part of their review: o Detailed Site Plan; o Stormwater Management Report; o Noise and Vibration Study. Contact: proximity@cn.ca
Robert Watson City of Pickering, Fire Prevention Officer, Fire Services	• Please provide a code matrix illustrating how the buildings will be meeting the Ontario Building Code; and • Please show the proposed fire route including hydrants, and Siamese connections. Contact: rwatson@pickering.ca
Paal Helgesen City of Pickering, Division Head, Water Resources &	The following documents are required for a complete application: • **Functional Servicing and Stormwater Management Report** (FSSR). The FSSR must include, but not be limited to, the following: ▪ **Functional Site Grading Plan** – all elevations are to be referred to a City of Pickering benchmark;

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Development Services and Laura Calvelli Supervisor, Development Approvals	▪ **Functional Servicing Plan**; and ▪ A section which briefly describes the **Erosion & Sediment Control** and **Construction Management** for each phase of construction. • **Site Plan** – clearly show exterior site components and driveway access design with appropriate dimensions. • **Geotechnical Report** – include groundwater information. • **Hydrogeological Report** which addresses both long-term and short-term ground settlement. • The Applicant will be required to construct a 1.8 metre concrete sidewalk along Kingston Road, and the extension of the sidewalk further south on Dixie Road. Contact: phelgesen@pickering.ca & lcalvelli@pickering.ca
Irina Marouchko City of Pickering, Manager, Water Resources	The following stormwater management criteria applies to the subject site: • Quantity control: control of post-development peak flow rates to pre-development levels for all storm events up to the 100-year return period. • Quality control: Enhanced water quality protection (80% TSS Removal). • Erosion control: minimum 5mm on-site infiltration. Low Impact Development (LID) measures shall be designed in accordance with the TRCA & CVC LID SWM Planning & Design Guide and the City's SWM Design Guidelines. The on-site retention must be addressed through an infiltration. The stormwater reuse measures (i.e. irrigation system, car wash, etc.) will not be credited towards the retention/infiltration criteria. • The applicant is to advise if outfall is to be provided to Kingston Road, this is to be confirmed, and to the satisfaction of the Region of Durham and the City. Contact: imarouchko@pickering.ca
Nadeem Zahoor City of Pickering, Manager, Transportation & Traffic *(via email)*	• A **Transportation Impact Study** (TIS) is required. The study must be as per the City of Pickering TIS Guidelines. Please provide the terms of reference for the City's review and approval. • Show all the proposed/existing access widths and radiuses. • Show the existing/proposed sidewalk on Dixie Road. • Provide AutoTURN maneuvering diagrams for all of the proposed vehicles.

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	Contact: nzahoor@pickering.ca
Arnold Mostert City of Pickering, Manager, Landscape & Parks Development	• Provide a Tree Inventory Report and protection/compensation plan. Based on the scope of the proposed development, it would appear that not many of the existing trees will be preserved. Replanting at grade and on the roof decks will be required to compensate for tree loss in keeping with the City's Tree Compensation Policy. • Provide conceptual landscape plans indicating the intended programming of all outdoor amenity spaces. Provide amenities for all ages and abilities. Indicate if these spaces will be private or public. Contact: amostert@pickering.ca
Carl Kolbe City of Pickering, Manager Building Services & Deputy CBO	• A Tower Crane Swing Agreement and Tieback Encroachment Agreement will be required at a later date. It is recommended that the Applicant's solicitor contact the City's legal department. • A Vibration Control Strategy is required. • Prior to submitting building permit applications, staff recommend that the Applicant contact Building Services to discuss the method of submission as there is a new portal process. Contact: ckolbe@pickering.ca
Déan Jacobs City of Pickering, Manager, Policy & Geomatics	**Official Plan Designation** The subject lands are designated "Mixed Use Areas - Mixed Corridor" in the City of Pickering Official Plan (POP). Mixed Corridors permit a minimum and maximum residential density over 30 and up to and including 140 units per hectare. The maximum Floorspace Index (FSI) in Mixed Corridors is up to and including 2.5. The proposed density and FSI do not conform with the in-effect Official Plan, as such, a site-specific Official Plan Amendment application is required. Policy 3.6(a) states that on "Mixed Use Areas on Schedule I, lands have or are intended to have the widest variety of uses and highest levels of activities in the City". However, this policy needs to be read together with policy 3.6(d)(i): "Despite Table 6, densities and FSI's may be limited to address concerns of good design, appropriate scale, and compatibility of development", and policy 3.6(d)(ii), which refers to any pertinent neighbourhood specific policies in Chapter 12 of the Official Plan. Please note policy 12.10(a) stipulates that the highest mix and intensity of uses and activities in the City is encouraged in the City Centre Neighbourhood,

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	which emphasizes the Council's priority of maintaining an intensification hierarchy in the City. According to Schedule IIID of the Official Plan, a Highly Vulnerable Aquifer Area is identified on the northwest part of the subject lands. Although the proposed uses on the site are not regarded as High-Risk Land Uses according to Durham Region Official Plan, the proposed development, if approved, is required to comply with Policy 10.8(a)(iii) which requires that snow storage areas should be located on impervious surfaces that drain into the storm sewer and prevent salt run-off into the soil. Also, in accordance with policy 10.13(g) a Salt Management Plan will be required at the Site Plan Approval Stage. **Official Plan Amendment 38** Although OPA 38 is not yet in force, it was approved by Council and the Region of Durham. Accordingly, the proponent is encouraged to demonstrate how the proposed heights, densities, and FSI complement OPA 38. **Designation** On Schedule XIV – Kingston Mixed Corridor and Brock Mixed Node Intensification Areas (sheet 3 of 4) the lands are located within the "Dunbarton/Liverpool Precinct Intensification Area" and designated "Mixed Use Type A", with a "Gateways" symbol at the intersection of Kingston Road and Dixie Road, and one "POPS" symbol at the northeast corner of the site. Although OPA 38 has not yet come into effect, the proponent is encouraged to demonstrate how the proposed heights, densities, and FSI complement OPA 38. **Density** The Kingston Mixed Corridor permits a minimum residential density of over 60 units per hectare, with no maximum. The maximum Floorspace Index (FSI) in the Kingston Mixed Corridor is 0.75 with a maximum up to and including 2.5. City Council may permit, in certain circumstances, FSIs beyond 2.5 and up to and including 5.0, where appropriate, through a site-specific zoning by-law amendment, subject to certain criteria (please refer to amendment no.10 in OPA 38). Although OPA 38 needs to be reviewed in its totality, the proponent's attention is directed specifically to the following policies within OPA 38: • 3.2(d) promotes the Kingston Mixed Corridor and Brock Mixed Node Intensification Areas as Strategic Growth Areas in the City, secondary to the City Centre, for accommodating intensification and higher-density mixed uses in a more compact built form;

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	• 11A.5 contains policy objectives associated with the Dunbarton/Liverpool Precinct; • 11A.9 contains land use policies that apply to all development within the intensification areas. As Kingston Road redevelops, and the form intensifies, it is expected to integrate commercial, office, and institutional uses with residential uses to become a complete community. This includes creating various sizes of commercial/retail spaces (see policies 11A.9.(a) and (b) and 11A.9.2; • 11A.10.1 (c) contains performance criteria for mid and high-rise developments (to be read in concert with the draft Kingston Road Urban Design Guidelines); • 11A.11 which pertains to proposed parks, POPS and amenity spaces • 11A.14 requires development applications on larger sites, identified through the implementing zoning by-law, to provide a block development plan to demonstrate the full build out of new streets and blocks within the site, potential connections to adjacent sites, redevelopment within all future blocks, and the provision of supporting open spaces and community infrastructure as required. **Affordable Housing** City Council shall require that a minimum of 25 percent of new residential construction, on a City-wide basis, be of forms that would be affordable to households of low or moderate income, reflecting affordable housing forms identified in “Appendix I - Quality of Life Indicators and Performance Targets” (6.4 a.). Affordable means annual housing costs (rent or mortgage payments) that do not exceed 30 percent of gross household income. As well, the Pickering Housing Strategy & Action Plan, 2021-2031, identifies the need for additional rental, affordable and accessible housing. It is unclear, in terms of what is being proposed whether the development includes any affordable housing component. Please provide a Housing Affordability and Accessibility Brief with the following information to assist with the proposal’s review and housing monitoring within the City: 1. Average purchase price. 2. Average rental price per unit type. 3. Number of units that qualify as “affordable” based on the Pickering Official Plan and the Provincial Affordable Housing Bulletin. 4. Number of units meeting accessibility requirements for disabled persons.

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	5. Total number of rental units. 6. Breakdown in the type of rental units (i.e. apartment 1-bedroom, 2-bedroom, 3-bedroom units, townhouse 2-bedroom, 3-bedroom units, etc.). 7. Current CMHC vacancy rate for the associated market area. 8. Does the development proposal include or offer opportunities to accommodate additional dwelling units? 9. Have any grants or funding agreements entered into with the Province and/or Region of Durham, been considered for the development proposal? 10. Provide a rationale if your proposal does not include any affordable housing. **Site-specific Considerations:** • While the proposed uses conform with the in-effect Official Plan, the complete removal of the commercial GFA of approximately 8,327 square metres and the absence of any proposed new commercial GFA in relation to the amount of proposed residential units is a significant concern and requires justification. Proposed redevelopment and intensification should strive to strike a balance between maximizing the development potential of the lands and creating a complete community on-site, while respecting the development hierarchy in the City and the surrounding context. To this end, the redevelopment and intensification of the lands should seek to provide a range of housing options, and for the daily retail, service uses (for example, offices, childcare), and amenity needs of the new residential community on-site as well as the broader precinct. • The proposed density and FSI do not conform with the in-effect Official Plan, and require a site-specific OPA. • Although OPA 38 has not yet come into effect, the proponent is encouraged to demonstrate how the proposed heights, densities, and FSI complement OPA 38. • The predominant residential type and density proposed is high-rise residential. The proponent is encouraged to consider the inclusion of mid-rise residential (more commonly known as the “missing middle”), to provide a broader variety of housing options. • Although a POPS is proposed in the centre of the site along Kingston Road, it would be advisable to move it to the northeast corner of the site, to be consistent with the location of the POPS shown in OPA 38, and to be complementary to the gateway design and function. • A Planning Justification Report is required regarding:

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	▪ The proposed density and FSI; ▪ The lack of commercial GFA in the proposal; and, ▪ Housing affordability or the lack there of in the proposal. **Additional Policies** According to Schedule IIID of the Official Plan, a High Vulnerable Aquifer is identified in the northeast corner of the site. Although the proposed uses on the site is not regarded as High-Risk Land Uses according to Durham Region Official Plan, the proposed development, if approved, needs to comply with policy 10.8 (a)(iii) of the Pickering Official Plan which requires that snow storage areas should be located on impervious surfaces that drain into the storm sewer and prevent salt run-off into the soil. Also, in accordance with policy 10.13(g) a Salt Management Plan will be required at the site plan approval stage. **Submission Requirements** 1. A Planning Rationale Report, demonstrating consistency with the Provincial Planning Statement 2024, conformity with the Regional and City of Pickering Official Plans, and how the proposal complements the spirit and intent of OPA 38 (if OPA 38 is not yet in force at the time of a formal development application considered by Council); 2. A Housing Affordability and Accessibility Brief; 3. A Hydrogeology and Water Budget Study for development in Highly Vulnerable Aquifer Areas; and 4. A Multi-modal Transportation Study. Contact: djacobs@pickering.ca
Nilesh Surti City of Pickering, Division Head, Development Review & Urban Design and Amanda Dunn Principal Planner, Development Review & Urban Design	The lands are currently designated “Mixed Use Areas – Mixed Corridor” within the City’s Official Plan. This designation permits a maximum residential density of over 30 and up to and including 140 dwellings per hectare, and a maximum Floor Space Index of up to and including 2.5. The City and Region approved OPA 38 in 2022, however, it is currently subject to appeal. Despite the policies of OPA 38 not being in full force and effect, we rely on the direction for detailed land use, density and built form established within the OPA. The subject site is within the Dunbarton/Liverpool Precinct and designated Mixed Use Type ‘C’ and is also located within a Gateway, under OPA 38. The Plan identifies this precinct as extending from Fairport Road to the west, and Pine Creek to the east. **Density and Height**

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	OPA 38 permits a maximum net residential density of over 60 dwelling units per hectare and a maximum Floor Space Index (FSI) of over 0.75, and up to, and including 2.5. Section 10.F of the Official Plan states that in certain circumstances, a floor space index beyond 2.5, up to and including 5.0 may be considered, where appropriate, through a site-specific zoning by-law amendment and subject to the following criteria: • That the site is generally located in an appropriate gateway location and/or adjacent to Highway 401; • That the proposal is compatible with adjacent land uses, particularly stable neighbourhoods, in terms of massing, height, scale and transition; • That the applicant demonstrates the proposed development would not preclude other properties within the precinct from developing or redeveloping to their planned potential; and • That the proposal meets the general intent of the policies of Chapter 11A of this Plan. The applicant must justify how the above criteria have been met in order to permit a density which exceeds the FSI of 2.5. As OPA 38 is not in full force and effect, an Official Plan Amendment is required for the proposed density and FSI proposed. However, the applicant is advised that the development proposal is being reviewed in regard to applicable OPA 38 policies. Section 11A.5 states that development within the Dunbarton- Liverpool Precinct shall be in accordance with the following: • The greatest densities and building heights shall be directed to the south of the intersection of Kingston Road and Dixie Road and south of Kingston Road along Highway 401; and • Development of the Precinct is to be a local community and shopping destination with a series of connected and animated neighborhood-oriented green spaces and squares will be encouraged. The applicant shall confirm the density (within units per hectare) and provide clarity if the proposed FSI 4.68 is calculated on a net basis, which includes the exclusions of public right of ways/road widening and lands to be conveyed to a public authority. As OPA 38 is not yet in effect, an Official Plan Amendment is required to permit the density of over 140 units per hectare and an FSI which exceeds 2.5. In support of the proposed density, the applicant must demonstrate how the criteria of OPA 38 are met, to allow for the increase in FSI. **Affordable Housing**

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	Section 6.4 of the Pickering Official Plan states that City Council shall require a minimum of 25 percent of new residential construction, on a City-wide basis, to be of forms that would be affordable to households of low and moderate incomes. Additionally, the Pickering Housing Strategy & Action Plan (2021-2031), identifies the need for additional rental, affordable and accessible housing within the City of Pickering. Chapter 6 of the Official Plan identifies that affordable means annual housing costs (rent or mortgage payments) that do not exceed 30 percent of gross household income. Staff require the applicant to explore opportunities to provide affordable housing units within the development. An affordable housing brief outlining the type of units that will be provided and how they plan to contribute to the City's desire to achieve a minimum of 25 percent of new residential construction, on a City-wide basis, that would be affordable to households of low to moderate income. **Building Design/Site Layout** • The Draft Urban Design Guidelines (DUDG) for the Kingston Road Corridor and Specialty Retailing Node identifies that the subject lands are within the Dunbarton/Liverpool Precinct. • In accordance with policy 11A.10.1 of OPA 38, high-rise buildings are to be a maximum of 35 storeys in height, to generally be located within appropriate major gateway locations at the intersection of transit spines and major arterials, along Highway 401, and proximate to highway interchanges. Staff would encourage the applicant to reduce the height of the proposed towers along Kingston Road to provide greater articulation of building heights. • The DUDG outlines that the built form should conform to a 45-degree angular plane measured from the front property line, beginning at a height of 30 percent the width of the adjacent right-of-way. An angular plane is one of many tools intended to help shape the scale, height, spacing, and character of development, and assist in achieving transitions in an area by limiting the overall height. The applicant is required to demonstrate how the proposal complies with the angular plane requirements of the DUDG, particularly for the two towers proposed along Kingston Road. • The applicant is advised that in accordance with Section 3.3.1 of OPA 38, any building which is over 13 storeys or greater is subject to the Tall Building provisions, contained within Section 3.3.1 of the Official Plan as well as the draft Urban Design Guidelines and is required to identify how the proposal complies to the subject policies. • In accordance with Section 2.2 i. and ii. of the DUDG block lengths should generally range between 100 and 150 metres to promote permeability within the streetscape, support walkability and increase the

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	ease of pedestrian and cyclist movement. Where a block is longer than 150 metres and shorter alternatives are not feasible, mid-block connections shall be introduced through pedestrian paths or linear parks. Pedestrian-scale lighting should be implemented along these paths to increase comfort and safety. • Block layouts should be designed to maximize views and vistas through development blocks and towards gateways and natural heritage features. • The DUDG states tall buildings over 13 storeys in height, a minimum separation distance of 25 metres shall be maintained between towers (Section 2.15.1) and a minimum separation distance of 15 metres shall be provided between facing buildings on sites with multiple buildings. On multi-site buildings, it is encouraged that buildings are offset or angled away from each other to maintain privacy between facing units, as well as 15 metres of separation distance where adjacent buildings are proposed within a podium. Further, the buildings shall have a maximum tower floor plate of 750 square metres. The submitted development concepts have identified that a minimum separation distance of 25 metres between towers will be provided and a maximum floorplate of 750 square metres is provided. The applicant is to confirm whether the proposed block lengths do not exceed 150 metres. • Section 2.3.3.ii, iv., and v. of the DUDG identify that buildings fronting Kingston Road shall be setback 5.0 metres from the front property line and buildings shall be setback a minimum of 2.0 metres from new public and private streets that are internal to the development block and 3.0 metres from parks and other open spaces. The proposal identifies a setback of 3.0 metres from the front property line, this will need to be revised to comply with 5.0 metres, and a minimum of 2.0 metres is to be shown from internal roads. • Section 2.1 Transition and Massing of the DUDG identifies that in cases where buildings have a height of 8 storeys or more proposed adjacent to a streetline, the upper storey of buildings should be sited on podiums having a minimum height of 3 storeys and a maximum height of 6 storeys. The proposed development provides a podium which appears to have a maximum height that extends to the 8-10th floor which provides outdoor amenity space. The applicant is advised that a maximum podium height of 6 storeys is permitted. • Section 2.14 identifies the subject lands as a Gateway location. Gateways are entry points into significant streetscapes, areas or neighbourhoods, often signified by a distinctive public realm or built form and enhanced through site and building design. The design guidelines identify that: ▪ Buildings with significant heights and massing should be located at gateway locations, including both mid-rise and tall buildings.

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	Building and landscape design should aim to create a sense of arrival; ▪ Gateways should incorporate public gathering spaces, such as plazas and urban squares; and ▪ Primary building entrances should be located at gateways. The proposed development does not currently provide any distinctive public realm or incorporate public gathering space such as a plaza or urban square at the northeast corner of Dixie Road and Kingston Road. • The DUDG identifies the primary retail frontage along Dixie and Kingston Road, and the secondary frontage along Kingston Road. The primary frontages would allow for the creation of a main street running through the centre of the Precinct. • Section 2.13 i) states that primary frontages shall contain predominantly street-related active retail or commercial uses at grade, with primary entrances oriented towards the street to encourage a vibrant public realm. • Section 2.13 ii) states that secondary frontages should contain street-related active retail or other commercial service uses at grade, with primary entrances oriented towards the street to encourage a vibrant public realm. The applicant is advised in accordance with the above noted guidelines staff strongly encourage the incorporation of retail and commercial uses at grade to articulate the frontages of the proposed development. Section 11A.9 of OPA 38 states that City Council shall ensure the function of the intensification areas as key retail shopping destinations within the City, supporting various sizes and types of retail uses, is maintained and that the expansion and establishment of new office and commercial uses is encouraged. • Staff have a concern with the location of the proposed drop-off area and would prefer for the building to have articulation along Kingston Road and Dixie Road, and for the proposed pick-up and drop-off area to be relocated along Dixie Road. **Park Space** • Lands on the south side of Kingston Road are not currently serviced well by parks and Kingston Road and this represents a physical barrier to convenient access to existing parks within the neighbourhoods to the north. • The applicant is to provide clarification if the proposed outdoor amenity space located on the level 2 floor plan is a private amenity or public amenity space. The applicant shall also identify how much amenity space is proposed per unit. • OPA 38 on Schedule XIV identifies that the subject lands contain a Privately Owned Public Space (POPS). Section 11A.11.2 identifies that

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	Council supports the development of Privately-Owned Publicly Accessible Spaces (POPS) throughout the intensification areas, including spaces such as urban squares, gateway plazas, parkettes, linear parks, and green spaces. These spaces are privately owned and maintained, however, they are accessible to the general public. The preferred location of POPS have been identified conceptually on Schedule XIV, however POPS are encouraged as a component of all new development within the intensification areas, particularly in Gateways and near transit stops. • Staff request that a POPS space be included to accommodate future residents. Please include a facility fit plan as a part of the conceptual Landscape Plan, demonstrating how the at-grade amenity space could be utilized. • The applicant is advised to review the City's draft Parkland By-law and Draft Guidelines for Strata Parks and POPS to confirm the amount of required parkland dedication. **Parking** • The proposed development is providing a parking rate of 0.80 spaces per unit, inclusive of visitor parking spaces. Please note that staff do not support a parking ratio of 0.8 spaces per unit inclusive of visitor parking spaces. Staff request that a minimum of 0.25 spaces per unit for visitors be provided. A Parking Justification Report will be required, and the Applicant is advised that the Parking Justification may be required to be peer reviewed, and the Applicant would be responsible for peer review costs. • One full level of underground parking is proposed along with parking within the ground floor, mezzanine and podium levels 2 to 5. The applicant is encouraged to explore opportunities to locate residential parking within an underground parking garage. Parking located with the mezzanine, and second to fifth levels of the building is discouraged as it would be highly visible from Kingston Road and has the potential to compromise the building design. The applicant is encouraged to refer to Section 2.5.2 Structured Parking within the draft Urban Design Guidelines. • Consideration may be provided for some at-grade visitor parking spaces for accessibility purposes. **Noise Attenuation** Please ensure the submitted **Noise Report**, required by the Region of Durham and CN Rail, provides an analysis of any noise impacts on the outdoor amenity space proposed and outlines any mitigation measures required. **Other Comments**

Item/ Ref #	Details, Discussion & Conclusion (summary of discussion)
	• The applicant has advised that a portion of the above-grade parking (levels 1-5 of the podium) is located within the CNR's 30 metre rail setback. CNR's comments identify that should the required 30 metre setback not be provided, CNR may consider the installation of a crash wall as part of the design. Staff would encourage further levels of underground parking to reduce the amount of parking required within the podiums. • The proposal illustrates a multi-use path from Kingston Road to the southern portion of the site connecting to Dixie Road. The DUDG illustrates a planned cycling network along Kingston Road connecting to Dixie Road. The applicant is to include this cycling facility as part of the proposal. Further, the existing sidewalk on Dixie Road is also to be extended south from Kingston Road. **SUBMISSION REQUIREMENTS** The following plans/studies are required for official plan and zoning by-law amendment applications: • **Conceptual Site Plan;** • **Preliminary Landscape Plans** and **Facility Fit Plan;** • **Traffic Impact Study** to include an AutoTURN Analysis as well as a Parking Justification Study; • **Planning Rationale Report & Urban Design Brief** which identifies how the proposal will achieve conformity with the Provincial Planning Statement 2024, Region of Durham Official Plan, current Official Plan policies and emerging policies proposed through OPA 38, the Kingston Road Corridor and Specialty Retailing Node Intensification Plan and the draft Urban Design Guidelines; • **Affordable Housing Brief;** • **Draft Official Plan Amendment;** • **Draft Zoning By-law;** • **Coloured Conceptual Site Plan;** • **Survey** (please show all existing easements, if applicable) and identify who the easements are in favour to; • **Shadow Study and Written Analysis;** • **Cross-Sections** to also include angular plane analysis; • **Transportation Impact Study**, which includes a **Parking Justification Study** and outlines any Transportation Demand Management Measures as well as **Auto-turn diagrams** for waste management and emergency vehicles; • **Conceptual Building Elevations;** • **Coloured Conceptual Renderings**; and

Item/ Ref #	Details, Discussion & Conclusion (summary of discussion)
	• **Conceptual Floor Plans.** Contact: nsurti@pickering.ca & adunn@pickering.ca
Kerry Yelk City of Pickering, Planner II, Zoning & Administration (*via email*)	The subject lands are currently zoned "M1-SC30" Special Commercial, under Zoning By-law 3036, as amended, by By-law 4138/92. Through the submission of a draft Zoning By-law Amendment, Zoning staff will be circulated a copy for review and will comment against the plans provided. As part of the submission, please provide the following: ▪ updated detailed Site Plan; ▪ Floor Plans and Elevations; and ▪ Site Grading plan. The applicant is required to obtain a Zoning Certificate to confirm zoning compliance as part of the Site Plan application submission. Submission requirements include: • Completed application form (can be found at the following link: https://forms.pickering.ca/Forms/CDD2303-Zoning-Certificate) • Property survey; • Detailed site plan – fully dimensioned showing adjacent properties and building including all setbacks; • Floor plans – fully dimensioned indicating uses of all spaces; • Site Grading Plans for calculating height from average grade; • Applicable building elevations and cross-sections; and • Fee – mixed use ($695.00). Note: All drawings must be provided in PDF format, submitted by email, to scale, fully dimensioned, and signed and dated. Staff may request additional drawings and information. The applicable fee is payable via cheque, dropped off at City Hall. Contact: kyelk@pickering.ca
Lalita Paray City of Pickering, Senior Planner, Sustainability (*via email*)	**Integrated Sustainable Design Standards (ISDS)** In September 2022, the Council adopted new Integrated Sustainable Design Standards (ISDS) for all new developments in the City, replacing the 2007 Sustainable Development Guidelines (Council Resolution #982/22). These standards enable the City to evaluate development projects with a focus on sustainability, utilizing modern green technology criteria and best practices. In January 2023, the ISDS was implemented, becoming mandatory for all new *Planning Act* applications, including both mandatory (Tier 1) and voluntary (Tier 2) standards. For new developments resulting from Site

Item/ Ref #	Details, Discussion & Conclusion (summary of discussion)
	Plan and Subdivision applications deemed complete on or after January 1, 2023, Tier 1 elements would be required. Subsequently, in November 2023, Council passed By-law 8054/23 to adopt Amendment 50 of the Pickering Official Plan. This By-law recognizes and reinforces the ISDS policies within the Pickering Official Plan. The ISDS is primarily intended to be implemented through the Site Plan Control and Draft Plan of Subdivision planning processes. For Official Plan Amendments, Zoning By-law Amendments, and Minor Variances, the ISDS may serve as a tool to communicate the City's expectations to applicants through Site Plan Control or Draft Plan of Subdivision, where appropriate. For more information, please visit the City's website. **Application Requirements** a) As part of the Official Plan Amendment and Zoning By-law Amendment complete application submissions, the applicant is required to submit the ISDS Mid to High-Rise Residential and Non-Residential Checklist and a Sustainability Report. The Checklist and Report can be included as part of the Planning Justification Report to the City. b) For future Site Plan complete application submission, the applicant is required to submit a completed ISDS Mid to High-Rise Residential & Non-Residential Development Checklist and a Sustainability Report and, at a minimum, achieve Tier 1 performance standards. As per Council Resolution #982/22, the ISDS Tier 1 performance measure must be met to receive Site Plan approval. To assist the applicant in preparing the ISDS Checklist, a draft User Guide and background information can be found on the City's website. Contact: lparay@pickering.ca
Tahani Ismael City of Pickering, AMANDA Business Specialist (*via email*)	• At the time of submission, the City requires the proponent to submit georeferenced drawings defining a geographic coordinate system of: NAD83 UTM Zone 17N. These drawings, in relation to the by-law to be passed and the site plan and the final 40M or 40R plan, should be in a format that is compatible with or the same as the following: ▪ ArcGIS Desktop 10.8 ▪ ArcGIS Pro 2.8.1 ▪ AutoCAD Map 3D 2018 • Private streets on this proposal are simple in nature and will not be named. • One address will be assigned to the entire site. Unit numbers will consist of a building number and unit.

Item/ Ref #	Details, Discussion & Conclusion (summary of discussion)
	• Final addressing will be assigned and provided to the land owner and the public when the City receives a copy of the registered deed of the new consolidated property. • Before submitting a request for addressing for your development project, it's essential to schedule a meeting with our Geomatics staff. This preliminary discussion is crucial to ensure a smooth and efficient addressing process. Once your development plan reaches its final stage, kindly reach out to us at geomatics@pickering.ca to arrange the meeting. During this meeting, we will discuss the flow of the units and the doors to access these units. Taking this proactive step will significantly expedite the addressing process and streamline the overall development procedure. Contact: tismael@pickering.ca
4.	**Technical Reports Required**
	Please see the attached Technical Report Checklist.
5.	**Fees Requirement**
	For the proposed development, the following fees are required: **City of Pickering, City Development Department** • Please see the fee schedule online. • Fees do not include registration costs and/or disbursements. • Please note that application fees are subject to change. **City of Pickering, Engineering Services:** Please contact engineering services for required fees. **Region of Durham:** Please see online.

AD:nr
/CityDevDept/D1000/D-1000-001 Pre-Consultation/2024/PRE 35-24 - 1095 Kingston - AD/5. Comments Summary/1095 Kingston Road - Meeting Summary.docx

Copy: Claire Wallis-South, Region of Durham, Works Department

Nilesh Surti, Division Head, Development Review & Urban Design
Paal Helgesen, Division Head, Water Resources & Development Services
Robert Watson, Fire Prevention Officer
Carl Kolbe, Manager, Building Services & Deputy CBO
Arnold Mostert, Manager, Landscape & Parks Development
Déan Jacobs, Manager, Policy & Geomatics
Nadeem Zahoor, Manager, Transportation & Traffic
Irina Marouchko, Manager, Water Resources
Laura Calvelli, Supervisor, Development Approvals
Lalita Paray, Senior Planner, Sustainability
Amanda Dunn, Principal Planner, Development Review & Urban Design
Tahani Ismael, AMANDA Business Specialist

Materials and Studies Required for PRE 035/24
Submissions for Official Plan and Zoning By-law Amendment

Please note: Required materials and studies are subject to change based on revisions to the proposal.

Plans/Studies/Reports	POP Reference	Required (Y/N)	Comments
Planning Justification Report	16.5A(i)	**Y**	Include draft OPA and ZBA. To be signed and stamped by a professional planner.
Traffic Impact Study	16.5A(ii)	**Y**	All reports to be signed and stamped by a professional engineer. Terms of Reference should be reviewed by the Region of Durham and City.
Shadow Study	16.5A(iii)	**Y**	Test times shall be done hourly between 9:18 am and 7:18 pm on March 21, June 21, September 21, and December 21. In addition, the study should also evaluate shadow impacts within the development site, including an assessment of the shadow impact on any proposed outdoor amenity, courtyard area or amenity space. The Shadow Study shall include a written summary of the findings.
Wind Study	16.5A(iv)	**Y**	
Heritage Conservation Compliance Statement	16.5A(v)		
Archaeological Assessment	16.5A(vi)		
Functional Servicing Study/ Site Servicing Study	16.5A(vii)	**Y**	All reports to be signed and stamped by a professional engineer.
Stormwater Management Report	16.5A(viii)	**Y**	The SWM Report can be combined into a Functional Servicing and Stormwater Management Report (FSSR) for functional design stages. All reports to be signed and stamped by a professional engineer.
Flood Plain Impact Engineering Study	16.5A(ix)		
Site Suitability Study	16.5A(xi)		
Environmental Impact Study	16.5A(xii)		
Natural Heritage Evaluation	16.5A(xiii)		
Hydrological Evaluation	16.5A(xiv)		
Hydrogeological Report	16.5A(xv)	**Y**	All reports to be signed and stamped by a professional engineer and shall include a Water Budget Study.
Watershed/Sub-watershed Study	16.5A(xvi)		
Aggregate Extraction Impact Study	16.5A(xvii)		
Aggregate Extraction Assessment Study	16.5A(xviii)		

Assessment of Lands within 500 metres of Known Waste Disposal Site	16.5A(xix)		
Phase I Environmental Site Assessment Phase II Environmental Site Assessment Record of Site Condition	16.5A(xx)		Or a Site-Screening Questionnaire. All reports are to be signed and stamped by a professional engineer. The Phase 1 ESA Report must be accompanied by the Regional Reliance Letter and Certificate of Insurance.
Contamination Management Plan (High Aquifer Vulnerability Area)	16.5A(xxi)		
Contamination Management Plan (near Wellhead protection Area)	16.5A(xxii)		
Waste Disposal Community Impact Study	16.5A(xxiii)		
Noise and Vibration Study	16.5A(xxiv) & (xxv)	**Y**	Any proposed outdoor amenity area should be specifically looked at in the noise and vibration study. All reports to be signed and stamped by a professional engineer.
Dust/Odour Control Study	16.5A(xxvi)		
Photometric Lighting Plan	16.5A(xxvii)	**Y**	Will be required at the time of Site Plan submission.
Sustainable Development Report and Checklist	16.5A(xxix)	**Y**	
Rental Housing Conversion Study	16.5A(xxx)		
Urban Design Brief	16.5A(xxxi)	**Y**	Can be included in the Planning Justification Report.
Architectural Design Study	16.5A(xxxiii)		
Groundwater Impact Study	16.5A(xxxv)		
Water Management Plan	16.5A(xxxvi)		
Other Plans/Studies/Reports		**Required (Y/N)**	**Comments**
Parking Standard Analysis/Justification		**Y**	Can be included in the Traffic Impact Study. All reports are to be signed and stamped by a professional engineer. This study will be subject to peer review, which the applicant will be responsible reimbursing the City's full cost of the peer review
Construction Management Plan			
Landscape/Parks Plans		**Y**	Include a concept plan for both the public and private realm (which includes outdoor amenity space on the podium, rooftop and/or at grade.
Facility Fit Plan		**Y**	Can be included on the landscape drawings
Tree Inventory and Assessment Report/Plan		**Y**	All reports are to be signed and stamped by an arborist.

Geotechnical Report	**Y**	All reports are to be signed and stamped by a professional engineer.
Railway Corridor Safety Study		
Affordable Housing Brief	**Y**	Can be included as part of the Planning Justification Report.
Detailed Site Plan and Coloured Site Plan	**Y**	Should be fully dimensioned showing adjacent properties and buildings including setbacks. Site Plan should also include a phasing plan.
Block Development Plan		
Access & Fire Route Plan	**Y**	Can be included on the site plan.
Site Grading Plan	**Y**	Storm floodplain limit to be plotted on drawings.
Erosion & Sediment Control Plan	**Y**	
Site Servicing Plan	**Y**	
Lot Survey	**Y**	
Coloured Elevations & Renderings	**Y**	Should also include cross-sections.
Conceptual Floor Plans	**Y**	
Waste Management Plan		
Autoturn Analysis for Fire, Delivery and Waste Vehicles	**Y**	Can be included in the Traffic Impact Study.
OBC Matrix		
Sanitary Sewer Capacity Analysis Report	**Y**	Can be included as part of the required FSSR.
Electronic copies of all materials in .pdf format on USB; and a letter of verification, stating that the documents provided are in an accessible format and meet the AODA standards	**Y**	All PDF documents that are intended to be uploaded to the City's website, must be accessible in order to meet the Province's *Accessibility for Ontarians with Disabilities Act* (AODA) Information and Communications Standards. Please see attached the Accessible Document Checklist for Vendors to provide assistance on creating an accessible PDF document.
Plans in CAD or GIS format	**Y**	Compatible with either ArcGIS Desktop 10.8, ArcGIS Pro 2.8.1, or AutoCAD Map 3D 2018 – and georeferenced to NAD 83 UTM Zone 17N.

Please provide all drawings and reports via a File Share link, to be provided by City staff.

Appendix B:
Terms of Reference and Correspondence

January 10, 2025

Nadeem Zahoor
Manager of Transportation, Engineering Services Department
City of Pickering
E-mail: nzahoor@pickering.ca

Doug Robertson
Senior Project Manager, Works Department (Transportation Infrastructure Division)
Regional Municipality of Durham
E-mail: doug.robertson@durham.ca

Peter Deluca
Senior Project Manager
Ministry of Transportation
E-mail: peter.deluca@ontario.ca

RE: TRANSPORTATION IMPACT STUDY TERMS OF REFERENCE FOR 1095 KINGSTON ROAD, CITY OF PICKERING PRE 35/24

Dear Nadeem, Doug, and Peter,

Introduction

This document outlines the scope, objectives, methodologies, and deliverables for the Transportation Impact Study (TIS) to be prepared in support of an Official Plan Amendment (OPA) and Zoning By-law Amendment (ZBA) application for the proposed residential development municipally located at 1095 Kingston Road in the City of Pickering (herein referred to as "the site" or "proposed development"). The site is bounded by Kingston Road to the north, Highway 401 to the south, Dixie Road to the east, and the Lakeshore East railway line to the west. The development proposal comprises approximately 1,517 residential units.

Notably, the planned Durham-Scarborough Bus Rapid Transit (DSBRT) system will be assumed as operational along Kingston Road for all future condition analyses.

In addition, the TIS will be prepared in reference to the Region of Durham's TIS Guidelines (dated 2011).

Study Area

The study area will encompass the following intersections near the proposed development site:

- Kingston Road / Highway 401 Westbound On-Off Ramps (signalized)
- Kingston Road / Fairport Road (signalized)
- Kingston Road / Dixie Road (signalized)
- Kingston Road / Walnut Lane (signalized)
- Kingston Road / Liverpool Road (signalized)
- Existing and future site accesses

The planned DSBRT system will be assumed as operational for all future background and future total analyses. The latest preliminary designs (dated 2021) suggest two through lanes in each direction along Kingston Road, with auxiliary turning lanes and a centre-median BRT system. Additionally, cycle tracks are shown on both the north and south sides of Kingston Road. The nearest DSBRT stop is planned for the intersection of Kingston Road and Dixie Road, located adjacent the site.

Methodology

The TIS will utilize a comprehensive approach including the following key components:

- Collection of existing traffic data, including peak-hour traffic volumes and existing signal timing plans.
- Capacity analysis using Synchro version 11, based on the City of Pickering and Region of Durham's latest guidelines.
- Assessment of existing and future Level of Service (LOS) within the study area based on established criteria.
- Evaluation of transit, pedestrian and cyclist facilities and their integration with the proposed development.

Analysis Periods

The study will focus on the 2030 and 2035 horizon years for all study area intersections and the 2040 horizon year for all study area intersections under the jurisdiction of the Ministry of Transportation (MTO). These horizon years have been selected to account for anticipated development and growth within the area in line with other studies currently being undertaken nearby. These periods will consider short-term impacts as well as potential changes in travel behavior over the long term.

Background Traffic

Given the significant volume of development planned along Kingston Road, corridor growth in addition to specific background development traffic will not be considered. With the introduction of the DSBRT and anticipated modal shift away from single occupant vehicle trips, it is expected that there will be an overall reduction in vehicle traffic along Kingston Road in future during peak hours. Background traffic generated by specific area developments will be included as part of the future horizon analyses.

Data Collection

Data collection will involve a combination of field surveys and existing data sources. Turning movement counts will be conducted during peak periods to capture the full spectrum of traffic conditions where recently acquired existing data are not already available to BA Group.

Mitigation Measures

Based on the analysis, the TIS will identify potential mitigation measures, if necessary, to address identified impacts as a result of the proposed development. These measures may include signal timing adjustments, intersection geometric enhancements, and improvements to pedestrian and cyclist infrastructure.

Parking and Loading Assessment

The study will assess the requirement and supply of vehicle parking, bicycle parking, and loading facilities to adequately support the proposed development.

Transportation Demand Management (TDM)

A comprehensive TDM plan will be developed as part of the study. The plan will outline strategies to promote sustainable travel options, reduce single-occupancy vehicle trips, and enhance overall transportation efficiency.

Reporting and Documentation

The final TIS report will include:

- Vehicle parking, bicycle parking, and loading assessment results.
- Traffic impact modeling results and assumptions.
- Detailed analysis of traffic impacts at identified intersections and road segments.
- Mitigation strategies and their potential effectiveness (if required).
- TDM plan measures.
- Supporting data, figures, and tables.

Agency Review

Upon completion, the report will be submitted to the City of Pickering, Region of Durham, and the MTO for review and feedback. Comments received during the review process will be taken into consideration for future submissions.

* * * * * *

We trust that this study terms of reference satisfies the City of Pickering, Regional Municipality of Durham, and Ministry of Transportation requirements for a transportation study at this location. Should you wish to discuss further with BA Group on the scope of this study, please contact the undersigned.

Sincerely,

BA Consulting Group Ltd.

Monica Miranda
Lead Transportation Analyst

cc. Steven X. Kwan, P.Eng., Nathan H. Yau, P.Eng.

Nathan H. Yau

From:	Haben Russom <Haben.Russom@Durham.ca>
Sent:	January 21, 2025 11:59 AM
To:	Monica Miranda
Cc:	Doug Robertson; Steven X. Kwan; Nathan H. Yau
Subject:	RE: 1095 Kingston Road - City of Pickering - TIS Terms of Reference [PRE 35/24]
Attachments:	PRELIMINARY DESIGN dsbrt_epr_appendixa1.2_pickeringdesign_0 - Merritton - Dixie.pdf; 90% PM & SIGNAGE PLANS- Delta to Merriton.pdf; IFT 60669043-D-K-PM - DIXIE - BAINBRIDGE.pdf

Hi Monica,

We have reviewed your proposed Terms of Reference and they are generally acceptable, subject to the comments below:

1. Your study should comply with the Region's Traffic Impact Study Guidelines, including the requirements for Synchro analysis (Chapters 9 and 10 in the Design Specifications for Traffic Control Devices, Pavement Marking, Signage and Roadside Protection).

2. We agree with the study area intersections identified. Please be reminded, the Region does not support an access onto/from Kingston Rd. All accesses to the site should be via Dixie Rd, as it is for the existing site.

3. If needed, the most current intersection turning movement counts, ATR counts and AADT data available from the Region can be downloaded from our web site through the interactive traffic counts map. Other traffic data, including signal timings, are available for purchase from our Traffic Engineering & Operations Division (traffic@durham.ca 905-666-8116).

4. The study is to include a site visit to observe existing infrastructure and operations for all travel modes. Key observations are to be included in the report, including any observed operational or safety issues. Observations of existing traffic operations (e.g. queue lengths) should be used to validate the existing conditions Synchro analysis results.

5. We will require an assessment of three horizon years: existing conditions, expected build-out year, and build-out year +5 years. Please confirm 2030 will be the built-out year.

6. The study is to include sections on transit and active transportation to document existing and planned networks and services and provide recommendations for safe and effective connectivity to the site for non-auto travel.

7. The Travel Demand Management section should provide recommendations on infrastructure and programs to minimize travel demand and encourage non-auto travel mode use by the residents of this development. The TDM recommendations are to be site-specific, and the study is to identify who would be responsible for the initial implementation and on-going operation (as applicable) of each recommended facility or program.

8. We agree with the background traffic approach provided that the City of Pickering is contacted to obtain studies from relevant development projects. In the report, include relevant development projects that would impact the traffic within the study area.

9. The Region will be implementing median BRT lanes on Kingston Road through your study area as part of the Durham-Scarborough BRT project. According to our 2025 Durham Budget, construction of Bus Rapid Transit Lanes on Kingston Rd, from Altona Rd to Notion Rd is forecasted to begin in 2026.

10. With implementation of the BRT, the following changes are to be incorporated into the Synchro analysis for intersections along Kingston Road:
    - Change general purpose lane configuration as needed to match the provided design plans (note that the bus-only lanes are not coded into Synchro as they do not contribute to the general traffic capacity of the intersection);
    - Reassign left turn movements from unsignalized intersections and accesses that will be restricted to right-in/right-out to U-turn movements at the adjacent signalized intersections;
    - Change eastbound/westbound left turn operation from protected-permitted to protected-only;
    - Extend northbound/southbound all-red clearance interval to account for the additional width across Highway 2; and
    - Extend northbound/southbound pedestrian times to account for the additional width across Highway 2.

Additional Comments

Attached are Pavement Markings drawings intended to assist in the assignment of lanes and movement along Kingston Road. These pavement markings are to be used for the expected build-out and build-out + 5 years (should the build-out year be 2030). All construction can be assumed to be completed by 2034.

Please note this is the best information we have, at this time. Drawings are subject to change and should be for the purposes of this report only.

Regards,

Haben

From: Monica Miranda <>
Sent: Friday, January 10, 2025 4:20 PM
To: Zahoor, Nadeem <nzahoor@pickering.ca>; Doug Robertson <Doug.Robertson@Durham.ca>; peter.deluca@ontario.ca
Cc: Steven X. Kwan <>; Nathan H. Yau <>
Subject: 1095 Kingston Road - City of Pickering - TIS Terms of Reference [PRE 35/24]

⚠ **CAUTION:** This email is from an external source. Verify sender before opening links and attachments. ⚠

Hi Nadeem, Doug, and Peter,

BA Group has been retained by the landowners of the property municipally known as 1095 Kingston Road in the City of Pickering (southwest corner of Kingston Road/Dixie Road) to undertake transportation consulting services for a proposed residential redevelopment. A Pre-Consultation Meeting, dated October 23, 2024, has been held virtually with the City, Region, and Ministry of Transportation to discuss the application and facilitate the redevelopment of the property.

We have prepared a Transportation Impact Study (TIS) Terms of Reference to provide a scope of work that will be completed and submitted as part of the Official Plan Amendment and Zoning By-law Amendment application.

Please find attached our proposed study terms, which considers the Region's TIS guidelines and Pre-Consultation Meeting comments.

Feel free to contact us for any comments or questions.

Thank you,

Monica Miranda
Lead Transportation Analyst

BA Consulting Group Ltd.
95 St. Clair Avenue West, Suite 1000 | Toronto
416 961 7110 x202 |



THIS MESSAGE IS FOR THE USE OF THE INTENDED RECIPIENT(S) ONLY AND MAY CONTAIN INFORMATION THAT IS PRIVILEGED, PROPRIETARY, CONFIDENTIAL, AND/OR EXEMPT FROM DISCLOSURE UNDER ANY RELEVANT PRIVACY LEGISLATION. No rights to any privilege have been waived. If you are not the intended recipient, you are hereby notified that any review, re-transmission, dissemination, distribution, copying, conversion to hard copy, taking of action in reliance on or other use of this communication is strictly prohibited. If you are not the intended recipient and have received this message in error, please notify me by return e-mail and delete or destroy all copies of this message.

Appendix C:
Durham Traffic Impact Study Guidelines

The Regional Municipality of Durham

TRAFFIC IMPACT STUDY GUIDELINES

Works Department
Traffic Engineering and Operations Division
101 Consumers Drive, Box 623
Whitby, ON L1N 6A3

March 2010
Revised Oct 2011

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1. Introduction

1.1 Purpose

Traffic impact studies are primarily required to identify the impacts of new development on the public road system, on public transportation and other modes; and their mitigation through measures such as road and intersection improvements and/or the need to install or upgrade traffic control devices. In addition, traffic impact studies can assist in identifying the financial responsibility, timing for transportation system improvements and the staging of development. While the focus of these studies is on maintaining a safe and efficient road system for automobile and truck traffic, it is also important to consider other modes of transportation including public transit, cyclists and pedestrians. Therefore, recommendations emanating from a traffic impact study may also include improvements to facilities and/or services for other transport modes.

These guidelines have been developed by the Regional Municipality of Durham (the Region) to meet the following objectives:

- Provide land owners, development companies, and Consultants with an approach to preparing traffic impact studies that will meet the requirements of the Region;
- Ensure consistency in the preparation of traffic impact studies, which will facilitate thorough and expeditious reviews by the Region;
- Provide a process that forms a working partnership between the Region and the private sector in planning the technical framework for “information services” to Regional Council and the public forum; and
- Reduce the costs and delay to developers caused by confusion of the process for development approval.

1.2 Durham Region’s Role

Within Durham Region, the Region has responsibility for most arterial roads as well as traffic signals, and an interest in arterial and other roads under the jurisdiction of the local municipalities as their operation may affect the Regional roads. The Regional road system is illustrated in **Figure 1**, which shows the entire Region, and in **Figure 2**, which focuses on the denser road network serving the City of Pickering, Town of Ajax, Town of Whitby, and City of Oshawa. In addition, Durham Region Transit (DRT) has jurisdiction over the provision of transit services within the Region, and the Region also plays a significant role in transportation demand management (TDM) through its Smart Commute Durham efforts. The designated Transit Priority Network is illustrated in **Figure 3**. The Region also designates a Strategic Goods Movement Network containing preferred haul routes which are to accommodate commercial vehicles on a year round basis and link major generators of goods movement traffic as illustrated in **Figure 4**.While these maps are useful in determining the jurisdiction and functions of roads that may be directly impacted by a proposed development, the onus is on the proponent to contact all potentially affected government agencies to determine their individual requirements with respect to addressing impacts on various aspects of the transportation system.

For a development site situated on a Regional road, the Region’s Works Department is the key contact for traffic impact studies, and in conjunction with other Regional Departments, will assist in establishing the scope of a transportation impact study. As noted above, the proponent will need to consult with other government agencies such as local municipalities, Durham Region Transit (DRT), the Ministry of Transportation of Ontario (MTO), and GO Transit to confirm the full scope. The transportation facilities that are typically under the jurisdiction of the local municipalities include local and collector roads, sidewalks, trails, and cycling facilities, while the MTO has jurisdiction over the 400 series freeways and provincial highways. DRT provides public transit services within the Region, and GO Transit has jurisdiction over inter-region rail and bus transit.

With respect to pre-consultation, submission, and review of traffic impact studies, the following Regional department and/or agency structure applies:

- ***Works Department*** – primary and first point of contact for all traffic impact studies, and the key resource for traffic and collision data as well as information regarding traffic control devices;
- ***Planning Department*** – primary point of contact for all Regional and local municipal development applications, except site plan applications, and coordinates the Region's response. The Planning Department is also responsible for the Smart Commute Durham program and implementation of TDM measures within the Region. As well, the Planning Department is the key resource for travel demand model data including information such as population and employment growth, development patterns, travel demand management, and long range traffic forecasts; and
- ***Durham Region Transit*** – separate agency with specific interests in development impacts that affect transit service and/or facilities, and the key resource for local transit routing and requirements.

Following a review of a traffic impact study, the comments prepared by staff in the departments listed above are collected by the Regional Works Development Approvals branch for circulation and action.

1.3 Description of the Planning Process Relevant to Transportation

The planning process related to assessing the traffic impact of new development or redevelopment ranges from broader, longer range issues to very site specific details. The key instruments in the planning process as related to addressing potential changes in traffic requirements are described briefly below:

- ***Regional and/or Area Municipal Official Plan Amendments:*** as may be required to change land use designations to accommodate a proposed land use (e.g., re-designating lands from residential to mixed use);
- ***Re-Zoning:*** as may be required to increase the intensity or diversity of land uses on a site (e.g., altering how land may be used, where buildings and other structures can be located, the types of buildings that are permitted and how they may be used, or the lot sizes and dimensions, parking requirements, building heights and setbacks from the street);
- ***Plan of Subdivision:*** as may be required to address the details of a subdivision of land (e.g., new street connections to the public road system, locations of traffic signals, etc.); and
- ***Site Plan:*** as may be required to address the details of a specific development (e.g., driveway access design details) or Plan of Condominium.

As part of a traffic impact study, the introduction should include a description of where the development is in the planning process, and what is being applied for with respect to any changes to the existing planning regulations.

These guidelines have been developed to address traffic impact studies that focus on a particular development, and are not intended to cover the full range of activities that may be necessary for secondary planning or corridor transportation studies. The latter types of studies, which are broader and more comprehensive, are often required as part of the background work for a proposed amendment to the official plan of either an area municipality or the Region.

1.4 When is a Traffic Impact Study Required?

A Traffic Impact Study report is typically required where a proposed development may impact the transportation network, including the road, transit route, cycling and pedestrian components.
For these situations, as well as when a proposed land use is considered as-of-right, a transportation impact study is required when:

- The proposed development is anticipated to generate 100 or more vehicle peak hour trips (two-way); or
- The proposed development is anticipated to generate less than 100 vehicle peak hour trips, however, the site or study area characteristics are such that traffic or other transportation issues or concerns may have to be addressed to accommodate the development.

It is also recognized that developments may not proceed as originally planned for a variety of reasons. Should the proposed development remain dormant for two years or more, i.e., the application process has become inactive, it will be necessary to update the traffic impact study to address any changes in either the development proposal or study area transportation conditions.

1.5 Pre-Consultation

Prior to the undertaking of a traffic impact study, pre-consultation is required between the Region and the applicant's consultant. The intent of the pre-consultation is to discuss the development proposal, relevant issues pertaining to the type of development or its location, establish the scope of study required, and to confirm acceptable study parameters.

The format for pre-consultation will depend in part on the scale of the development proposal, the proposed land use and its likely traffic impacts, and may include a phone discussion, email exchange, or a meeting. A checklist of discussion items is provided in Section 3 of these guidelines to provide structure to the pre-consultation, and to serve as the basis for the requirements of a particular transportation impact study.

The Region may accept study findings and recommendations even where pre-consultation has not occurred, but omitting pre-consultation is likely to result in a need for multiple revisions, and resubmissions, which can greatly extend the review process.

1.6 Required Qualifications

As part of the pre-consultation exercise, the applicant's consultant should be prepared to demonstrate the experience and expertise that both the firm and the individual acting as project manager have in the field of transportation and traffic engineering and the preparation of traffic impact studies. In the event that the consultant lacks the prerequisite experience, the Region would require that the applicant retain a new qualified consultant, or possibly a qualified sub-consultant to assist the original consultant. The latter case would address situations where the original consultant is providing other services within their field of expertise to the applicant.

The submitted traffic impact study will include a transmittal or signature page with the signatures of the project manager and a second person responsible for quality assurance (i.e., "checked by"). If the study is prepared or reviewed by a professional engineer, the report should be stamped accordingly. For studies prepared by other professionals specializing in transportation planning, the Region will assess the need for co-signing and stamping by a professional engineer depending on several factors such as the experience and qualifications of the author of the

report, the degree or scale of engineering content within the study (e.g., design drawings), and the perceived liability to the Region with respect to safeguarding of life, health, property, or the public welfare.

1.7 Responsibilities Following Region's Review of Traffic Impact Study

If it is determined through the Region's review of the traffic impact study that all transportation and traffic impacts have been properly assessed, and the recommended improvements to the transportation system will allow the development to proceed without adverse impacts, favourable comments will be provided with respect to transportation and traffic considerations for the development review and approval process.

Should the Region determine that the traffic impact study is incomplete, has significant errors, or has not properly identified the necessary improvements, the applicant's consultant will be required to:

- Address any study issues or deficiencies as identified in the Region's review; and
- Submit an addendum report identifying how the issues and deficiencies have been or are to be addressed. The addendum would require two signatures as was required for the original report.

Pending receipt and subsequent acceptance of an addendum report, favourable comment on the development proposal will be withheld by the Region.

2. Technical Component

The traffic analysis will follow the framework of the comprehensive transportation planning process which includes but may not be limited to the following tasks;

- Description of the Proposed Development
- Definition of the Study Area
- Description of Existing Conditions
- Setting a Planning Horizon and Determining Background Traffic Forecast
- Trip Generation and Modal Split assumptions
- Trip Distribution
- Trip Assignment
- Traffic Analysis
- Screenline Analysis
- Provisions for Non-auto Modes
- Community Impact Analysis – Neighbourhood Impacts, Parking Impacts, TDM
- Findings and Recommendations

2.1 Description of Development Proposal

The report title page shall include the name of the proposed development, the developer's name and the consultant's name, as well as the road and municipality where the proposed development is located.

The type and size of the proposed development shall be clearly described, including as much detail as possible on the proposed uses, number and size of buildings, etc. The current status of the development proposal within the planning process shall be noted, as well as the expected dates for construction start, full build-out, and completion of any interim phases.

The location of buildings on the site, the proposed accesses to the public road network, and the internal auto, cycling and pedestrian circulation system and amenities shall be illustrated on a site plan, which is to be included for reference as part of the traffic impact study. The site plan shall be clear, legible, and current.

With respect to traffic impact, the time periods when the development will have the greatest impact on the transportation system shall be identified as related to the nature of the proposed land use (e.g., weekday and weekend am/pm peak hour, street peak, peak of generator, etc.). This would include a description of the hours of operation, and/or considerations such as shift changes, special events, or other unique aspects of a proposed development. Other characteristics, such as higher generation of truck traffic, transit trips, pedestrian/cyclist traffic, etc., shall also be identified.

Description of proposed development and planning context
Clear, legible, and current site plan to be included in the report
Identification of critical time periods for assessing impact

2.2 Definition of the Study Area

The study area for a traffic impact study will typically vary according to the size of the proposed development, but should include the road sections and intersections, transit routes, and cycling and pedestrian facilites that will experience significantly higher traffic demands and/or impacts due to the proposed development. Therefore, pre-consultation with the Region shall be required to establish the limits of the study area including specific intersections to be included in the analysis. The traffic impact study report shall include a key map to illustrate the study area in the context of the local municipality.

Pre-Consultation required with Region to confirm study area
Key Map for report to illustrate study area

2.3 Description of Existing Conditions

The existing physical conditions in the study area shall be clearly documented through a site visit, and shall include detailed descriptions of the roadways, intersections, traffic control devices, transit, cycling and pedestrian facilities and amenities, traffic regulations (e.g., turn prohibitions, speed limits, parking restrictions, etc.), parking facilities, and adjacent land uses. The classification of study area roads shall also be provided as well as any other designation with respect to their intended function such as goods movement corridor, transit corridor, cycling spine, etc. The latter designations may be found in the Official Plans of the Region and local municipalities, or in current transportation master plans, cycling master plans, etc. To augment the descriptive text, it is recommended that site photos be taken, and selected photos should be included in the traffic impact study to assist in illustrating existing conditions.

The most recent traffic volumes available in the Region's and/or local jurisdiction's database shall be requested, and shall be supplemented by new traffic counts in the event that either the available traffic counts are more than one year old or there are no traffic counts available for a particular intersection or roadway. This will ensure that the basis for both assessing existing traffic conditions and forecasting future traffic conditions will properly reflect current traffic data for the peak periods of interest. A summary of the key traffic data and other relevant data that may be required (depending on the scope of the traffic impact study) is as follows:

- Existing and historical traffic volumes
- Pedestrian crossing volumes
- Collision records (typically three year history)
- Signal timing
- Transit routes, schedules and ridership data
- List of committed road improvements

Existing traffic operations shall also be observed and documented during the peak periods. Preferably, the observations should be carried out at the same time as the data collection. This will assist in determining if there are any unusual traffic conditions or issues within the study area, and will serve to validate the results of subsequent analyses.

The data collection activities shall be described in the traffic impact study with existing peak period traffic volumes presented clearly and legibly in figures (preferable), charts, and/or tables. The raw traffic data summaries obtained from field counts shall be provided for reference as part of the report appendix materials.

Description of physical conditions of transportation network
Current traffic data supported by observations of operations
Clear and legible presentation of traffic data

2.4 Setting a Planning Horizon and Determining Background Traffic Forecast

Background traffic refers to the traffic that would be using the study area road network regardless of whether the proposed development is built or not, and as such, provides a benchmark for the assessment of the development's impact. Prior to estimating background traffic, it is necessary to establish a horizon year(s), or design year(s), for assessing future traffic conditions and requirements. The appropriate horizon year(s) shall be determined on a case-by-case basis depending on the scale of the development, and in some cases, development phasing. This will be part of the pre-consultation with the Region.

It is recognized that a relatively short term planning horizon is used for most traffic impact studies, since the traffic assessment is usually based on detailed operational analysis methodologies, and longer range forecasts are not considered to be sufficiently precise to be analyzed in this way. Therefore, typical horizon years that shall be considered are as follows:

- "Opening day" to represent full build-out of a proposed development within one to three years of the base year (current) conditions
- Five or 10 years after full build-out to assess a relatively mature state of development in the study area
- If the development is to be phased, at build-out of each significant development phase
- Any combination of the above to reflect logical checkpoints as development progresses

The typical methods for preparing background traffic forecasts include:

- Application of growth factors based on historical traffic growth, travel demand forecasting models, population growth, etc.
- Addition of traffic that will be generated by other developments within the study area that are approved, but not constructed
- Reassignment of area traffic to reflect planned improvements to a road network such as the addition of a new road that may change travel patterns

- A combination of the above

As noted above, it may be necessary to make assumptions with respect to future road network improvements that could logically be in place by the study horizon year(s). Information pertaining to planned road network improvements shall be drawn from the capital works programs or development charges by-laws of the Region and other local jurisdictions, or from current transportation master plans or other longer range transportation planning studies. Since these information sources may give a range of years for the implementation of a planned improvement, a conservative approach shall be taken whereby it is assumed that the improvement would occur later rather than earlier in a planning period when associating it with a particular horizon year.

The acceptable methodology for estimating future background traffic shall also be discussed with the Region as part of pre-consultation. The appropriate method will be largely dependent on Study Area characteristics as well as the horizon year(s).

The background traffic forecasts for the peak hour periods for each horizon year shall be presented clearly and legibly in figures. Supporting information such as regression analysis to develop historical growth rates, travel demand model output, and assumptions used in estimating background traffic volumes shall be provided for reference as part of the report appendix materials.

Establishment of horizon year(s) for forecasting
Confirmation of background traffic forecasting methodology
Confirmation of future road network assumptions
Clear and legible presentation of background traffic forecasts

2.5 Trip Generation and Modal Split Assumptions

The number of vehicle trips that will be generated by the proposed development during the peak hour period of the adjacent or nearby arterial roads shall be estimated using generally accepted methodologies, which may vary depending on the type of development. These methodologies include:

- First principles – estimates of traffic based on anticipated site activity (e.g., number of employees) and converted into vehicle trips through the application of factors such as modal split, percentage of traffic occurring during peak hours, etc.
- Trip generation surveys of proxy developments conducted by the applicant's consultant
- Trip rates and formulae published in the current version of the Institute of Transportation Engineers (ITE) manual, "Trip Generation"

The basic trip generation developed using the sources above shall be adjusted where appropriate to account for the following factors that affect the number of vehicle trips generated by a site or considered additional to the study area road network:

- Pass-by trips, diverted link trips, and on-site synergy between complementary land uses – according to ITE methodology, original research, or reasonable assumptions
- Modal split and TDM adjustments – according to reasonable assumptions for the study horizon year,. Reference should be made to the targets established in the Region's Transportation Master Plan (auto reduction target) and Durham Region Transit's Long Term Transit Strategy Study (transit mode split objectives).

The methodology and assumptions to be used in estimating peak period site trip generation shall be confirmed through pre-consultation with the Region and shall be applied in accordance with the current edition of the ITE "Trip Generation Handbook". When transit ridership is part of the growth scenario (i.e., transit station area), the trip generation shall be based on "person trip" principles before the modal split is applied.

The site trip generation shall be clearly presented in tables or charts, and supporting research or other relevant information shall be provided for reference as part of the report appendix materials.

Acceptable site trip generation methodologies – pre-consultation
Acceptable site trip generation adjustments – pre-consultation
Clear presentation of site trip generation and reference material

2.6 Trip Distribution

The distribution of the site generated trips to the study area road network shall be based on generally accepted methodologies, which may vary by the type of development and for different horizon years. As well, different methods may be applied to determine the trip distribution for primary, pass-by, and diverted link trips. These methodologies include:

- Existing traffic patterns
- I.T.E. Trip generation manual
- Origin-destination or similar travel surveys
- Market research and related study by a market consultant
- Travel demand forecasting model information related to origins/destinations for a specific traffic zone or zones
- Current Transportation Tomorrow Survey data
- Census data

The rationale for determining trip distribution shall be discussed as part of pre-consultation activities, and shall be clearly articulated in the traffic impact study. The trip distribution shall be presented clearly in tables or figures, and relevant background information shall be provided for reference as part of the report appendix materials.

Acceptable trip distribution methodologies – pre-consultation
Acceptable trip distribution variations – pre-consultation
Clear presentation of trip distribution and reference material

2.7 Trip Assignment and Total Traffic Forecasts

The assignment of the site trips to the study area road network shall combine the trip generation and distribution information with logical decision-making regarding the choice of alternative routes to/from a site. A trip assignment may be made manually or automatically generated through a travel demand model. The selected method may depend on the scale of development.

The assumptions or parameters used in undertaking the trip assignment shall be clearly articulated in the traffic study by providing the following:

- Description of the rationale for routing choices where alternatives exist
- Explanation of iterative assignments if undertaken to avoid problem traffic movements
- Separate figures that clearly illustrate primary site trips, pass-by/diverted link trips, and internal trips, as applicable

The site trip assignment, or assignments if considering a phased development, shall be summed with the corresponding background traffic forecasts to determine total traffic forecasts for each peak period and each horizon year. A separate figure shall be provided to clearly illustrate the total traffic forecast for each horizon year.

Trip generation/distribution combined with logical routings
Manual or transportation planning model site trip assignments
Site and background traffic summed for total traffic forecasts
Clear presentation of site and horizon year total traffic forecasts

2.8 Traffic Analysis

The analysis of existing and future traffic conditions shall be conducted using methodologies and software analysis tools that are accepted by the Region. This is necessary as part of ensuring that the analysis is easily understood as well as maintaining consistency in the review of traffic impact studies for development sites across the Region.

For guidance with respect to analysis, the Region has prepared several reference documents, including:

- Design Specifications for Traffic Control Devices, Pavement Markings, Signage and Roadside Protection (Works Department, April 2007 – updated periodically)
- Right-Turn Lane Guideline
- Policy for Entranceways
- Arterial Corridor Guidelines (February 2007)

The analysis shall follow the methodology of the “Highway Capacity Manual” as determined by the “setting” of the proposed development. Capacity analysis and Level of Service (LOS) calculations are different for rural and urban environments. In urban areas, LOS is based on “vehicular delay” at intersections while in rural areas the LOS is based on “speed”. It is the planning policy of the Region of Durham to operate the road network in an urban setting” to a LOS “D” or better. Rural highways are expected to operate at LOS “C” or better.

The capacity analysis and LOS shall address the performance of all the proposed site entrance/exits and the regional road intersection(s) impacted for existing and future conditions for the identified analysis period. The performance of each signalized and unsignalized intersection will be tested in the following scenarios:

- Existing Conditions
- Existing Conditions + Full Development
- Future Background Conditions
- Future Background Conditions + Full Development

For certain types of development like shopping centres, a big issue can be the provision of “on-site parking” and the possibility of “overspill parking” on community residential streets. In some cases, a large mixed land use

development may want a reduction in the zoning parking requirements based on “shared parking principles”. When parking supply or demand is expected to be an issue, the Consultant should discuss this aspect at the beginning of the project. The Region’s primary concern is to ensure that the parking supply/layout does not impact traffic operations on the regional roads.

In some growth areas and along some arterial roadway corridors, public transportation is a key issue. In these studies, the study framework may change. The analysis would consider the impact of changing “modal split”. In these cases, the analysis would be based on person-trip characteristics. Modal split is an issue which the Consultant should discuss at the beginning of the project.

The respective roles of the Region and the consultant in establishing the ground rules for the analysis and presenting the results of that analysis are summarized in **Table 1**.

TABLE 1
TRAFFIC OPERATIONS ANALYSIS
ROLES AND RESPONSIBILITIES

Component	Region	Consultant
Methodology and Software	Identify acceptable operational analysis techniques and software. Currently Highway Capacity Manual methodology and Synchro software are required; Identify setting; urban or rural	Consult with Region with respect to acceptable Synchro software version and/or the acceptability of using an alternative analysis tool where Synchro is not appropriate (e.g., microsimulation, etc.) In rural setting follow Highway Capacity Manual for LOS of highway
Input Parameters	Identify acceptable and/or required parameters – saturation flow, peak hour factor, heavy vehicle percentages, cycle lengths, clearance intervals, minimum phases, etc. Refer to the Region’s Design Specifications for Traffic Control Devices, Pavement Markings, Signage and Roadside Protection, Section 9.	Clearly state all parameters and assumptions, and identify any changes to software default parameters or other parameters prescribed by the Region. Include software reports (as per the Region’s standards) and drawings in an appendix, with all clearly labeled for ease of reference
Queuing	Identify acceptable methodology for queue analysis. Currently Synchro and 95th percentile queue	Identify where queues would be expected to exceed available storage
Measures of Effectiveness (Level of Service – LOS; volume to capacity ratio – v/c)	Identify acceptable LOS, and provide a definition of critical movements by LOS and/or v/c where improvements are required	Clearly present analysis results in tables, charts, figures, and/or drawings. Highlight critical movements warranting improvements
Traffic Signal Justification	Identify acceptable methodology for traffic signal justification. Currently, Book 12 of the Ontario Traffic Manual, excluding the four hour justification	Clearly state assumptions and calculations as well as any deviation from accepted methodology or the rationale for using an alternative methodology. Provide calculation sheets in an appendix, clearly labeled for ease of reference.

TABLE 1 TRAFFIC OPERATIONS ANALYSIS ROLES AND RESPONSIBILITIES		
Component	**Region**	**Consultant**
Traffic Signal Operation	Provide signal timing information and identify acceptable cycle lengths, minimum timings, and phasing. Refer to the Region's Design Specifications for Traffic Control Devices, Pavement Markings, Signage and Roadside Protection, Section 9.	Conduct analysis in consideration of the Region's signal operation philosophy and guidelines.
Sight Distance	Identify acceptable reference material and methodology for sight distance requirements. Currently, TAC Geometric Design Guide for Canadian Roads	Provide references to manuals used and document field measurements, including assumed design speed, object and eye heights. Illustrate with appropriate drawings and/or photos where this will be beneficial
Collision Review	Identify collision prone locations or safety concerns, and safety performance indicators to be considered	Summarize data in tables and/or in collision diagrams, and identify patterns and likely contributing factors (if any)

Acceptable methodology and analysis software
Acceptable reference materials and/or manuals
Safety aspects related to traffic operations and road design
Provision of detailed analysis information and relevant reference material
Parking/supply and demand
Modal split analysis

2.10 Screenline Analysis

For larger scale development proposals a screenline analysis must be undertaken. Screenline analysis is a comparison of forecasted demands and lane capacities on the major road network (including freeways, arterial roads and major collector roads) connecting the site to the area transportation network. Typical lane capacities should be established based on Regional and area municipal Official Plan road classifications and the general characteristics of the roads (e.g., suburban with limited access, urban with on-street parking, etc.). Mitigation measures in the form of additional lane capacity must be identified where V/C for the screenline exceeds 0.90.

Screenline analysis should consider new capacity that is planned to occur within the horizon of the development. Planned transportation network changes are identified in the schedules of the Regional Official Plan, area municipal official plans, Regional Transportation Master Plan (TMP), area municipal TMPs where applicable, and detailed through the Region's annual Capital Budget and Four Year Forecast exercise and area municipal budgets if applicable.

Transit demands should also be considered, based on the assumed transit modal split, and transit network requirements identified. Consideration should be given to the Official Plan schedule showing the Transit Priority network and the Durham Region Long Term Transit Strategy.

Identification of Screenline deficiencies and recommended mitigation measures
Identification of Transit Demands and Transit Network Requirements

2.11 Provisions for Non-auto Modes

An assessment is required of the provisions made in the development proposal for all non-auto modes, in keeping with the policy directions established by the Regional Official Plan, Regional TMP and the Regional Cycling Plan. Consideration should also be given to DRT's Long Term Transit Strategy and the Transit Oriented Development Strategy. Elements of the proposal that support rapid and conventional transit ridership, cycling, and pedestrian movements on the study area transportation network must be identified. The method and means by which the development, as well as adjacent areas, can be efficiently and effectively serviced by transit must be determined. Pedestrian and bicycle network continuity should also be considered.

An assessment of potential impacts on transit operations must be undertaken for current transit routes and any service changes proposed by the applicant and where the site accesses connect to or cross elements of the Region's Transit Priority Networks (see refer to the Regional Official Plan and the Long Term Transit Strategy). The assessment will identify the potential for increased delay to transit vehicles, safety concerns/conflicts with transit vehicles, and any impacts on stations or stops.

Gaps in pedestrian and cycling network continuity, due to missing infrastructure or as a result of winter maintenance, should be identified. That is, the Consultant should note where obvious gaps in the networks would exist as a result of the site pedestrian and cycling facilities not connecting or being accessible or having access to pedestrian and/or cycling facilities on the existing transportation network. Identification of these gaps will assist local municipal and Regional staff in approving development related transportation infrastructure and/or prioritizing their own programs for pedestrian and cycling facility construction and maintenance.

A detailed assessment of pedestrian facility level of service will be required in the vicinity of the site where the development is expected to produce high pedestrian volumes. Additional sidewalk or facility width may be required in such circumstances.

Assessment of Non-auto modes
Potential impacts on Transit Operations
Gaps in pedestrian and cycling infrastructure
Assessment of Pedestrian Facility Level of Service

2.12 Community Impact Analysis

Neighbourhood Impacts

The traffic impact study will review the transportation network in the vicinity of the proposed development and identify potential neighbourhood infiltration routes. Focusing on these routes in the study area, the report will identify site-related traffic impacts on potentially affected neighbourhood streets during both the commuter peak and the projected site peak and an appropriate mitigation strategy, where one is required.

Parking Impacts

For developments that generate significant auto parking demand the traffic impact study will review the site-generated parking demand and will demonstrate an appropriate parking strategy for the development.

Transportation Demand Management

A goal of the Region's Official Plan is to reduce peak hour travel demand, reduce auto dependency, increase vehicle occupancy, encourage linked trips and encourage other modes of travel as part of Travel Demand Management (TDM). Any reductions in vehicle trip generation based on TDM must be clearly explained with reference material as part of a "person-trip" analysis of the development scenario. A Travel Options plan will be required on certain developments determined by the Region. The Travel Options plan will identify recommended TDM measures, links to Region's TDM initiatives (e.g. Smart Commute Durham), and mechanisms for integrating the proposed development into the existing services and programs. The Region's Planning Department will be available to assist in developing a TDM plan.

Identification of potential neighbourhood infiltration routes and mitigation measures
Parking Management Strategy
Transportation Demand Management plan

2.13 Findings and Recommendations

The translation or interpretation of the results of the traffic analysis into recommended road and traffic control improvements and requirements shall reflect the Region's practices and policies. In addition to the reference documents outlined in the previous section, the Regional Official Plan contains transportation policies and schedules, which should also be referenced as required with respect to road classifications, future transportation improvements (e.g., new road links, transit spines, interchanges, cycling and walking facilities, etc.), and descriptions of the functions and characteristics of the regional road network.

Other reference documents are also used by the Region including the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads and the various "Books" of the Ontario Traffic Manual published by the Ministry of Transportation of Ontario.

The respective roles of the Region and the consultant in identifying required improvements and related mitigation measures are summarized in **Table 2**.

TABLE 2
TRANSPORTATION IMPROVEMENTS
ROLES AND RESPONSIBILITIES

Component	Region	Consultant
Improvements (General)	Confirm methodology for assessing improvements required as a result of background traffic growth versus those required due to the proposed addition of site traffic	Identify any existing deficiencies and improvement measures. Clearly identify traffic impacts associated with each of background and total traffic, as well as the required mitigation measures and timing for implementation. Demonstrate that the recommended improvements will address the impacts.
Roads/Intersections	Identify the acceptable design standards/guidelines for recommended improvements, design speed(s) to be applied and the required level of supporting graphics or drawings. Currently, Region's Design Specifications manual and TAC Geometric Design Guide for Canadian Roads	Present improvement measures in tables, schematic figures, functional plans, or preliminary design plans – i.e., at a level sufficient to confirm feasibility and satisfy the Region's requirements. Where applicable, provide references to guidelines and/or standards used.
Traffic Signals	Identify traffic signal spacing requirements and potentially related requirements for progression analysis/signal coordination.	Where required, conduct appropriate analyses to demonstrate feasibility of changes to signal operations or additional traffic signals
Access Management	Identify acceptable reference material for access management policies and guidelines pertaining to Regional roads. Currently, the Region's Official Plan, Arterial Corridor Guidelines and Policy for Entranceways and TAC Geometric Design Guide for Canadian Roads	Clearly identify access management measures that may be required to mitigate safety or operational concerns. Identify where access plans comply or don't comply with the Region's policies and guidelines, and the rationale for non-compliance
Active Transportation and Public Transit	Provide the contact information for staff of Durham Region, Durham Region Transit, and other agencies with an interest in these modes	Identify deficiencies and recommend improvement measures related to walking, cycling, and/or transit modes.
Transportation Demand Management	Provide contact information for staff in the Planning Department, Transportation Planning and Research section. Planning Department will identify the need for Travel Options plans.	Identify appropriate TDM measures and the development of site-specific Travel Options plans.
Funding/Cost Estimates	Identify/confirm the improvements that will be the financial responsibility of either the Region or the development proponent. Provide guidance with respect to unit costs for road and traffic control improvement measures.	Where required, provide preliminary cost estimates for proposed transportation improvements.

Improvements required for existing, background and total traffic
Feasibility of improvements and compliance with policies and guidelines

Clear presentation of required improvements
Consideration of cost estimates and funding

2.14 Reporting

It is critical to the timing and efficiency of the Region's review that the traffic impact study be clearly and legibly documented in a report. Pre-submission quality control measures should include thorough checking of technical content and calculations, as well as proof-reading for errors in spelling and grammar. Failing to provide a report that meets the intent of the Region's guidelines will result in the report being returned to the consultant to address deficiencies prior to re-submission.

The specific requirements for reporting are as follows:

- Five hard copies of the report and technical appendices
- One electronic file (pdf of report and technical appendices)
- Signature page to indicate the persons responsible for preparing and reviewing the report
- Table of contents to generally follow the organization of the TIS Guidelines
- Key maps, tables, graphs, and figures to be placed within the report adjacent to the relevant text, rather than in an appendix
- Synchro analysis files to be made available upon request

As discussed in the Introduction, the traffic impact study will be considered to have a "shelf life" of two years if the development application is dormant. If the application is to be reconsidered after this two year period, an updated report or addendum will be required to address any changes to the development proposal and/or the transportation system.

It is noted that the Region may at their discretion engage the services of another consultant to peer review a traffic impact study. In this event, the Region will notify the development proponent and their consultant in advance.

Clear documentation essential to expedient review
Five hard copies and pdf file for report and technical appendices
Shelf life of two years if project is dormant in the planning process

3. Traffic Impact Study Guidelines Checklist

A checklist is provided below as a framework for both the Region and Consultant to follow at the key stages of a traffic impact study. The purpose of the checklist at each stage is as follows:

- ***Initiation:*** to guide the pre-consultation discussion between the Region and Consultant, and establish and confirm the required scope of work
- ***Preparation:*** to ensure completeness and facilitate quality control by the Consultant
- ***Submission:*** to ensure a comprehensive and expeditious review by the Region

Number	Item	Comments
Pre-Study		
1	Pre-Consultation	
2	Planning Process	
	▪ Official Plan Amendment	
	▪ Re-Zoning	
	▪ Site Plan	
3	Traffic Impact Study Required?	
	▪ Peak hour trip generation > 100 trips	
	▪ Site or area traffic issues	
4	Consultant Qualifications and Experience	
Study Parameters		
1	Study Area	
2	Data Requirements	
	▪ Establish peak periods for study	
	▪ Regional traffic data	
	▪ Regional signal timing information	
	▪ Regional collision data	
	▪ Regional transit information	
	▪ Traffic data collection required	
	▪ Traffic observations required	
3	Background Traffic Forecast	
	▪ Horizon year(s) ▪ Future road network	
	▪ Methodology	
4	Site Trip Generation and Modal Split Assumptions	
	▪ ITE land use code(s) and trip rates	
	▪ Proxy site data collection	
	▪ First principles	
	▪ Modal split adjustment	
	▪ Pass-by/diverted link adjustments	
	▪ Development phases	
5	Site Trip Distribution	
	▪ Existing travel patterns	
	▪ Travel survey information (e.g., TTS)	
	▪ Travel demand forecast model	
	▪ Market study	
6	Site Trip Assignment and Total Traffic Forecasts	
	▪ Methodology	
7	Traffic Analysis	
	▪ Reference: Works Department Design Specifications for Traffic Control Devices, Pavement Markings, Signage, and Roadside Protection	
	▪ Synchro software	

Number	Item	Comments
	▪ Signal timing parameters	
	▪ Synchro inputs/defaults	
	▪ Signal spacing	
	▪ Signal justification (OTM Book 12, exclude 4 hour justification)	
	▪ Acceptable LOS	
	▪ Critical v/c ratio	
	▪ Queue analysis required	
	▪ Auxiliary turn lane warrants	
	▪ Decision sight distance • On-site parking supply/demand	
9	Screenline Analysis …	
10	Provisions for Non-auto Modes …	
11	Community Impact Analysis … • Neighbourhood Impacts • Parking impacts • Transportation Demand Management • Travel Options Plan	
12	Findings and Recommendations	
	▪ Regional entranceway policies	
	▪ Regional access management guidelines	
	▪ TAC guidelines for geometric design	
	▪ Acceptable design speed	
13	Reporting	
	▪ Number of hard copies (3)	
	▪ PDF requirements (1 or more files)	

4. Traffic Impact Study Guide User Comments

A goal of the Traffic Impact Study Guidelines are to provide the ”users” in the transportation industry an easy to use document loaded with information that will aid decision-makers in their understanding of the project impacts in order to allow a particular development to proceed in the development approval process..

We encourage all users of the guidelines to contact the Region if there is any confusion or misunderstanding in the document during the initial years of use so that changes can be made over time.

All comments received will remain confidential. The sender will receive a response from the Region regarding the comments and their application to the guide. Please send any comments to:

Traffic Engineering and Operations Division
Regional Municipality of Durham
101 Consumers Drive
P.O. Box 623
Whitby, ON
L1N 6A3
Phone 905-666-8116

Appendix D:
Reduced Scale Architectural Plans

BDP.
Quadrangle

Quadrangle Architects Limited
The Well, 8 Spadina Avenue, Suite 2100, Toronto, ON M5V 0S8
t 416 598 1240 www.bdpquadrangle.com



1095 Kingston Road, Pickering

Ontario, Canada

for
Resident

Project No. 21068
Date 2025-03-20
Issued for **ZBA SUBMISSION**

ARCHITECTURAL DRAWINGS

A001.0 Statistics

A101.0 Site Plan
A102.0 P1 Underground

A201.0 Ground Floor Plan
A202.0 Mezzanine Floor Plan
A203.0 Level 2 Floor Plan
A204.0 Level 3rd Floor Plan
A205.0 Level 5 Floor Plan
A206.0 Level 6 Floor Plan
A207.0 Level 7 Floor Plan
A208.0 Level 8 Floor Plan
A209.0 Level 9 Floor Plan
A210.0 Typical Tower Floor Plan
A211.0 MPH Floor Plan
A212.0 Roof Plan

A401.0 Building Elevations
A402.0 Building Elevations
A403.0 Building Elevations
A404.0 Building Elevations
A405.0 Building Elevations
A406.0 Building Elevations
A407.0 Coloured Elevation - Building 2A West Elevation
A408.0 Coloured Elevation - Building 1A North Elevation

A501.0 Building 1&2 East-West Section
A502.0 Building 2 North-South Section
A503.0 Building 1 Section

A601.0 Renderings

PLANNING CONSULTANT

The Biglieri Group
2472 Kingston Road
Toronto, ON M1N 1V3
T: 416.693.9155

CIVIL ENGINEER

Counterpoint Engineering
8395 Jane Street
Suite 100
Vaughan, ON L4K 5Y2
T: 905.326.1404

LANDSCAPE ARCHITECT

MHBC
7050 Weston Road
Woodbridge, ON L4L 8G7
T: 905.761.5588

TRAFFIC CONSULTANT

BA Consulting Group Ltd.
95 St. Clair Ave. W
Suite 1000
Toronto, ON, M4V 1N6
T: 416.961.7110

WIND CONSULTANT

Gnobi Consulting Inc.
N/A
Guelph, ON
T: 226.343.0728

GEOTECHNICAL & ENVIRONMENTAL ENGINEER

Grounded Engineering Inc.
12 Banigan Drive
Toronto, ON, M4H 1E9
T: 647.264.7909

NOISE & VIBRATION CONSULTANT

Dillon Consulting Ltd.
111 Farquhar Street
Suite 301
Guelph, ON, N1H 3N4
T: 519.571.9833

PROJECT STATISTICS SUMMARY		
Municipal Address:	1095 Kingston Road, Pickering, ON	
		(sm)
Gross Site Area Net Site Area (Gross Site Area -Sight Triangle)		20,901 20,834
Zoning By-law = City Centre By-law 7553/17		
		(m)
Average Grade =		89.34
Building 1 Height (Storeys): (excl. Mech Penthouse) Building 2 Height (Storeys): (excl. Mech Penthouse)		35 35
Building 1 Height (m): (excl. Mech.Penthouse) Building 2 Height (m): (excl. Mech Penthouse)		114.36 112.81
Net Floor Area (less required Amenity)		(sm) 98,184
Floor Space Index (FSI):		4.71
Number of Residential Suites:		1,492
Total Residential Indoor Amenity Space Provided: Total Residential Exterior Amenity Space Provided:		(sm) 1,000 1,985
Vehicular Parking Provided: Long-Term Residential: Vehicular Parking Provided: Combined Visitor & Retail: Vehicular Parking Provided: Total:		920 223 1,143
Bicycle Parking Total Required: Bicycle Parking Total Provided:		895 895
Total Loading Spaces Provided:		6

GREEN ROOF STATISTICS		
GENERAL PROJECT DESCRIPTION		PROPOSED
TOTAL GROSS FLOOR AREA		98,184 m²
AVAILABLE ROOF SPACE CALCULATION		PROPOSED
TOTAL ROOF AREA (m²)		10,053 m²
AREA OF RESIDENTIAL PRIVATE TERRACES (m²)		1,883.1 m²
ROOFTOP OUTDOOR AMENITY SPACE, IF IN A RESIDENTIAL BUILDING (m²)		2,240 m²
AREA OF RENEWABLE ENERGY DEVICES (m²)		0.0 m²
TOWER(S) ROOF AREA WITH FLOOR PLATE LESS THAN 750 m²		0.0 m²
TOTAL AVAILABLE ROOF SPACE (m²)		5,929.9 m²
GREEN ROOF COVERAGE	REQUIRED	PROPOSED
COVERAGE OF AVAILABLE ROOF SPACE (m²)	2,960 m²	2,960 m²
COVERAGE OF AVAILABLE ROOF SPACE (%)	50 %	50 %

Green Roof Stats

RESIDENTIAL BUILDING ACCESSIBILITY CHECKLIST		
	TOR	ZONING
1.0	SITE PLAN	
1.1	Sidewalks min. 1500mm wide (SDP9)	A101.S, A201.S
1.2	Parking according to SDP9 - Type A - min. 3400mm, Access Aisle - min. 1500mm	A101.S, A201.S, A202.S, A203.S
1.3	Passenger Loading Zone min. 3400mm x 7400mm, overhead clearance min. 3600mm AFF	A101.S, A201.S
1.4	Curb ramp min. 1500mm wide + Tactile Walks, TWS	Refer to Landscape Arch.
1.5	Overhead clearance min. 1980mm AFF	A101.S, A201.S
1.6	Path - stable, firm, slip resistant	Refer to Landscape Arch.
1.7	Min. 1700mm path of travel min. 1400mm x 1400mm ramp space every 30m	A101.S, A201.S
2.0	Parking Levels	
2.1	Overhead clearance from parking entrance to accessible parking min. 2100mm AFF	A101.S, A201.S, A202.S, A203.S
2.2	Accessible parking spaces	A101.S, A201.S, A202.S, A203.S
2.3	Signage at accessible parking spaces (SV4)	Refer to enlarged plans, A100.S, A101.S, A201.S, A202.S
2.4	Access aisles	A101.S, A201.S, A202.S, A203.S
2.5	Curb ramps where level change max. 200mm or less	N/A
2.6	Accessible entrance into building	A101.S, A201.S, A202.S, A203.S
2.7	Pedestrian min. 1500mm (doors in series), min. 1500mm turning circle (unobstructed doors)	A101.S, A201.S, A202.S, A203.S
2.8	Elevator(s) to passenger elevator	A101.S, A201.S, A202.S, A203.S, A400.S, A401.S
3.0	Building Entrance	
3.1	Barrier-free entrance to weekly, like G&C	A101.S, A201.S, A202.S, A203.S, A400.S, A401.S
3.2	Door clear width min. 860mm	A101.S, A201.S, A202.S, A203.S, A400.S, A401.S
3.3	Designated barrier-free stall (where multiple stalls)	N/A AT THIS STAGE
3.4	Accessible door hardware (no or style handles, 3 or U-shaped handles)	N/A AT THIS STAGE
3.5	Power door operator (min. 915mm - max. 1100mm AFF), min. 600mm - max 1500mm from door swing where door swings towards corridor / Proximity scanning device	N/A AT THIS STAGE
3.6	Vestibule min. 1500mm (doors in series), min. 1500mm turning circle (unobstructed doors)	A101.S, A201.S, A202.S, A203.S, A400.S, A401.S
3.7	Accessible door threshold max. 13mm	N/A AT THIS STAGE
3.8	Signage incorporating the International Symbol of Access (ISA)	N/A AT THIS STAGE
3.9	Min. 1700mm path of travel	A101.S, A201.S, A202.S, A203.S, A400.S, A401.S
4.0	Amenity Spaces	
4.1	Power door operator (min. 915mm - max. 1100mm AFF), min. 600mm - max 1500mm from door swing where door swings towards corridor / Proximity scanning device	N/A AT THIS STAGE
4.2	Accessible washroom (multi-stall with barrier-free stall)	N/A AT THIS STAGE
4.3	Universal Washroom	N/A AT THIS STAGE
5.0	Barrier-Free Suites	
5.1	Barrier-free path of travel to one washroom	N/A AT THIS STAGE
5.2	Barrier-free path of travel to one bedroom	N/A AT THIS STAGE
5.3	Barrier-free path of travel to kitchen space	N/A AT THIS STAGE
5.4	Barrier-free path of travel to living room space	N/A AT THIS STAGE
5.5	Level floor area of suites	A201.S,A202.S
5.6	Barrier-free washroom min. 1500mm turning circle and wall reinforcement	N/A AT THIS STAGE
6.0	General Requirements for All Spaces and Common Conditions	
6.1	Door clear width min. 860mm	A102.S - A203.S
6.2	Latch-side clearance min. 600mm (pull-side), min. 300mm (push-side)	A102.S - A203.S
6.3	Level floor area of suite: 1700mm x 1500mm square	A102.S - A203.S
6.4	Power door operator provided where latch-side clearance is not met	N/A AT THIS STAGE
6.5	Min. 1700mm path of travel	A102.S - A203.S
6.6	Min. 1500mm x 1800mm study space every 30m where applicable	A102.S - A203.S
6.7	Ramp max. slope = 1:12 (8.3%), 1800mm x 1500mm landing, demarcation of edge	Refer to Landscape Arch.
6.8	Pedestrian min. 1500mm (doors in series), min. 1500mm turning circle (unobstructed doors)	A102.S - A203.S
6.9	Thru-out the top of all stairs and landings served by a door	A102.S - A203.S
6.10	Corridor with no guard, min. 75% visual contrast between wall and door	N/A AT THIS STAGE
6.11	Wall reinforcement in main bathrooms in all suites (per A.9.5.2.1(6))	N/A AT THIS STAGE
6.12	Suites wholly within a one-storey unit (A.3.8.5.1(2))	N/A AT THIS STAGE

Accessibility Checklist



1 CONTEXT PLAN 1:4000
A001.S

PHASE 1 / BUILDING 1 TWO 35 STOREY TOWERS w/ 6 STOREY PODIUM	Floor	GBA/Typ. Floor (sm)	No. Typ. Floors	GBA Gross Building Area (no exclusions) sm	sf	Exemptions	City Centre By-law 7553/17 Net Floor Area (Res) sm	sf	Floor	Number of Units: S	1B	1B+D	2B	2B+D	3B	Total Suites
TOWER 1B	MPH	750	1	750	8,073	750	0	0	MPH							
	Level 10-35	750	26	19,500	209,898	1,401	18,099	194,813	Level 10-35		130	52	52	26	26	286
	Level 9	750	1	750	8,073	54	696	7,493	Level 9		5	2	1	1	0	9
TOWER 1A	MPH	750	1	750	8,073	750	0	0	MPH							
	Level 10-35	750	26	19,500	209,898	1,401	18,099	194,813	Level 10-35		130	52	52	26	26	286
	Level 9	750	1	750	8,073	54	696	7,493	Level 9		5	2	0	1	1	9
PODIUM	Level 8	2,495	1	2,495	26,856	181	2,314	24,908	Level 8		11	20	3	0	4	38
	Level 7	2,495	1	2,495	26,853	103	2,388	25,701	Level 7		11	18	3	0	3	35
	Level 2-6	4,870	5	24,348	262,076	20,203	4,145	44,617	Level 2-6		15	30	5	0	10	60
	Level Mezz	3,751	1	3,751	40,370	3,639	112	1,211	Level Mezz							0
	Ground Floor	5,381	1	5,381	56,843	3,354	1,927	20,739	Ground							0
	Building 1 Total		34	80,369	865,087		48,484	521,883		0	327	174	116	54	70	721
BUILDING HEIGHT				Interior amenity deduction (2*unit(s) =			1,842	19,822	% of Unit Type:	0.0%	42.6%	24.1%	16.1%	7.5%	9.7%	
Building Height Height To Top of MPH Roof		114.36 m 120.36 m		NFA =	47,042 sm			506,061 sf	Saleable Areas (sf): Average Unit Area (sf):	0 N/A	194,662 594	101,190 582	82,751 713	44,315 821	64,346 892	487,264 -
				Total =	47,042 sm			506,061 sf	Required Barrier Free:	10	33		26	11		110

PHASE 2 / BUILDING 2 TWO 35 STOREY TOWERS w/ 6 STOREY PODIUM	Floor	GBA/Typ. Floor (sm)	No. Typ. Floors	GBA Gross Building Area (no exclusions) sm	sf	Exemptions	City Centre By-law 7553/17 Net Floor Area (Res) sm	sf	Floor	Number of Units: S	1B	1B+D	2B	2B+D	3B	Total Suites
TOWER 2B	MPH	750	1	750	8,073	750	0	0	MPH							0
	Level 7-35	750	29	21,750	234,117	1,578	20,172	217,136	Level 7-35		116	87	58	29	29	319
TOWER 2A	MPH	750	1	750	8,073	750	0	0	MPH							0
	Level 7-35	750	29	21,750	234,117	1,575	20,175	217,167	Level 7-35		116	87	58	29	29	319
PODIUM	Level 6	2,842	1	2,842	30,589	253	2,590	27,882	Level 6		4	17	12	1	4	38
	Level 5	2,842	1	2,842	30,588	120	2,722	29,300	Level 5		1	10	11	1	4	27
	Level 3-4	4,086	2	8,411	90,555	5,088	3,323	35,776	Level 3-4		28	9	2	2	8	48
	Level 2	4,013	1	4,013	43,194	2,538	1,475	15,876	Level 2		11	4	1	1	3	20
	Level Mezz	3,142	1	3,142	33,817	2,453	688	7,409	Level Mezz							0
	Ground Floor	4,361	1	4,361	46,940	2,958	1,393	14,999	Ground							0
	Building 2 Total		38	78,812	780,063		52,549	565,634		0	276	213	142	63	77	721
BUILDING HEIGHT				Interior amenity deduction (2*units) =			1,542	26,598	% of Unit Type:	0.0%	35.8%	27.6%	18.4%	8.2%	10.0%	
Building Height Height To Top of MPH Roof		112.81 m 118.81 m		NFA =	51,007 sm			549,036 sf	Saleable Areas (sf): Average Unit Area (sf):	0 N/A	133,615 484	128,660 594	100,615 709	48,965 777	74,840 972	484,648 -
				Total NFA =	51,007 sm			549,036 sf	Required Barrier Free:	10	34		11	12		117

BELOW GRADE	Floor	GBA/Typ. Floor (sm)	No. Typ. Floors	GBA Gross Building Area (no exclusions) sm	sf	Exemptions	City Centre By-law 7553/17 Net Floor Area (Res) sm	sf
	P1	14,910.80	1	14,911	160,500	14,776	135	1,451
	Below Grade Total			14,911	160,500		135	1,451

STATISTICS SUMMARY

TOTAL DEVELOPMENT		TOTAL NEW RESIDENTIAL NET FLOOR AREA sm	sf				TOTAL UNIT NUMBER	
	BUILDING 1 =	47,982	516,467				BUILDING 1 =	721
	BUILDING 2 =	51,007	549,036				BUILDING 2 =	771
	P1 =	135	1,451					
	TOTAL NFA =	98,184	1,056,948				TOTAL =	1,492

FSI									
			FSI Calculation		PUBLIC OUTDOOR SPACE			Landscape Coverage (Gross Site Area)	
			Gross Site Area =	20,901 sm	POPS Provided =	1,054 sm		Total	9,582 sm
			Sight Triangle Conveyance =	67.5 sm	GATEWAY PLAZA	368 sm			
			Net Site Area for FSI = (Gross Site Area - Sight Triangle)	20,834 sm					
								LOT COVERAGE (Gross Site Area)	
Total NFA =	98,184 sm	1,056,948 sf	FSI = Total NFA/NSA	4.71	TOTAL Provided =	1,422 sm		Total	9,642 sm 46.13%

PARKING	Unit Mix: Unit Type	Unit Count	Unit %	Parking Provided: Level	Visitor	Resident	Non Parking Space Ratio	Accessible Parking (included in the total): Provided	Required (Per Traffic Consultant)
	Bachelor	8	0%	Level 6		57		Level 6 0 Type A	11
	1B	970	65%	Level 5		61		Level 5 0 Type B	12
	2B	475	32%	Level 4		148		Level 4 0	
	3B	167	11%	Level 3		149		Level 3 0	
				Level 2		145	0.13	Level 2 9	
				Level Mezz		98		Level Mezz 0	
				Ground Floor	59			Ground Floor 5	
				Level P1	164	-220		Level P1 9	
	TOTAL	1,492 units		SITE TOTAL	223	439		TOTAL	23

AMENITY	Building	Unit Count	Amenity Provided (sm): Location	Indoor	Outdoor	Total (sm): Indoor	Outdoor	Ratio (sm/unit): Indoor	Outdoor	Combined
	Building 1	721	Level 9	260	753	1,410	1,440			
			Level 7	350	517			2.01	2.00	4.01
			Ground	840						
			Green Roof		980					
	Building 2	771	Level 5	710	1,160	1,590	1,545			
			Mezz	500						
			Ground	540				2.01	2.00	4.01
			Green Roof		385					
	SITE TOTAL	1,492				3,000	2,985	2.01	2.00	4.01

* Balconies and private terraces are not calculated in Outdoor Amenity Area.
* 25% of the required Outdoor Amenity area is provided as Green Roof.

BICYCLE PARKING		UNITS/GFA	Min. Rate	Required	Provided
		Residential			
	Long-Term	1,492 units	0.5 / Unit	746	746
	Short-Term	1,492 units	0.1 / Unit	149	149
		Long-Term Residential Electric Bike Provision			
		Bikes	746	15%	111	111

Date	No.	Description
REVISION RECORD		
2025.03.20	ZBA Submission	
ISSUE RECORD		

BDP Quadrangle

Quadrangle Architects Limited
The Well, 8 Spadina Avenue, Suite 2100, Toronto, ON M5V 0S8
T 416 598 1240 www.bdpquadrangle.com

1095 Kingston Road, Pickering

Ontario, Canada

for Resident

21068 NA PROJECT | SR SCALE | SSC DRAWN | REVIEWED

Statistics

A001.S

Note: This drawing is the property of the Architect and may not be reproduced or used without the expressed consent of the Architect. The Contractor is responsible for confirming and correlating all dimensions relating to this work. Any discrepancies to the Architect and written clarification prior to commencing work.

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SITE PLAN LEGEND

- PROPERTY LINE
- LINE OF BELOW GRADE PARKING/TUNNEL
- MAIN BUILDING ENTRANCE
- EXIT
- VEHICLE / LOADING ENTRANCE / EXIT
- FIRE HYDRANT
- SIAMESE CONNECTION
- MH MANHOLE COVER
- AD AREA DRAIN
- F.F.E. FINISH FLOOR ELEVATION
- FIRE ACCESS ROUTE HEAVY DUTY PAVING ASSEMBLY TO BE DESIGNED TO MEET THE LOADS IMPOSED BY FIRE FIGHTING EQUIPMENT
- OUTDOOR AMENITY
- GREEN ROOF

Date	No.	Description
REVISION RECORD		

2020-03-20 ZBA Submission

ISSUE RECORD

BDP. Quadrangle

Quadrangle Architects Limited
The Well, 8 Spadina Avenue, Suite 2100, Toronto, ON M5V 0S8
T 416 598 1240 www.bdpquadrangle.com

1095 Kingston Road, Pickering

Ontario, Canada

for

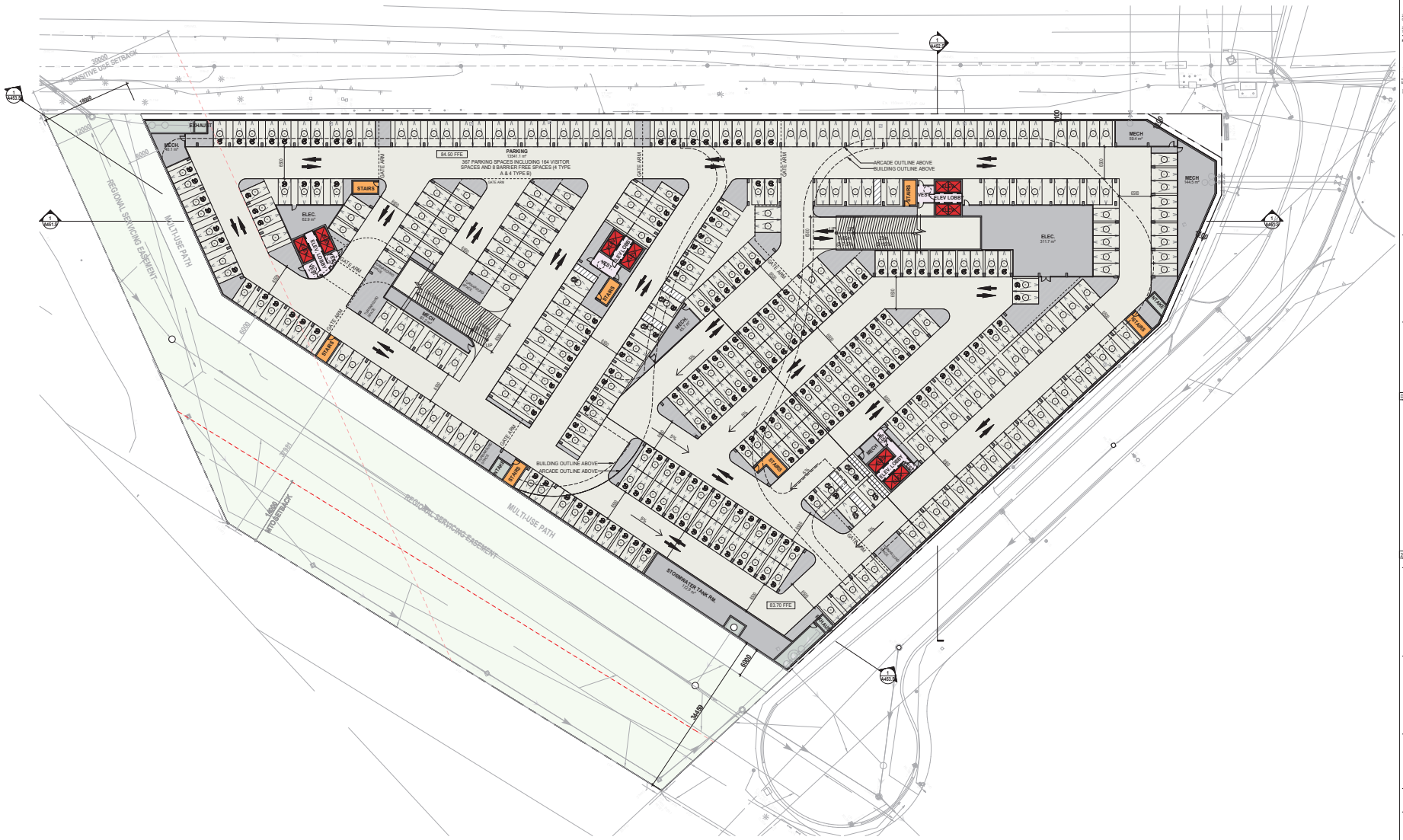
Resident

21068 1:300 ML/ME/JK SR
PROJECT SCALE DRAWN REVIEWED

Site Plan

A101.S

Note: This drawing is the property of the Architect and may not be reproduced or used without the expressed consent of the Architect. The Contractor is responsible for confirming and correlating all dimensions before commencing work. Any discrepancies to be brought to the Architect and written clarification prior to commencing work.



PARKING NOTES:

1. MINIMUM PARKING SPACE SIZES (UNLESS OTHERWISE NOTED):
- 2600mm WIDE X 5500mm LONG (NO SIDES OBSTRUCTED)
- 2900mm WIDE X 5500mm LONG (ONE SIDE OBSTRUCTED)
- 3300mm WIDE X 5500mm LONG (TWO SIDES OBSTRUCTED)

2. MAINTAIN MINIMUM DRIVE AISLE WIDTH OF 6000mm UNLESS OTHERWISE NOTED.

3. MAINTAIN MINIMUM HEADROOM CLEARANCE OF 2100mm THROUGHOUT.

PARKING LEGEND:

- RESIDENTIAL PARKING SPACE
- VISITOR PARKING SPACE
- BIKE LOCKER
- BIKE PARKING (STACKED)
- BIKE PARKING (VERTICAL)
- CONVEX MIRROR
- ELECTRIC VEHICLE READY SPACE
- ELECTRIC VEHICLE ROUGH IN SPACE
- ELECTRIC BICYCLE SPACE
- PAINTED LINES

TYPICAL | ONE SIDE OBSTRUCTED | ACCESSIBLE VISITOR - TYPE A | ACCESSIBLE VISITOR - TYPE B

VEHICULAR PARKING STATISTICS

	RESIDENT	RESIDENT ACCESSIBLE	VISITOR/ ACCESSIBLE
P-4	0	97	0
P-3	0	91	0
P-2	0	189	0
P-1	0	139	0
GF	0	165	8
MEZZ	0	36	4
GROUND	58	0	0
PLUGIN	164	203	8
TOTAL	222	920	23

TOTAL INCLUDES
- 4 BARRIER FREE SPACES
- 24 RESIDENTIAL SPACES WITH EVSE (16%)
- 164 RESIDENTIAL SPACES WITH ROUGH-IN CONDUITS (29%)

BICYCLE & LOCKER STATISTICS

	RESIDENT/ACTIVE PARKING SPACES	
	SHORT TERM	LONG TERM
P-4		
MEZZ	NIA	169
GROUND FLOOR	NIA	NIA
PLUGIN	NIA	NIA
TOTAL	NIA	169

TOTAL INCLUDES
- 171 LONG TERM SPACES WITH OVERSIZED OUTLETS (5%)

Date	No.	Description

REVISION RECORD

2025.03.20 | ZBA Submission

ISSUE RECORD

BDP. Quadrangle

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The Well, 8 Spadina Avenue, Suite 2100, Toronto, ON M5V 0S8
T 416 598 1240 www.bdpquadrangle.com

1095 Kingston Road, Pickering

Ontario, Canada

for
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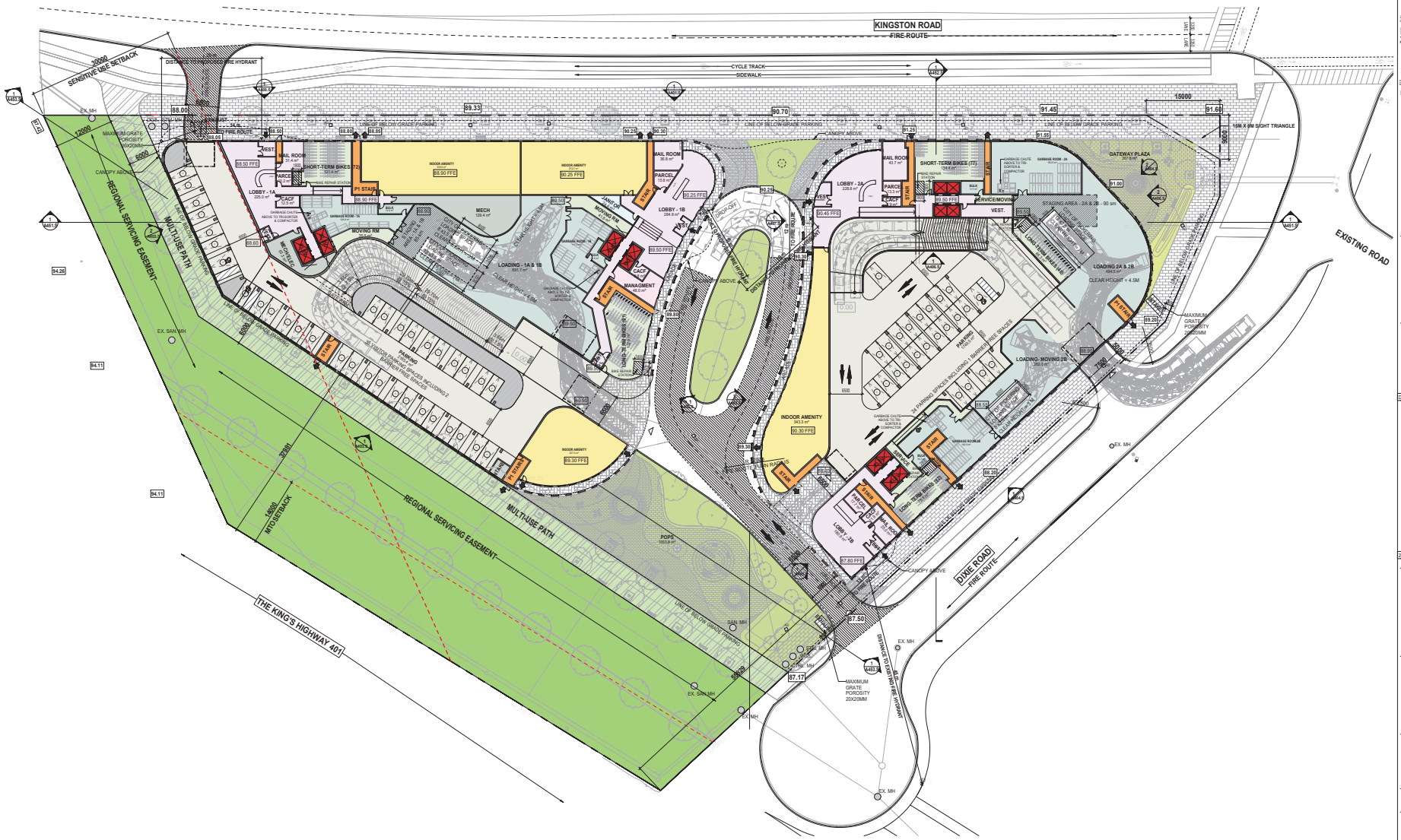
21068 1:250 ML/ME/JK SR
PROJECT SCALE DRAWN REVIEWED

P1 Underground

A103.S

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PARKING NOTES:

1. MINIMUM PARKING SPACE SIZES (UNLESS OTHERWISE NOTED):
   - 2600mm WIDE X 5200mm LONG (NO SIDES OBSTRUCTED)
   - 2900mm WIDE X 5200mm LONG (ONE SIDE OBSTRUCTED)
   - 3300mm WIDE X 5200mm LONG (TWO SIDES OBSTRUCTED)
2. MAINTAIN MINIMUM DRIVE AISLE WIDTH OF 6000mm UNLESS OTHERWISE NOTED.
3. MAINTAIN MINIMUM HEADROOM CLEARANCE OF 2100mm THROUGHOUT.

PARKING LEGEND:

- RESIDENTIAL PARKING SPACE
- VISITOR PARKING SPACE
- BIKE LOCKER
- BIKE PARKING (STACKED)
- BIKE PARKING (VERTICAL)
- CONVEX MIRROR
- ELECTRIC VEHICLE READY SPACE
- ELECTRIC VEHICLE ROUGH IN SPACE
- ELECTRIC BICYCLE SPACE
- PAINTED LINES

TYPICAL | ONE SIDE OBSTRUCTED | ACCESSIBLE - TYPE A | ACCESSIBLE - TYPE B

VEHICULAR PARKING STATISTICS:

	RESIDENT	VISITOR	TOTAL PROVIDED
1 BED	0	97	0
1+1	0	81	0
2 BED	0	189	0
2+1	0	129	0
3 BED	0	165	0
3+1	0	96	0
GROUND	59	0	0
FLOORS	164	253	0
TOTAL	223	920	23

TOTAL INCLUDES:
- 0 RESIDENTIAL SPACES WITH EV CHARGING
- 0 RESIDENTIAL SPACES WITH ELECTRICAL CONDUITS (0%)

BICYCLE & LOCKER STATISTICS:

	RESIDENT/VISITOR PARKING SPACES	
	SHORT TERM	LONG TERM
1 BED		
1+1	N/A	169
2 BED		
2+1	N/A	129
3 BED		
3+1	N/A	261
TOTAL	N/A	559

TOTAL BELOW:
- 0 LONG TERM SPACES WITH CHARGING OUTLETS (0%)

Date	No.	Description
2025-03-20		ZBA Submission

REVISION RECORD

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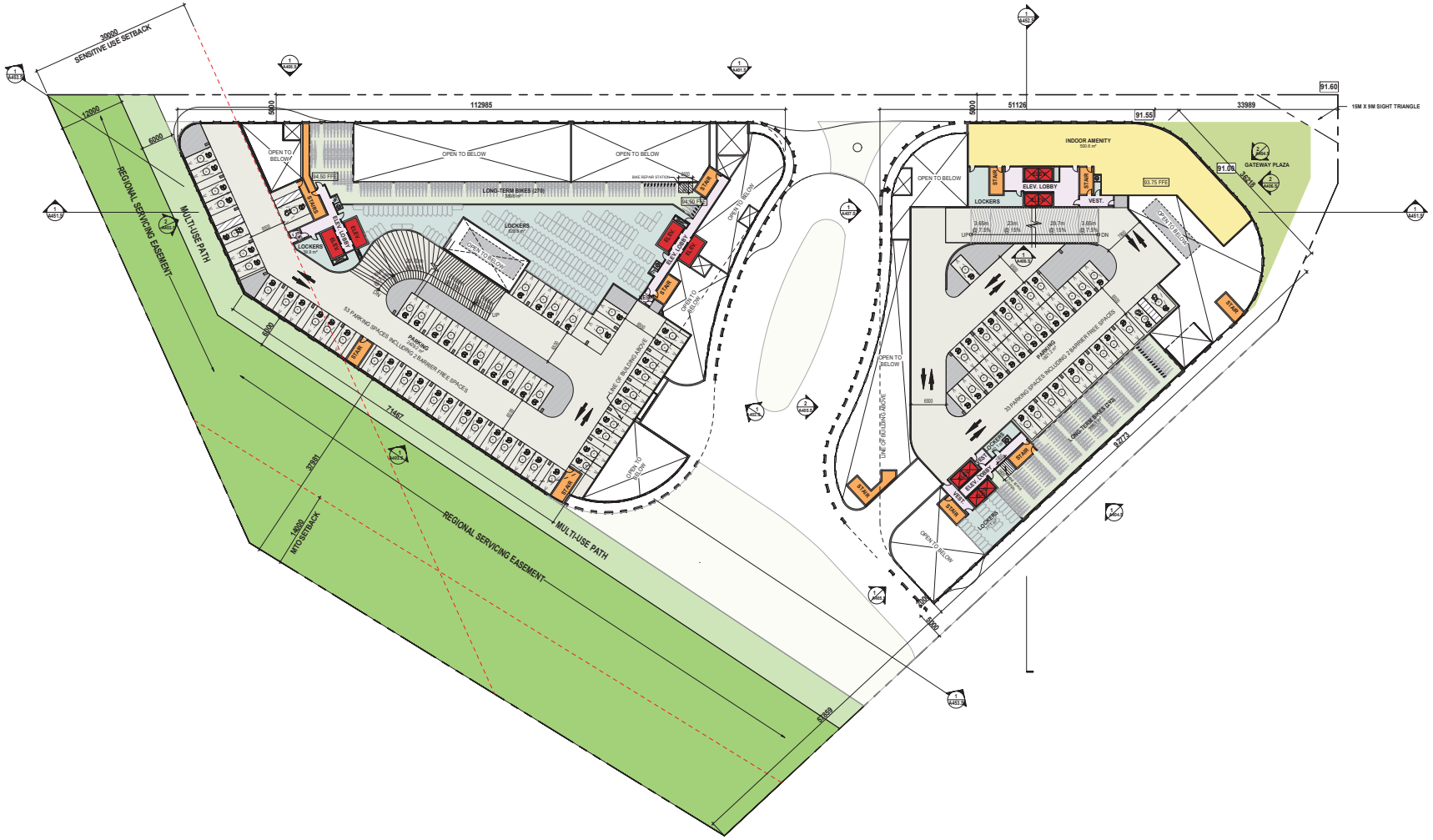
21068 1:250 ML/ME/JK SR
PROJECT SCALE DRAWN REVIEWED

Ground Floor Plan

A201.S

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PARKING NOTES:

1. MINIMUM PARKING SPACE SIZES (UNLESS OTHERWISE NOTED):
- 2600mm WIDE X 5300mm LONG (NO SIDES OBSTRUCTED)
- 2900mm WIDE X 5300mm LONG (ONE SIDE OBSTRUCTED)
- 3200mm WIDE X 5300mm LONG (TWO SIDES OBSTRUCTED)

2. MAINTAIN MINIMUM DRIVE AISLE WIDTH OF 6000mm UNLESS OTHERWISE NOTED.

3. MAINTAIN MINIMUM HEADROOM CLEARANCE OF 2100mm THROUGHOUT.

PARKING LEGEND:

- R — RESIDENTIAL PARKING SPACE
- V — VISITOR PARKING SPACE
- BIKE LOCKER
- BIKE PARKING (STACKED)
- BIKE PARKING (VERTICAL)
- CONVEX MIRROR
- ELECTRIC VEHICLE READY SPACE
- ELECTRIC VEHICLE ROUGH IN SPACE
- ELECTRIC BICYCLE SPACE
- PAINTED LINES

TYPICAL | BIKE WELL OBSTRUCTED | ACCESSIBLE VISITOR - TYPE A | ACCESSIBLE VISITOR - TYPE B

VEHICULAR PARKING STATISTICS:

	RESIDENT	VISITOR	TOTAL
P-1	0	87	0
P-2	0	91	0
P-3	0	189	0
P-4	0	139	0
P-5	0	165	0
MEZZ	0	36	0
GROUND	58	0	0
FLOORS	164	203	8
TOTAL	222	920	23

TOTAL INCLUDES:
- 0 ACCESSIBLE SPACES
- 58 RESIDENTIAL SPACES WITH EVSE (18%)
- 164 RESIDENTIAL SPACES WITH ROUGH-IN CONDUITS (49%)

BICYCLE & LOCKER STATISTICS:

	RESIDENTIAL PARKING SPACES	
	SHORT TERM	LONG TERM
P-1		
MEZZ	NA	169
GROUND FLOOR	NA	NA
FLOORS	NA	NA
TOTAL	NA	NA

TOTAL INCLUDES:
272 LONG TERM SPACES WITH OVERSIZED OUTLETS (75%)

Date	No.	Description

REVISION RECORD

2025.03.20 | ZBA Submission

ISSUE RECORD

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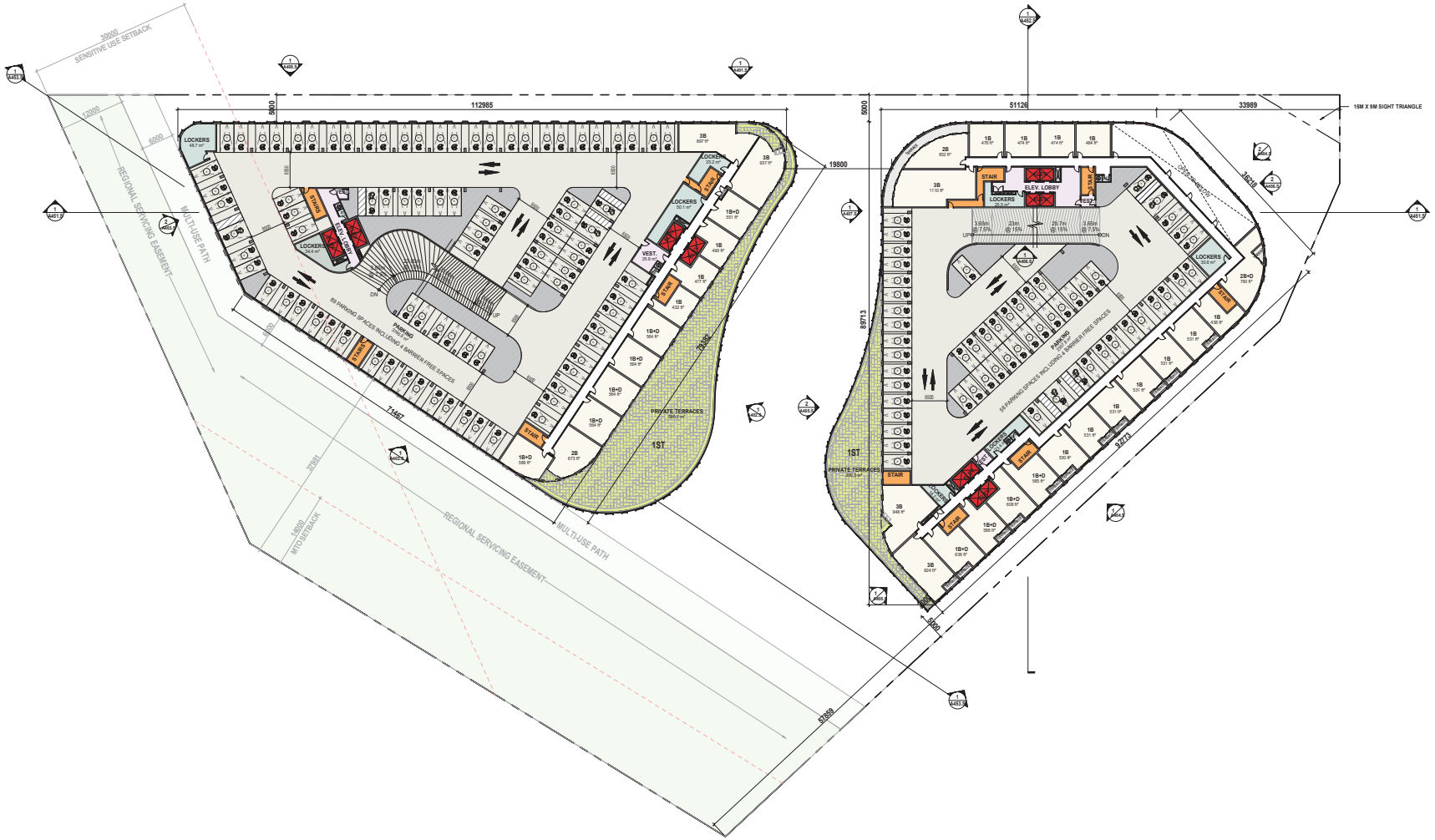
21068 | 1:250 | ML/ME/JK | SR
PROJECT | SCALE | DRAWN | REVIEWED

Mezzanine Floor Plan

A202.S

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PARKING NOTES:

1. MINIMUM PARKING SPACE SIZES (UNLESS OTHERWISE NOTED):
   - 2600mm WIDE X 5500mm LONG (NO SIDES OBSTRUCTED)
   - 2900mm WIDE X 5500mm LONG (ONE SIDE OBSTRUCTED)
   - 3400mm WIDE X 5500mm LONG (TWO SIDES OBSTRUCTED)
2. MAINTAIN MINIMUM DRIVE AISLE WIDTH OF 6000mm UNLESS OTHERWISE NOTED.
3. MAINTAIN MINIMUM HEADROOM CLEARANCE OF 2100mm THROUGHOUT.

PARKING LEGEND:

- RESIDENTIAL PARKING SPACE
- VISITOR PARKING SPACE
- BIKE LOCKER
- BIKE PARKING (STACKED)
- BIKE PARKING (VERTICAL)
- CONVEX MIRROR
- ELECTRIC VEHICLE READY SPACE
- ELECTRIC VEHICLE ROUGH-IN SPACE
- ELECTRIC BICYCLE SPACE
- PAINTED LINES

TYPICAL | ONE SIDE OBSTRUCTED | ACCESSIBLE VISITOR - TYPE A | ACCESSIBLE VISITOR - TYPE B

VEHICULAR PARKING STATISTICS:

	VISITOR	RESIDENT	TOTAL
1+1	0	87	0
1+1	0	81	0
1+1	0	169	0
1+1	0	129	0
1+1	0	165	0
2BED	0	36	0
2BEDHE	58	0	0
PLUSEL	165	203	8
TOTAL	223	920	23

TOTAL INCLUDES:
- 23 ELECTRIC READY SPACES
- 23 RESIDENTIAL SPACES WITH EVSE (1EL)
- 165 RESIDENTIAL SPACES WITH ELECTRICAL CONDUITS (2EL)

BICYCLE & LOCKER STATISTICS:

	RESIDENTIAL/VISITOR PARKING SPACES	
	SHORT TERM	LONG TERM
1+1		
2BED	N/A	920
2BEDHE FLOOR	n/a	n/a
PLUSEL	N/A	N/A
TOTAL	n/a	n/a

TOTAL INCLUDES:
- 211 LONG TERM SPACES WITH OVERSIZED OUTLETS (1EL)

Date	No.	Description

REVISION RECORD

2025-03-20 | ZBA Submission

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Ontario, Canada

for
Resident

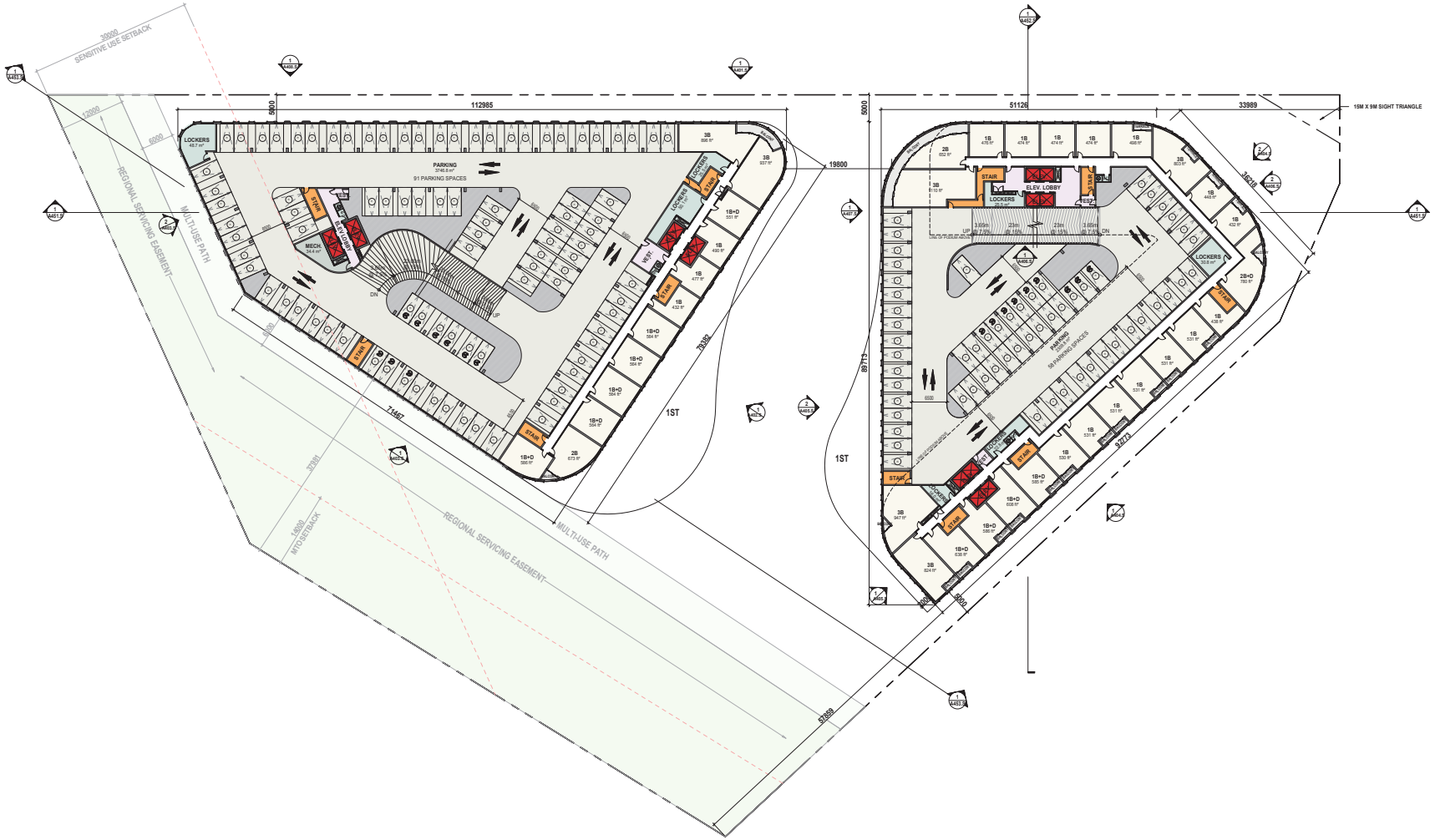
21068 1:250 ML/ME/JK SR
PROJECT SCALE DRAWN REVIEWED

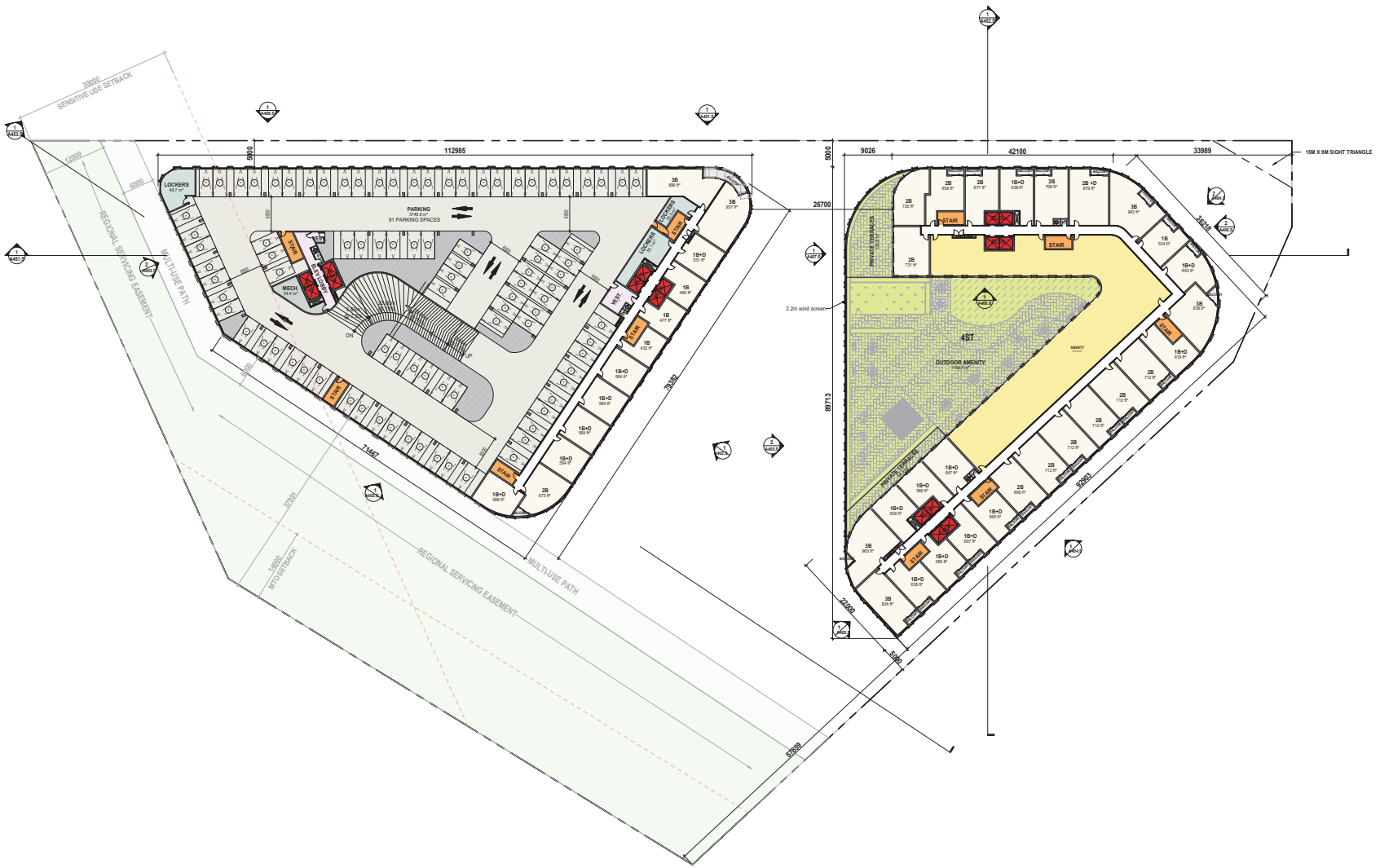
Level 2 Floor Plan

A203.S

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C:\Users\ML.KESH\Documents\21068_BDP_Q_1095_Kingston Road_R23B_mlarYB22.rvt


38000
SENSITIVE USE SETBACK
12000
6000
REGIONAL SERVICING EASEMENT
MULTI-USE PATH
112985
5000
19800
51126
33989
15M X 9M SIGHT TRIANGLE
PARKING
5746.0 m²
91 PARKING SPACES
LOCKERS
48.7 m²
STAIR
ELEV.(1500)
MECH.
54.4 m²
DN
UP
1ST
71467
37939
14000
MTO SETBACK
57859
ELEV. LOBBY
LOCKERS
55.4 m²
RESET
3.95m
23m
@ 17.2%
@ 15%
3.95m
23m
@ 17.2%
@ 15%
DN
UP
LOCKERS
103.8 m²
LOCKERS
107.7 m²
LOCKERS
107.7 m²
LOCKERS
107.7



PARKING NOTES:

1. MINIMUM PARKING SPACE SIZES (UNLESS OTHERWISE NOTED):
   - 2600mm WIDE X 5500mm LONG (NO SIDES OBSTRUCTED)
   - 2900mm WIDE X 5500mm LONG (ONE SIDE OBSTRUCTED)
   - 3300mm WIDE X 5500mm LONG (TWO SIDES OBSTRUCTED)
2. MINIMUM MINIMUM DRIVE AISLE WIDTH OF 6000mm UNLESS OTHERWISE NOTED.
3. MINIMUM MINIMUM HEADROOM CLEARANCE OF 2100mm THROUGHOUT.

PARKING LEGEND:

- R — RESIDENTIAL PARKING SPACE
- V — VISITOR PARKING SPACE
- BIKE LOCKER
- BIKE PARKING (STACKED)
- BIKE PARKING (VERTICAL)
- CONVEX MIRROR
- EVSE — ELECTRIC VEHICLE READY SPACE
- EVSE — ELECTRIC VEHICLE ROUGH IN SPACE
- ELECTRIC BICYCLE SPACE
- PAINTED LINES

TYPICAL — BIKE WORK OBSTRUCTIONS

ACCESSIBLE VISITOR - TYPE A — ACCESSIBLE VISITOR - TYPE B

VEHICULAR PARKING STATISTICS:

	RESIDENT	VISITOR	CAR SHARE
LVL 1	0	87	0
LVL 2	0	91	0
LVL 3	0	189	3
LVL 4	0	139	3
LVL 5	0	165	8
MEZZ	0	36	4
GROUND	59	0	3
PLUGIN	164	203	8
TOTAL	223	920	23

TOTAL INCLUDES:
- 1143 RESIDENTIAL SPACES
- 59 RESIDENTIAL SPACES WITH EVSE (18%)
- 164 RESIDENTIAL SPACES WITH ROUGH-IN EVSE CONDUITS (29%)

BICYCLE & LOCKER STATISTICS:

	RESIDENTIAL/VISITOR PARKING SPACES	
	SHORT TERM	LONG TERM
LEVEL 1		
MEZZ	n/a	100
GROUND FLOOR	n/a	n/a
PLUGIN	n/a	n/a
TOTAL	n/a	n/a

TOTAL INCLUDES:
- 1111 LONG TERM SPACES WITH OVERSIZED LOCKERS (5%)

Date	No.	Description
2025-03-20	ZBA	Submission

REVISION RECORD

ISSUE RECORD

BDP. Quadrangle

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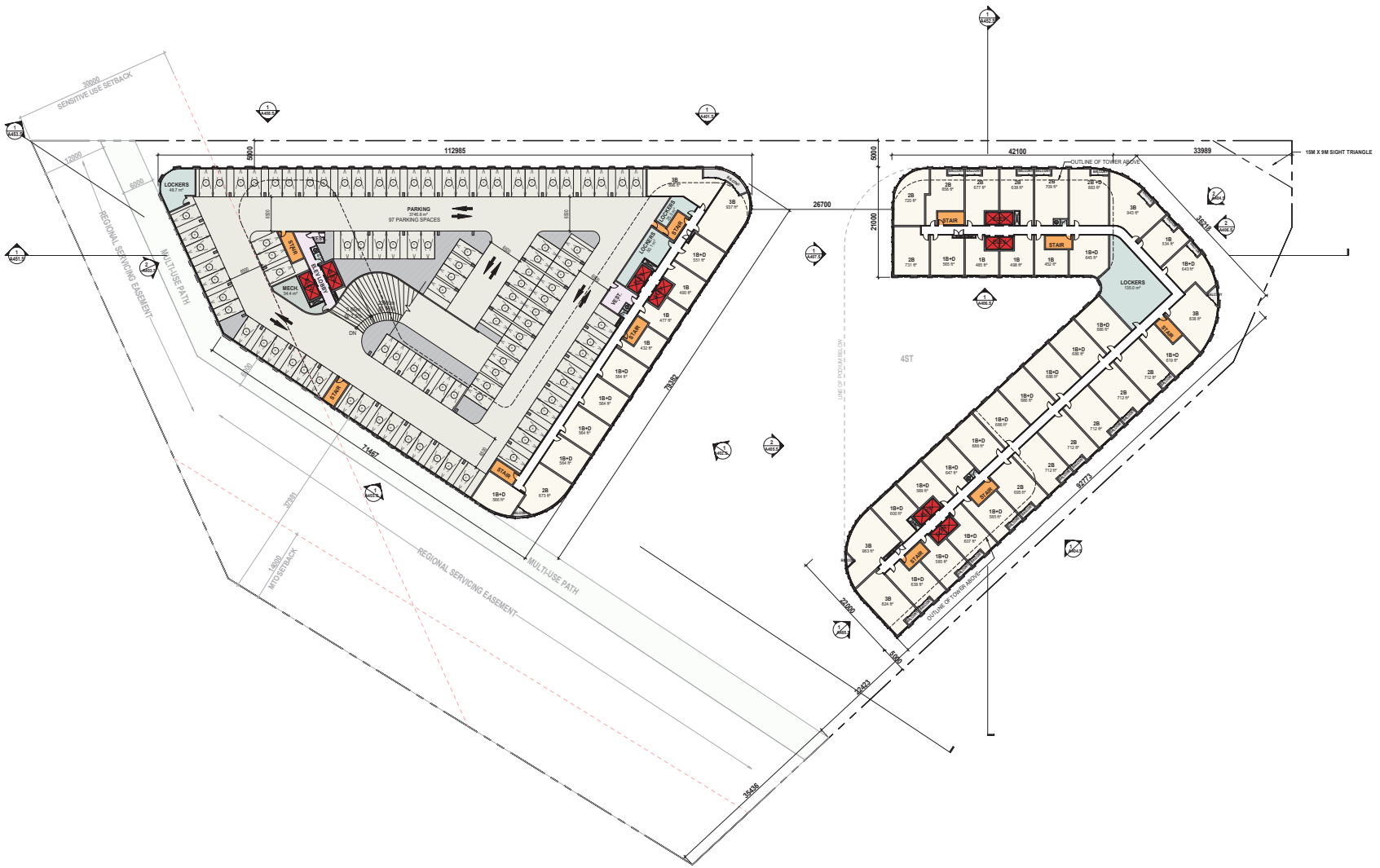
21068 1:250 ML/ME/JK SR
PROJECT SCALE DRAWN REVIEWED

Level 5 Floor Plan

A205.S

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PARKING NOTES:

1. MINIMUM PARKING SPACE SIZES (UNLESS OTHERWISE NOTED):
   - 2600mm WIDE X 5300mm LONG (NO SIDES OBSTRUCTED)
   - 2900mm WIDE X 5300mm LONG (ONE SIDE OBSTRUCTED)
   - 3400mm WIDE X 5300mm LONG (TWO SIDES OBSTRUCTED)
2. MINIMUM MINIMUM DRIVE AISLE WIDTH OF 6000mm UNLESS OTHERWISE NOTED.
3. MINIMUM MINIMUM HEADROOM CLEARANCE OF 2100mm THROUGHOUT.

PARKING LEGEND:

- RESIDENTIAL PARKING SPACE
- VISITOR PARKING SPACE
- BIKE LOCKER
- BIKE PARKING (STACKED)
- BIKE PARKING (VERTICAL)
- CONVEX MIRROR
- ELECTRIC VEHICLE READY SPACE
- ELECTRIC VEHICLE ROUGH IN SPACE
- ELECTRIC BICYCLE SPACE
- PAINTED LINES

TYPICAL | ONE SIDE OBSTRUCTED | ACCESSIBLE VISITOR - TYPE A | ACCESSIBLE VISITOR - TYPE B

VEHICULAR PARKING STATISTICS:

	RESIDENT	RESIDENT ACCESSIBLE	VISITOR/ ACCESSIBLE
L4-5	0	97	0
L1-3	0	81	0
L7	0	189	3
L7-3	0	139	3
L7-2	0	165	8
MEZZ	0	86	4
GROUND	59	0	3
PLUGIN	164	203	8
TOTAL	223	920	23

TOTAL INCLUDED:
- 20 ELECTRIC SPACES
- 20 RESIDENTIAL SPACES WITH EVSE (10%)
- 184 RESIDENTIAL SPACES WITH ROUGHED-IN CONDUITS (90%)

BICYCLE & LOCKER STATISTICS:

	RESIDENT/VISITOR PARKING SPACES	
	SHORT TERM	LONG TERM
L4-5		
MEZZ	NIA	100
GROUND FLOOR	12	NIA
PLUGIN	NIA	NIA
TOTAL	12	100

TOTAL INCLUDED:
- 112 LONG TERM SPACES WITH OVERSIZED OUTLETS (75%)

Date	No.	Description
2025-03-20	ZBA	Submission

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Ontario, Canada

for
Resident

21068 1:250 ML/ME/JK SR
PROJECT SCALE DRAWN REVIEWED

Level 6 Floor Plan

A206.S

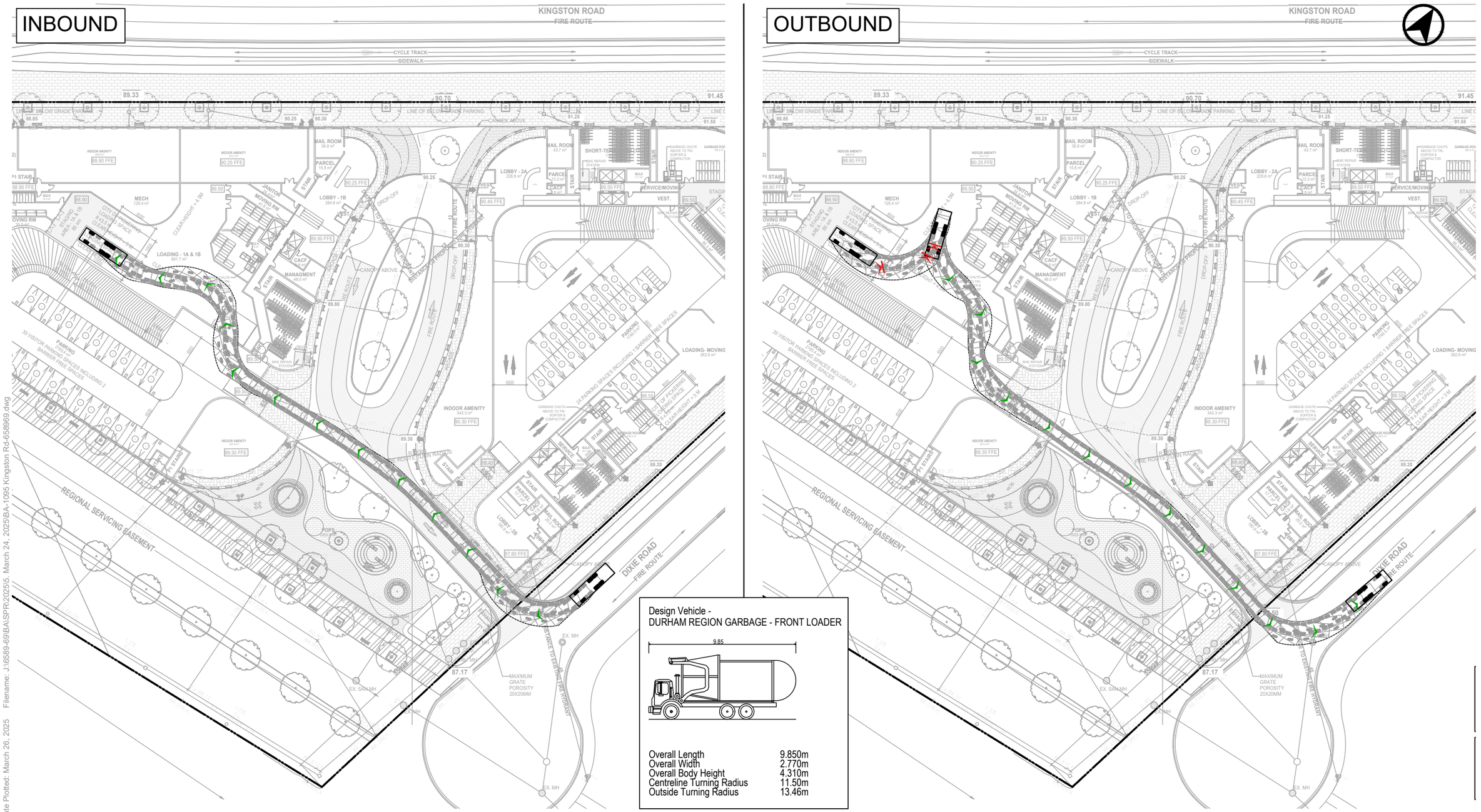
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Appendix E:
Vehicle Manoeuvring Diagrams

INBOUND

OUTBOUND



Design Vehicle -
DURHAM REGION GARBAGE - FRONT LOADER

Overall Length	9.850m
Overall Width	2.770m
Overall Body Height	4.310m
Centreline Turning Radius	11.50m
Outside Turning Radius	13.46m

BA Group

1095 KINGSTON ROAD

Vehicle Manoeuvring Diagram
Tower 1A/1B - Loading Space #1
Durham Region Garbage - Front Loader

Project:	1095 Kingston Road
Project No.	6589-69
Date:	April 12, 2024
Revised:	March 26, 2025

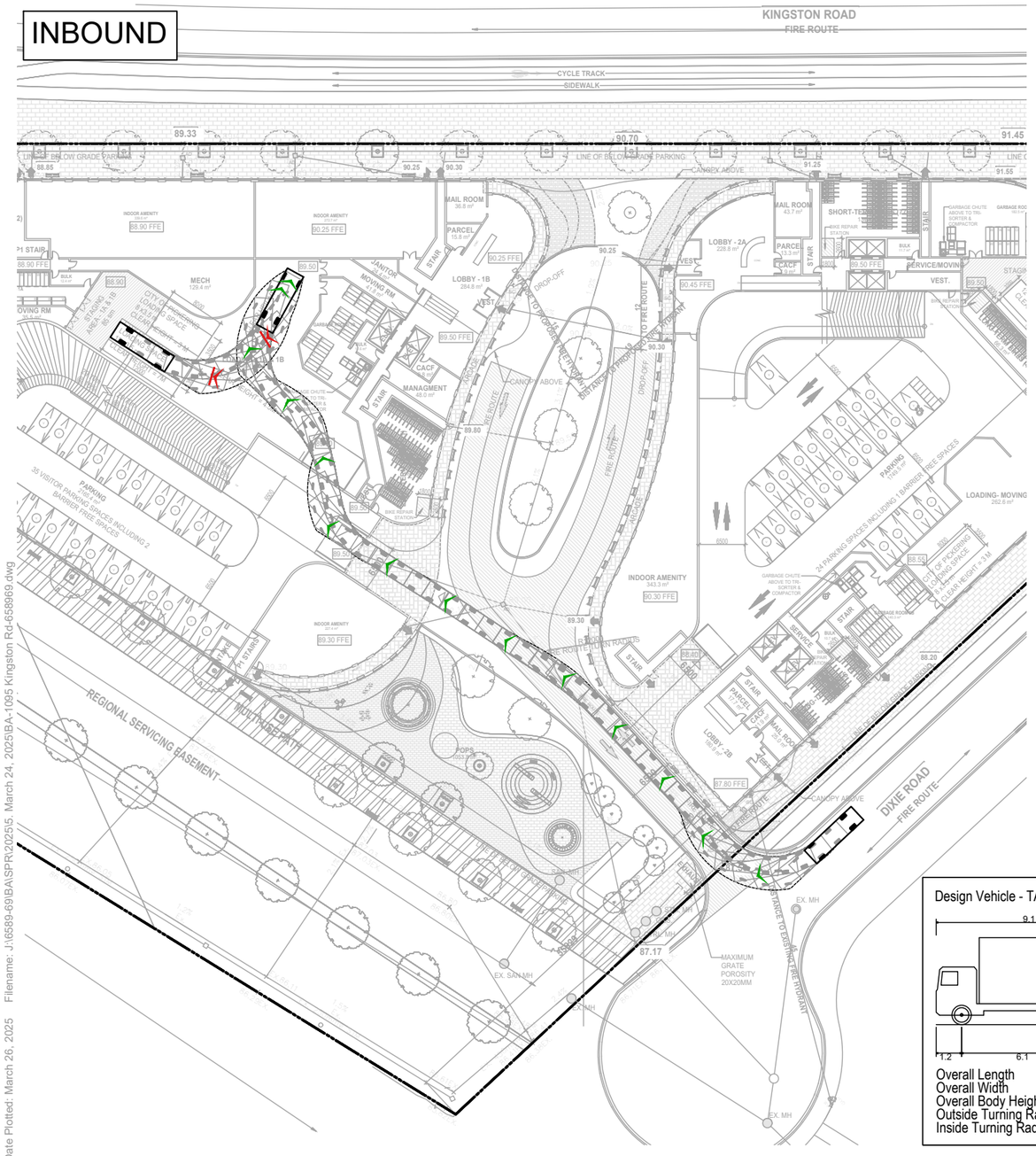
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Drawing No. VMD-01

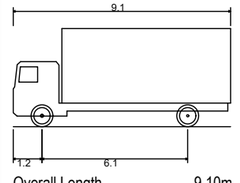
Date Plotted: March 26, 2025 Filename: J:\6589-69\BA\SPR\2025\5. March 24, 2025\BA-1095 Kingston Rd-6589699.dwg

INBOUND

OUTBOUND



Design Vehicle - TAC SU (Single Unit Truck)



Overall Length	9.10m
Overall Width	2.60m
Overall Body Height	4.11m
Outside Turning Radius	13.40m
Inside Turning Radius	8.60m

Date Plotted: March 26, 2025 Filename: J:\6589-69\BA\SPR\202515. March 24, 2025\BA-1095 Kingston Rd-658969.dwg

BA Group

1095 KINGSTON ROAD

Vehicle Manoeuvring Diagram
Tower 1A/1B - Loading Space #1
TAC Single Unit (SU) Truck

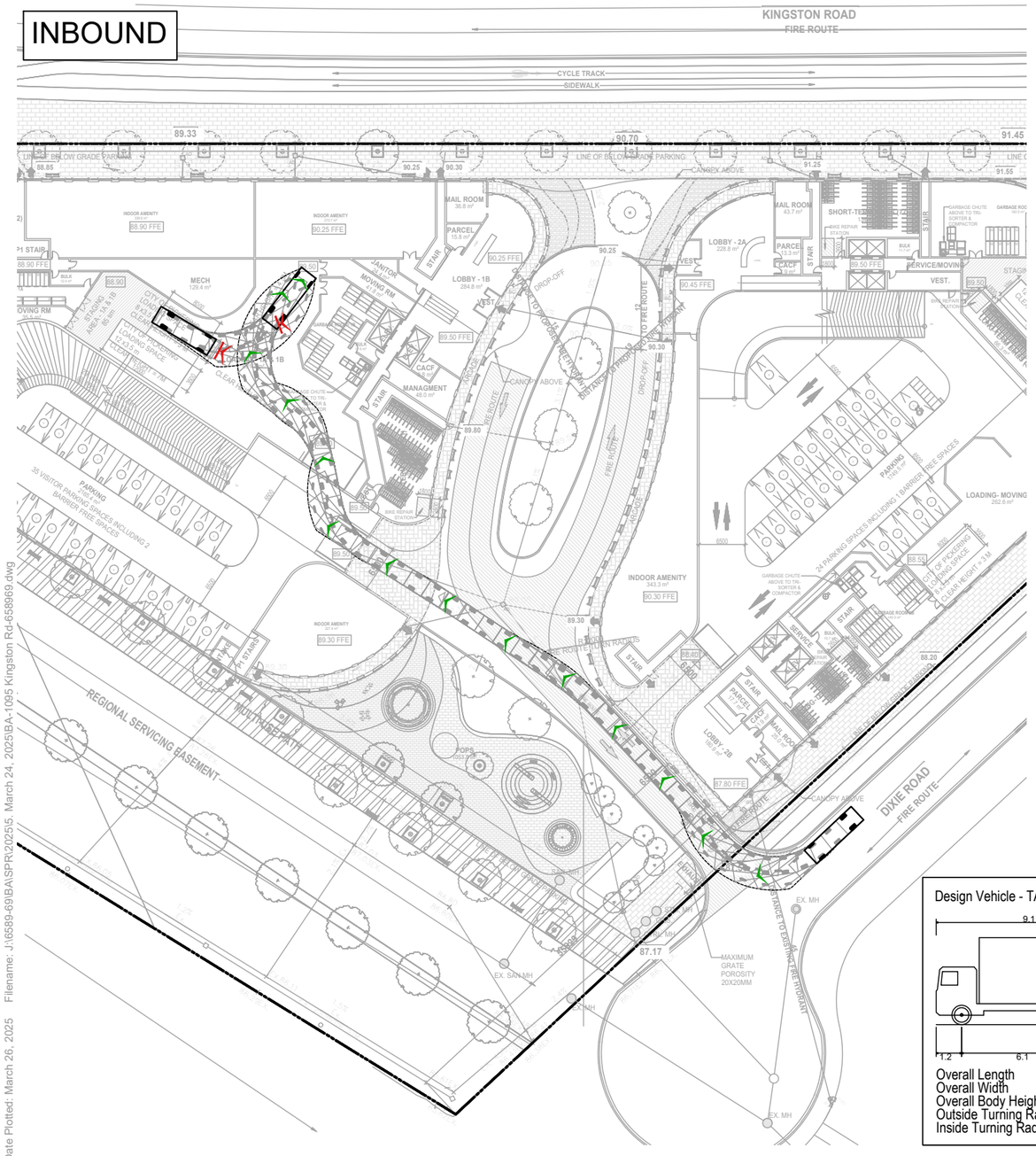
Project:	1095 Kingston Road
Project No.	6589-69
Date:	April 12, 2024
Revised:	March 26, 2025

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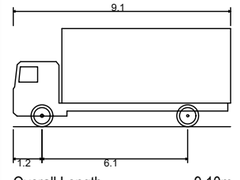
Drawing No. VMD-02

INBOUND

OUTBOUND



Design Vehicle - TAC SU (Single Unit Truck)



Overall Length	9.10m
Overall Width	2.60m
Overall Body Height	4.11m
Outside Turning Radius	13.40m
Inside Turning Radius	8.60m

Date Plotted: March 26, 2025 Filename: J:\6589-69\BA\SPR\202515. March 24, 2025\BA-1095 Kingston Rd-6589869.dwg

BA Group

1095 KINGSTON ROAD

Vehicle Manoeuvring Diagram
Tower 1A/1B - Loading Space #2
TAC Single Unit (SU) Truck

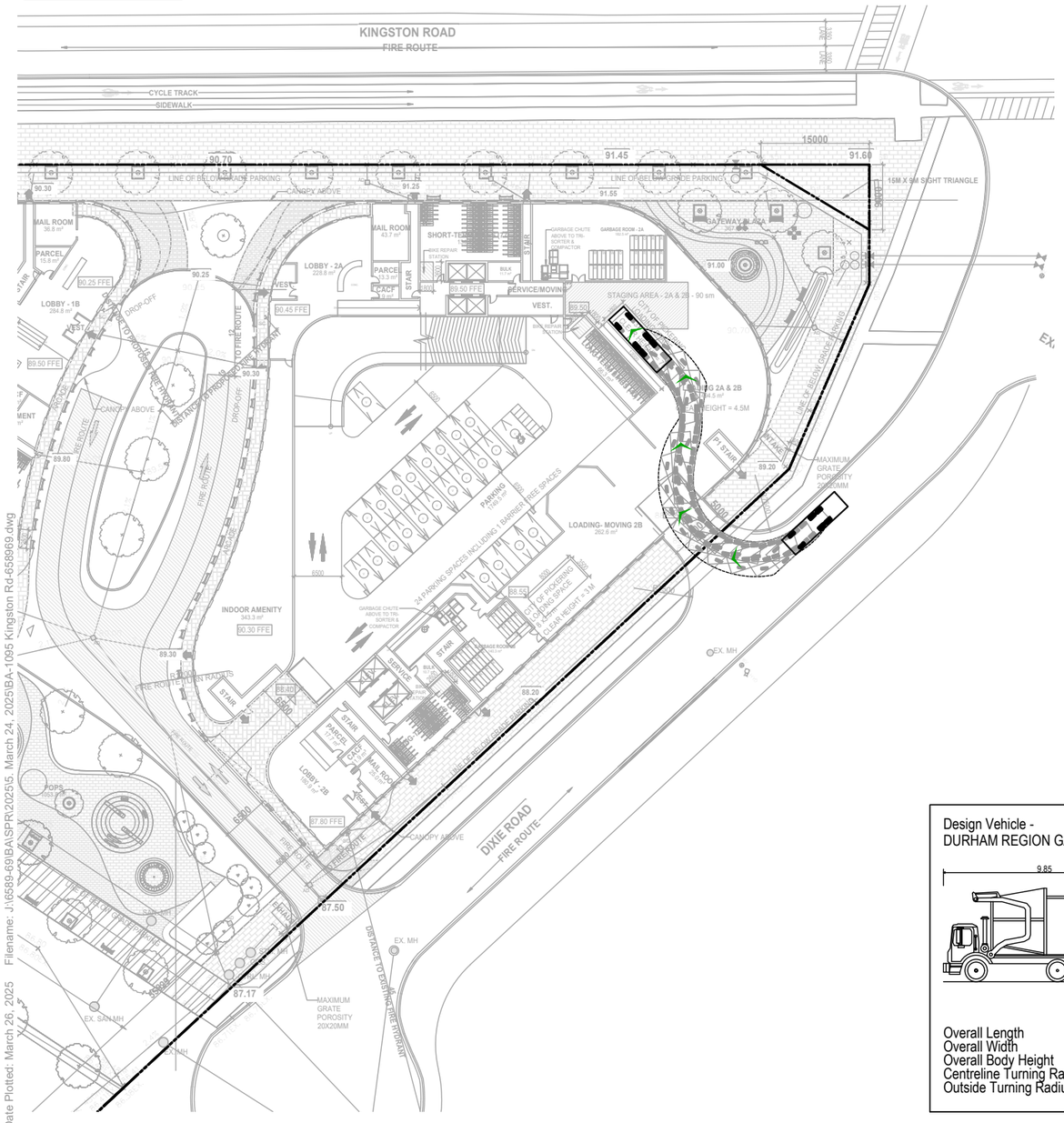
Project:	1095 Kingston Road
Project No.	6589-69
Date:	April 12, 2024
Revised:	March 26, 2025

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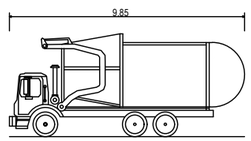
Drawing No. VMD-03

INBOUND

OUTBOUND



Design Vehicle -
DURHAM REGION GARBAGE - FRONT LOADER



Overall Length	9.850m
Overall Width	2.770m
Overall Body Height	4.310m
Centreline Turning Radius	11.50m
Outside Turning Radius	13.46m

Filename: J:\6589-69\BA\SPR\2025\5. March 24, 2025\BA-1095 Kingston Rd-658969.dwg

Date Plotted: March 26, 2025

BA Group

1095 KINGSTON ROAD

Vehicle Manoeuvring Diagram
Tower 2A/2B - Loading Space #1
Durham Region Garbage - Front Loader

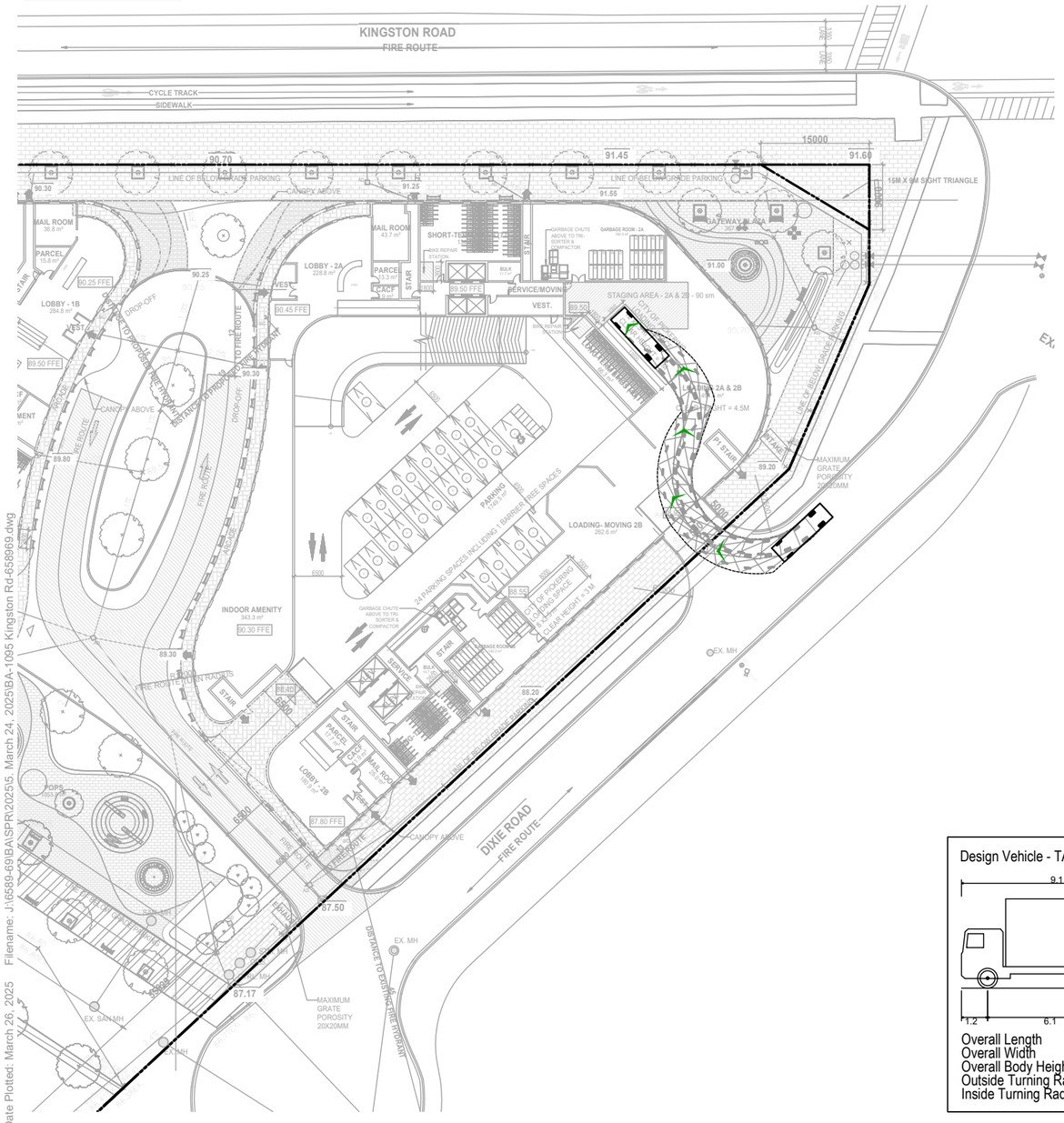
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Project No.	6589-69
Date:	April 12, 2024
Revised:	March 26, 2025

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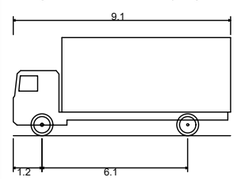
Drawing No. VMD-04

INBOUND

OUTBOUND



Design Vehicle - TAC SU (Single Unit Truck)



Overall Length	9.10m
Overall Width	2.60m
Overall Body Height	4.11m
Outside Turning Radius	13.40m
Inside Turning Radius	8.60m

Filename: J:\6589-69\BA\SPR\2025\5. March 24, 2025\BA-1095 Kingston Rd-658969.dwg

Date Plotted: March 26, 2025

BA Group

1095 KINGSTON ROAD

Vehicle Manoeuvring Diagram
Tower 2A/2B - Loading Space #1
TAC Single Unit (SU) Truck

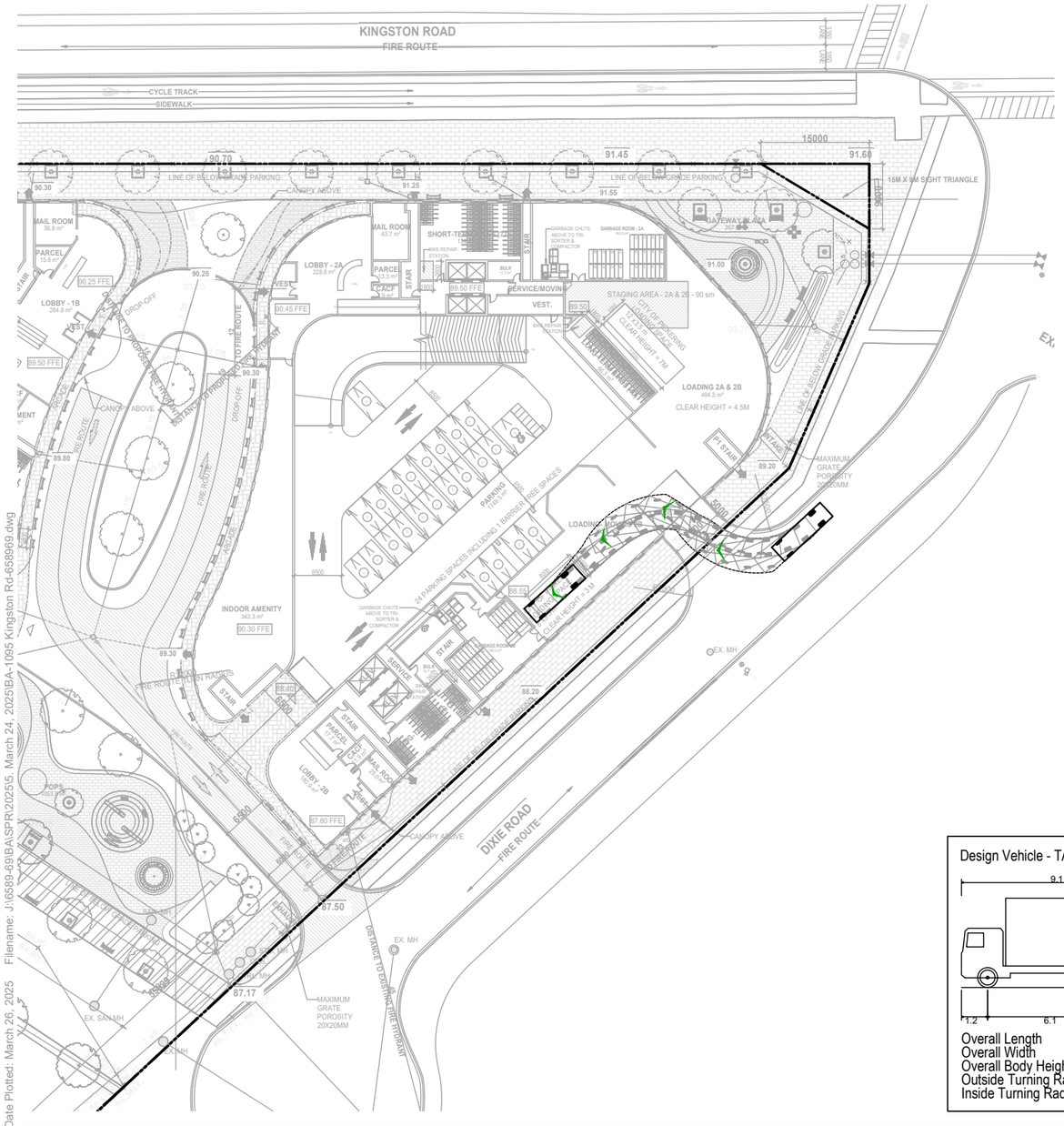
Project:	1095 Kingston Road
Project No.	6589-69
Date:	April 12, 2024
Revised:	March 26, 2025

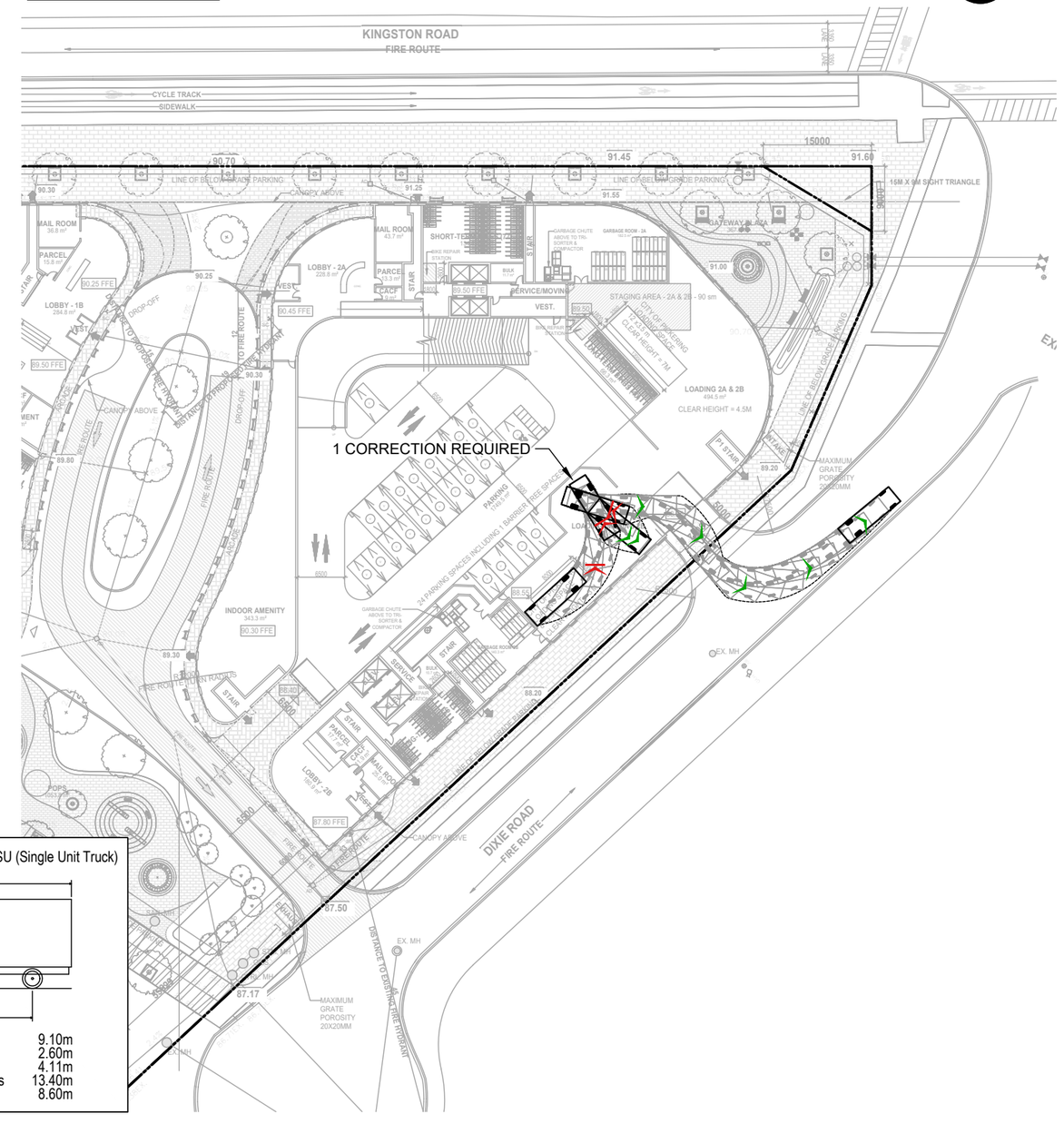
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Drawing No. VMD-05

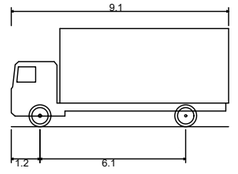
INBOUND

OUTBOUND





Design Vehicle - TAC SU (Single Unit Truck)



Overall Length	9.10m
Overall Width	2.60m
Overall Body Height	4.11m
Outside Turning Radius	13.40m
Inside Turning Radius	8.60m

Date Plotted: March 26, 2025 Filename: J:\6589-69\BA\SPR\202515. March 24, 2025\BA-1095 Kingston Rd-658969.dwg

BA Group

1095 KINGSTON ROAD

Vehicle Manoeuvring Diagram
Tower 2A/2B - Loading Space #2
TAC Single Unit (SU) Truck

Project:	1095 Kingston Road
Project No.	6589-69
Date:	April 12, 2024
Revised:	March 26, 2025

Scale 1:750 (0, 15, 30m)

Drawing No. VMD-06

INBOUND

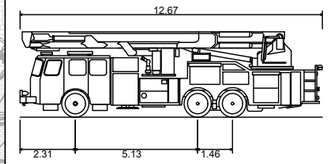
OUTBOUND

KINGSTON ROAD

REGIONAL SERVICING EASEMENT

MULTI-USE PATH

Design Vehicle - TORONTO AERIAL FIRE
(F114 RLP Bronto)



Overall Length	12.67m
Overall Width	2.54m
Overall Body Height	3.58m
Outside Turning Radius	11.40m
Inside Turning Radius	5.46m

Date Plotted: April 8, 2025 Filename: J:\6589-69\BA\Functional Road Plan\2025\3. March 25, 2025\BA-1095 Kingston Rd-FD-658969-Ultimate-VMD.dwg

BA Group

1095 KINGSTON ROAD

Vehicle Manoeuvring Diagram
Tower 1A - Fire Route
Toronto Aerial Fire Truck (F114 RLP Bronto)

Project:	1095 Kingston Road
Project No.	6589-69
Date:	April 8, 2025
Revised:	--

Scale 1:750 (0 15 30m)

Drawing No. VMD-07

INBOUND

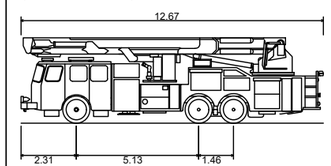
OUTBOUND

KINGSTON ROAD

DIXIE ROAD

FIRE ROUTE

Design Vehicle - TORONTO AERIAL FIRE
(F114 RLP Bronto)



Overall Length	12.67m
Overall Width	2.54m
Overall Body Height	3.58m
Outside Turning Radius	11.40m
Inside Turning Radius	5.46m

BA Group

1095 KINGSTON ROAD

Vehicle Manoeuvring Diagram

Tower 1B - Fire Route

Toronto Aerial Fire Truck (F114 RLP Bronto)

Project:	1095 Kingston Road
Project No.	6589-69
Date:	April 8, 2025
Revised:	--

Scale 1:750 (0, 15, 30m)

Drawing No. VMD-08

Date Plotted: April 8, 2025 Filename: J:\6589-69\BA\Functional Road Plan\202513_March 25, 2025\BA-1095 Kingston Rd-FD-658969-Ultimate-VMD.dwg

INBOUND

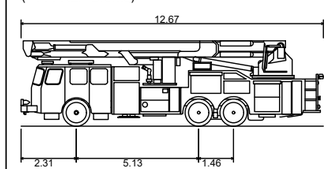
OUTBOUND

KINGSTON ROAD

DIXIE ROAD

FIRE ROUTE

Design Vehicle - TORONTO AERIAL FIRE
(F114 RLP Bronto)



Overall Length	12.67m
Overall Width	2.54m
Overall Body Height	3.58m
Outside Turning Radius	11.40m
Inside Turning Radius	5.46m

BA Group

1095 KINGSTON ROAD

Vehicle Manoeuvring Diagram
Tower 2A - Fire Route
Toronto Aerial Fire Truck (F114 RLP Bronto)

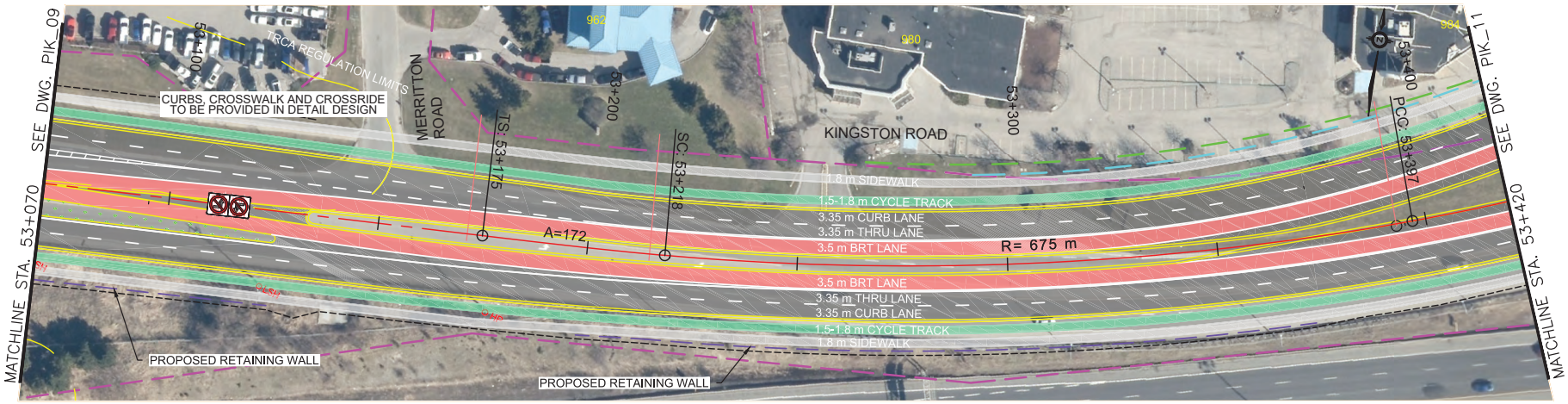
Project:	1095 Kingston Road
Project No.	6589-69
Date:	April 8, 2025
Revised:	--

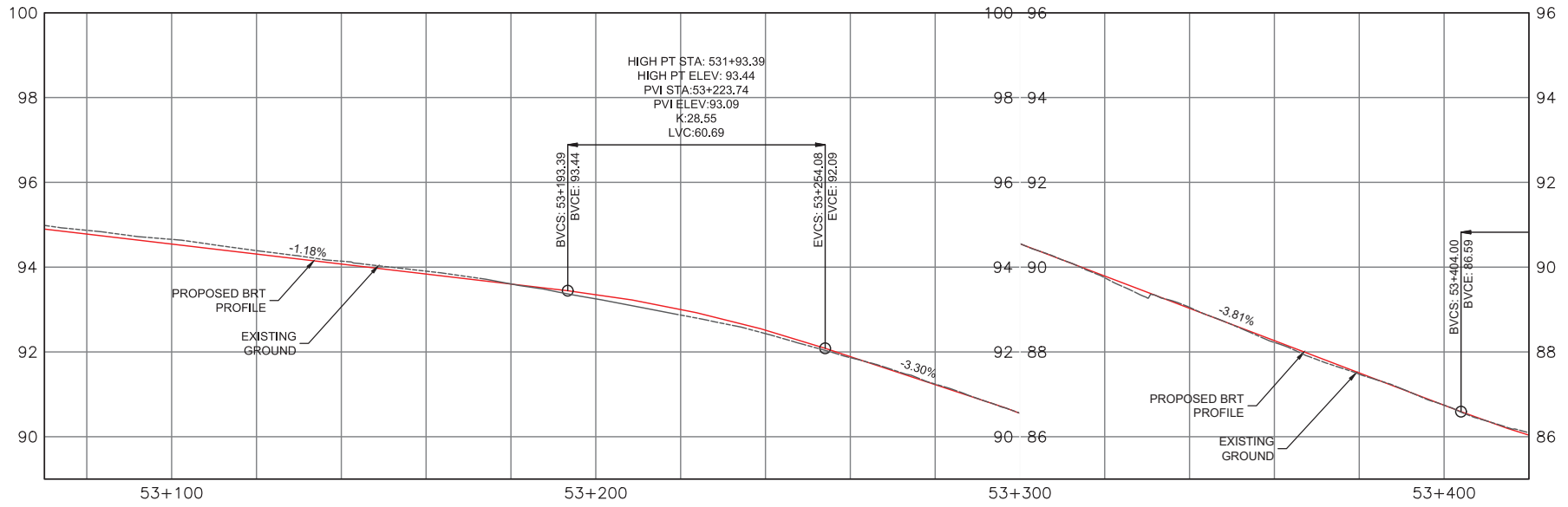
Scale 1:750 (0, 15, 30m)

Drawing No. VMD-09

Date Plotted: April 8, 2025 Filename: J:\6589-69\BA\Functional Road Plan\202513_March 25, 2025\BA-1095 Kingston Rd-FD-658969-Ultimate-VMD.dwg

Appendix F:
Durham Scarborough Bus Rapid Transit Preliminary Design – Merritton Road to Dixie Road





ALL DIMENSIONS SHOWN ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE NOTED.

DRAWN BY: A.C 08/17/21	DESIGNED BY: M.H 08/17/21
CHECKED BY: M.H 08/17/21	APPROVED BY: M.P 08/17/21
SCALE: HOR 1:1000 VER 1:100	FULL SIZE ONLY 0 1 2m

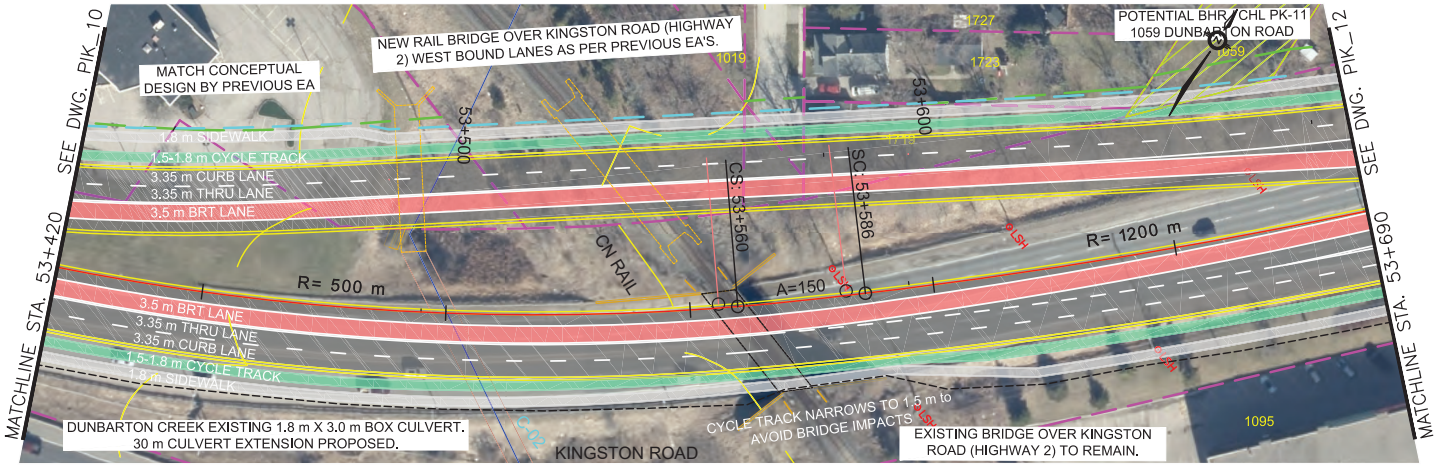
TORONTO | DURHAM REGION | IBI | PARSONS | METROLINX | Durham Region Transit

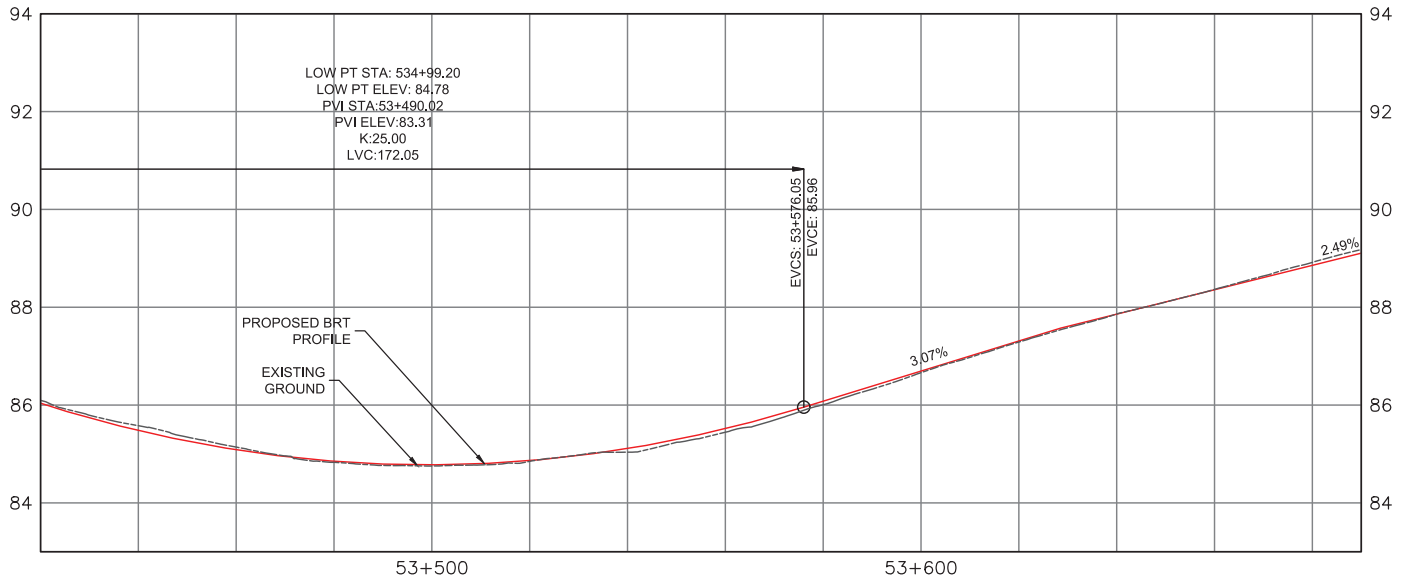
DURHAM – SCARBOROUGH
Bus Rapid Transit

DURHAM–SCARBOROUGH BUS RAPID TRANSIT
ENVIRONMENTAL ASSESSMENT
PLAN AND PROFILE
STA. 53+070 TO STA. 53+420

CONTRACT NO.	DWG. NO.	REV.	SHEET
RQQ-2018-PPDD-244	CPG_DSBRT_CO-200_PLAN&PROFILE_PIK	01	PIK_10

January 14, 2022, 4:19 PM Login name: adrian.chiu
Drawing Name: J:\119887_Mx_DS_BRT\5.9 Drawings\59civil\layouts\CPG_DSBRT_CO-200_PLAN&PROFILE_PIK.dwg





ALL DIMENSIONS SHOWN ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE NOTED.

DRAWN BY: A.C 08/17/21	DESIGNED BY: M.H 08/17/21	
CHECKED BY: M.H 08/17/21	APPROVED BY: M.P 08/17/21	
SCALE: HOR 1:1000 VER 1:100	FULL SIZE ONLY 0 1m 2m	

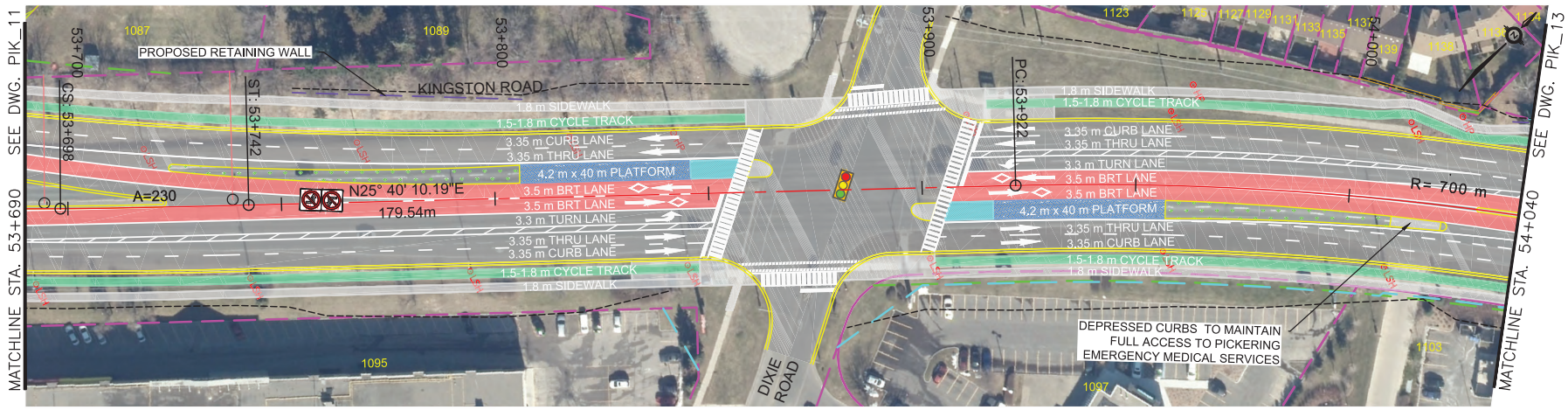
TORONTO | DURHAM REGION | IBI | PARSONS | METROLINX | Durham Region Transit

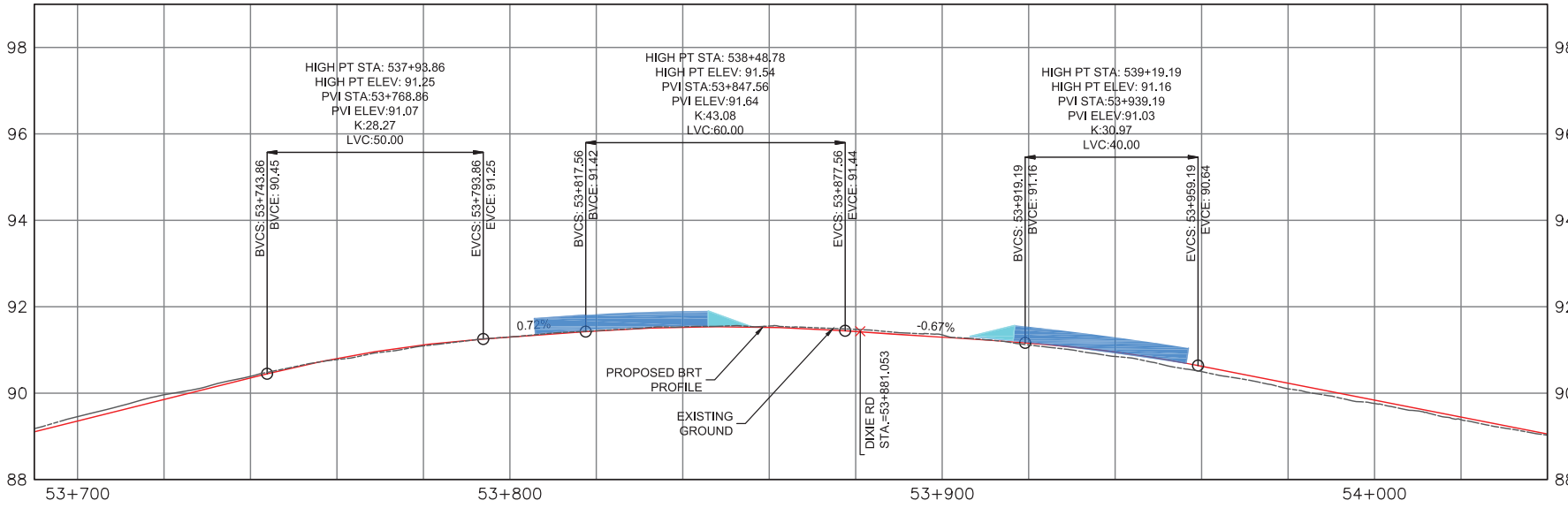
DURHAM – SCARBOROUGH
Bus Rapid Transit

DURHAM–SCARBOROUGH BUS RAPID TRANSIT
ENVIRONMENTAL ASSESSMENT
PLAN AND PROFILE
STA. 53+420 TO STA. 53+690

CONTRACT NO.	DWG. NO.	REV.	SHEET
RQQ-2018-PPDD-244	CPG_DSBRT_CO-200_PLAN&PROFILE_PIK	01	PIK_11

January 14, 2022, 4:19 PM Login name: adrian.chiu
Drawing Name: J:\119887_Mx_DS_BRT\5.9 Drawings\59civil\layouts\CPG_DSBRT_CO-200_PLAN&PROFILE_PIK.dwg





ALL DIMENSIONS SHOWN ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE NOTED.

DRAWN BY: A.C 08/17/21	DESIGNED BY: M.H 08/17/21
CHECKED BY: M.H 08/17/21	APPROVED BY: M.P 08/17/21
SCALE: HOR 1:1000 VER 1:100	FULL SIZE ONLY 0 10 20m 0 1 2m

TORONTO | DURHAM REGION | IBI | PARSONS | METROLINX | Durham Region Transit

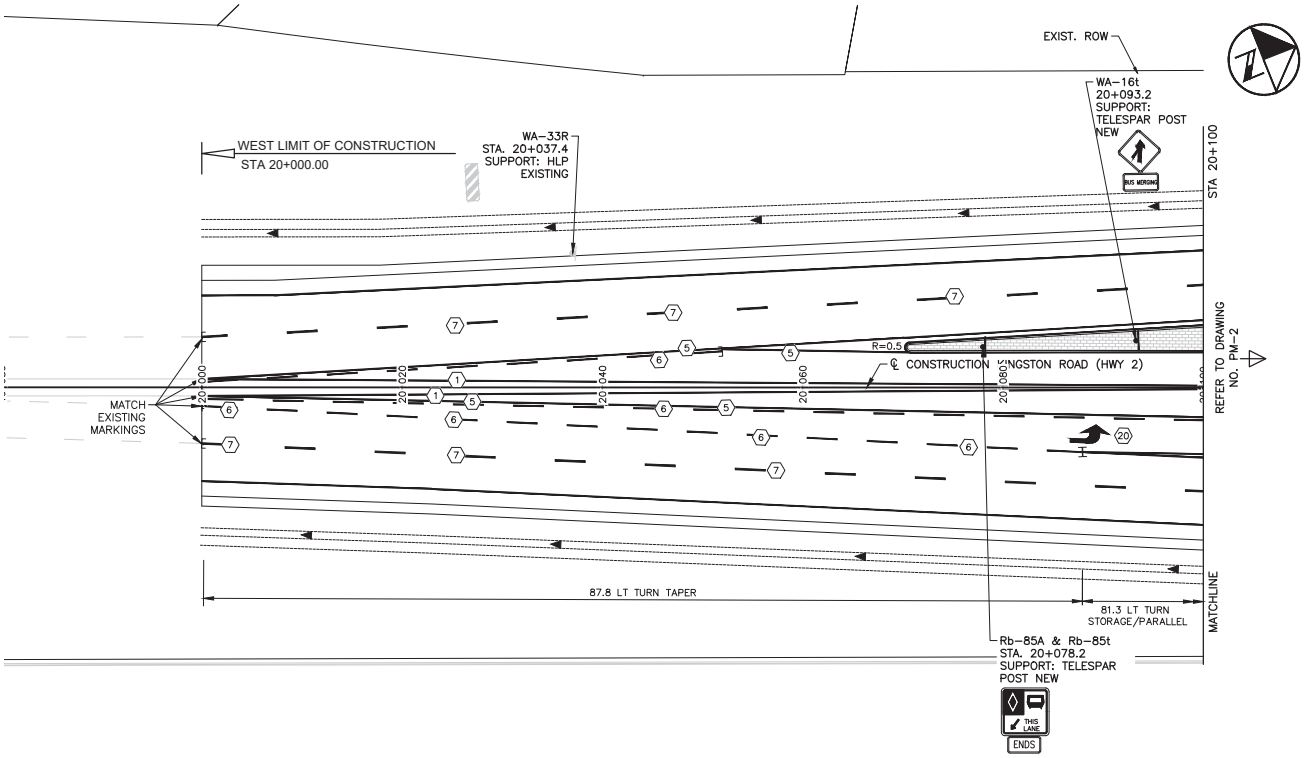
DURHAM – SCARBOROUGH
Bus Rapid Transit

DURHAM–SCARBOROUGH BUS RAPID TRANSIT
ENVIRONMENTAL ASSESSMENT
PLAN AND PROFILE
STA. 53+690 TO STA. 54+040

CONTRACT NO.	DWG. NO.	REV.	SHEET
RQQ-2018-PPDD-244	CPG_DSBRT_CO-200_PLAN&PROFILE_PIK	01	PIK_12

January 14, 2022, 4:19 PM Login name: adrian.chiu
Drawing Name: J:\119887_Mx_DS_BRT\5.9 Drawings\59civil\layouts\CPG_DSBRT_CO-200_PLAN&PROFILE_PIK.dwg

TRAFFIC SIGN SCHEDULE			
SIGN IDENTIF.	DESCRIPTION	QUANTITY	COMMENTS
Wa–33R	OBJECT MARKER (ONE DIRECTION)	1	EXISTING
RB–85t	RESERVED LANE ENDS TAB	1	NEW
RB–85a	RESERVED LANE	1	NEW
WA–16t	BUS MERGING	1	NEW



KINGSTON ROAD - HIGHWAY 2

NOTE: ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.

PAVEMENT MARKING SCHEDULE			
IDENTIFICATION	TYPE	COLOUR	WIDTH (cm)
1	SOLID	YELLOW	10
2	DOUBLE SOLID	YELLOW	10
3	3–6–3 BROKEN	YELLOW	10
4	SOLID;3–6–3 BROKEN	YELLOW	10
5	SOLID	WHITE	10
6	3–3–3 BROKEN	WHITE	10
7	3–6–3 BROKEN	WHITE	10
8	3–9–3 BROKEN	WHITE	10
9	SOLID	WHITE	20
10	1–1–1 BROKEN	WHITE	20
11	3–3–3 BROKEN	WHITE	20
12	3–3–3 BROKEN	WHITE	30
13	SOLID	WHITE	30
14	SOLID	WHITE	45
15	SOLID	WHITE	60
16	1–1–1 BROKEN	WHITE	10
20	SYMBOLS	–	–
21	0.4–0.4–0.4 BROKEN	WHITE	40
] OR [	LIMITS OF MARKINGS	–	–

PAVEMENT MARKING DENOTATIONS :

- 3–3–3, 3–6–3, 3,9,3: LINE–GAP–LINE SPACING IN METRES
- (1) PERMANENT
- [1] TEMPORARY
- ▽1 TEMPORARY–REMOVABLE
- (1) DURABLE
- ◇1 EXISTING MARKING TO BE REMOVED

NOTES :

1. ALL MARKINGS AND SIGNS SHALL CONFORM WITH THE ONTARIO TRAFFIC MANUAL (OTM) BOOK 11.
2. PROPOSED MARKINGS TO MATCH EXIST. AT ALL WORK AND/OR ROAD RECONSTRUCTION LIMITS.
3. LONGITUDINAL MARKINGS – PAINT ON BASE COURSE AND PLASTIC ON TOP COURSE.
4. TRANSVERSE MARKINGS – SYMBOLS PLASTIC ON BOTH BASE AND TOP COURSE.
5. SIGN MOUNTING HEIGHTS, AND LATERAL OFFSETS SHALL BE IN ACCORDANCE WITH THE ONTARIO TRAFFIC MANUAL (OTM) BOOK 1B, SECTION 12.
6. ALL SIGNAGE FOR BICYCLE PATHS INTERSECTING WITH SIDEWALKS SHOULD BE AS PER OTM BOOK 18 AND WILL BE DETAILED IN 90% SUBMISSION PACKAGE.

NO.	DATE	NAME	REVISIONS
4	12.11.2024	A.N.	IFT SUBMISSION
3	12.14.2023	A.N.	90% DESIGN RESUBMISSION
2	12.15.2022	W.K.	90% DESIGN SUBMISSION
1	08.15.2022	W.K.	60% DESIGN SUBMISSION

AECOM

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Do not scale this document. All measurements must be obtained from stated dimensions.

UTILITIES VERIFIED

ROGERS	2022 JUNE 20
BELL CANADA	2022 JUNE 20
ENBRIDGE	2022 JUNE 20

APPROXIMATE UTILITY LOCATIONS ARE SHOWN PER MARK–UPS RECEIVED FROM THIRD PARTIES ON THE DATES NOTED ABOVE. CONTRACTOR TO BE RESPONSIBLE FOR LOCATION OF ALL EXISTING U/G & OVERHEAD UTILITIES. VARIOUS UTILITIES REQUIRE ADVANCE NOTICE PRIOR TO DIGGING, FOR STAKE OUT. THE REGION ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE LOCATION OF EXISTING UTILITIES AS INDICATED ON THIS DRAWING.

SURVEY DATA DATE 2021 12 17

SCALE HORIZONTAL 5m 0 5m

DRAWN:	D. RAHIKKA	DATE: 2023 12
DESIGN:	W. KACZOREK	DATE: 2022 12
CHECKED:	E. YANG	DATE: 2023 12
APPROVED:	E. YANG	DATE: 2023 12

THE REGIONAL MUNICIPALITY OF DURHAM

WORKS DEPARTMENT

WHITBY ONTARIO

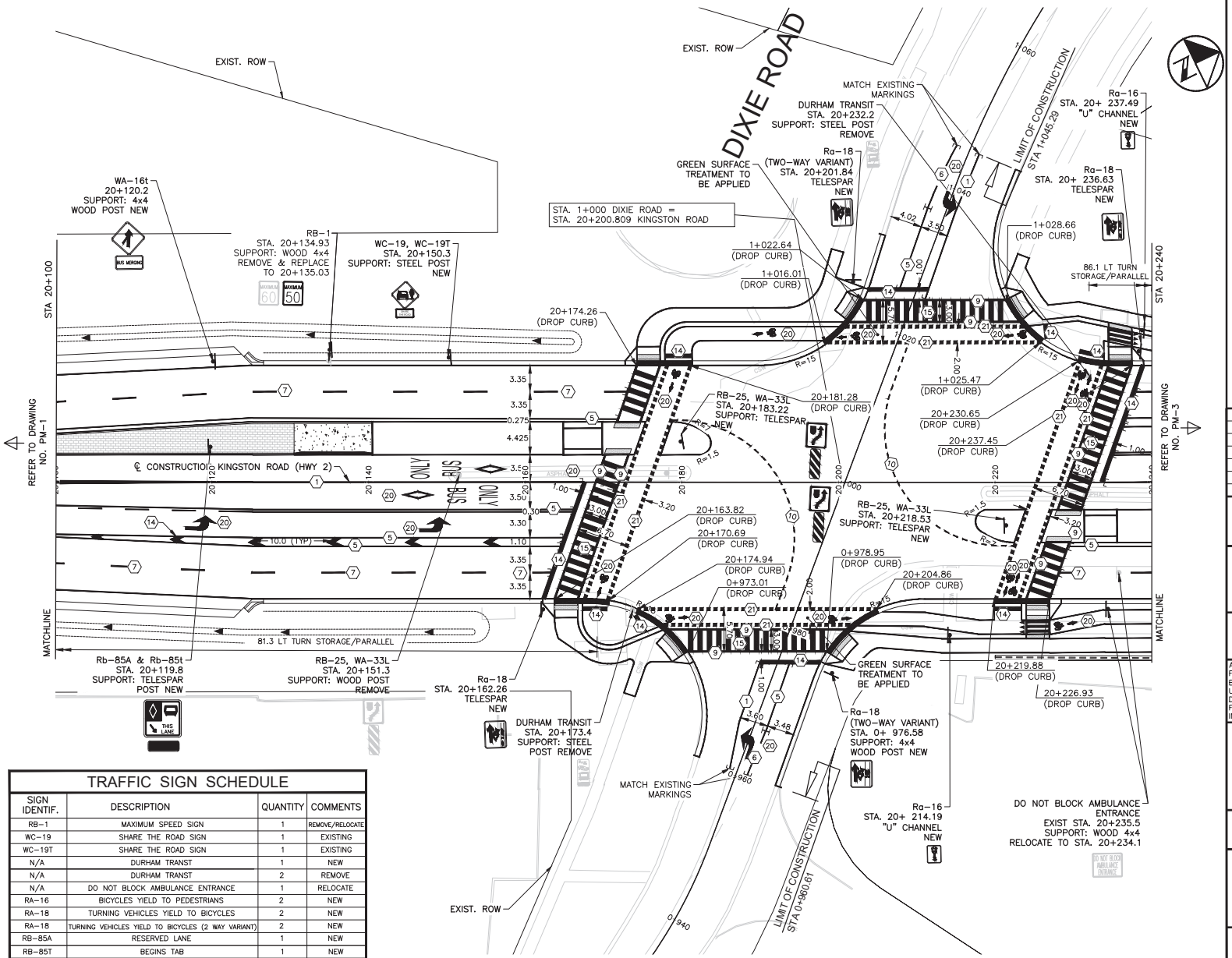
KINGSTON ROAD – HIGHWAY 2

PAVEMENT MARKINGS AND SIGNAGE

FROM 220.8m W. OF DIXIE RD. TO 100.8m W. OF DIXIE RD.

CONCESSION	REG. RD. NO.	AREA MUNICIPALITY
–	HWY 2	CITY OF PICKERING

DRAWING NUMBER	CONTRACT NUMBER	SHEET NUMBER
PM–1	D2025–49	152 OF 413



TRAFFIC SIGN SCHEDULE

SIGN IDENTIF.	DESCRIPTION	QUANTITY	COMMENTS
RB-1	MAXIMUM SPEED SIGN	1	REMOVE/RELOCATE
WC-19	SHARE THE ROAD SIGN	1	EXISTING
WC-19T	SHARE THE ROAD SIGN	1	EXISTING
N/A	DURHAM TRANST	1	NEW
N/A	DURHAM TRANST	2	REMOVE
N/A	DO NOT BLOCK AMBULANCE ENTRANCE	1	RELOCATE
RA-16	BICYCLES YIELD TO PEDESTRIANS	2	NEW
RA-18	TURNING VEHICLES YIELD TO BICYCLES	2	NEW
RA-18	TURNING VEHICLES YIELD TO BICYCLES (2 WAY VARIANT)	2	NEW
RB-85A	RESERVED LANE	1	NEW
RB-85T	BEGINS TAB	1	NEW
WA-16	MERGE SIGN	1	NEW
RB-25/ WA-33L	KEEP RIGHT/ OBJECT MARKER (ONE DIRECTION)	1	REMOVE
RB-25/ WA-33L	KEEP RIGHT/ OBJECT MARKER (ONE DIRECTION)	2	NEW

KINGSTON ROAD - HIGHWAY 2

NOTE: ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.

PAVEMENT MARKING SCHEDULE

IDENTIFICATION	TYPE	COLOUR	WIDTH (cm)
1	SOLID	YELLOW	10
2	DOUBLE SOLID	YELLOW	10
3	3-6-3 BROKEN	YELLOW	10
4	SOLID;3-6-3 BROKEN	YELLOW	10
5	SOLID	WHITE	10
6	3-3-3 BROKEN	WHITE	10
7	3-6-3 BROKEN	WHITE	10
8	3-9-3 BROKEN	WHITE	10
9	SOLID	WHITE	20
10	1-1-1 BROKEN	WHITE	20
11	3-3-3 BROKEN	WHITE	20
12	3-3-3 BROKEN	WHITE	30
13	SOLID	WHITE	30
14	SOLID	WHITE	45
15	SOLID	WHITE	60
16	1-1-1 BROKEN	WHITE	10
20	SYMBOLS	–	–
21	0.4-0.4-0.4 BROKEN	WHITE	40
] OR [	LIMITS OF MARKINGS	–	–

PAVEMENT MARKING DENOTATIONS :

- 3-3-3, 3-6-3, 3,9,3; LINE-GAP-LINE SPACING IN METRES
- (1) PERMANENT
- [1] TEMPORARY
- ▽(1) TEMPORARY-REMOVABLE
- (1) DURABLE
- ⟨1⟩ EXISTING MARKING TO BE REMOVED

NOTES :

1. ALL MARKINGS AND SIGNS SHALL CONFORM WITH THE ONTARIO TRAFFIC MANUAL (OTM) BOOK 11.
2. PROPOSED MARKINGS TO MATCH EXIST. AT ALL WORK AND/OR ROAD RECONSTRUCTION LIMITS.
3. LONGITUDINAL MARKINGS - PAINT ON BASE COURSE AND PLASTIC ON TOP COURSE.
4. TRANSVERSE MARKINGS - SYMBOLS PLASTIC ON BOTH BASE AND TOP COURSE.
5. SIGN MOUNTING HEIGHTS, AND LATERAL OFFSETS SHALL BE IN ACCORDANCE WITH THE ONTARIO TRAFFIC MANUAL (OTM) BOOK 18, SECTION 12.
6. ALL SIGNAGE FOR BICYCLE PATHS INTERSECTING WITH SIDEWALKS SHOULD BE AS PER OTM BOOK 18 AND WILL BE DETAILED IN 90% SUBMISSION PACKAGE.

NO.	DATE	NAME	REVISIONS
4	12.11.2024	A.N.	IFT SUBMISSION
3	12.14.2023	A.N.	90% DESIGN RESUBMISSION
2	12.15.2022	W.K.	90% DESIGN SUBMISSION
1	08.15.2022	W.K.	60% DESIGN SUBMISSION

AECOM

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Do not scale this document. All measurements must be obtained from stated dimensions.

UTILITIES VERIFIED

ROGERS	2022 JUNE 20
BELL CANADA	2022 JUNE 20
ENBRIDGE	2022 JUNE 20

APPROXIMATE UTILITY LOCATIONS ARE SHOWN PER MARK-UPS RECEIVED FROM THIRD PARTIES ON THE DATES NOTED ABOVE. CONTRACTOR TO BE RESPONSIBLE FOR LOCATION OF ALL EXISTING U/G & OVERHEAD UTILITIES. VARIOUS UTILITIES REQUIRE ADVANCE NOTICE PRIOR TO DIGGING, FOR STAKE OUT. THE REGION ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE LOCATION OF EXISTING UTILITIES AS INDICATED ON THIS DRAWING.

SURVEY DATA DATE
2021 12 17

SCALE
HORIZONTAL
5m 0 5m

DRAWN:	D. RAHIKKA	DATE: 2023 12
DESIGN:	W. KACZOREK	DATE: 2022 12
CHECKED:	E. YANG	DATE: 2023 12
APPROVED:	E. YANG	DATE: 2023 12

THE REGIONAL MUNICIPALITY
OF DURHAM
WORKS DEPARTMENT
WHITBY ONTARIO

KINGSTON ROAD – HIGHWAY 2

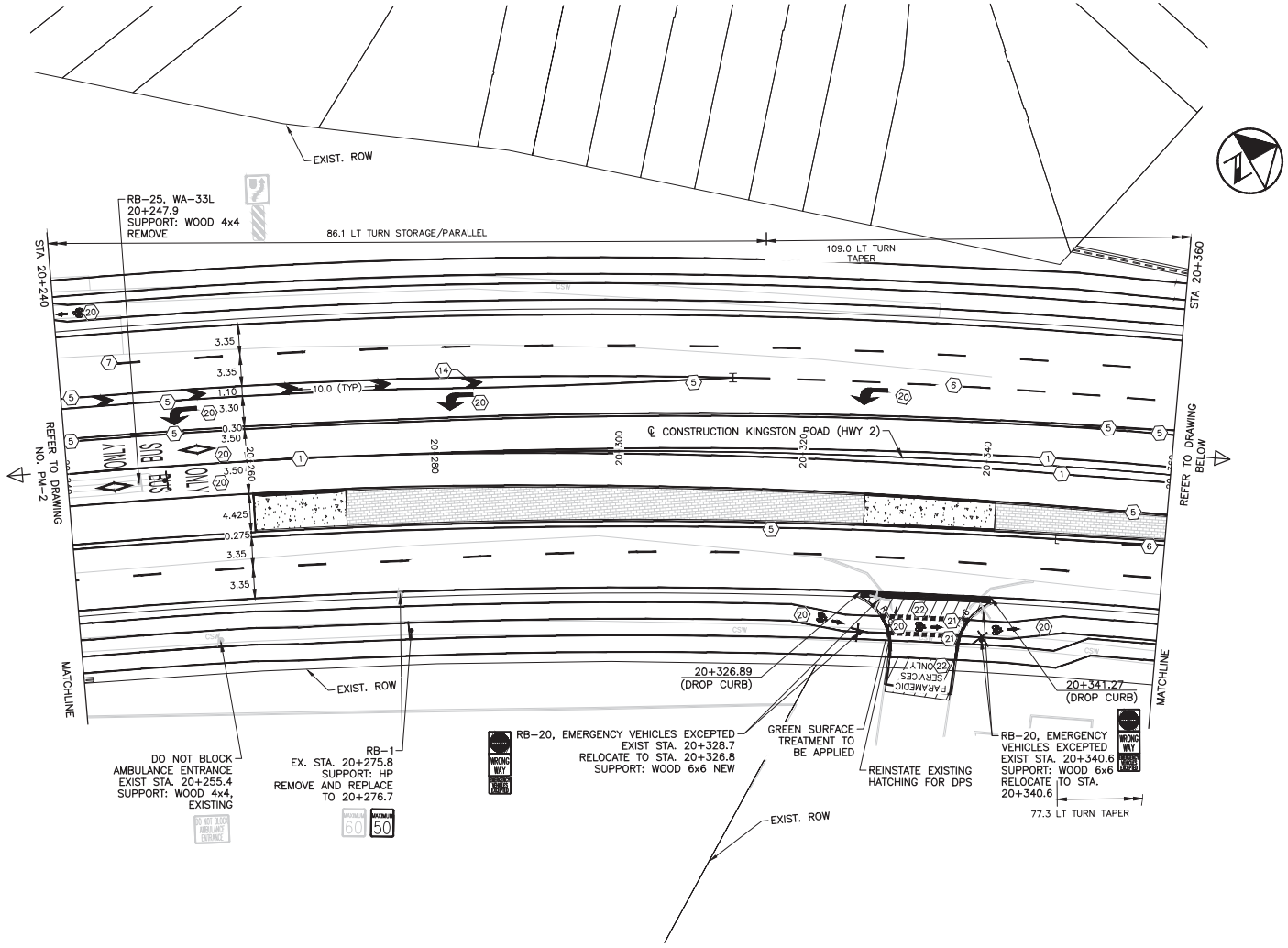
PAVEMENT MARKINGS AND SIGNAGE
FROM 100.8m W. OF DIXIE RD. TO 39.2m E. OF DIXIE RD.

CONCESSION	REG. RD. NO.	AREA MUNICIPALITY
–	HWY 2	CITY OF PICKERING

DRAWING NUMBER	CONTRACT NUMBER	SHEET NUMBER
PM-2	D2025-49	153 OF 413

TRAFFIC SIGN SCHEDULE

SIGN IDENTIF.	DESCRIPTION	QUANTITY	COMMENTS
RB-1	OBJECT MARKER (ONE DIRECTION)	1	REMOVE/RELOCATE
RB-20	WRONG WAY	2	RELOCATE
N/A	EMERGENCY VEHICLES EXCEPTED	2	RELOCATE
RB-25	KEEP RIGHT	1	REMOVE
WA-33L	OBJECT MARKER (ONE DIRECTION)	1	REMOVE
N/A	DO NOT BLOCK AMBULANCE ENTRANCE	1	EXISTING



KINGSTON ROAD - HIGHWAY 2

NOTE: ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.

PAVEMENT MARKING SCHEDULE

IDENTIFICATION	TYPE	COLOUR	WIDTH (cm)
1	SOLID	YELLOW	10
2	DOUBLE SOLID	YELLOW	10
3	3-6-3 BROKEN	YELLOW	10
4	SOLID;3-6-3 BROKEN	YELLOW	10
5	SOLID	WHITE	10
6	3-3-3 BROKEN	WHITE	10
7	3-6-3 BROKEN	WHITE	10
8	3-9-3 BROKEN	WHITE	10
9	SOLID	WHITE	20
10	1-1-1 BROKEN	WHITE	20
11	3-3-3 BROKEN	WHITE	20
12	3-3-3 BROKEN	WHITE	30
13	SOLID	WHITE	30
14	SOLID	WHITE	45
15	SOLID	WHITE	60
16	1-1-1 BROKEN	WHITE	10
20	SYMBOLS	–	–
21	0.4-0.4-0.4 BROKEN	WHITE	40
22	SOLID	RED	10
] OR [	LIMITS OF MARKINGS	–	–

PAVEMENT MARKING DENOTATIONS :

- 3-3-3, 3-6-3, 3,9,3: LINE-GAP-LINE SPACING IN METRES
- (1) PERMANENT
- [1] TEMPORARY
- ▽1 TEMPORARY-REMOVABLE
- ◇1 DURABLE
- ◇1 EXISTING MARKING TO BE REMOVED

NOTES :

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2. PROPOSED MARKINGS TO MATCH EXIST. AT ALL WORK AND/OR ROAD RECONSTRUCTION LIMITS.
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4. TRANSVERSE MARKINGS - SYMBOLS PLASTIC ON BOTH BASE AND TOP COURSE.
5. SIGN MOUNTING HEIGHTS, AND LATERAL OFFSETS SHALL BE IN ACCORDANCE WITH THE ONTARIO TRAFFIC MANUAL (OTM) BOOK 18, SECTION 12.
6. ALL SIGNAGE FOR BICYCLE PATHS INTERSECTING WITH SIDEWALKS SHOULD BE AS PER OTM BOOK 18 AND WILL BE DETAILED IN 90% SUBMISSION PACKAGE.

NO.	DATE	NAME	REVISIONS
4	12.11.2024	A.N.	IFT SUBMISSION
3	12.14.2023	A.N.	90% DESIGN RESUBMISSION
2	12.15.2022	W.K.	90% DESIGN SUBMISSION
1	08.15.2022	W.K.	60% DESIGN SUBMISSION

AECOM

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Do not scale this document. All measurements must be obtained from stated dimensions.

UTILITIES VERIFIED

ROGERS	2022 JUNE 20
BELL CANADA	2022 JUNE 20
ENBRIDGE	2022 JUNE 20

APPROXIMATE UTILITY LOCATIONS ARE SHOWN PER MARK-UPS RECEIVED FROM THIRD PARTIES ON THE DATES NOTED ABOVE. CONTRACTOR TO BE RESPONSIBLE FOR LOCATION OF ALL EXISTING U/G & OVERHEAD UTILITIES. VARIOUS UTILITIES REQUIRE ADVANCE NOTICE PRIOR TO DIGGING, FOR STAKE OUT. THE REGION ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE LOCATION OF EXISTING UTILITIES AS INDICATED ON THIS DRAWING.

E. E. SHEVAR 100144828 PROVINCE OF ONTARIO

SURVEY DATA DATE 2021 12 17

SCALE HORIZONTAL 5m 0 5m

DRAWN:	D. RAHIKKA	DATE: 2023 12
DESIGN:	W. KACZOREK	DATE: 2022 12
CHECKED:	E. YANG	DATE: 2023 12
APPROVED:	E. YANG	DATE: 2023 12

THE REGIONAL MUNICIPALITY OF DURHAM

WORKS DEPARTMENT

WHITBY ONTARIO

KINGSTON ROAD – HIGHWAY 2

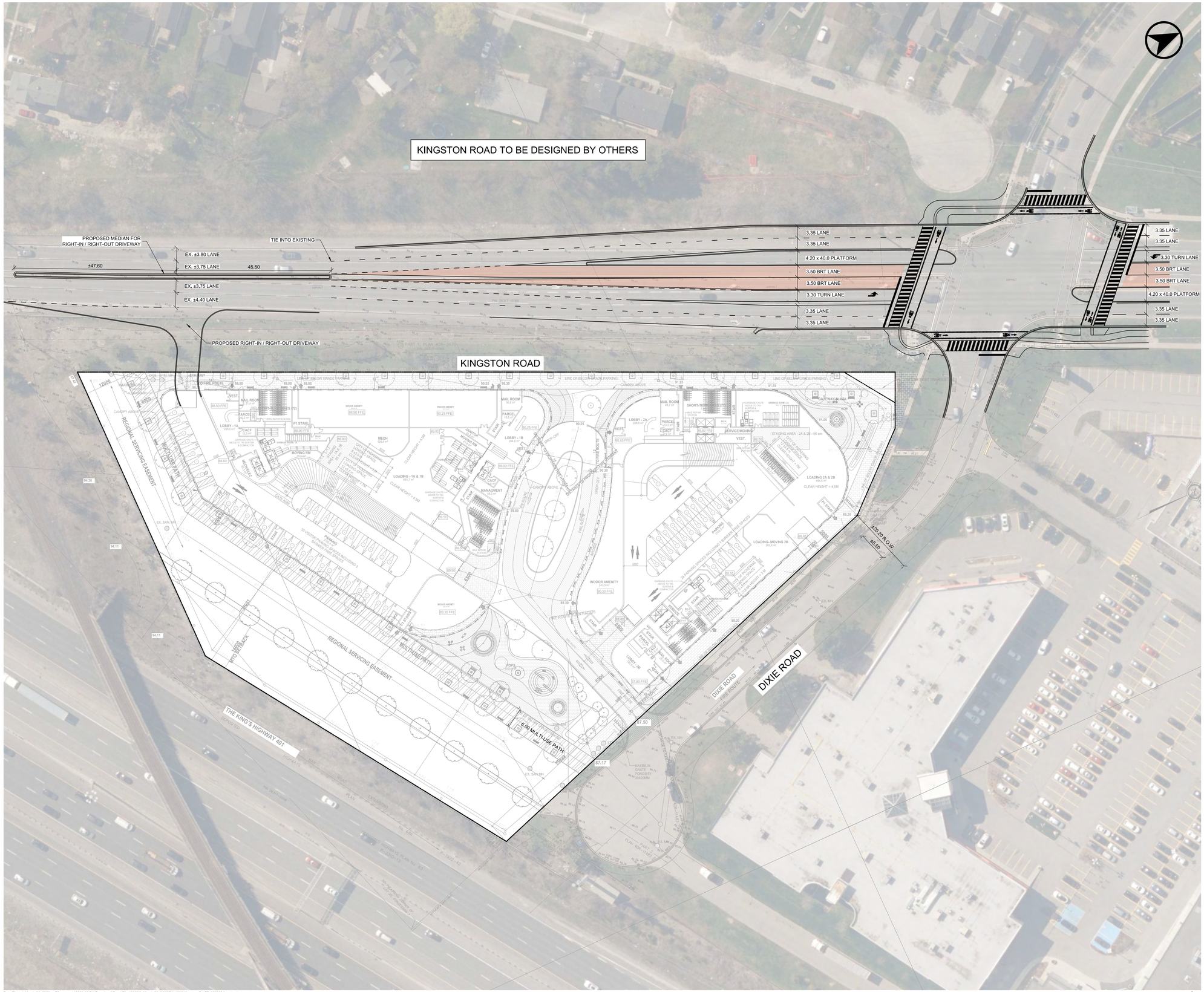
PAVEMENT MARKINGS AND SIGNAGE

FROM 39.2m E. OF DIXIE RD. TO 158.9m E. OF DIXIE RD.

CONCESSION	REG. RD. NO.	AREA MUNICIPALITY
–	HWY 2	CITY OF PICKERING

DRAWING NUMBER	CONTRACT NUMBER	SHEET NUMBER
PM-3	D2025-49	154 OF 413

Appendix G:
Functional Road Plan



LEGEND

PROPOSED PROPERTY LINE

00	03-26-25	KIC	ISSUED FOR ZBA SUBMISSION

BA Group

BA Consulting Group Ltd,
1000 – 55 St. Clair Ave. W,
Toronto ON M4V 1N6
TEL 416 961 7110
EMAIL bagroup@bagroup.com

MOVEMENT IN URBAN ENVIRONMENTS
BAGROUP.COM

1095 KINGSTON ROAD

FUNCTIONAL ROAD PLAN

INTERIM CONDITION

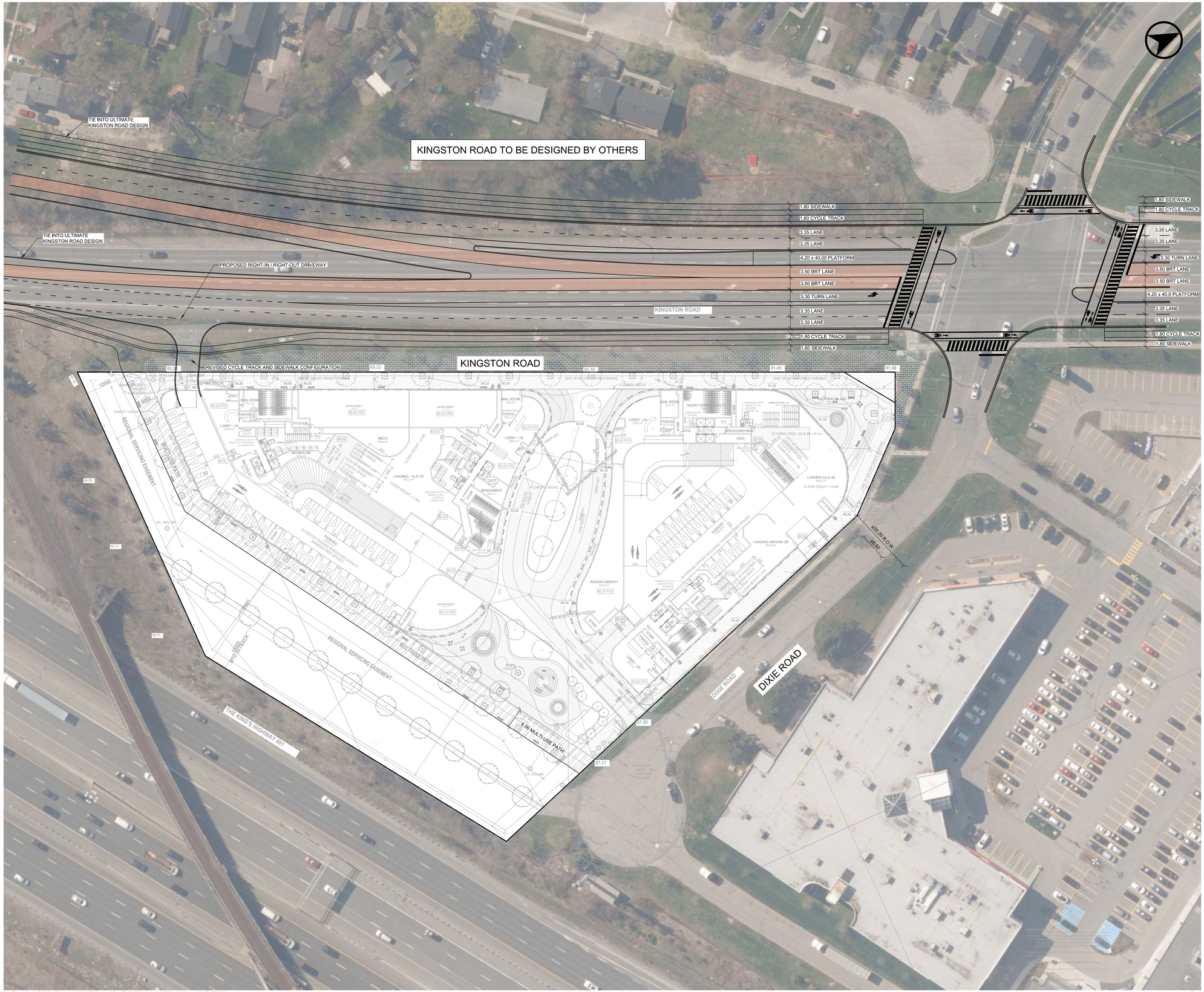
Date: March 26, 2025

Project No.: 6589-69

Scale: 1:500 (0 5 10 15 20m)

FD-01

Date Plotted: March 26, 2025 Filename: J:\6589-69\BA\Functional Road Plan\202503. March 25, 2025\BA-1095 Kingston Rd-FD-658969-Interim.dwg



Date Plotted: March 26, 2025 Filename: J:\6589-69\BA\Functional Road Plan\202503_March 25, 2025\BA-1095 Kingston Rd-FD-658969-Ultimate.dwg

LEGEND

PROPOSED PROPERTY LINE

00	03-26-25	KIC	ISSUED FOR ZBA SUBMISSION

BA Group

BA Consulting Group Ltd.
1000 – 95 St. Clair Ave. W.
Toronto ON M4V 1N6
TEL 416 961 7110
EMAIL bagroup@bagroup.com

MOVEMENT IN URBAN ENVIRONMENTS
BAGROUP.COM

1095 KINGSTON ROAD

FUNCTIONAL ROAD PLAN

ULTIMATE CONDITION

Date: March 26, 2025

Project No.: 6589-69

Scale: 1:500 (0 5 10 15 20m)

FD-01

Appendix H:
Transportation Tomorrow Survey Query Analysis

RESIDENTIAL

AM OUT

Tue Oct 08 2024 22:55:36 GMT-0400 (Eastern Daylight Time)

Frequency Distribution Query Form - Trip - 2016

Field: Primary travel mode of trip - mode_prime

Filters:
(Start time of trip - start_time In 600-859
and
2006 GTA zone of origin - gta06_orig In 1038 1040 1041 1048
and
Trip purpose of origin - purp_orig In H)

Table: Trip 2016

Row:	Count:	Expanded:	TOTAL
Transit excluding GO rail	5	174	**4%**
Auto driver	111	2530	**64%**
GO rail only	12	163	**4%**
Joint GO rail and local transit	4	88	**2%**
Auto passenger	20	496	**13%**
School bus	6	215	**5%**
Walk	8	263	**7%**
Total:	166	3929	**100%**

Auto Drive	64.4%
Auto Pass	18.1%
Transit	10.8%
Cycling	0.0%
Walking	6.7%
Total	100.0%

PM IN

Tue Oct 08 2024 22:56:51 GMT-0400 (Eastern Daylight Time)

Frequency Distribution Query Form - Trip - 2016

Field: Primary travel mode of trip - mode_prime

Filters:
(Start time of trip - start_time In 1500-1759
and
2006 GTA zone of destination - gta06_dest In 1038 1040 1041 1048
and
Trip purpose of destination - purp_dest In H)

Table: Trip 2016

Row:	Count:	Expanded	TOTAL
Transit excluding GO rail	8	320	**9%**
Cycle	1	15	**0%**
Auto driver	103	2204	**62%**
GO rail only	12	209	**6%**
Joint GO rail and local transit	4	93	**3%**
Auto passenger	14	349	**10%**
School bus	2	89	**3%**
Walk	10	277	**8%**
Total:	154	3556	**100%**

Auto Drive	62.0%
Auto Pass	12.3%
Transit	17.5%
Cycling	0.4%
Walking	7.8%
Total	100.0%

Linear interpolation from 2025 to 2041 targets

		2016	2025	2030	2035	2040	2041	Target
Auto Drive	63.2%	62.0%	56.6%	53.6%	50.6%	47.6%	47.0%	**47%**
Auto Pass	15.2%	16.0%	14.6%	13.8%	13.0%	12.2%	12.0%	**12%**
Transit	14.2%	14.0%	20.8%	24.6%	28.4%	32.2%	33.0%	**33%**
Cycling	0.2%	0.0%	1.0%	1.0%	1.0%	1.0%	1.0%	
Walking	7.2%	8.0%	7.0%	7.0%	7.0%	7.0%	7.0%	
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	

Rate of transit mode share increase (up to 33% at 2041):

0.76% per year (also equivalent to rate of auto mode decrease)

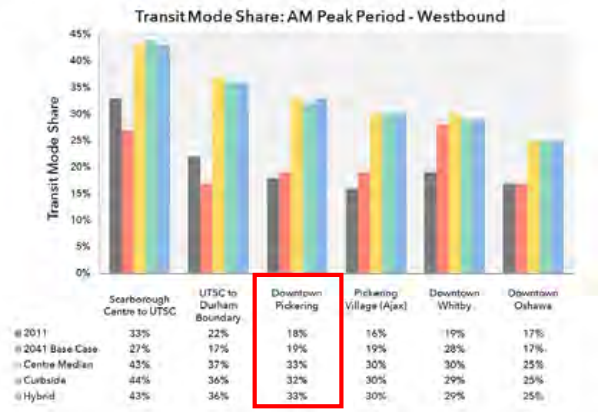
driver 0.60% per year decrease

passenge 0.16% per year decrease

	2025	2030	2035	2040	2041	Diff (2041-2025)
Auto Driver	57.0%	54.0%	51.0%	48.0%	47.0%	-10.0%
Auto Passenger	15.0%	14.0%	13.0%	12.0%	12.0%	-3.0%
Transit	20.0%	24.0%	28.0%	32.0%	33.0%	13.0%
Cycling	1.0%	1.0%	1.0%	1.0%	1.0%	0.0%
Walking	7.0%	7.0%	7.0%	7.0%	7.0%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	

chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://assets.metrolinx.com/image/upload/v1663237565/Documents/Metrolinx/2019-01-24-DSBRT_Final-for-Publication_updated.pdf

Exhibit 5.6: Transit Mode Shares (2 hour AM Peak Period – Westbound)



Thu May 30 2024 10:28:49 GMT-0400 (Eastern Daylight Time) - Run Time: 2592ms

Cross Tabulation Query Form - Trip - 2016

Row: Planning district of destination - pd_dest
Column: 2006 GTA zone of origin - gta06_orig

Filters:
(Start time of trip - start_time In 600-859
and
2006 GTA 1040
and
Trip purpose of origin - purp_orig In H
and
Primary tra M P T U)

Trip 2016
Table:

	1038	1040	TOTAL
PD 1 of To	73	0	73
PD 3 of To	69	0	69
PD 4 of To	10	0	10
PD 5 of To	58	0	58
PD 6 of To	0	21	21
PD 10 of T	36	22	58
PD 11 of T	29	0	29
PD 12 of T	86	0	86
PD 13 of T	143	40	183
PD 15 of T	85	9	94
PD 16 of T	131	65	196
Pickering	790	148	938
Ajax	121	155	276
Whitby	20	0	20
Oshawa	87	19	106
Aurora	46	0	46
Whitchurch	0	33	33
Markham	111	116	227
Vaughan	86	122	208
Mississaug	43	0	43
Flamborou	0	30	30

Thu May 30 2024 10:44:11 GMT-0400 (Eastern Daylight Time) - Run Time: 2704ms

Cross Tabulation Query Form - Trip - 2016

Row: 2006 GTA zone of destination - gta06_dest
Column: 2006 GTA zone of origin - gta06_orig

Filters:
(Start time of trip - start_time In 600-859
and
2006 GTA 1040
and
Trip purpose of origin - purp_orig In H
and
Primary tra M P T U
and
Planning di)

Trip 2016
Table:

	1038	1040	TOTAL
1024	10	0	10
1031	182	54	236
1035	305	0	305
1037	43	0	43
1038	42	0	42
1041	41	10	51
1042	16	0	16
1043	50	11	61
1045	25	0	25
1046	44	23	67
1051	19	41	60
1053	0	8	8
1056	14	0	14

PD 1 of Toronto	73
PD 3 of Toronto	69
PD 4 of Toronto	10
PD 5 of Toronto	58
PD 6 of Toronto	21
PD 10 of Toronto	58
PD 11 of Toronto	29
PD 12 of Toronto	86
PD 13 of Toronto	183
PD 15 of Toronto	94
PD 16 of Toronto	196
Ajax	276
Whitby	20
Oshawa	106
Aurora	46
Whitchurch-Stouffville	33
Markham	227
Vaughan	208
Mississauga	43
Flamborough	30
1024	10
1031	236
1035	305
1037	43
1038	42
1041	51
1042	16
1043	61
1045	25
1046	67
1051	60
1053	8
1056	14

Thu May 30 2024 10:48:07 GMT-0400 (Eastern Daylight Time) - Run Time: 2556ms

Cross Tabulation Query Form - Trip - 2016

Row: Planning district of origin - pd_orig
Column: 2006 GTA zone of destination - gta06_dest

Filters:
(Start time of trip - start_time In 1500-1759
and
2006 GTA 1040
and
Trip purpose of destination - purp_dest In H
and
Primary tra M P T U)

Trip 2016
Table:

	1038	1040	TOTAL
PD 1 of To	101	0	101
PD 2 of To	19	0	19
PD 3 of To	10	0	10
PD 5 of To	65	0	65
PD 6 of To	0	21	21
PD 12 of T	73	26	99
PD 13 of T	113	214	327
PD 15 of T	32	0	32
PD 16 of T	166	0	166
Pickering	561	173	734
Ajax	144	113	257
Whitby	10	13	23
Oshawa	73	0	73
Aurora	21	0	21
Whitchurch	26	33	59
Markham	121	126	247
Vaughan	67	51	118
Muskoka	19	0	19

Thu May 30 2024 10:47:23 GMT-0400 (Eastern Daylight Time) - Run Time: 2821ms

Cross Tabulation Query Form - Trip - 2016

Row: 2006 GTA zone of origin - gta06_orig
Column: 2006 GTA zone of destination - gta06_dest

Filters:
(Start time of trip - start_time In 1500-1759
and
2006 GTA 1040
and
Trip purpose of destination - purp_dest In H
and
Primary tra M P T U
and
Planning di)

Trip 2016
Table:

	1038	1040	TOTAL
1018	14	0	14
1028	0	10	10
1031	28	54	82
1035	184	0	184
1036	14	0	14
1037	19	0	19
1038	14	0	14
1039	7	0	7
1040	25	0	25
1041	96	13	109
1043	50	0	50
1045	45	0	45
1046	51	23	74
1051	14	65	79
1053	0	8	8

PD 1 of Toronto	101
PD 2 of Toronto	19
PD 3 of Toronto	10
PD 5 of Toronto	65
PD 6 of Toronto	21
PD 12 of Toronto	99
PD 13 of Toronto	327
PD 15 of Toronto	32
PD 16 of Toronto	166
Ajax	257
Whitby	23
Oshawa	73
Aurora	21
Whitchurch-Stouffville	59
Markham	247
Vaughan	118
Muskoka	19
1018	14
1028	10
1031	82
1035	184
1036	14
1037	19
1038	14
1039	7
1040	25
1041	109
1043	50
1045	45
1046	74
1051	79
1053	8

AM

Outbound

2025-03-26

RESIDENTIAL VEHICLE TRIP DISTRIBUTION

Traffic Volume Allocation

	Zone	Trips	%	EAST Kingston Rd	EAST Highway 401	WEST Kingston Rd	WEST Highway 401	NORTH Whites Rd N	NORTH Fairport Rd	NORTH Dixie Rd	NORTH Liverpool Rd	SOUTH Whites Rd N	SOUTH Liverpool Rd	TOTAL
	PD 1 of Toronto	73	2.65%				100%							100.00%
	PD 3 of Toronto	69	2.51%				100%							100.00%
	PD 4 of Toronto	10	0.36%				100%							100.00%
	PD 5 of Toronto	58	2.11%				100%							100.00%
	PD 6 of Toronto	21	0.76%				100%							100.00%
	PD 10 of Toronto	58	2.11%				100%							100.00%
	PD 11 of Toronto	29	1.05%				100%							100.00%
	PD 12 of Toronto	86	3.12%				100%							100.00%
	PD 13 of Toronto	183	6.65%			30%	70%							100.00%
	PD 15 of Toronto	94	3.41%			50%	50%							100.00%
	PD 16 of Toronto	196	7.12%			50%	50%							100.00%
	Ajax	276	10.03%	50%	50%									100.00%
	Whitby	20	0.73%	30%	70%									100.00%
	Oshawa	106	3.85%		100%									100.00%
	Aurora	46	1.67%				20%	40%		40%				100.00%
	Whitchurch-Stouffville	33	1.20%				20%	40%		40%				100.00%
	Markham	227	8.25%					60%		40%				100.00%
	Vaughan	208	7.56%				100%							100.00%
	Mississauga	43	1.56%				100%							100.00%
	Flamborough	30	1.09%				100%							100.00%
Pickering	1024	10	0.36%			50%		50%						100.00%
	1031	236	8.57%						40%	40%	20%			100.00%
	1035	305	11.08%					50%	30%	20%				100.00%
	1037	43	1.56%					30%	35%	35%				100.00%
	1038	42	1.53%					35%	35%	30%				100.00%
	1042	16	0.58%	100%										100.00%
	1043	61	2.22%	100%										100.00%
	1045	25	0.91%	100%										100.00%
	1046	67	2.43%			50%		50%						100.00%
	1051	60	2.18%										100%	100.00%
	1053	8	0.29%										100%	100.00%
	1056	14	0.51%									50%	50%	100.00%
	TOTAL	2753	100%											

EAST Kingston Rd	EAST Highway 401	WEST Kingston Rd	WEST Highway 401	NORTH Whites Rd N	NORTH Fairport Rd	NORTH Dixie Rd	NORTH Liverpool Rd	SOUTH Whites Rd N	SOUTH Liverpool Rd	TOTAL
0.00%	0.00%	0.00%	2.65%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.65%
0.00%	0.00%	0.00%	2.51%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.51%
0.00%	0.00%	0.00%	0.36%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.36%
0.00%	0.00%	0.00%	2.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.11%
0.00%	0.00%	0.00%	0.76%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.76%
0.00%	0.00%	0.00%	2.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.11%
0.00%	0.00%	0.00%	1.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.05%
0.00%	0.00%	0.00%	3.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.12%
0.00%	0.00%	1.99%	4.65%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.65%
0.00%	0.00%	1.71%	1.71%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.41%
0.00%	0.00%	3.56%	3.56%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.12%
5.01%	5.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.03%
0.22%	0.51%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.73%
0.00%	3.85%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.85%
0.00%	0.00%	0.00%	0.33%	0.67%	0.00%	0.67%	0.00%	0.00%	0.00%	1.67%
0.00%	0.00%	0.00%	0.24%	0.48%	0.00%	0.48%	0.00%	0.00%	0.00%	1.20%
0.00%	0.00%	0.00%	0.00%	4.95%	0.00%	3.30%	0.00%	0.00%	0.00%	8.25%
0.00%	0.00%	0.00%	7.56%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.56%
0.00%	0.00%	0.00%	1.56%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.56%
0.00%	0.00%	0.00%	1.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.09%
0.00%	0.00%	0.18%	0.00%	0.18%	0.00%	0.00%	0.00%	0.00%	0.00%	0.36%
0.00%	0.00%	0.00%	0.00%	0.00%	3.43%	3.43%	1.71%	0.00%	0.00%	8.57%
0.00%	0.00%	0.00%	0.00%	5.54%	3.32%	2.22%	0.00%	0.00%	0.00%	11.08%
0.00%	0.00%	0.00%	0.00%	0.47%	0.55%	0.55%	0.00%	0.00%	0.00%	1.56%
0.00%	0.00%	0.00%	0.00%	0.53%	0.53%	0.46%	0.00%	0.00%	0.00%	1.53%
0.58%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.58%
2.22%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.22%
0.91%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%
0.00%	0.00%	1.22%	0.00%	1.22%	0.00%	0.00%	0.00%	0.00%	0.00%	2.43%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.18%	2.18%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.29%	0.29%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.25%	0.25%	0.51%
8.9%	**9.4%**	**8.7%**	**35.4%**	**14.0%**	**7.8%**	**11.1%**	**1.7%**	**0.3%**	**2.7%**	**100.0%**

10.0%	**10.0%**	**10.0%**	**30.0%**	**15.0%**	**5.0%**	**10.0%**	**5.0%**	**0.0%**	**5.0%**	**100.0%**

North	35.0%
South	5.0%
East	20.0%
West	40.0%
	100.0%

PM

Inbound

2025-03-26

RESIDENTIAL VEHICLE TRIP DISTRIBUTION

Traffic Volume Allocation

	Zone	Trips	%	EAST Kingston Rd	EAST Highway 401	WEST Kingston Rd	WEST Highway 401	NORTH Whites Rd N	NORTH Fairport Rd	NORTH Dixie Rd	NORTH Liverpool Rd	SOUTH Whites Rd N	SOUTH Liverpool Rd	TOTAL
	PD 1 of Toronto	101	4.43%				100%							100.00%
	PD 2 of Toronto	19	0.83%				100%							100.00%
	PD 3 of Toronto	10	0.44%				100%							100.00%
	PD 5 of Toronto	65	2.85%				100%							100.00%
	PD 6 of Toronto	21	0.92%				100%							100.00%
	PD 12 of Toronto	99	4.34%				100%							100.00%
	PD 13 of Toronto	327	14.33%			30%	70%							100.00%
	PD 15 of Toronto	32	1.40%			50%	50%							100.00%
	PD 16 of Toronto	166	7.27%			50%	50%							100.00%
	Ajax	257	11.26%	50%	50%									100.00%
	Whitby	23	1.01%	30%	70%									100.00%
	Oshawa	73	3.20%		100%									100.00%
	Aurora	21	0.92%				20%	40%		40%				100.00%
	Whitchurch-Stouffville	59	2.59%				20%	40%		40%				100.00%
	Markham	247	10.82%					60%		40%				100.00%
	Vaughan	118	5.17%				100%							100.00%
	Muskoka	19	0.83%				20%			40%	40%			100.00%
Pickering	1018	14	0.61%	50%							50%			100.00%
	1028	10	0.44%							50%	50%			100.00%
	1031	82	3.59%						40%	40%	20%			100.00%
	1035	184	8.06%					50%	30%	20%				100.00%
	1036	14	0.61%					100%						100.00%
	1037	19	0.83%					30%	35%	35%				100.00%
	1038	14	0.61%					35%	35%	30%				100.00%
	1039	7	0.31%	40%						20%	40%			100.00%
	1040	25	1.10%							50%	50%			100.00%
	1043	50	2.19%	100%										100.00%
	1045	45	1.97%	100%										100.00%
	1046	74	3.24%			50%		50%						100.00%
	1051	79	3.46%										100%	100.00%
	1053	8	0.35%										100%	100.00%
	TOTAL	2282	100%											

EAST Kingston Rd	EAST Highway 401	WEST Kingston Rd	WEST Highway 401	NORTH Whites Rd N	NORTH Fairport Rd	NORTH Dixie Rd	NORTH Liverpool Rd	SOUTH Whites Rd N	SOUTH Liverpool Rd	TOTAL
0.00%	0.00%	0.00%	4.43%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.43%
0.00%	0.00%	0.00%	0.83%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.83%
0.00%	0.00%	0.00%	0.44%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.44%
0.00%	0.00%	0.00%	2.85%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.85%
0.00%	0.00%	0.00%	0.92%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.92%
0.00%	0.00%	0.00%	4.34%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.34%
0.00%	0.00%	4.30%	10.03%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	14.33%
0.00%	0.00%	0.70%	0.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.40%
0.00%	0.00%	3.64%	3.64%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.27%
5.63%	5.63%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.26%
0.30%	0.71%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.01%
0.00%	3.20%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.20%
0.00%	0.00%	0.00%	0.18%	0.37%	0.00%	0.37%	0.00%	0.00%	0.00%	0.92%
0.00%	0.00%	0.00%	0.52%	1.03%	0.00%	1.03%	0.00%	0.00%	0.00%	2.59%
0.00%	0.00%	0.00%	0.00%	6.49%	0.00%	4.33%	0.00%	0.00%	0.00%	10.82%
0.00%	0.00%	0.00%	5.17%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.17%
0.00%	0.00%	0.00%	0.17%	0.00%	0.00%	0.33%	0.33%	0.00%	0.00%	0.83%
0.31%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.31%	0.00%	0.00%	0.61%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.22%	0.22%	0.00%	0.00%	0.44%
0.00%	0.00%	0.00%	0.00%	0.00%	1.44%	1.44%	0.72%	0.00%	0.00%	3.59%
0.00%	0.00%	0.00%	0.00%	4.03%	2.42%	1.61%	0.00%	0.00%	0.00%	8.06%
0.00%	0.00%	0.00%	0.00%	0.61%	0.00%	0.00%	0.00%	0.00%	0.00%	0.61%
0.00%	0.00%	0.00%	0.00%	0.25%	0.29%	0.29%	0.00%	0.00%	0.00%	0.83%
0.00%	0.00%	0.00%	0.00%	0.21%	0.21%	0.18%	0.00%	0.00%	0.00%	0.61%
0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.06%	0.12%	0.00%	0.00%	0.31%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.55%	0.55%	0.00%	0.00%	1.10%
2.19%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.19%
1.97%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.97%
0.00%	0.00%	1.62%	0.00%	1.62%	0.00%	0.00%	0.00%	0.00%	0.00%	3.24%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.46%	3.46%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.35%	0.35%
10.5%	**9.5%**	**10.3%**	**34.2%**	**14.6%**	**4.4%**	**10.4%**	**2.2%**	**0.0%**	**3.8%**	**100.0%**

10.0%	**10.0%**	**10.0%**	**30.0%**	**15.0%**	**5.0%**	**10.0%**	**5.0%**	**0.0%**	**5.0%**	**100.0%**

North	35.0%
South	5.0%
East	20.0%
West	40.0%
	100.0%

Appendix I:
Existing Traffic Movement Counts

Spectrum

Turning Movement Count
Location Name: DIXIE RD & 1095 KINGSTON RD NORTH DRIVEWAY
Date: Tue, May 14, 2024 Deployment Lead: David Chu

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Turning Movement Count (6 . DIXIE RD & 1095 KINGSTON RD NORTH DRIVEWAY)

Start Time	N Approach DIXIE RD					S Approach DIXIE RD					W Approach 1095 KINGSTON RD NORTH DRIVEWAY					Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	UTurn N:N	Peds N:	Approach Total	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Left W:N	UTurn W:W	Peds W:	Approach Total		
07:00:00	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	
07:15:00	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	2	
07:30:00	3	2	0	0	5	3	0	0	0	3	0	0	0	0	0	8	
07:45:00	4	8	0	0	12	1	0	0	0	1	0	3	0	1	3	16	28
08:00:00	2	4	0	0	6	4	0	0	0	4	0	4	0	1	4	14	40
08:15:00	3	3	0	0	6	2	0	0	0	2	0	1	0	1	1	9	47
08:30:00	8	7	0	0	15	2	0	0	0	2	0	4	0	0	4	21	60
08:45:00	5	11	0	0	16	3	0	0	0	3	0	3	0	0	3	22	66
09:00:00	5	5	0	0	10	3	0	0	0	3	0	2	0	0	2	15	67
09:15:00	3	2	0	0	5	5	0	0	0	5	0	3	0	0	3	13	71
09:30:00	6	7	0	0	13	3	0	0	0	3	0	5	0	0	5	21	71
09:45:00	4	9	0	0	13	5	0	0	0	5	0	6	0	1	6	24	73
BREAK																	
16:00:00	12	9	0	0	21	14	0	0	0	14	0	8	0	0	8	43	
16:15:00	7	6	0	0	13	11	0	0	0	11	0	8	0	0	8	32	
16:30:00	6	7	0	0	13	13	0	0	1	13	0	5	0	1	5	31	
16:45:00	10	6	0	0	16	10	0	0	0	10	1	8	0	0	9	35	141
17:00:00	7	6	0	0	13	21	0	0	0	21	0	8	0	0	8	42	140
17:15:00	10	2	0	0	12	16	0	0	0	16	0	6	0	0	6	34	142
17:30:00	12	7	0	0	19	18	0	0	0	18	0	5	0	1	5	42	153
17:45:00	8	12	0	2	20	12	0	0	0	12	0	4	0	1	4	36	154
18:00:00	8	9	0	0	17	12	0	0	0	12	0	7	0	1	7	36	148
18:15:00	12	9	0	0	21	9	0	0	0	9	0	8	0	0	8	38	152
18:30:00	8	5	0	0	13	12	0	0	1	12	0	9	0	0	9	34	144
18:45:00	7	13	0	0	20	14	0	0	0	14	0	7	0	1	7	41	149
Grand Total	153	149	0	2	302	194	0	0	2	194	1	114	0	9	115	**611**	-
Approach%	50.7%	49.3%	0%		-	100%	0%	0%		-	0.9%	99.1%	0%		-	**-**	-
Totals %	25%	24.4%	0%		49.4%	31.8%	0%	0%		31.8%	0.2%	18.7%	0%		18.8%	**-**	-
Heavy	1	7	0		-	4	0	0		-	0	1	0		-	**-**	-
Heavy %	0.7%	4.7%	0%		-	2.1%	0%	0%		-	0%	0.9%	0%		-	**-**	-
Bicycles	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-
Bicycle %	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-

Peak Hour: 09:00 AM - 10:00 AM Weather: Light Rain (14.76 °C)

Start Time	N Approach DIXIE RD					S Approach DIXIE RD					W Approach 1095 KINGSTON RD NORTH DRIVEWAY					Int. Total (15 min)
	Right	Thru	UTurn	Peds	Approach Total	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	
09:00:00	5	5	0	0	10	3	0	0	0	3	0	2	0	0	2	15
09:15:00	3	2	0	0	5	5	0	0	0	5	0	3	0	0	3	13
09:30:00	6	7	0	0	13	3	0	0	0	3	0	5	0	0	5	21
09:45:00	4	9	0	0	13	5	0	0	0	5	0	6	0	1	6	24
Grand Total	18	23	0	0	41	16	0	0	0	16	0	16	0	1	16	**73**
Approach%	43.9%	56.1%	0%		-	100%	0%	0%		-	0%	100%	0%		-	**-**
Totals %	24.7%	31.5%	0%		56.2%	21.9%	0%	0%		21.9%	0%	21.9%	0%		21.9%	**-**
PHF	0.75	0.64	0		0.79	0.8	0	0		0.8	0	0.67	0		0.67	**-**
Heavy	0	2	0		2	3	0	0		3	0	0	0		0	**-**
Heavy %	0%	8.7%	0%		4.9%	18.8%	0%	0%		18.8%	0%	0%	0%		0%	**-**
Lights	18	21	0		39	13	0	0		13	0	16	0		16	**-**
Lights %	100%	91.3%	0%		95.1%	81.3%	0%	0%		81.3%	0%	100%	0%		100%	**-**
Single-Unit Trucks	0	1	0		1	0	0	0		0	0	0	0		0	**-**
Single-Unit Trucks %	0%	4.3%	0%		2.4%	0%	0%	0%		0%	0%	0%	0%		0%	**-**
Articulated Trucks	0	1	0		1	3	0	0		3	0	0	0		0	**-**
Articulated Trucks %	0%	4.3%	0%		2.4%	18.8%	0%	0%		18.8%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	**-**
Pedestrians%	-	-	-	0%		-	-	-	0%		-	-	-	100%		**-**
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	0%		-	-	-	0%		-	-	-	0%		**-**

Peak Hour: 05:00 PM - 06:00 PM Weather: Overcast Clouds (18.76 °C)

Start Time	N Approach DIXIE RD					S Approach DIXIE RD					W Approach 1095 KINGSTON RD NORTH DRIVEWAY					Int. Total (15 min)
	Right	Thru	UTurn	Peds	Approach Total	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	
17:00:00	7	6	0	0	13	21	0	0	0	21	0	8	0	0	8	42
17:15:00	10	2	0	0	12	16	0	0	0	16	0	6	0	0	6	34
17:30:00	12	7	0	0	19	18	0	0	0	18	0	5	0	1	5	42
17:45:00	8	12	0	2	20	12	0	0	0	12	0	4	0	1	4	36
Grand Total	37	27	0	2	64	67	0	0	0	67	0	23	0	2	23	**154**
Approach%	57.8%	42.2%	0%		-	100%	0%	0%		-	0%	100%	0%		-	**-**
Totals %	24%	17.5%	0%		41.6%	43.5%	0%	0%		43.5%	0%	14.9%	0%		14.9%	**-**
PHF	0.77	0.56	0		0.8	0.8	0	0		0.8	0	0.72	0		0.72	**-**
Heavy	0	0	0		0	1	0	0		1	0	0	0		0	**-**
Heavy %	0%	0%	0%		0%	1.5%	0%	0%		1.5%	0%	0%	0%		0%	**-**
Lights	37	27	0		64	66	0	0		66	0	23	0		23	**-**
Lights %	100%	100%	0%		100%	98.5%	0%	0%		98.5%	0%	100%	0%		100%	**-**
Single-Unit Trucks	0	0	0		0	1	0	0		1	0	0	0		0	**-**
Single-Unit Trucks %	0%	0%	0%		0%	1.5%	0%	0%		1.5%	0%	0%	0%		0%	**-**
Articulated Trucks	0	0	0		0	0	0	0		0	0	0	0		0	**-**
Articulated Trucks %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	2	-	-	-	-	0	-	-	-	-	2	-	**-**
Pedestrians%	-	-	-	50%		-	-	-	0%		-	-	-	50%		**-**
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	0%		-	-	-	0%		-	-	-	0%		**-**

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 09:00 AM - 10:00 AM Weather: Light Rain (14.76 °C)



	Bicycles on Crosswalk	Pedestrians
N	0	0
S	0	0
W	0	1

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 05:00 PM - 06:00 PM Weather: Overcast Clouds (18.76 °C)



	Bicycles on Crosswalk	Pedestrians
N	0	2
S	0	0
W	0	2

Spectrum

Turning Movement Count
Location Name: DIXIE RD & 1099 KINGSTON RD NORTH DRIVEWAY
Date: Tue, May 14, 2024 Deployment Lead: David Chu

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Turning Movement Count (5 . DIXIE RD & 1099 KINGSTON RD NORTH DRIVEWAY)

Start Time	N Approach DIXIE RD					E Approach 1099 KINGSTON RD NORTH DRIVEWAY					S Approach DIXIE RD					Int. Total (15 min)	Int. Total (1 hr)
	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	UTurn S:S	Peds S:	Approach Total		
07:00:00	2	6	0	0	8	9	0	0	0	9	0	0	0	1	0	17	
07:15:00	1	11	0	0	12	2	0	0	0	2	0	1	0	0	1	15	
07:30:00	5	17	0	1	22	11	0	0	0	11	0	3	0	2	3	36	
07:45:00	12	24	1	0	37	6	0	0	1	6	0	4	0	0	4	47	115
08:00:00	6	23	0	0	29	7	0	0	0	7	0	8	0	1	8	44	142
08:15:00	7	29	0	0	36	20	0	0	0	20	0	3	0	0	3	59	186
08:30:00	14	37	0	0	51	21	0	0	1	21	0	6	0	0	6	78	228
08:45:00	16	56	0	0	72	11	0	0	1	11	0	6	0	1	6	89	270
09:00:00	10	53	0	0	63	18	0	1	1	19	0	5	0	1	5	87	313
09:15:00	4	62	0	0	66	23	1	0	0	24	1	7	0	0	8	98	352
09:30:00	14	45	0	0	59	29	0	0	0	29	0	8	0	3	8	96	370
09:45:00	12	47	0	1	59	27	0	0	0	27	3	8	0	1	11	97	378
BREAK																	
16:00:00	21	43	0	0	64	34	0	0	1	34	4	18	0	0	22	120	
16:15:00	14	43	0	0	57	45	0	0	0	45	2	17	0	0	19	121	
16:30:00	11	58	0	0	69	49	1	0	2	50	2	16	0	0	18	137	
16:45:00	14	55	0	0	69	37	2	0	0	39	2	17	0	0	19	127	505
17:00:00	13	30	0	0	43	64	0	0	0	64	0	29	0	1	29	136	521
17:15:00	12	60	0	0	72	59	0	0	0	59	3	19	0	0	22	153	553
17:30:00	18	47	0	0	65	42	1	0	0	43	2	21	0	1	23	131	547
17:45:00	18	68	0	0	86	43	2	0	0	45	3	13	0	2	16	147	567
18:00:00	17	56	0	0	73	60	1	0	0	61	2	17	0	0	19	153	584
18:15:00	20	54	0	0	74	42	0	0	3	42	2	17	0	1	19	135	566
18:30:00	12	44	0	1	56	27	0	0	0	27	2	19	0	2	21	104	539
18:45:00	19	46	0	0	65	45	1	0	0	46	2	19	0	0	21	132	524
Grand Total	292	1014	1	3	1307	731	9	1	10	741	30	281	0	17	311	**2359**	-
Approach%	22.3%	77.6%	0.1%		-	98.7%	1.2%	0.1%		-	9.6%	90.4%	0%		-	**-**	-
Totals %	12.4%	43%	0%		55.4%	31%	0.4%	0%		31.4%	1.3%	11.9%	0%		13.2%	**-**	-
Heavy	8	3	0		-	3	0	0		-	0	5	0		-	**-**	-
Heavy %	2.7%	0.3%	0%		-	0.4%	0%	0%		-	0%	1.8%	0%		-	**-**	-
Bicycles	0	2	0		-	1	0	0		-	0	0	0		-	**-**	-
Bicycle %	0%	0.2%	0%		-	0.1%	0%	0%		-	0%	0%	0%		-	**-**	-

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 09:00 AM - 10:00 AM Weather: Light Rain (14.76 °C)

Start Time	N Approach DIXIE RD					E Approach 1099 KINGSTON RD NORTH DRIVEWAY					S Approach DIXIE RD					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
09:00:00	10	53	0	0	63	18	0	1	1	19	0	5	0	1	5	87
09:15:00	4	62	0	0	66	23	1	0	0	24	1	7	0	0	8	98
09:30:00	14	45	0	0	59	29	0	0	0	29	0	8	0	3	8	96
09:45:00	12	47	0	1	59	27	0	0	0	27	3	8	0	1	11	97
Grand Total	40	207	0	1	247	97	1	1	1	99	4	28	0	5	32	**378**
Approach%	16.2%	83.8%	0%		-	98%	1%	1%		-	12.5%	87.5%	0%		-	**-**
Totals %	10.6%	54.8%	0%		65.3%	25.7%	0.3%	0.3%		26.2%	1.1%	7.4%	0%		8.5%	**-**
PHF	0.71	0.83	0		0.94	0.84	0.25	0.25		0.85	0.33	0.88	0		0.73	**-**
Heavy	2	1	0		3	1	0	0		1	0	3	0		3	**-**
Heavy %	5%	0.5%	0%		1.2%	1%	0%	0%		1%	0%	10.7%	0%		9.4%	**-**
Lights	38	206	0		244	96	1	1		98	4	25	0		29	**-**
Lights %	95%	99.5%	0%		98.8%	99%	100%	100%		99%	100%	89.3%	0%		90.6%	**-**
Single-Unit Trucks	1	1	0		2	1	0	0		1	0	0	0		0	**-**
Single-Unit Trucks %	2.5%	0.5%	0%		0.8%	1%	0%	0%		1%	0%	0%	0%		0%	**-**
Articulated Trucks	1	0	0		1	0	0	0		0	0	3	0		3	**-**
Articulated Trucks %	2.5%	0%	0%		0.4%	0%	0%	0%		0%	0%	10.7%	0%		9.4%	**-**
Pedestrians	-	-	-	1	-	-	-	-	1	-	-	-	-	5	-	**-**
Pedestrians%	-	-	-	14.3%		-	-	-	14.3%		-	-	-	71.4%		**-**
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	0%		-	-	-	0%		-	-	-	0%		**-**
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	0%		-	-	-	0%		-	-	-	0%		**-**

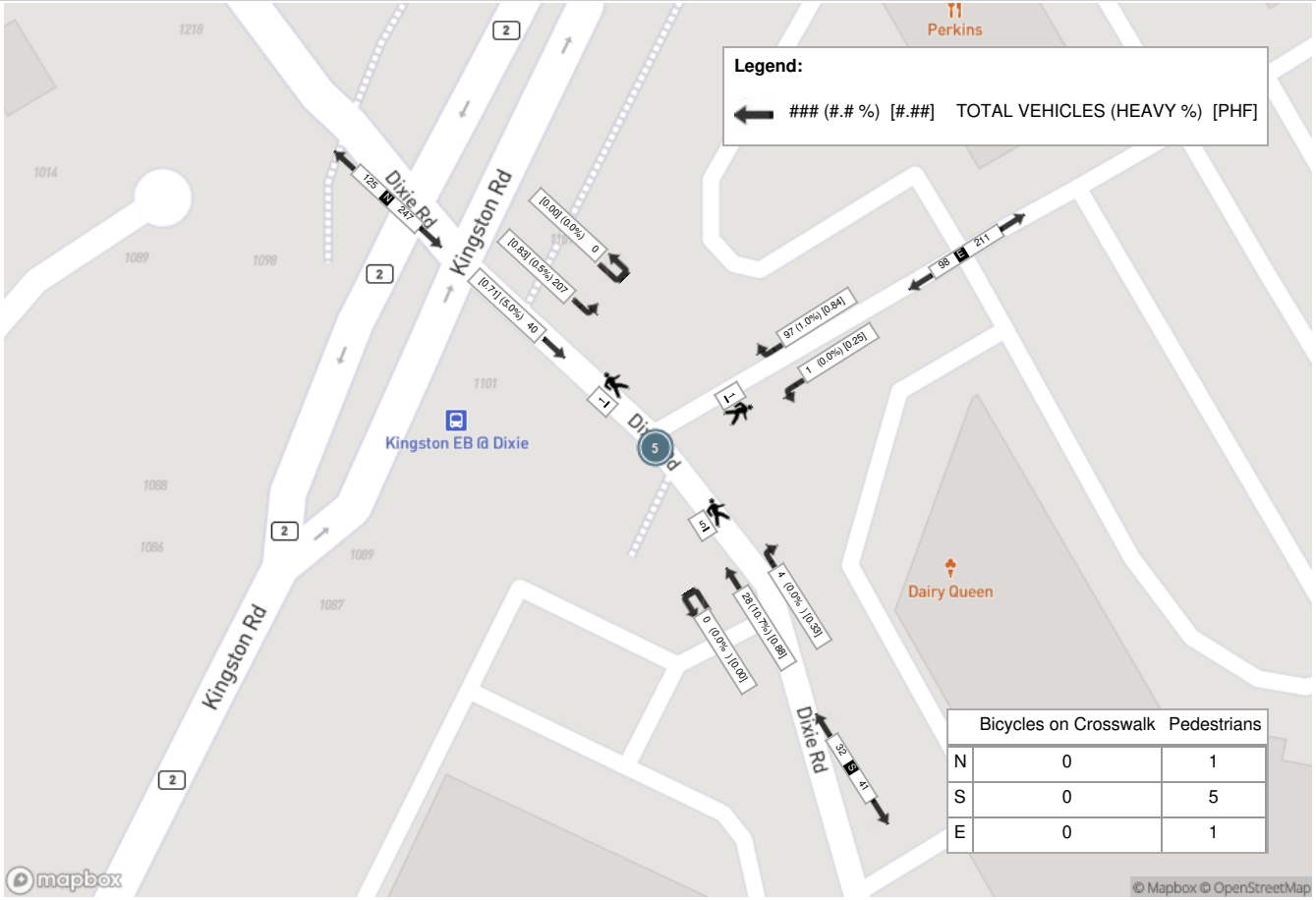
BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 05:15 PM - 06:15 PM Weather: Overcast Clouds (18.76 °C)

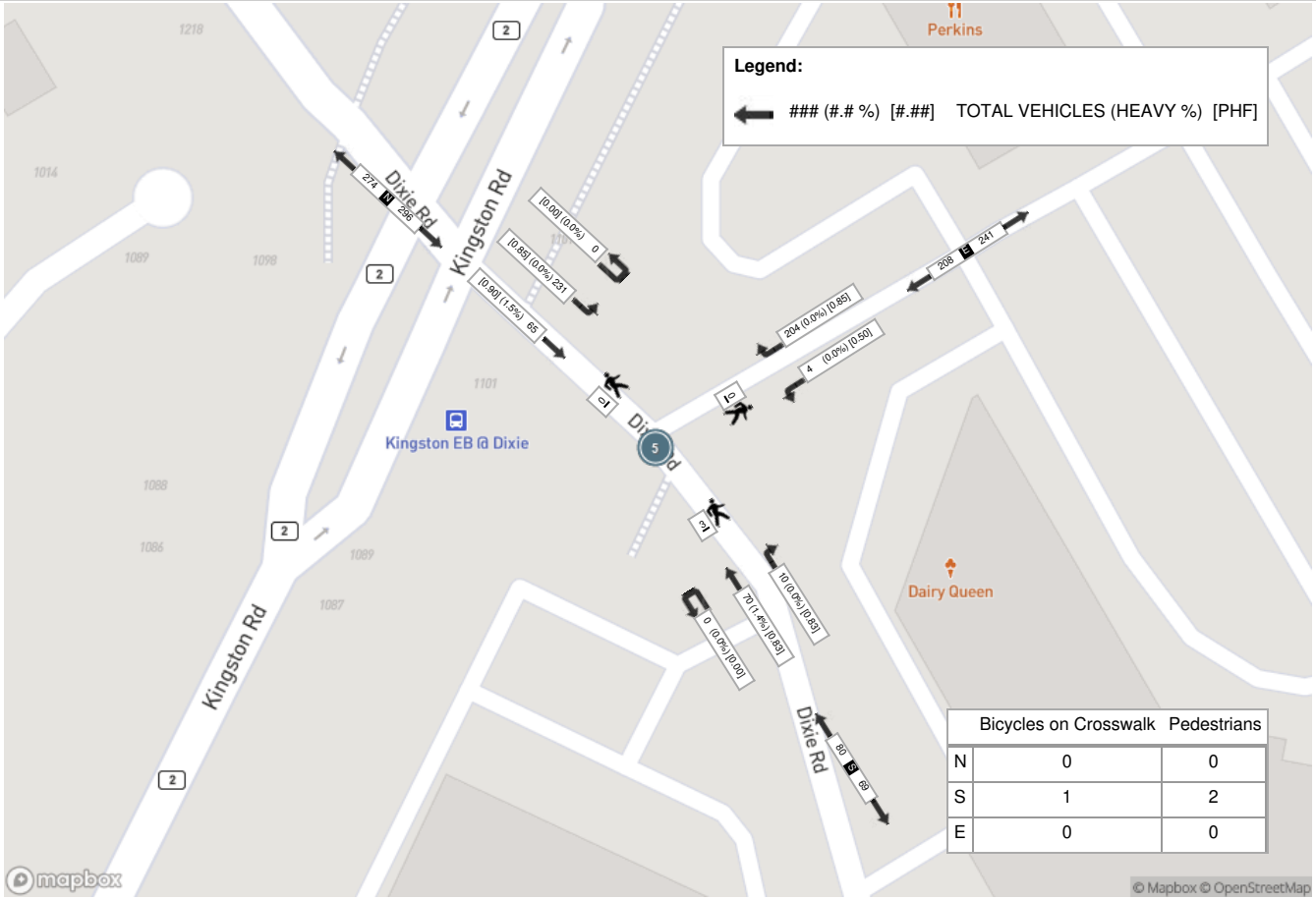
Start Time	N Approach DIXIE RD					E Approach 1099 KINGSTON RD NORTH DRIVEWAY					S Approach DIXIE RD					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
17:15:00	12	60	0	0	72	59	0	0	0	59	3	19	0	0	22	153
17:30:00	18	47	0	0	65	42	1	0	0	43	2	21	0	1	23	131
17:45:00	18	68	0	0	86	43	2	0	0	45	3	13	0	2	16	147
18:00:00	17	56	0	0	73	60	1	0	0	61	2	17	0	0	19	153
Grand Total	65	231	0	0	296	204	4	0	0	208	10	70	0	3	80	**584**
Approach%	22%	78%	0%		-	98.1%	1.9%	0%		-	12.5%	87.5%	0%		-	**-**
Totals %	11.1%	39.6%	0%		50.7%	34.9%	0.7%	0%		35.6%	1.7%	12%	0%		13.7%	**-**
PHF	0.9	0.85	0		0.86	0.85	0.5	0		0.85	0.83	0.83	0		0.87	**-**
Heavy	1	0	0		1	0	0	0		0	0	1	0		1	**-**
Heavy %	1.5%	0%	0%		0.3%	0%	0%	0%		0%	0%	1.4%	0%		1.3%	**-**
Lights	64	231	0		295	204	4	0		208	10	69	0		79	**-**
Lights %	98.5%	100%	0%		99.7%	100%	100%	0%		100%	100%	98.6%	0%		98.8%	**-**
Single-Unit Trucks	0	0	0		0	0	0	0		0	0	1	0		1	**-**
Single-Unit Trucks %	0%	0%	0%		0%	0%	0%	0%		0%	0%	1.4%	0%		1.3%	**-**
Articulated Trucks	1	0	0		1	0	0	0		0	0	0	0		0	**-**
Articulated Trucks %	1.5%	0%	0%		0.3%	0%	0%	0%		0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	2	-	**-**
Pedestrians%	-	-	-	0%		-	-	-	0%		-	-	-	66.7%		**-**
Bicycles on Road	0	0	0	0	-	1	0	0	0	-	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	0%		-	-	-	0%		-	-	-	0%		**-**
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	**-**
Bicycles on Crosswalk%	-	-	-	0%		-	-	-	0%		-	-	-	33.3%		**-**

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 09:00 AM - 10:00 AM Weather: Light Rain (14.76 °C)



Peak Hour: 05:15 PM - 06:15 PM Weather: Overcast Clouds (18.76 °C)



Spectrum

Turning Movement Count
Location Name: DIXIE RD & 1095 KINGSTON RD MIDDLE DRIVEWAY
Date: Tue, May 14, 2024 Deployment Lead: David Chu

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Turning Movement Count (7 . DIXIE RD & 1095 KINGSTON RD MIDDLE DRIVEWAY)

Start Time	N Approach DIXIE RD							E Approach 1099 KINGSTON RD LANEWAY ACCESS							S Approach DIXIE RD							W Approach 1095 KINGSTON RD MIDDLE DRIVEWAY							SE Approach 1099 KINGSTON RD LOADING BAY ACCESS							Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Bear Left N:SE	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	Hard Left E:SE	UTurn E:E	Peds E:	Approach Total	Hard Right S:SE	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Bear Right W:SE	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total	Hard Right SE:E	Bear Right SE:N	Bear Left SE:W	Hard Left SE:S	UTurn SE:SE	Peds SE:	Approach Total		
07:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
07:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	
07:30:00	0	3	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	4	
07:45:00	2	5	0	0	0	0	7	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	1	0	0	0	2	1	9	14
08:00:00	1	3	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	3	0	1	3	0	0	0	0	0	0	0	7	21
08:15:00	1	3	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	6	26
08:30:00	3	2	0	0	0	1	5	0	0	0	0	0	0	0	0	0	2	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	30
08:45:00	2	7	0	0	0	0	9	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	12	33
09:00:00	1	3	1	0	0	0	5	1	0	0	0	0	0	1	0	0	1	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	8	34
09:15:00	1	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	4	0	0	4	0	0	0	0	0	1	0	7	35
09:30:00	1	7	0	0	0	0	8	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0	11	38
09:45:00	3	5	0	0	0	0	8	0	0	0	0	0	0	0	1	0	4	0	0	0	5	0	0	0	2	0	0	2	0	0	0	0	0	1	0	15	41
BREAK																																					
16:00:00	4	2	1	1	1	0	9	4	0	0	0	0	0	4	0	0	7	0	0	0	7	0	0	0	1	0	1	1	0	1	0	0	0	0	1	22	
16:15:00	2	4	0	0	0	1	6	3	0	0	0	0	0	3	0	0	5	0	0	0	5	0	0	0	2	0	0	2	0	0	0	0	0	0	0	16	
16:30:00	2	4	0	0	1	0	7	3	0	0	0	0	1	3	0	0	6	0	0	0	6	0	0	0	3	0	0	3	0	0	0	0	0	2	0	19	
16:45:00	1	6	0	0	0	0	7	2	0	0	0	0	0	2	0	0	6	0	0	1	6	0	0	0	2	0	0	2	0	0	0	0	0	0	0	17	74
17:00:00	3	2	0	0	1	0	6	8	1	1	0	0	0	10	0	0	8	1	0	0	9	0	0	0	4	0	0	4	0	0	0	0	0	0	0	29	81
17:15:00	1	1	0	0	0	0	2	8	1	0	0	0	0	9	0	0	8	0	0	0	8	0	0	0	4	0	0	4	0	0	0	0	0	0	0	23	88
17:30:00	3	4	0	0	0	0	7	3	0	0	0	0	0	3	0	0	8	0	0	0	8	0	0	0	3	0	0	3	0	0	0	0	0	0	0	21	90
17:45:00	5	6	0	0	0	2	11	8	2	0	0	0	0	10	0	0	2	0	0	0	2	0	0	0	2	0	0	2	0	0	0	0	0	1	0	25	98
18:00:00	6	2	0	0	0	0	8	5	0	0	0	0	0	5	0	0	5	0	0	1	5	0	0	0	4	0	0	4	0	0	0	0	0	0	0	22	91
18:15:00	3	4	1	0	1	0	9	8	0	1	0	0	0	9	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4	0	19	87
18:30:00	4	1	0	0	0	1	5	6	0	0	0	0	0	6	0	0	3	0	0	0	3	0	0	0	4	0	1	4	0	0	0	0	0	0	0	18	84
18:45:00	12	3	0	0	0	0	15	8	1	2	0	0	0	11	0	0	3	0	0	0	3	0	0	0	1	0	0	1	0	0	0	0	0	0	0	30	89
Grand Total	61	78	3	1	4	5	147	67	5	4	0	0	1	76	1	0	77	2	0	4	80	0	0	0	44	0	4	44	0	2	0	0	0	14	2	**349**	-
Approach%	41.5%	53.1%	2%	0.7%	2.7%		-	88.2%	6.6%	5.3%	0%	0%		-	1.3%	0%	96.3%	2.5%	0%		-	0%	0%	0%	100%	0%		-	0%	100%	0%	0%	0%		-	**-**	-
Totals %	17.5%	22.3%	0.9%	0.3%	1.1%		42.1%	19.2%	1.4%	1.1%	0%	0%		21.8%	0.3%	0%	22.1%	0.6%	0%		22.9%	0%	0%	0%	12.6%	0%		12.6%	0%	0.6%	0%	0%	0%		0.6%	**-**	-
Heavy	1	6	0	0	0		-	0	0	0	0	0		-	0	0	3	0	0		-	0	0	0	1	0		-	0	0	0	0	0		-	**-**	-
Heavy %	1.6%	7.7%	0%	0%	0%		-	0%	0%	0%	0%	0%		-	0%	0%	3.9%	0%	0%		-	0%	0%	0%	2.3%	0%		-	0%	0%	0%	0%	0%		-	**-**	-
Bicycles	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	-		-	**-**	-
Bicycle %	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	-		-	**-**	-

Spectrum

Turning Movement Count
Location Name: DIXIE RD & 1095 KINGSTON RD MIDDLE DRIVEWAY
Date: Tue, May 14, 2024 Deployment Lead: David Chu

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 09:00 AM - 10:00 AM Weather: Light Rain (14.76 °C)

Start Time	N Approach DIXIE RD							E Approach 1099 KINGSTON RD LANEWAY ACCESS							S Approach DIXIE RD							W Approach 1095 KINGSTON RD MIDDLE DRIVEWAY							SE Approach 1099 KINGSTON RD LOADING BAY ACCESS							Int. Total (15 min)
	Right	Thru	Bear Left	Left	UTurn	Peds	Approach Total	Right	Thru	Left	Hard Left	UTurn	Peds	Approach Total	Hard Right	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Bear Right	Thru	Left	UTurn	Peds	Approach Total	Hard Right	Bear Right	Bear Left	Hard Left	UTurn	Peds	Approach Total	
09:00:00	1	3	1	0	0	0	5	1	0	0	0	0	0	1	0	0	1	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	8
09:15:00	1	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	4	0	0	4	0	0	0	0	0	1	0	7
09:30:00	1	7	0	0	0	0	8	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0	11
09:45:00	3	5	0	0	0	0	8	0	0	0	0	0	0	0	1	0	4	0	0	0	5	0	0	0	2	0	0	2	0	0	0	0	0	1	0	15
Grand Total	6	16	1	0	0	0	23	1	0	0	0	0	0	1	1	0	9	0	0	1	10	0	0	0	7	0	0	7	0	0	0	0	0	4	0	**41**
Approach%	26.1%	69.6%	4.3%	0%	0%		-	100%	0%	0%	0%	0%		-	10%	0%	90%	0%	0%		-	0%	0%	0%	100%	0%		-	0%	0%	0%	0%	0%		-	-
Totals %	14.6%	39%	2.4%	0%	0%		56.1%	2.4%	0%	0%	0%	0%		2.4%	2.4%	0%	22%	0%	0%		24.4%	0%	0%	0%	17.1%	0%		17.1%	0%	0%	0%	0%	0%		0%	-
PHF	0.5	0.57	0.25	0	0		0.72	0.25	0	0	0	0		0.25	0.25	0	0.56	0	0		0.5	0	0	0	0.44	0		0.44	0	0	0	0	0		0	-
Heavy	0	2	0	0	0		2	0	0	0	0	0		0	0	0	3	0	0		3	0	0	0	0	0		0	0	0	0	0	0		0	-
Heavy %	0%	12.5%	0%	0%	0%		8.7%	0%	0%	0%	0%	0%		0%	0%	0%	33.3%	0%	0%		30%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	-
Lights	6	14	1	0	0		21	1	0	0	0	0		1	1	0	6	0	0		7	0	0	0	7	0		7	0	0	0	0	0		0	-
Lights %	100%	87.5%	100%	0%	0%		91.3%	100%	0%	0%	0%	0%		100%	100%	0%	66.7%	0%	0%		70%	0%	0%	0%	100%	0%		100%	0%	0%	0%	0%	0%		0%	-
Single-Unit Trucks	0	1	0	0	0		1	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0	-
Single-Unit Trucks %	0%	6.3%	0%	0%	0%		4.3%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	-
Articulated Trucks	0	1	0	0	0		1	0	0	0	0	0		0	0	0	3	0	0		3	0	0	0	0	0		0	0	0	0	0	0		0	-
Articulated Trucks %	0%	6.3%	0%	0%	0%		4.3%	0%	0%	0%	0%	0%		0%	0%	0%	33.3%	0%	0%		30%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-	-	-	-	-	1	-	-	-	-	-	-	0	-	-	-	-	-	-	4	-	-
Pedestrians%	-	-	-	-	-	0%		-	-	-	-	-	0%		-	-	-	-	-	20%		-	-	-	-	-	0%		-	-	-	-	-	80%		-

Spectrum

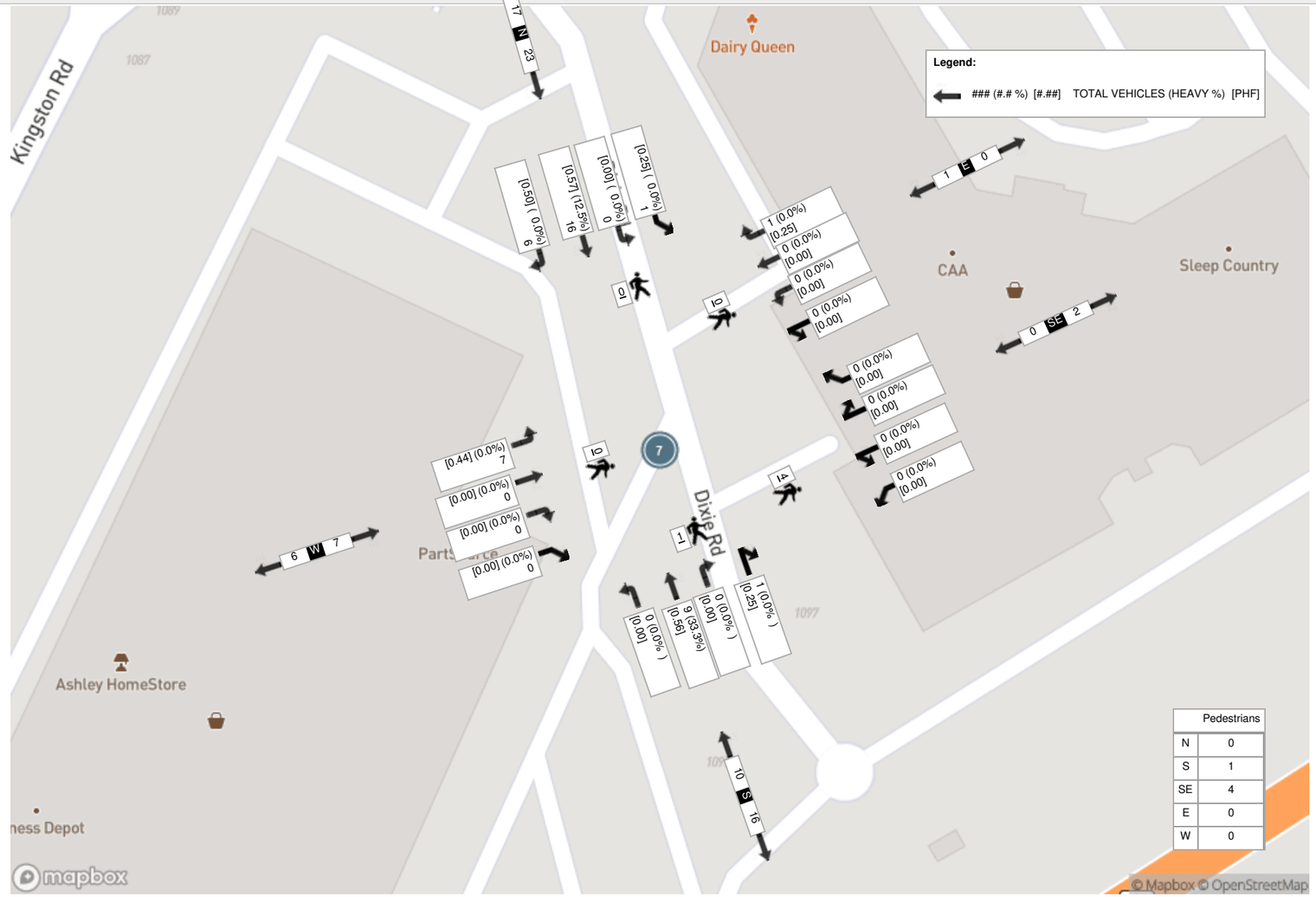
Turning Movement Count
Location Name: DIXIE RD & 1095 KINGSTON RD MIDDLE DRIVEWAY
Date: Tue, May 14, 2024 Deployment Lead: David Chu

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

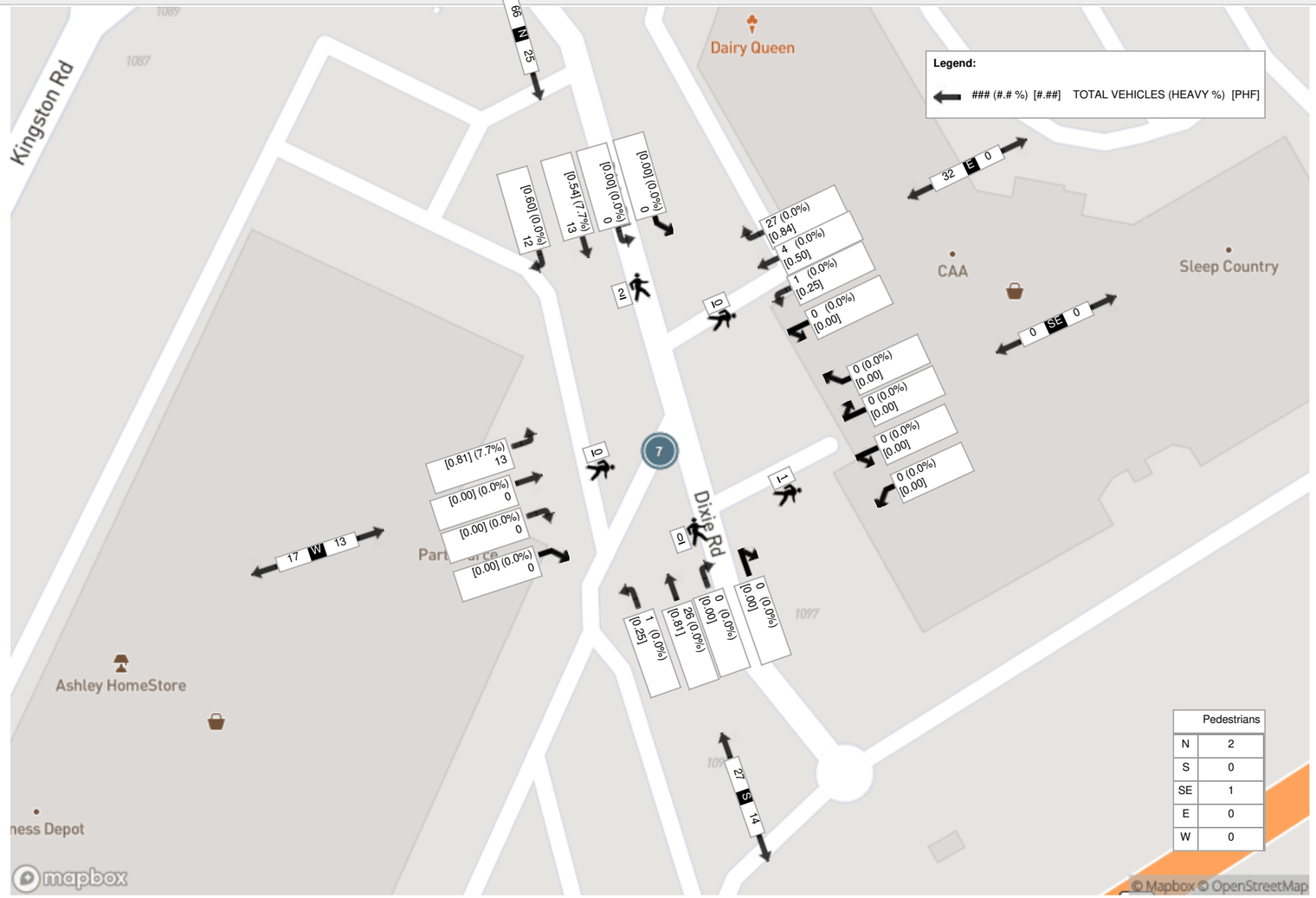
Peak Hour: 05:00 PM - 06:00 PM Weather: Overcast Clouds (18.76 °C)

Start Time	N Approach DIXIE RD							E Approach 1099 KINGSTON RD LANEWAY ACCESS							S Approach DIXIE RD							W Approach 1095 KINGSTON RD MIDDLE DRIVEWAY							SE Approach 1099 KINGSTON RD LOADING BAY ACCESS							Int. Total (15 min)
	Right	Thru	Bear Left	Left	UTurn	Peds	Approach Total	Right	Thru	Left	Hard Left	UTurn	Peds	Approach Total	Hard Right	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Bear Right	Thru	Left	UTurn	Peds	Approach Total	Hard Right	Bear Right	Bear Left	Hard Left	UTurn	Peds	Approach Total	
17:00:00	3	2	0	0	1	0	6	8	1	1	0	0	0	10	0	0	8	1	0	0	9	0	0	0	4	0	0	4	0	0	0	0	0	0	0	29
17:15:00	1	1	0	0	0	0	2	8	1	0	0	0	0	9	0	0	8	0	0	0	8	0	0	0	4	0	0	4	0	0	0	0	0	0	0	23
17:30:00	3	4	0	0	0	0	7	3	0	0	0	0	0	3	0	0	8	0	0	0	8	0	0	0	3	0	0	3	0	0	0	0	0	0	0	21
17:45:00	5	6	0	0	0	2	11	8	2	0	0	0	0	10	0	0	2	0	0	0	2	0	0	0	2	0	0	2	0	0	0	0	0	1	0	25
Grand Total	12	13	0	0	1	2	26	27	4	1	0	0	0	32	0	0	26	1	0	0	27	0	0	0	13	0	0	13	0	0	0	0	0	1	0	**98**
Approach%	46.2%	50%	0%	0%	3.8%		-	84.4%	12.5%	3.1%	0%	0%		-	0%	0%	96.3%	3.7%	0%		-	0%	0%	0%	100%	0%		-	0%	0%	0%	0%	0%		-	-
Totals %	12.2%	13.3%	0%	0%	1%		26.5%	27.6%	4.1%	1%	0%	0%		32.7%	0%	0%	26.5%	1%	0%		27.6%	0%	0%	0%	13.3%	0%		13.3%	0%	0%	0%	0%	0%		0%	-
PHF	0.6	0.54	0	0	0.25		0.59	0.84	0.5	0.25	0	0		0.8	0	0	0.81	0.25	0		0.75	0	0	0	0.81	0		0.81	0	0	0	0	0		0	-
Heavy	0	1	0	0	0		1	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	1	0		1	0	0	0	0	0		0	-
Heavy %	0%	7.7%	0%	0%	0%		3.8%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	0%	0%	0%	7.7%	0%		7.7%	0%	0%	0%	0%	0%		0%	-
Lights	12	12	0	0	1		25	27	4	1	0	0		32	0	0	26	1	0		27	0	0	0	12	0		12	0	0	0	0	0		0	-
Lights %	100%	92.3%	0%	0%	100%		96.2%	100%	100%	100%	0%	0%		100%	0%	0%	100%	100%	0%		100%	0%	0%	0%	92.3%	0%		92.3%	0%	0%	0%	0%	0%		0%	-
Single-Unit Trucks	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	1	0		1	0	0	0	0	0		0	-
Single-Unit Trucks %	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	0%	0%	0%	7.7%	0%		7.7%	0%	0%	0%	0%	0%		0%	-
Articulated Trucks	0	1	0	0	0		1	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0	-
Articulated Trucks %	0%	7.7%	0%	0%	0%		3.8%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	-	2	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-	-	-	-	-	1	-	-
Pedestrians%	-	-	-	-	-	66.7%		-	-	-	-	-	0%		-	-	-	-	-	0%		-	-	-	-	-	0%		-	-	-	-	-	33.3%		-

Peak Hour: 09:00 AM - 10:00 AM Weather: Light Rain (14.76 °C)



Peak Hour: 05:00 PM - 06:00 PM Weather: Overcast Clouds (18.76 °C)



Spectrum

Turning Movement Count
Location Name: DIXIE RD & 1095 KINGSTON RD SOUTH DRIVEWAY / REAR LANEWAY
Date: Tue, May 14, 2024 Deployment Lead: David Chu

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Turning Movement Count (8 . DIXIE RD & 1095 KINGSTON RD SOUTH DRIVEWAY / REAR LANEWAY)

Start Time	N Approach DIXIE RD					E Approach REAR LANEWAY					W Approach 1095 KINGSTON RD SOUTH DRIVEWAY					Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	UTurn E:E	Peds E:	Approach Total	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
07:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
07:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
07:30:00	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	2	
07:45:00	3	3	0	0	6	0	0	0	0	0	0	0	0	0	0	6	8
08:00:00	2	1	0	0	3	0	0	0	0	0	1	1	0	0	2	5	13
08:15:00	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	3	16
08:30:00	1	1	0	0	2	0	0	0	0	0	0	3	0	0	3	5	19
08:45:00	2	4	1	0	7	1	0	0	0	1	2	2	0	0	4	12	25
09:00:00	0	3	0	0	3	1	0	0	0	1	0	0	0	0	0	4	24
09:15:00	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	2	23
09:30:00	2	3	2	0	7	1	0	0	0	1	0	1	0	0	1	9	27
09:45:00	2	2	1	0	5	3	0	0	0	3	1	1	0	0	2	10	25
BREAK																	
16:00:00	1	1	0	0	2	3	0	0	0	3	1	3	0	0	4	9	
16:15:00	0	4	0	1	4	3	0	0	0	3	0	3	0	0	3	10	
16:30:00	0	3	0	0	3	3	0	0	0	3	0	2	0	0	2	8	
16:45:00	2	4	0	0	6	5	0	0	0	5	0	1	0	0	1	12	39
17:00:00	0	2	0	0	2	4	1	0	0	5	0	5	0	0	5	12	42
17:15:00	0	1	1	0	2	2	0	0	0	2	0	5	0	0	5	9	41
17:30:00	1	3	0	0	4	4	0	0	0	4	0	4	0	0	4	12	45
17:45:00	2	3	1	0	6	0	0	0	0	0	1	2	0	0	3	9	42
18:00:00	0	1	0	0	1	2	0	0	0	2	0	3	0	0	3	6	36
18:15:00	0	2	2	0	4	0	0	0	0	0	1	0	0	0	1	5	32
18:30:00	0	1	1	0	2	1	0	0	0	1	0	1	0	0	1	4	24
18:45:00	2	2	0	0	4	2	0	0	0	2	1	1	0	0	2	8	23
Grand Total	22	47	9	1	78	37	1	0	0	38	8	38	0	0	46	**162**	-
Approach%	28.2%	60.3%	11.5%		-	97.4%	2.6%	0%		-	17.4%	82.6%	0%		-	**-**	-
Totals %	13.6%	29%	5.6%		48.1%	22.8%	0.6%	0%		23.5%	4.9%	23.5%	0%		28.4%	**-**	-
Heavy	3	3	0		-	2	0	0		-	1	1	0		-	**-**	-
Heavy %	13.6%	6.4%	0%		-	5.4%	0%	0%		-	12.5%	2.6%	0%		-	**-**	-
Bicycles	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-
Bicycle %	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 08:45 AM - 09:45 AM Weather: Light Rain (14.76 °C)

Start Time	N Approach DIXIE RD					E Approach REAR LANEWAY					W Approach 1095 KINGSTON RD SOUTH DRIVEWAY					Int. Total (15 min)
	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	Thru	Left	UTurn	Peds	Approach Total	
08:45:00	2	4	1	0	7	1	0	0	0	1	2	2	0	0	4	12
09:00:00	0	3	0	0	3	1	0	0	0	1	0	0	0	0	0	4
09:15:00	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	2
09:30:00	2	3	2	0	7	1	0	0	0	1	0	1	0	0	1	9
Grand Total	5	10	3	0	18	4	0	0	0	4	2	3	0	0	5	**27**
Approach%	27.8%	55.6%	16.7%		-	100%	0%	0%		-	40%	60%	0%		-	**-**
Totals %	18.5%	37%	11.1%		66.7%	14.8%	0%	0%		14.8%	7.4%	11.1%	0%		18.5%	**-**
PHF	0.63	0.63	0.38		0.64	1	0	0		1	0.25	0.38	0		0.31	**-**
Heavy	2	0	0		2	2	0	0		2	1	0	0		1	**-**
Heavy %	40%	0%	0%		11.1%	50%	0%	0%		50%	50%	0%	0%		20%	**-**
Lights	3	10	3		16	2	0	0		2	1	3	0		4	**-**
Lights %	60%	100%	100%		88.9%	50%	0%	0%		50%	50%	100%	0%		80%	**-**
Single-Unit Trucks	1	0	0		1	0	0	0		0	1	0	0		1	**-**
Single-Unit Trucks %	20%	0%	0%		5.6%	0%	0%	0%		0%	50%	0%	0%		20%	**-**
Articulated Trucks	1	0	0		1	2	0	0		2	0	0	0		0	**-**
Articulated Trucks %	20%	0%	0%		5.6%	50%	0%	0%		50%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	0%		-	-	-	0%		-	-	-	0%		**-**

Peak Hour: 04:45 PM - 05:45 PM Weather: Overcast Clouds (18.76 °C)

Start Time	N Approach DIXIE RD					E Approach REAR LANEWAY					W Approach 1095 KINGSTON RD SOUTH DRIVEWAY					Int. Total (15 min)
	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	Thru	Left	UTurn	Peds	Approach Total	
16:45:00	2	4	0	0	6	5	0	0	0	5	0	1	0	0	1	12
17:00:00	0	2	0	0	2	4	1	0	0	5	0	5	0	0	5	12
17:15:00	0	1	1	0	2	2	0	0	0	2	0	5	0	0	5	9
17:30:00	1	3	0	0	4	4	0	0	0	4	0	4	0	0	4	12
Grand Total	3	10	1	0	14	15	1	0	0	16	0	15	0	0	15	**45**
Approach%	21.4%	71.4%	7.1%		-	93.8%	6.3%	0%		-	0%	100%	0%		-	**-**
Totals %	6.7%	22.2%	2.2%		31.1%	33.3%	2.2%	0%		35.6%	0%	33.3%	0%		33.3%	**-**
PHF	0.38	0.63	0.25		0.58	0.75	0.25	0		0.8	0	0.75	0		0.75	**-**
Heavy	0	0	0		0	0	0	0		0	0	0	0		0	**-**
Heavy %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	**-**
Lights	3	10	1		14	15	1	0		16	0	15	0		15	**-**
Lights %	100%	100%	100%		100%	100%	100%	0%		100%	0%	100%	0%		100%	**-**
Single-Unit Trucks	0	0	0		0	0	0	0		0	0	0	0		0	**-**
Single-Unit Trucks %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	**-**
Articulated Trucks	0	0	0		0	0	0	0		0	0	0	0		0	**-**
Articulated Trucks %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	0%		-	-	-	0%		-	-	-	0%		**-**

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 08:45 AM - 09:45 AM Weather: Light Rain (14.76 °C)



BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 04:45 PM - 05:45 PM Weather: Overcast Clouds (18.76 °C)



BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Turning Movement Count (4 . KINGSTON RD & HWY 401 WB RAMPS)

Start Time	E Approach KINGSTON RD					S Approach HWY 401 WB ACCESS					W Approach KINGSTON RD					Int. Total (15 min)	Int. Total (1 hr)
	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	UTurn W:W	Peds W:	Approach Total		
07:00:00	98	56	0	0	154	7	68	0	0	75	2	59	0	0	61	290	
07:15:00	114	75	0	0	189	6	92	0	0	98	1	85	0	0	86	373	
07:30:00	111	61	0	0	172	7	95	0	1	102	1	100	0	0	101	375	
07:45:00	140	65	0	0	205	29	139	0	0	168	5	135	0	0	140	513	1551
08:00:00	132	91	0	0	223	12	131	0	0	143	2	149	0	0	151	517	1778
08:15:00	175	95	0	0	270	23	134	0	0	157	2	167	0	0	169	596	2001
08:30:00	136	75	0	0	211	16	172	0	0	188	2	175	0	0	177	576	2202
08:45:00	160	63	0	0	223	12	158	0	0	170	1	210	0	0	211	604	2293
09:00:00	152	57	0	0	209	27	130	0	0	157	1	187	0	0	188	554	2330
09:15:00	138	55	0	1	193	16	108	0	0	124	4	200	0	0	204	521	2255
09:30:00	137	41	0	0	178	19	104	0	0	123	2	207	0	0	209	510	2189
09:45:00	123	73	0	1	196	16	82	0	0	98	0	222	0	0	222	516	2101
BREAK																	
16:00:00	186	52	0	0	238	21	137	0	0	158	4	407	0	0	411	807	
16:15:00	192	50	0	1	242	33	158	0	0	191	5	389	0	0	394	827	
16:30:00	198	55	0	1	253	18	175	0	1	193	5	421	0	0	426	872	
16:45:00	174	39	1	0	214	30	195	0	0	225	2	392	0	0	394	833	3339
17:00:00	221	43	0	2	264	24	169	0	1	193	8	430	0	0	438	895	3427
17:15:00	205	45	0	0	250	35	168	0	0	203	6	391	0	0	397	850	3450
17:30:00	185	48	0	1	233	31	143	0	1	174	7	417	0	0	424	831	3409
17:45:00	153	59	0	2	212	35	164	0	1	199	7	335	0	0	342	753	3329
18:00:00	201	58	0	1	259	15	133	0	2	148	5	363	0	0	368	775	3209
18:15:00	169	52	0	0	221	30	149	1	0	180	9	323	0	0	332	733	3092
18:30:00	168	40	0	2	208	21	128	0	2	149	5	343	0	0	348	705	2966
18:45:00	160	43	1	0	204	20	168	0	0	188	7	302	0	0	309	701	2914
Grand Total	3828	1391	2	12	5221	503	3300	1	9	3804	93	6409	0	0	6502	**15527**	-
Approach%	73.3%	26.6%	0%		-	13.2%	86.8%	0%		-	1.4%	98.6%	0%		-	**-**	-
Totals %	24.7%	9%	0%		33.6%	3.2%	21.3%	0%		24.5%	0.6%	41.3%	0%		41.9%	**-**	-
Heavy	87	33	0		-	11	55	0		-	0	129	0		-	**-**	-
Heavy %	2.3%	2.4%	0%		-	2.2%	1.7%	0%		-	0%	2%	0%		-	**-**	-
Bicycles	1	0	0		-	0	0	0		-	0	2	0		-	**-**	-
Bicycle %	0%	0%	0%		-	0%	0%	0%		-	0%	0%	0%		-	**-**	-

Peak Hour: 08:15 AM - 09:15 AM Weather: Overcast Clouds (14.7 °C)

Start Time	E Approach KINGSTON RD					S Approach HWY 401 WB ACCESS					W Approach KINGSTON RD					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
08:15:00	175	95	0	0	270	23	134	0	0	157	2	167	0	0	169	596
08:30:00	136	75	0	0	211	16	172	0	0	188	2	175	0	0	177	576
08:45:00	160	63	0	0	223	12	158	0	0	170	1	210	0	0	211	604
09:00:00	152	57	0	0	209	27	130	0	0	157	1	187	0	0	188	554
Grand Total	623	290	0	0	913	78	594	0	0	672	6	739	0	0	745	**2330**
Approach%	68.2%	31.8%	0%		-	11.6%	88.4%	0%		-	0.8%	99.2%	0%		-	**-**
Totals %	26.7%	12.4%	0%		39.2%	3.3%	25.5%	0%		28.8%	0.3%	31.7%	0%		32%	**-**
PHF	0.89	0.76	0		0.85	0.72	0.86	0		0.89	0.75	0.88	0		0.88	**-**
Heavy	19	5	0		24	2	17	0		19	0	32	0		32	**-**
Heavy %	3%	1.7%	0%		2.6%	2.6%	2.9%	0%		2.8%	0%	4.3%	0%		4.3%	**-**
Lights	604	285	0		889	76	577	0		653	6	707	0		713	**-**
Lights %	97%	98.3%	0%		97.4%	97.4%	97.1%	0%		97.2%	100%	95.7%	0%		95.7%	**-**
Single-Unit Trucks	5	3	0		8	2	9	0		11	0	10	0		10	**-**
Single-Unit Trucks %	0.8%	1%	0%		0.9%	2.6%	1.5%	0%		1.6%	0%	1.4%	0%		1.3%	**-**
Buses	12	2	0		14	0	3	0		3	0	18	0		18	**-**
Buses %	1.9%	0.7%	0%		1.5%	0%	0.5%	0%		0.4%	0%	2.4%	0%		2.4%	**-**
Articulated Trucks	2	0	0		2	0	5	0		5	0	4	0		4	**-**
Articulated Trucks %	0.3%	0%	0%		0.2%	0%	0.8%	0%		0.7%	0%	0.5%	0%		0.5%	**-**
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	0%		-	-	-	0%		-	-	-	0%		**-**
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	0%		-	-	-	0%		-	-	-	0%		**-**

Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (18.84 °C)

Start Time	E Approach KINGSTON RD					S Approach HWY 401 WB ACCESS					W Approach KINGSTON RD					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
16:30:00	198	55	0	1	253	18	175	0	1	193	5	421	0	0	426	872
16:45:00	174	39	1	0	214	30	195	0	0	225	2	392	0	0	394	833
17:00:00	221	43	0	2	264	24	169	0	1	193	8	430	0	0	438	895
17:15:00	205	45	0	0	250	35	168	0	0	203	6	391	0	0	397	850
Grand Total	798	182	1	3	981	107	707	0	2	814	21	1634	0	0	1655	**3450**
Approach%	81.3%	18.6%	0.1%		-	13.1%	86.9%	0%		-	1.3%	98.7%	0%		-	**-**
Totals %	23.1%	5.3%	0%		28.4%	3.1%	20.5%	0%		23.6%	0.6%	47.4%	0%		48%	**-**
PHF	0.9	0.83	0.25		0.93	0.76	0.91	0		0.9	0.66	0.95	0		0.94	**-**
Heavy	10	6	0		16	0	6	0		6	0	15	0		15	**-**
Heavy %	1.3%	3.3%	0%		1.6%	0%	0.8%	0%		0.7%	0%	0.9%	0%		0.9%	**-**
Lights	788	176	1		965	107	701	0		808	21	1619	0		1640	**-**
Lights %	98.7%	96.7%	100%		98.4%	100%	99.2%	0%		99.3%	100%	99.1%	0%		99.1%	**-**
Single-Unit Trucks	2	2	0		4	0	3	0		3	0	4	0		4	**-**
Single-Unit Trucks %	0.3%	1.1%	0%		0.4%	0%	0.4%	0%		0.4%	0%	0.2%	0%		0.2%	**-**
Buses	8	4	0		12	0	2	0		2	0	11	0		11	**-**
Buses %	1%	2.2%	0%		1.2%	0%	0.3%	0%		0.2%	0%	0.7%	0%		0.7%	**-**
Articulated Trucks	0	0	0		0	0	1	0		1	0	0	0		0	**-**
Articulated Trucks %	0%	0%	0%		0%	0%	0.1%	0%		0.1%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	3	-	-	-	-	2	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	60%		-	-	-	40%		-	-	-	0%		**-**
Bicycles on Road	1	0	0	0	-	0	0	0	0	-	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	0%		-	-	-	0%		-	-	-	0%		**-**

Peak Hour: 08:15 AM - 09:15 AM Weather: Overcast Clouds (14.7 °C)



Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (18.84 °C)



BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Turning Movement Count (5 . KINGSTON RD & FAIRPORT RD)

Start Time	N Approach FAIRPORT RD					E Approach KINGSTON RD					W Approach KINGSTON RD					Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	UTurn E:E	Peds E:	Approach Total	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
07:00:00	51	18	0	0	69	6	106	0	0	112	56	8	0	0	64	245	
07:15:00	51	25	0	0	76	15	137	0	0	152	79	11	0	0	90	318	
07:30:00	56	31	0	0	87	18	124	0	0	142	102	14	0	4	116	345	
07:45:00	60	33	0	0	93	22	135	0	0	157	119	30	0	0	149	399	1307
08:00:00	68	50	0	2	118	26	163	0	0	189	143	16	0	1	159	466	1528
08:15:00	75	35	0	0	110	21	175	0	0	196	152	34	0	0	186	492	1702
08:30:00	69	58	0	0	127	28	144	0	0	172	158	23	0	3	181	480	1837
08:45:00	63	65	0	2	128	29	153	0	0	182	188	27	0	1	215	525	1963
09:00:00	45	59	0	0	104	32	165	0	0	197	196	33	0	0	229	530	2027
09:15:00	42	50	0	0	92	33	153	0	0	186	187	25	0	0	212	490	2025
09:30:00	41	58	0	1	99	25	143	0	0	168	200	23	0	1	223	490	2035
09:45:00	44	61	0	1	105	30	127	0	0	157	208	25	0	0	233	495	2005
BREAK																	
16:00:00	40	67	0	2	107	36	196	0	0	232	358	40	0	2	398	737	
16:15:00	34	53	0	1	87	42	215	0	0	257	378	60	0	1	438	782	
16:30:00	41	59	0	1	100	52	198	0	0	250	364	44	0	3	408	758	
16:45:00	32	57	0	2	89	54	199	0	0	253	389	67	1	0	457	799	3076
17:00:00	35	81	0	3	116	51	207	0	0	258	371	44	0	1	415	789	3128
17:15:00	32	57	0	0	89	52	218	0	0	270	391	55	0	3	446	805	3151
17:30:00	39	60	0	2	99	57	195	0	0	252	368	57	0	3	425	776	3169
17:45:00	26	63	0	0	89	50	177	0	0	227	325	66	0	0	391	707	3077
18:00:00	50	72	0	3	122	53	188	0	0	241	314	45	1	4	360	723	3011
18:15:00	33	60	0	1	93	50	189	0	0	239	311	59	0	1	370	702	2908
18:30:00	31	56	0	1	87	50	173	0	0	223	295	44	0	1	339	649	2781
18:45:00	25	79	0	0	104	45	181	0	0	226	295	44	0	4	339	669	2743
Grand Total	1083	1307	0	22	2390	877	4061	0	0	4938	5947	894	2	33	6843	**14171**	-
Approach%	45.3%	54.7%	0%		-	17.8%	82.2%	0%		-	86.9%	13.1%	0%		-	**-**	-
Totals %	7.6%	9.2%	0%		16.9%	6.2%	28.7%	0%		34.8%	42%	6.3%	0%		48.3%	**-**	-
Heavy	13	20	0		-	7	105	0		-	128	11	0		-	**-**	-
Heavy %	1.2%	1.5%	0%		-	0.8%	2.6%	0%		-	2.2%	1.2%	0%		-	**-**	-
Bicycles	0	0	0		-	1	1	0		-	2	0	0		-	**-**	-
Bicycle %	0%	0%	0%		-	0.1%	0%	0%		-	0%	0%	0%		-	**-**	-

Peak Hour: 08:45 AM - 09:45 AM Weather: Overcast Clouds (14.7 °C)

Start Time	N Approach FAIRPORT RD					E Approach KINGSTON RD					W Approach KINGSTON RD					Int. Total (15 min)
	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	Thru	Left	UTurn	Peds	Approach Total	
08:45:00	63	65	0	2	128	29	153	0	0	182	188	27	0	1	215	525
09:00:00	45	59	0	0	104	32	165	0	0	197	196	33	0	0	229	530
09:15:00	42	50	0	0	92	33	153	0	0	186	187	25	0	0	212	490
09:30:00	41	58	0	1	99	25	143	0	0	168	200	23	0	1	223	490
Grand Total	191	232	0	3	423	119	614	0	0	733	771	108	0	2	879	**2035**
Approach%	45.2%	54.8%	0%		-	16.2%	83.8%	0%		-	87.7%	12.3%	0%		-	**-**
Totals %	9.4%	11.4%	0%		20.8%	5.8%	30.2%	0%		36%	37.9%	5.3%	0%		43.2%	**-**
PHF	0.76	0.89	0		0.83	0.9	0.93	0		0.93	0.96	0.82	0		0.96	**-**
Heavy	3	5	0		8	3	15	0		18	26	4	0		30	**-**
Heavy %	1.6%	2.2%	0%		1.9%	2.5%	2.4%	0%		2.5%	3.4%	3.7%	0%		3.4%	**-**
Lights	188	227	0		415	116	599	0		715	745	104	0		849	**-**
Lights %	98.4%	97.8%	0%		98.1%	97.5%	97.6%	0%		97.5%	96.6%	96.3%	0%		96.6%	**-**
Single-Unit Trucks	3	4	0		7	2	4	0		6	7	4	0		11	**-**
Single-Unit Trucks %	1.6%	1.7%	0%		1.7%	1.7%	0.7%	0%		0.8%	0.9%	3.7%	0%		1.3%	**-**
Buses	0	1	0		1	1	11	0		12	16	0	0		16	**-**
Buses %	0%	0.4%	0%		0.2%	0.8%	1.8%	0%		1.6%	2.1%	0%	0%		1.8%	**-**
Articulated Trucks	0	0	0		0	0	0	0		0	3	0	0		3	**-**
Articulated Trucks %	0%	0%	0%		0%	0%	0%	0%		0%	0.4%	0%	0%		0.3%	**-**
Pedestrians	-	-	-	3	-	-	-	-	0	-	-	-	-	2	-	**-**
Pedestrians%	-	-	-	60%		-	-	-	0%		-	-	-	40%		**-**
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	0%		-	-	-	0%		-	-	-	0%		**-**
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	0%		-	-	-	0%		-	-	-	0%		**-**

Peak Hour: 04:45 PM - 05:45 PM Weather: Overcast Clouds (18.84 °C)

Start Time	N Approach FAIRPORT RD					E Approach KINGSTON RD					W Approach KINGSTON RD					Int. Total (15 min)
	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	Thru	Left	UTurn	Peds	Approach Total	
16:45:00	32	57	0	2	89	54	199	0	0	253	389	67	1	0	457	799
17:00:00	35	81	0	3	116	51	207	0	0	258	371	44	0	1	415	789
17:15:00	32	57	0	0	89	52	218	0	0	270	391	55	0	3	446	805
17:30:00	39	60	0	2	99	57	195	0	0	252	368	57	0	3	425	776
Grand Total	138	255	0	7	393	214	819	0	0	1033	1519	223	1	7	1743	**3169**
Approach%	35.1%	64.9%	0%		-	20.7%	79.3%	0%		-	87.1%	12.8%	0.1%		-	**-**
Totals %	4.4%	8%	0%		12.4%	6.8%	25.8%	0%		32.6%	47.9%	7%	0%		55%	**-**
PHF	0.88	0.79	0		0.85	0.94	0.94	0		0.96	0.97	0.83	0.25		0.95	**-**
Heavy	1	3	0		4	3	12	0		15	12	0	0		12	**-**
Heavy %	0.7%	1.2%	0%		1%	1.4%	1.5%	0%		1.5%	0.8%	0%	0%		0.7%	**-**
Lights	137	252	0		389	211	807	0		1018	1507	223	1		1731	**-**
Lights %	99.3%	98.8%	0%		99%	98.6%	98.5%	0%		98.5%	99.2%	100%	100%		99.3%	**-**
Single-Unit Trucks	1	3	0		4	2	1	0		3	2	0	0		2	**-**
Single-Unit Trucks %	0.7%	1.2%	0%		1%	0.9%	0.1%	0%		0.3%	0.1%	0%	0%		0.1%	**-**
Buses	0	0	0		0	1	11	0		12	10	0	0		10	**-**
Buses %	0%	0%	0%		0%	0.5%	1.3%	0%		1.2%	0.7%	0%	0%		0.6%	**-**
Articulated Trucks	0	0	0		0	0	0	0		0	0	0	0		0	**-**
Articulated Trucks %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	6	-	-	-	-	0	-	-	-	-	7	-	**-**
Pedestrians%	-	-	-	42.9%		-	-	-	0%		-	-	-	50%		**-**
Bicycles on Road	0	0	0	0	-	0	1	0	0	-	1	0	0	0	-	**-**
Bicycles on Road%	-	-	-	0%		-	-	-	0%		-	-	-	0%		**-**
Bicycles on Crosswalk	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	7.1%		-	-	-	0%		-	-	-	0%		**-**

Peak Hour: 08:45 AM - 09:45 AM Weather: Overcast Clouds (14.7 °C)



	Bicycles on Crosswalk	Pedestrians
N	0	3
E	0	0
W	0	2

Peak Hour: 04:45 PM - 05:45 PM Weather: Overcast Clouds (18.84 °C)



	Bicycles on Crosswalk	Pedestrians
N	1	6
E	0	0
W	0	7

Spectrum

Turning Movement Count
Location Name: KINGSTON RD & DIXIE RD
Date: Tue, May 14, 2024 Deployment Lead: David Chu

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Turning Movement Count (1 . KINGSTON RD & DIXIE RD)

Start Time	N Approach DIXIE RD						E Approach KINGSTON RD						S Approach DIXIE RD						W Approach KINGSTON RD						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
07:00:00	33	2	11	0	0	46	8	76	2	0	1	86	1	1	6	0	1	8	5	50	4	0	2	59	199	
07:15:00	48	0	15	0	1	63	10	96	8	0	1	114	0	0	4	0	0	4	4	99	10	0	1	113	294	
07:30:00	35	3	21	0	0	59	14	107	6	0	0	127	2	3	5	0	0	10	13	100	8	0	3	121	317	
07:45:00	48	4	30	0	0	82	14	105	12	0	3	131	2	4	9	0	0	15	20	126	18	0	0	164	392	1202
08:00:00	63	4	18	0	1	85	12	134	15	0	0	161	7	2	5	0	1	14	10	141	25	0	2	176	436	1439
08:15:00	39	6	22	0	2	67	15	131	15	0	3	161	2	5	16	0	0	23	17	160	28	0	1	205	456	1601
08:30:00	42	8	28	0	1	78	20	127	22	0	3	169	7	3	13	0	4	23	20	158	21	0	1	199	469	1753
08:45:00	44	15	41	0	4	100	25	133	23	0	3	181	6	3	11	0	1	20	34	208	22	0	1	264	565	1926
09:00:00	42	6	26	0	1	74	18	139	23	0	1	180	6	4	12	0	2	22	33	174	26	0	2	233	509	1999
09:15:00	44	13	33	0	1	90	16	129	16	0	1	161	12	6	15	0	0	33	37	167	29	0	1	233	517	2060
09:30:00	29	13	20	0	1	62	15	120	10	0	6	145	11	2	24	0	2	37	37	209	12	1	1	259	503	2094
09:45:00	26	4	33	0	2	63	21	118	21	0	4	160	14	5	15	0	0	34	34	229	22	0	3	285	542	2071
BREAK																										
16:00:00	24	11	29	0	2	64	35	200	15	0	3	250	15	10	26	0	0	51	38	357	54	0	0	449	814	
16:15:00	30	6	32	0	2	68	42	175	17	0	2	234	19	17	27	0	1	63	36	331	42	0	1	409	774	
16:30:00	30	15	29	0	1	74	38	202	11	0	5	251	11	17	34	0	4	62	41	353	62	0	0	456	843	
16:45:00	21	12	35	0	4	68	37	179	18	0	4	234	15	16	26	0	0	57	39	318	51	0	1	408	767	3198
17:00:00	29	9	33	0	0	71	39	209	11	0	2	259	30	20	39	0	3	89	22	398	66	0	2	486	905	3289
17:15:00	18	14	35	0	0	67	33	183	18	0	7	234	23	17	41	0	1	81	40	352	47	0	2	439	821	3336
17:30:00	35	8	34	0	1	77	40	197	15	0	2	252	14	16	31	0	1	61	42	354	49	0	2	445	835	3328
17:45:00	34	19	30	0	0	83	32	148	20	0	3	200	11	19	29	0	3	59	48	287	51	0	3	386	728	3289
18:00:00	23	11	34	0	1	68	28	202	22	0	5	252	19	22	33	0	7	74	41	305	41	0	6	387	781	3165
18:15:00	31	16	20	0	1	67	39	155	18	1	7	213	19	10	34	0	0	63	39	274	39	0	0	352	695	3039
18:30:00	16	6	15	0	1	37	21	186	17	0	1	224	14	9	23	0	4	46	33	306	39	0	7	378	685	2889
18:45:00	18	16	29	0	2	63	23	165	19	0	8	207	12	13	38	0	0	63	30	277	49	0	2	356	689	2850
Grand Total	802	221	653	0	29	1676	595	3616	374	1	75	4586	272	224	516	0	35	1012	713	5733	815	1	44	7262	**14536**	-
Approach%	47.9%	13.2%	39%	0%		-	13%	78.8%	8.2%	0%		-	26.9%	22.1%	51%	0%		-	9.8%	78.9%	11.2%	0%		-	-	-
Totals %	5.5%	1.5%	4.5%	0%		11.5%	4.1%	24.9%	2.6%	0%		31.5%	1.9%	1.5%	3.5%	0%		7%	4.9%	39.4%	5.6%	0%		50%	-	-
Heavy	3	1	7	0		-	4	105	5	0		-	5	1	2	0		-	4	137	4	0		-	-	-
Heavy %	0.4%	0.5%	1.1%	0%		-	0.7%	2.9%	1.3%	0%		-	1.8%	0.4%	0.4%	0%		-	0.6%	2.4%	0.5%	0%		-	-	-
Bicycles	0	0	0	0		-	1	2	0	0		-	0	0	0	0		-	0	2	0	0		-	-	-
Bicycle %	0%	0%	0%	0%		-	0.2%	0.1%	0%	0%		-	0%	0%	0%	0%		-	0%	0%	0%	0%		-	-	-

Spectrum

Turning Movement Count
Location Name: KINGSTON RD & DIXIE RD
Date: Tue, May 14, 2024 Deployment Lead: David Chu

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 08:45 AM - 09:45 AM Weather: Light Rain (14.76 °C)

Start Time	N Approach DIXIE RD						E Approach KINGSTON RD						S Approach DIXIE RD						W Approach KINGSTON RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
08:45:00	44	15	41	0	4	100	25	133	23	0	3	181	6	3	11	0	1	20	34	208	22	0	1	264	565
09:00:00	42	6	26	0	1	74	18	139	23	0	1	180	6	4	12	0	2	22	33	174	26	0	2	233	509
09:15:00	44	13	33	0	1	90	16	129	16	0	1	161	12	6	15	0	0	33	37	167	29	0	1	233	517
09:30:00	29	13	20	0	1	62	15	120	10	0	6	145	11	2	24	0	2	37	37	209	12	1	1	259	503
Grand Total	159	47	120	0	7	326	74	521	72	0	11	667	35	15	62	0	5	112	141	758	89	1	5	989	**2094**
Approach%	48.8%	14.4%	36.8%	0%		-	11.1%	78.1%	10.8%	0%		-	31.3%	13.4%	55.4%	0%		-	14.3%	76.6%	9%	0.1%		-	**-**
Totals %	7.6%	2.2%	5.7%	0%		15.6%	3.5%	24.9%	3.4%	0%		31.9%	1.7%	0.7%	3%	0%		5.3%	6.7%	36.2%	4.3%	0%		47.2%	**-**
PHF	0.9	0.78	0.73	0		0.82	0.74	0.94	0.78	0		0.92	0.73	0.63	0.65	0		0.76	0.95	0.91	0.77	0.25		0.94	**-**
Heavy	1	1	2	0		4	1	16	1	0		18	2	1	0	0		3	0	32	1	0		33	**-**
Heavy %	0.6%	2.1%	1.7%	0%		1.2%	1.4%	3.1%	1.4%	0%		2.7%	5.7%	6.7%	0%	0%		2.7%	0%	4.2%	1.1%	0%		3.3%	**-**
Lights	158	46	118	0		322	73	505	71	0		649	33	14	62	0		109	141	726	88	1		956	**-**
Lights %	99.4%	97.9%	98.3%	0%		98.8%	98.6%	96.9%	98.6%	0%		97.3%	94.3%	93.3%	100%	0%		97.3%	100%	95.8%	98.9%	100%		96.7%	**-**
Single-Unit Trucks	1	0	1	0		2	0	4	1	0		5	0	1	0	0		1	0	11	1	0		12	**-**
Single-Unit Trucks %	0.6%	0%	0.8%	0%		0.6%	0%	0.8%	1.4%	0%		0.7%	0%	6.7%	0%	0%		0.9%	0%	1.5%	1.1%	0%		1.2%	**-**
Buses	0	0	1	0		1	0	12	0	0		12	0	0	0	0		0	0	19	0	0		19	**-**
Buses %	0%	0%	0.8%	0%		0.3%	0%	2.3%	0%	0%		1.8%	0%	0%	0%	0%		0%	0%	2.5%	0%	0%		1.9%	**-**
Articulated Trucks	0	1	0	0		1	1	0	0	0		1	2	0	0	0		2	0	2	0	0		2	**-**
Articulated Trucks %	0%	2.1%	0%	0%		0.3%	1.4%	0%	0%	0%		0.1%	5.7%	0%	0%	0%		1.8%	0%	0.3%	0%	0%		0.2%	**-**
Pedestrians	-	-	-	-	7	-	-	-	-	-	11	-	-	-	-	-	5	-	-	-	-	-	4	-	**-**
Pedestrians%	-	-	-	-	25%		-	-	-	-	39.3%		-	-	-	-	17.9%		-	-	-	-	14.3%		**-**
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	**-**
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	3.6%		**-**

Spectrum

Turning Movement Count
Location Name: KINGSTON RD & DIXIE RD
Date: Tue, May 14, 2024 Deployment Lead: David Chu

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (18.76 °C)

Start Time	N Approach DIXIE RD						E Approach KINGSTON RD						S Approach DIXIE RD						W Approach KINGSTON RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:30:00	30	15	29	0	1	74	38	202	11	0	5	251	11	17	34	0	4	62	41	353	62	0	0	456	843
16:45:00	21	12	35	0	4	68	37	179	18	0	4	234	15	16	26	0	0	57	39	318	51	0	1	408	767
17:00:00	29	9	33	0	0	71	39	209	11	0	2	259	30	20	39	0	3	89	22	398	66	0	2	486	905
17:15:00	18	14	35	0	0	67	33	183	18	0	7	234	23	17	41	0	1	81	40	352	47	0	2	439	821
Grand Total	98	50	132	0	5	280	147	773	58	0	18	978	79	70	140	0	8	289	142	1421	226	0	5	1789	**3336**
Approach%	35%	17.9%	47.1%	0%		-	15%	79%	5.9%	0%		-	27.3%	24.2%	48.4%	0%		-	7.9%	79.4%	12.6%	0%		-	**-**
Totals %	2.9%	1.5%	4%	0%		8.4%	4.4%	23.2%	1.7%	0%		29.3%	2.4%	2.1%	4.2%	0%		8.7%	4.3%	42.6%	6.8%	0%		53.6%	**-**
PHF	0.82	0.83	0.94	0		0.95	0.94	0.92	0.81	0		0.94	0.66	0.88	0.85	0		0.81	0.87	0.89	0.86	0		0.92	**-**
Heavy	0	0	1	0		1	0	18	2	0		20	0	0	1	0		1	0	19	0	0		19	**-**
Heavy %	0%	0%	0.8%	0%		0.4%	0%	2.3%	3.4%	0%		2%	0%	0%	0.7%	0%		0.3%	0%	1.3%	0%	0%		1.1%	**-**
Lights	98	50	131	0		279	147	755	56	0		958	79	70	139	0		288	142	1402	226	0		1770	**-**
Lights %	100%	100%	99.2%	0%		99.6%	100%	97.7%	96.6%	0%		98%	100%	100%	99.3%	0%		99.7%	100%	98.7%	100%	0%		98.9%	**-**
Single-Unit Trucks	0	0	1	0		1	0	3	2	0		5	0	0	1	0		1	0	7	0	0		7	**-**
Single-Unit Trucks %	0%	0%	0.8%	0%		0.4%	0%	0.4%	3.4%	0%		0.5%	0%	0%	0.7%	0%		0.3%	0%	0.5%	0%	0%		0.4%	**-**
Buses	0	0	0	0		0	0	15	0	0		15	0	0	0	0		0	0	12	0	0		12	**-**
Buses %	0%	0%	0%	0%		0%	0%	1.9%	0%	0%		1.5%	0%	0%	0%	0%		0%	0%	0.8%	0%	0%		0.7%	**-**
Articulated Trucks	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	-	5	-	-	-	-	-	18	-	-	-	-	-	7	-	-	-	-	-	4	-	**-**
Pedestrians%	-	-	-	-	13.9%		-	-	-	-	50%		-	-	-	-	19.4%		-	-	-	-	11.1%		**-**
Bicycles on Road	0	0	0	0	0	-	1	1	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	1	-	**-**
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	2.8%		-	-	-	-	2.8%		**-**

Peak Hour: 08:45 AM - 09:45 AM **Weather: Light Rain (14.76 °C)**



	Bicycles on Crosswalk	Pedestrians
N	0	7
S	0	5
E	0	11
W	1	4

Peak Hour: 04:30 PM - 05:30 PM **Weather: Overcast Clouds (18.76 °C)**



	Bicycles on Crosswalk	Pedestrians
N	0	5
S	1	7
E	0	18
W	1	4

Spectrum

Turning Movement Count
Location Name: KINGSTON RD & WALNUT LANE
Date: Tue, May 14, 2024 Deployment Lead: David Chu

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Turning Movement Count (2 . KINGSTON RD & WALNUT LANE)

Start Time	N Approach WALNUT LN						E Approach KINGSTON RD						S Approach WALNUT LN						W Approach KINGSTON RD						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
07:00:00	3	1	2	0	1	6	3	84	11	0	1	98	7	1	1	0	1	9	2	68	0	0	1	70	183	
07:15:00	4	0	4	0	1	8	3	103	16	0	1	122	5	0	4	0	2	9	2	91	1	0	2	94	233	
07:30:00	8	1	9	0	0	18	2	117	24	0	0	143	9	0	6	0	2	15	0	121	3	0	2	124	300	
07:45:00	4	1	7	0	0	12	3	122	28	0	2	153	9	2	8	0	1	19	3	133	3	0	1	139	323	1039
08:00:00	14	2	13	0	2	29	5	144	23	0	1	172	9	1	5	0	1	15	4	164	4	1	2	173	389	1245
08:15:00	7	2	2	0	0	11	5	145	46	0	0	196	11	1	10	0	4	22	5	148	3	0	1	156	385	1397
08:30:00	9	2	10	1	0	22	10	150	37	0	1	197	36	1	6	0	4	43	6	183	2	0	1	191	453	1550
08:45:00	12	3	5	0	1	20	5	159	47	0	0	211	21	0	13	0	0	34	7	209	4	0	2	220	485	1712
09:00:00	11	2	5	0	0	18	7	160	44	0	3	211	34	2	13	0	3	49	8	198	5	0	1	211	489	1812
09:15:00	4	3	5	0	0	12	7	146	55	0	0	208	30	4	15	0	3	49	10	191	4	0	4	205	474	1901
09:30:00	3	6	4	0	1	13	4	123	56	0	1	183	39	3	19	0	1	61	10	217	6	0	5	233	490	1938
09:45:00	3	5	7	0	0	15	7	137	46	0	1	190	44	2	17	0	10	63	12	232	6	0	0	250	518	1971
BREAK																										
16:00:00	6	5	6	0	6	17	10	193	30	0	2	233	64	6	45	0	5	115	12	344	12	1	5	369	734	
16:15:00	5	3	8	0	4	16	8	198	49	0	0	255	42	10	34	0	6	86	10	392	6	0	7	408	765	
16:30:00	11	5	7	0	1	23	9	218	46	0	1	273	50	14	29	0	2	93	12	341	14	0	7	367	756	
16:45:00	9	2	7	0	2	18	5	197	51	0	1	253	41	10	27	0	3	78	14	362	10	0	4	386	735	2990
17:00:00	2	8	7	0	2	17	11	211	50	0	0	272	60	4	41	0	5	105	16	386	10	0	7	412	806	3062
17:15:00	4	8	6	0	0	18	9	194	44	0	1	247	50	12	37	0	3	99	8	407	11	0	3	426	790	3087
17:30:00	6	1	14	0	0	21	9	219	37	1	0	266	68	5	22	0	2	95	10	341	9	1	5	361	743	3074
17:45:00	5	9	5	0	0	19	6	168	53	0	2	227	41	3	28	0	9	72	15	329	6	0	3	350	668	3007
18:00:00	5	5	7	0	4	17	11	215	51	0	1	277	48	6	36	0	7	90	7	312	6	0	6	325	709	2910
18:15:00	7	2	5	0	0	14	3	176	51	0	0	230	46	7	29	0	5	82	5	326	6	0	9	337	663	2783
18:30:00	4	4	15	0	1	23	11	187	38	0	2	236	42	5	26	0	5	73	12	285	1	0	5	298	630	2670
18:45:00	2	7	2	0	2	11	10	184	49	0	3	243	52	7	26	0	8	85	3	312	10	0	2	325	664	2666
Grand Total	148	87	162	1	28	398	163	3950	982	1	24	5096	858	106	497	0	92	1461	193	6092	142	3	85	6430	**13385**	-
Approach%	37.2%	21.9%	40.7%	0.3%		-	3.2%	77.5%	19.3%	0%		-	58.7%	7.3%	34%	0%		-	3%	94.7%	2.2%	0%		-	**-**	-
Totals %	1.1%	0.6%	1.2%	0%		3%	1.2%	29.5%	7.3%	0%		38.1%	6.4%	0.8%	3.7%	0%		10.9%	1.4%	45.5%	1.1%	0%		48%	**-**	-
Heavy	3	0	2	0		-	6	111	6	0		-	5	2	4	0		-	3	146	0	0		-	**-**	-
Heavy %	2%	0%	1.2%	0%		-	3.7%	2.8%	0.6%	0%		-	0.6%	1.9%	0.8%	0%		-	1.6%	2.4%	0%	0%		-	**-**	-
Bicycles	0	2	1	0		-	0	2	1	0		-	2	1	1	0		-	1	1	0	0		-	**-**	-
Bicycle %	0%	2.3%	0.6%	0%		-	0%	0.1%	0.1%	0%		-	0.2%	0.9%	0.2%	0%		-	0.5%	0%	0%	0%		-	**-**	-

Peak Hour: 09:00 AM - 10:00 AM Weather: Light Rain (14.76 °C)

Start Time	N Approach WALNUT LN						E Approach KINGSTON RD						S Approach WALNUT LN						W Approach KINGSTON RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
09:00:00	11	2	5	0	0	18	7	160	44	0	3	211	34	2	13	0	3	49	8	198	5	0	1	211	489
09:15:00	4	3	5	0	0	12	7	146	55	0	0	208	30	4	15	0	3	49	10	191	4	0	4	205	474
09:30:00	3	6	4	0	1	13	4	123	56	0	1	183	39	3	19	0	1	61	10	217	6	0	5	233	490
09:45:00	3	5	7	0	0	15	7	137	46	0	1	190	44	2	17	0	10	63	12	232	6	0	0	250	518
Grand Total	21	16	21	0	1	58	25	566	201	0	5	792	147	11	64	0	17	222	40	838	21	0	10	899	**1971**
Approach%	36.2%	27.6%	36.2%	0%		-	3.2%	71.5%	25.4%	0%		-	66.2%	5%	28.8%	0%		-	4.4%	93.2%	2.3%	0%		-	**-**
Totals %	1.1%	0.8%	1.1%	0%		2.9%	1.3%	28.7%	10.2%	0%		40.2%	7.5%	0.6%	3.2%	0%		11.3%	2%	42.5%	1.1%	0%		45.6%	**-**
PHF	0.48	0.67	0.75	0		0.81	0.89	0.88	0.9	0		0.94	0.84	0.69	0.84	0		0.88	0.83	0.9	0.88	0		0.9	**-**
Heavy	1	0	0	0		1	0	17	2	0		19	3	1	2	0		6	2	32	0	0		34	**-**
Heavy %	4.8%	0%	0%	0%		1.7%	0%	3%	1%	0%		2.4%	2%	9.1%	3.1%	0%		2.7%	5%	3.8%	0%	0%		3.8%	**-**
Lights	20	16	21	0		57	25	549	199	0		773	144	10	62	0		216	38	806	21	0		865	**-**
Lights %	95.2%	100%	100%	0%		98.3%	100%	97%	99%	0%		97.6%	98%	90.9%	96.9%	0%		97.3%	95%	96.2%	100%	0%		96.2%	**-**
Single-Unit Trucks	1	0	0	0		1	0	6	2	0		8	3	1	1	0		5	1	12	0	0		13	**-**
Single-Unit Trucks %	4.8%	0%	0%	0%		1.7%	0%	1.1%	1%	0%		1%	2%	9.1%	1.6%	0%		2.3%	2.5%	1.4%	0%	0%		1.4%	**-**
Buses	0	0	0	0		0	0	10	0	0		10	0	0	0	0		0	0	15	0	0		15	**-**
Buses %	0%	0%	0%	0%		0%	0%	1.8%	0%	0%		1.3%	0%	0%	0%	0%		0%	0%	1.8%	0%	0%		1.7%	**-**
Articulated Trucks	0	0	0	0		0	0	1	0	0		1	0	0	1	0		1	1	5	0	0		6	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0.2%	0%	0%		0.1%	0%	0%	1.6%	0%		0.5%	2.5%	0.6%	0%	0%		0.7%	**-**
Pedestrians	-	-	-	-	1	-	-	-	-	-	5	-	-	-	-	-	17	-	-	-	-	-	10	-	**-**
Pedestrians%	-	-	-	-	3%		-	-	-	-	15.2%		-	-	-	-	51.5%		-	-	-	-	30.3%		**-**
Bicycles on Road	0	1	1	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Spectrum

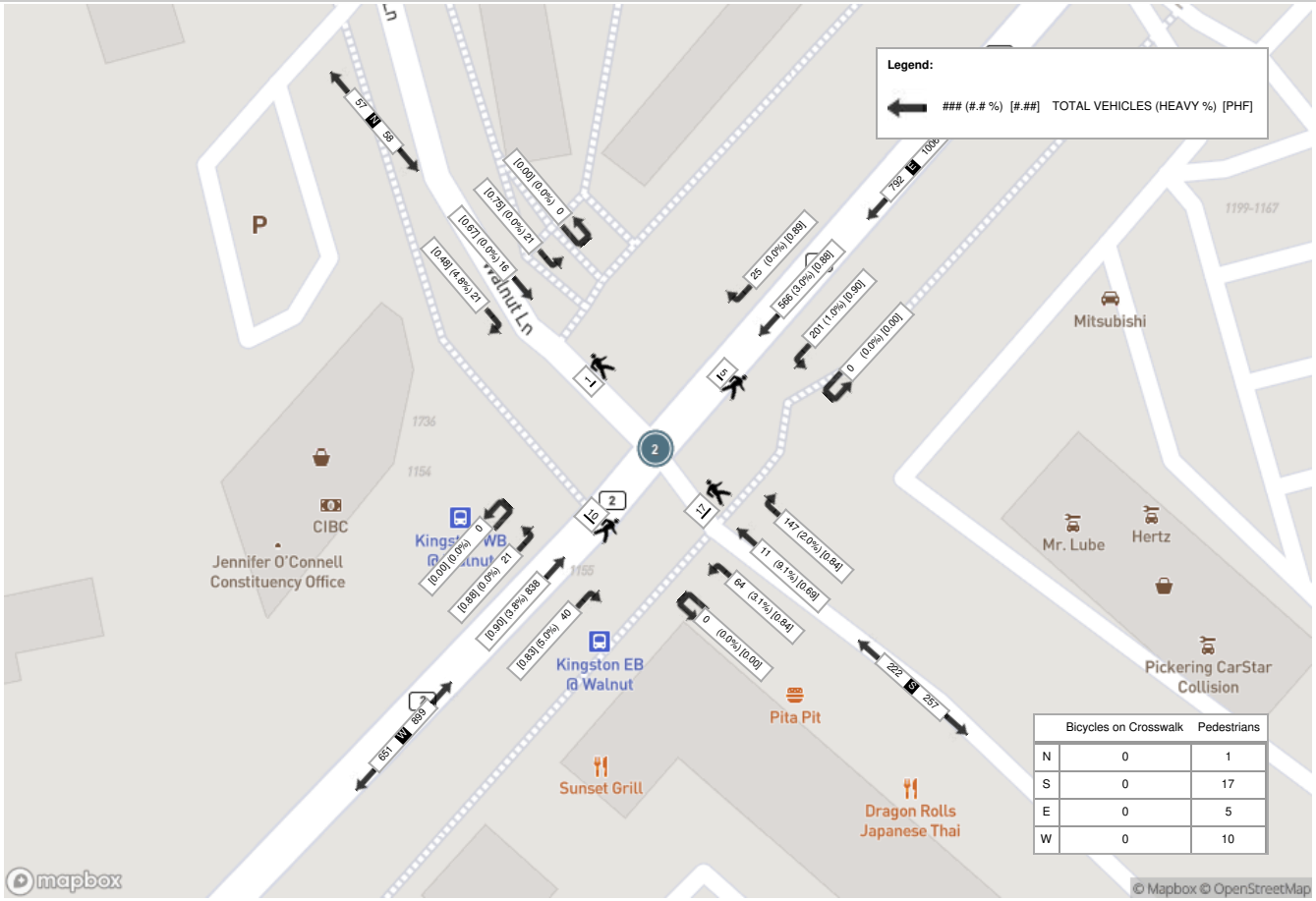
Turning Movement Count
Location Name: KINGSTON RD & WALNUT LANE
Date: Tue, May 14, 2024 Deployment Lead: David Chu

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (18.76 °C)

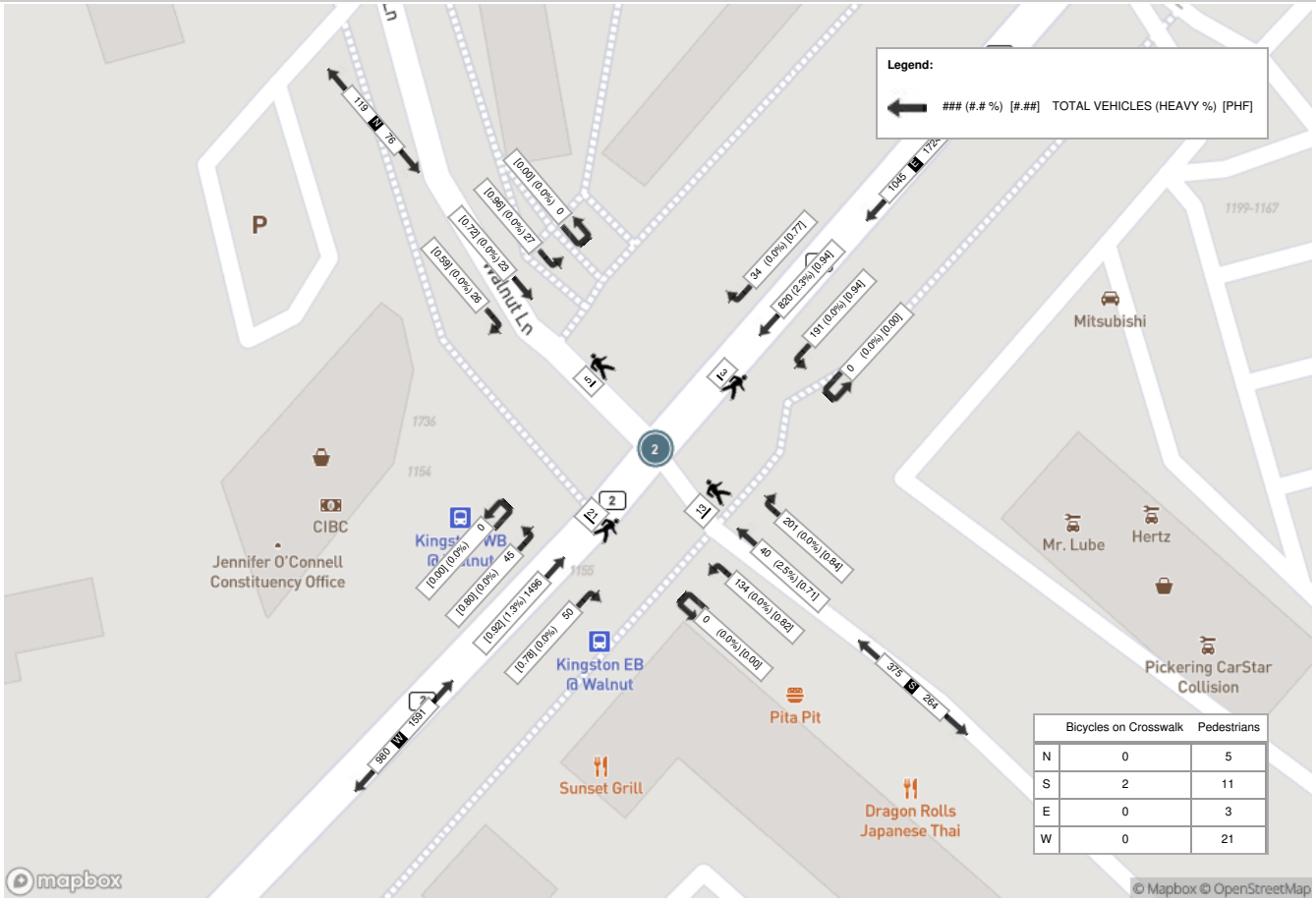
Start Time	N Approach WALNUT LN						E Approach KINGSTON RD						S Approach WALNUT LN						W Approach KINGSTON RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:30:00	11	5	7	0	1	23	9	218	46	0	1	273	50	14	29	0	2	93	12	341	14	0	7	367	756
16:45:00	9	2	7	0	2	18	5	197	51	0	1	253	41	10	27	0	3	78	14	362	10	0	4	386	735
17:00:00	2	8	7	0	2	17	11	211	50	0	0	272	60	4	41	0	5	105	16	386	10	0	7	412	806
17:15:00	4	8	6	0	0	18	9	194	44	0	1	247	50	12	37	0	3	99	8	407	11	0	3	426	790
Grand Total	26	23	27	0	5	76	34	820	191	0	3	1045	201	40	134	0	13	375	50	1496	45	0	21	1591	**3087**
Approach%	34.2%	30.3%	35.5%	0%		-	3.3%	78.5%	18.3%	0%		-	53.6%	10.7%	35.7%	0%		-	3.1%	94%	2.8%	0%		-	**-**
Totals %	0.8%	0.7%	0.9%	0%		2.5%	1.1%	26.6%	6.2%	0%		33.9%	6.5%	1.3%	4.3%	0%		12.1%	1.6%	48.5%	1.5%	0%		51.5%	**-**
PHF	0.59	0.72	0.96	0		0.83	0.77	0.94	0.94	0		0.96	0.84	0.71	0.82	0		0.89	0.78	0.92	0.8	0		0.93	**-**
Heavy	0	0	0	0		0	0	19	0	0		19	0	1	0	0		1	0	19	0	0		19	**-**
Heavy %	0%	0%	0%	0%		0%	0%	2.3%	0%	0%		1.8%	0%	2.5%	0%	0%		0.3%	0%	1.3%	0%	0%		1.2%	**-**
Lights	26	23	27	0		76	34	801	191	0		1026	201	39	134	0		374	50	1477	45	0		1572	**-**
Lights %	100%	100%	100%	0%		100%	100%	97.7%	100%	0%		98.2%	100%	97.5%	100%	0%		99.7%	100%	98.7%	100%	0%		98.8%	**-**
Single-Unit Trucks	0	0	0	0		0	0	4	0	0		4	0	1	0	0		1	0	8	0	0		8	**-**
Single-Unit Trucks %	0%	0%	0%	0%		0%	0%	0.5%	0%	0%		0.4%	0%	2.5%	0%	0%		0.3%	0%	0.5%	0%	0%		0.5%	**-**
Buses	0	0	0	0		0	0	15	0	0		15	0	0	0	0		0	0	11	0	0		11	**-**
Buses %	0%	0%	0%	0%		0%	0%	1.8%	0%	0%		1.4%	0%	0%	0%	0%		0%	0%	0.7%	0%	0%		0.7%	**-**
Articulated Trucks	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	-	5	-	-	-	-	-	3	-	-	-	-	-	11	-	-	-	-	-	21	-	**-**
Pedestrians%	-	-	-	-	11.9%		-	-	-	-	7.1%		-	-	-	-	26.2%		-	-	-	-	50%		**-**
Bicycles on Road	0	1	0	0	0	-	0	1	1	0	0	-	0	0	1	0	0	-	0	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	4.8%		-	-	-	-	0%		**-**

Peak Hour: 09:00 AM - 10:00 AM **Weather: Light Rain (14.76 °C)**



	Bicycles on Crosswalk	Pedestrians
N	0	1
S	0	17
E	0	5
W	0	10

Peak Hour: 04:30 PM - 05:30 PM **Weather: Overcast Clouds (18.76 °C)**



	Bicycles on Crosswalk	Pedestrians
N	0	5
S	2	11
E	0	3
W	0	21

Spectrum

Turning Movement Count
Location Name: KINGSTON RD & LIVERPOOL RD
Date: Tue, May 14, 2024 Deployment Lead: David Chu

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Turning Movement Count (4 . KINGSTON RD & LIVERPOOL RD)

Start Time	N Approach LIVERPOOL RD						E Approach KINGSTON RD						S Approach LIVERPOOL RD						W Approach KINGSTON RD						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
07:00:00	9	141	5	0	5	155	5	64	27	0	7	96	16	58	28	0	3	102	30	39	8	0	2	77	430	
07:15:00	9	138	9	0	2	156	6	98	36	0	8	140	22	52	34	0	3	108	37	50	14	0	5	101	505	
07:30:00	8	150	9	0	2	167	7	76	33	0	8	116	17	106	49	0	5	172	62	50	15	0	5	127	582	
07:45:00	24	178	12	0	7	214	9	97	39	0	11	145	23	75	50	0	5	148	57	91	19	0	8	167	674	2191
08:00:00	24	165	14	0	3	203	10	95	50	0	4	155	25	85	47	0	4	157	51	90	18	0	5	159	674	2435
08:15:00	26	134	18	0	2	178	10	125	35	0	4	170	31	91	65	0	2	187	47	106	17	2	1	172	707	2637
08:30:00	28	137	18	0	5	183	7	107	35	0	10	149	38	90	61	0	5	189	66	96	17	0	6	179	700	2755
08:45:00	21	144	5	0	17	170	17	129	31	0	17	177	42	78	70	0	9	190	62	137	30	1	6	230	767	2848
09:00:00	31	113	19	0	9	163	9	98	35	0	10	142	24	82	68	0	8	174	51	121	36	1	7	209	688	2862
09:15:00	32	85	20	0	7	137	16	116	34	0	10	166	34	78	67	0	5	179	48	146	24	1	6	219	701	2856
09:30:00	21	105	20	0	2	146	14	101	24	0	7	139	42	68	64	0	5	174	64	131	33	0	2	228	687	2843
09:45:00	23	94	24	0	7	141	6	117	25	0	7	148	35	53	61	0	2	149	67	158	39	0	3	264	702	2778
BREAK																										
16:00:00	23	97	28	0	8	148	21	138	49	0	21	208	65	196	64	0	5	325	77	214	52	0	9	343	1024	
16:15:00	30	91	23	0	17	144	20	176	63	1	14	260	52	175	70	0	11	297	67	260	53	0	11	380	1081	
16:30:00	29	110	24	0	3	163	15	128	49	0	13	192	56	169	83	0	12	308	83	234	50	0	11	367	1030	
16:45:00	32	113	22	0	17	167	17	145	49	0	23	211	53	169	86	1	9	309	80	262	41	0	11	383	1070	4205
17:00:00	33	114	22	0	13	169	20	144	44	0	20	208	80	212	92	0	9	384	96	241	50	0	12	387	1148	4329
17:15:00	26	114	23	0	21	163	11	152	67	0	31	230	61	191	85	0	5	337	100	263	58	0	6	421	1151	4399
17:30:00	27	146	30	0	11	203	19	122	52	0	23	193	64	212	86	0	12	362	89	236	52	1	21	378	1136	4505
17:45:00	28	118	25	0	15	171	18	140	63	0	19	221	81	199	81	0	13	361	71	259	67	0	8	397	1150	4585
18:00:00	16	124	29	0	4	169	23	143	51	0	13	217	59	170	81	0	12	310	75	199	56	0	17	330	1026	4463
18:15:00	14	113	23	0	10	150	18	130	54	0	13	202	64	160	86	1	22	311	80	237	57	0	12	374	1037	4349
18:30:00	25	115	25	0	10	165	12	111	48	0	17	171	64	148	82	0	7	294	79	179	62	0	8	320	950	4163
18:45:00	30	101	24	0	12	155	8	147	70	0	11	225	46	124	66	0	10	236	80	221	48	0	5	349	965	3978
Grand Total	569	2940	471	0	209	3980	318	2899	1063	1	321	4281	1094	3041	1626	2	183	5763	1619	4020	916	6	187	6561	**20585**	-
Approach%	14.3%	73.9%	11.8%	0%		-	7.4%	67.7%	24.8%	0%		-	19%	52.8%	28.2%	0%		-	24.7%	61.3%	14%	0.1%		-	**-**	-
Totals %	2.8%	14.3%	2.3%	0%		19.3%	1.5%	14.1%	5.2%	0%		20.8%	5.3%	14.8%	7.9%	0%		28%	7.9%	19.5%	4.4%	0%		31.9%	**-**	-
Heavy	10	21	5	0		-	2	79	14	0		-	60	50	36	0		-	40	103	9	0		-	**-**	-
Heavy %	1.8%	0.7%	1.1%	0%		-	0.6%	2.7%	1.3%	0%		-	5.5%	1.6%	2.2%	0%		-	2.5%	2.6%	1%	0%		-	**-**	-
Bicycles	0	0	0	0		-	1	3	0	0		-	0	3	0	0		-	1	3	0	0		-	**-**	-
Bicycle %	0%	0%	0%	0%		-	0.3%	0.1%	0%	0%		-	0%	0.1%	0%	0%		-	0.1%	0.1%	0%	0%		-	**-**	-

Spectrum

Turning Movement Count
Location Name: KINGSTON RD & LIVERPOOL RD
Date: Tue, May 14, 2024 Deployment Lead: David Chu

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 08:15 AM - 09:15 AM Weather: Light Rain (14.76 °C)

Start Time	N Approach LIVERPOOL RD						E Approach KINGSTON RD						S Approach LIVERPOOL RD						W Approach KINGSTON RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
08:15:00	26	134	18	0	2	178	10	125	35	0	4	170	31	91	65	0	2	187	47	106	17	2	1	172	707
08:30:00	28	137	18	0	5	183	7	107	35	0	10	149	38	90	61	0	5	189	66	96	17	0	6	179	700
08:45:00	21	144	5	0	17	170	17	129	31	0	17	177	42	78	70	0	9	190	62	137	30	1	6	230	767
09:00:00	31	113	19	0	9	163	9	98	35	0	10	142	24	82	68	0	8	174	51	121	36	1	7	209	688
Grand Total	106	528	60	0	33	694	43	459	136	0	41	638	135	341	264	0	24	740	226	460	100	4	20	790	**2862**
Approach%	15.3%	76.1%	8.6%	0%		-	6.7%	71.9%	21.3%	0%		-	18.2%	46.1%	35.7%	0%		-	28.6%	58.2%	12.7%	0.5%		-	**-**
Totals %	3.7%	18.4%	2.1%	0%		24.2%	1.5%	16%	4.8%	0%		22.3%	4.7%	11.9%	9.2%	0%		25.9%	7.9%	16.1%	3.5%	0.1%		27.6%	**-**
PHF	0.85	0.92	0.79	0		0.95	0.63	0.89	0.97	0		0.9	0.8	0.94	0.94	0		0.97	0.86	0.84	0.69	0.5		0.86	**-**
Heavy	5	5	1	0		11	0	17	4	0		21	12	7	7	0		26	11	19	4	0		34	**-**
Heavy %	4.7%	0.9%	1.7%	0%		1.6%	0%	3.7%	2.9%	0%		3.3%	8.9%	2.1%	2.7%	0%		3.5%	4.9%	4.1%	4%	0%		4.3%	**-**
Lights	101	523	59	0		683	43	442	132	0		617	123	334	257	0		714	215	441	96	4		756	**-**
Lights %	95.3%	99.1%	98.3%	0%		98.4%	100%	96.3%	97.1%	0%		96.7%	91.1%	97.9%	97.3%	0%		96.5%	95.1%	95.9%	96%	100%		95.7%	**-**
Single-Unit Trucks	2	2	0	0		4	0	4	1	0		5	1	2	4	0		7	4	6	2	0		12	**-**
Single-Unit Trucks %	1.9%	0.4%	0%	0%		0.6%	0%	0.9%	0.7%	0%		0.8%	0.7%	0.6%	1.5%	0%		0.9%	1.8%	1.3%	2%	0%		1.5%	**-**
Buses	3	3	1	0		7	0	11	2	0		13	10	5	2	0		17	7	10	2	0		19	**-**
Buses %	2.8%	0.6%	1.7%	0%		1%	0%	2.4%	1.5%	0%		2%	7.4%	1.5%	0.8%	0%		2.3%	3.1%	2.2%	2%	0%		2.4%	**-**
Articulated Trucks	0	0	0	0		0	0	2	1	0		3	1	0	1	0		2	0	3	0	0		3	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0.4%	0.7%	0%		0.5%	0.7%	0%	0.4%	0%		0.3%	0%	0.7%	0%	0%		0.4%	**-**
Pedestrians	-	-	-	-	33	-	-	-	-	-	41	-	-	-	-	-	23	-	-	-	-	-	20	-	**-**
Pedestrians%	-	-	-	-	28%		-	-	-	-	34.7%		-	-	-	-	19.5%		-	-	-	-	16.9%		**-**
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0.8%		-	-	-	-	0%		**-**

Spectrum

Turning Movement Count
Location Name: KINGSTON RD & LIVERPOOL RD
Date: Tue, May 14, 2024 Deployment Lead: David Chu

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 05:00 PM - 06:00 PM Weather: Overcast Clouds (18.76 °C)

Start Time	N Approach LIVERPOOL RD						E Approach KINGSTON RD						S Approach LIVERPOOL RD						W Approach KINGSTON RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
17:00:00	33	114	22	0	13	169	20	144	44	0	20	208	80	212	92	0	9	384	96	241	50	0	12	387	1148
17:15:00	26	114	23	0	21	163	11	152	67	0	31	230	61	191	85	0	5	337	100	263	58	0	6	421	1151
17:30:00	27	146	30	0	11	203	19	122	52	0	23	193	64	212	86	0	12	362	89	236	52	1	21	378	1136
17:45:00	28	118	25	0	15	171	18	140	63	0	19	221	81	199	81	0	13	361	71	259	67	0	8	397	1150
Grand Total	114	492	100	0	60	706	68	558	226	0	93	852	286	814	344	0	39	1444	356	999	227	1	47	1583	**4585**
Approach%	16.1%	69.7%	14.2%	0%		-	8%	65.5%	26.5%	0%		-	19.8%	56.4%	23.8%	0%		-	22.5%	63.1%	14.3%	0.1%		-	**-**
Totals %	2.5%	10.7%	2.2%	0%		15.4%	1.5%	12.2%	4.9%	0%		18.6%	6.2%	17.8%	7.5%	0%		31.5%	7.8%	21.8%	5%	0%		34.5%	**-**
PHF	0.86	0.84	0.83	0		0.87	0.85	0.92	0.84	0		0.93	0.88	0.96	0.93	0		0.94	0.89	0.95	0.85	0.25		0.94	**-**
Heavy	0	3	0	0		3	0	11	1	0		12	10	3	5	0		18	5	11	0	0		16	**-**
Heavy %	0%	0.6%	0%	0%		0.4%	0%	2%	0.4%	0%		1.4%	3.5%	0.4%	1.5%	0%		1.2%	1.4%	1.1%	0%	0%		1%	**-**
Lights	114	489	100	0		703	68	547	225	0		840	276	811	339	0		1426	351	988	227	1		1567	**-**
Lights %	100%	99.4%	100%	0%		99.6%	100%	98%	99.6%	0%		98.6%	96.5%	99.6%	98.5%	0%		98.8%	98.6%	98.9%	100%	100%		99%	**-**
Single-Unit Trucks	0	3	0	0		3	0	1	1	0		2	2	0	0	0		2	4	3	0	0		7	**-**
Single-Unit Trucks %	0%	0.6%	0%	0%		0.4%	0%	0.2%	0.4%	0%		0.2%	0.7%	0%	0%	0%		0.1%	1.1%	0.3%	0%	0%		0.4%	**-**
Buses	0	0	0	0		0	0	9	0	0		9	8	3	5	0		16	1	8	0	0		9	**-**
Buses %	0%	0%	0%	0%		0%	0%	1.6%	0%	0%		1.1%	2.8%	0.4%	1.5%	0%		1.1%	0.3%	0.8%	0%	0%		0.6%	**-**
Articulated Trucks	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	0	0	0	0		0	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0.2%	0%	0%		0.1%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	-	59	-	-	-	-	-	88	-	-	-	-	-	36	-	-	-	-	-	42	-	**-**
Pedestrians%	-	-	-	-	24.7%		-	-	-	-	36.8%		-	-	-	-	15.1%		-	-	-	-	17.6%		**-**
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	0	-	**-**
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	-	5	-	-	-	-	-	3	-	-	-	-	-	5	-	**-**
Bicycles on Crosswalk%	-	-	-	-	0.4%		-	-	-	-	2.1%		-	-	-	-	1.3%		-	-	-	-	2.1%		**-**

Peak Hour: 08:15 AM - 09:15 AM **Weather: Light Rain (14.76 °C)**



	Bicycles on Crosswalk	Pedestrians
N	0	33
S	1	23
E	0	41
W	0	20

Peak Hour: 05:00 PM - 06:00 PM **Weather: Overcast Clouds (18.76 °C)**



Appendix J:
Existing Signal Timing Plans

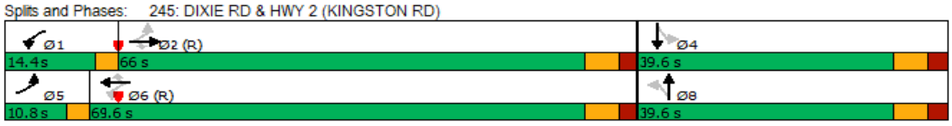
INTERSECTION SIGNAL TIMING REPORT

Location	Hwy. 2 and Dixie Rd.				
Date	10-05-24	**C&E No.**	55380908	**Prepared by**	N. Mimay
Prepared for	BA Group				

AM Peak 05:30 - 09:00

Phase Number	1	2	4	5	6	8
Movement	WBL	EBTL	SBTL	EBL	WBTL	NBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	14.4	66	39.6	10.8	69.6	39.6
Maximum Split (%)	12.0%	55.0%	33.0%	9.0%	58.0%	33.0%
Minimum Split (s)	8	28	41	8	28	41
Yellow Time (s)	3	4.2	4.4	3	4.2	4.4
All-Red Time (s)	0	2.4	2.7	0	2.4	2.7
Minimum Initial (s)	5	20	8	5	20	8
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		14	26		14	26
Intersection Summary						
Cycle Length			120			
Control Type		Actuated-Coordinated				
Natural Cycle			80			
Offset: 112.8 (94%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green						

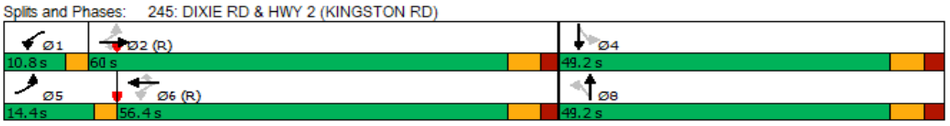
Splits and Phases: 245: DIXIE RD & HWY 2 (KINGSTON RD)



PM Peak 14:30 - 20:00

Phase Number	1	2	4	5	6	8
Movement	WBL	EBTL	SBTL	EBL	WBTL	NBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	10.8	60	49.2	14.4	56.4	49.2
Maximum Split (%)	9.0%	50.0%	41.0%	12.0%	47.0%	41.0%
Minimum Split (s)	8	28	41	8	28	41
Yellow Time (s)	3	4.2	4.4	3	4.2	4.4
All-Red Time (s)	0	2.4	2.7	0	2.4	2.7
Minimum Initial (s)	5	20	8	5	20	8
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		14	26		14	26
Intersection Summary						
Cycle Length			120			
Control Type		Actuated-Coordinated				
Natural Cycle			100			
Offset: 28.8 (24%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green						

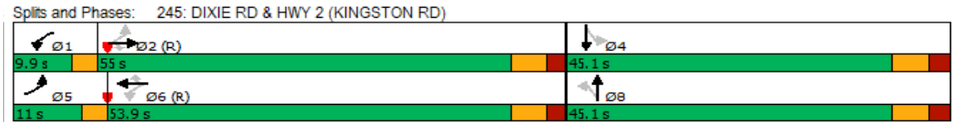
Splits and Phases: 245: DIXIE RD & HWY 2 (KINGSTON RD)



Weekend Peak 08:00 - 21:00

Phase Number	1	2	4	5	6	8
Movement	WBL	EBTL	SBTL	EBL	WBTL	NBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	9.9	55	45.1	11	53.9	45.1
Maximum Split (%)	9.0%	50.0%	41.0%	10.0%	49.0%	41.0%
Minimum Split (s)	8	28	41	8	28	41
Yellow Time (s)	3	4.2	4.4	3	4.2	4.4
All-Red Time (s)	0	2.4	2.7	0	2.4	2.7
Minimum Initial (s)	5	20	8	5	20	8
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		14	26		14	26
Intersection Summary						
Cycle Length			110			
Control Type		Actuated-Coordinated				
Natural Cycle			90			
Offset: 5.5 (5%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green						

Splits and Phases: 245: DIXIE RD & HWY 2 (KINGSTON RD)



**Please note a concerted effort has been made to ensure the accuracy and completeness of the data provided, however, inadvertent errors or omissions can still occur. Please bring any errors or omissions to the Region's attention.*

INTERSECTION SIGNAL TIMING REPORT

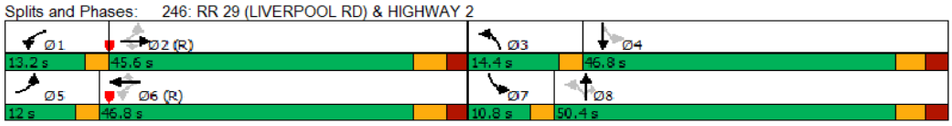
Location	Kingston Rd. (Hwy. 2) and Liverpool Rd. (RR 29)				
Date	10-05-24	**C&E No.**	55380908	**Prepared by**	N. Mimay
Prepared for	BA Group				

AM Peak (5:00-9:00)

Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	Max	None	C-Max	None	Max
Maximum Split (s)	13.2	45.6	14.4	46.8	12	46.8	10.8	50.4
Maximum Split (%)	11.0%	38.0%	12.0%	39.0%	10.0%	39.0%	9.0%	42.0%
Minimum Split (s)	8	36	8	41	8	36	8	41
Yellow Time (s)	3	4.3	3	3.8	3	4.3	3	3.8
All-Red Time (s)	0	2.8	0	3.2	0	2.8	0	3.2
Minimum Initial (s)	5	20	5	8	5	20	5	8
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		21		27		21		27

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 80.4 (67%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	

Splits and Phases: 246: RR 29 (LIVERPOOL RD) & HIGHWAY 2

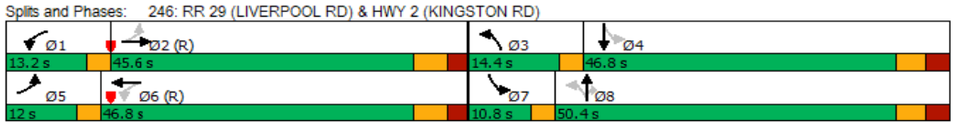


PM Peak (14:30-20:00)

Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	Max	None	C-Max	None	Max
Maximum Split (s)	13.2	45.6	14.4	46.8	12	46.8	10.8	50.4
Maximum Split (%)	11.0%	38.0%	12.0%	39.0%	10.0%	39.0%	9.0%	42.0%
Minimum Split (s)	8	36	8	41	8	36	8	41
Yellow Time (s)	3	4.3	3	3.8	3	4.3	3	3.8
All-Red Time (s)	0	2.8	0	3.2	0	2.8	0	3.2
Minimum Initial (s)	5	20	5	8	5	20	5	8
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		21		27		21		27

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 64.4 (54%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	

Splits and Phases: 246: RR 29 (LIVERPOOL RD) & HWY 2 (KINGSTON RD)

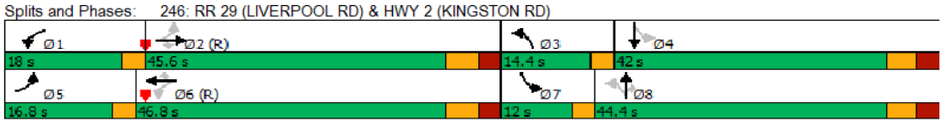


Weekend Peak (8:00-21:00)

Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	Max	None	C-Max	None	Max
Maximum Split (s)	18	45.6	14.4	42	16.8	46.8	12	44.4
Maximum Split (%)	15.0%	38.0%	12.0%	35.0%	14.0%	39.0%	10.0%	37.0%
Minimum Split (s)	8	36	8	41	8	36	8	41
Yellow Time (s)	3	4.3	3	3.8	3	4.3	3	3.8
All-Red Time (s)	0	2.8	0	3.2	0	2.8	0	3.2
Minimum Initial (s)	5	20	5	8	5	20	5	8
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		21		27		21		27

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	105
Offset: 50.4 (42%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	

Splits and Phases: 246: RR 29 (LIVERPOOL RD) & HWY 2 (KINGSTON RD)



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INTERSECTION SIGNAL TIMING REPORT

Location	Kingston Rd & Hwy 401 Ramp (E of Whites Rd.)				
Date	24-05-23	**C&E No.**	55380815	**Prepared by**	N. Mimay
Prepared for	BA Group				

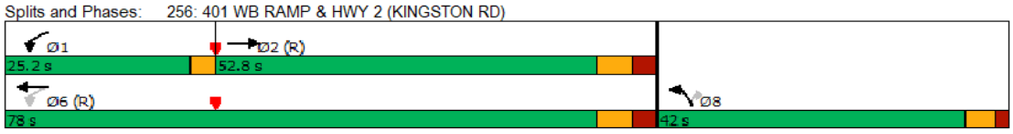
AM Peak 05:30 - 09:00

Phase Number	1	2	6	8
Movement	WBL	EBT	WBTL	NBL
Lead/Lag	Lead	Lag		
Lead-Lag Optimize	Yes	Yes		
Recall Mode	None	C-Max	C-Max	None
Maximum Split (s)	25.2	52.8	78	42
Maximum Split (%)	21.0%	44.0%	65.0%	35.0%
Minimum Split (s)	8	50	50	32
Yellow Time (s)	3	4.2	4.2	3.7
All-Red Time (s)	0	3	3	1.7
Minimum Initial (s)	5	20	20	8
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)		7	7	7
Flash Dont Walk (s)		35	35	19

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	100

Offset: 115.2 (96%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Splits and Phases: 256: 401 WB RAMP & HWY 2 (KINGSTON RD)



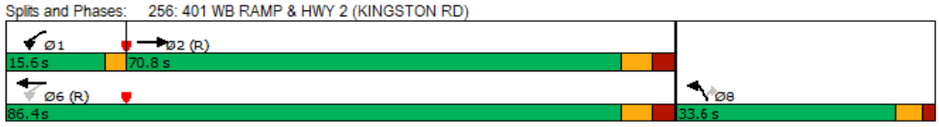
PM Peak 14:30-20:00

Phase Number	1	2	6	8
Movement	WBL	EBT	WBTL	NBL
Lead/Lag	Lead	Lag		
Lead-Lag Optimize	Yes	Yes		
Recall Mode	None	C-Max	C-Max	None
Maximum Split (s)	15.6	70.8	86.4	33.6
Maximum Split (%)	13.0%	59.0%	72.0%	28.0%
Minimum Split (s)	8	50	50	32
Yellow Time (s)	3	4.2	4.2	3.7
All-Red Time (s)	0	3	3	1.7
Minimum Initial (s)	5	20	20	8
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)		7	7	7
Flash Dont Walk (s)		35	35	19

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	100

Offset: 8.4 (7%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Splits and Phases: 256: 401 WB RAMP & HWY 2 (KINGSTON RD)



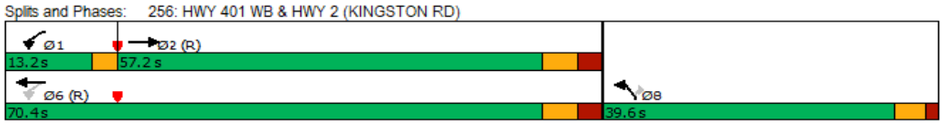
Weekend Peak 08:00 - 21:00

Phase Number	1	2	6	8
Movement	WBL	EBT	WBTL	NBL
Lead/Lag	Lead	Lag		
Lead-Lag Optimize	Yes	Yes		
Recall Mode	None	C-Max	C-Max	None
Maximum Split (s)	13.2	57.2	70.4	39.6
Maximum Split (%)	12.0%	52.0%	64.0%	36.0%
Minimum Split (s)	8	50	50	32
Yellow Time (s)	3	4.2	4.2	3.7
All-Red Time (s)	0	3	3	1.7
Minimum Initial (s)	5	20	20	8
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)		7	7	7
Flash Dont Walk (s)		35	35	19

Intersection Summary	
Cycle Length	110
Control Type	Actuated-Coordinated
Natural Cycle	90

Offset: 22 (20%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Splits and Phases: 256: HWY 401 WB & HWY 2 (KINGSTON RD)



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INTERSECTION SIGNAL TIMING REPORT

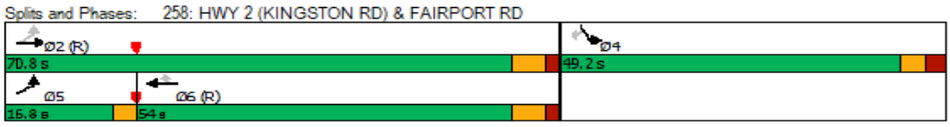
Location	Kingston Rd. (Hwy 2) and Fairport Rd.				
Date	10-05-24	**C&E No.**	55380815	**Prepared by**	N. Mimay
Prepared for	BA Group				

AM Peak (05:30-9:00)

Phase Number	2	4	5	6
Movement	EBTL	SBL	EBL	WBT
Lead/Lag			Lead	Lag
Lead-Lag Optimize			Yes	Yes
Recall Mode	C-Max	None	None	C-Max
Maximum Split (s)	70.8	49.2	16.8	54
Maximum Split (%)	59.0%	41.0%	14.0%	45.0%
Minimum Split (s)	33	29	8	33
Yellow Time (s)	4.3	3.3	3	4.3
All-Red Time (s)	2	2.7	0	2
Minimum Initial (s)	20	8	5	20
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7		7
Flash Dont Walk (s)	19	16		19

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 60 (50%), Referenced to phase 2:EBTL and 6:WBT, Start of Green	

Splits and Phases: 258: HWY 2 (KINGSTON RD) & FAIRPORT RD

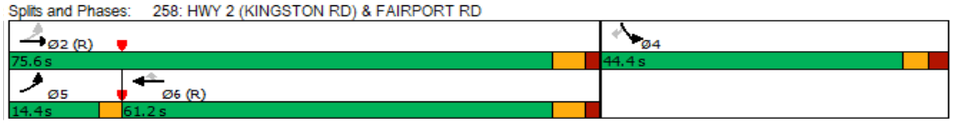


PM Peak 14:30-20:00

Phase Number	2	4	5	6
Movement	EBTL	SBL	EBL	WBT
Lead/Lag			Lead	Lag
Lead-Lag Optimize			Yes	Yes
Recall Mode	C-Max	None	None	C-Max
Maximum Split (s)	75.6	44.4	14.4	61.2
Maximum Split (%)	63.0%	37.0%	12.0%	51.0%
Minimum Split (s)	33	29	8	33
Yellow Time (s)	4.3	3.3	3	4.3
All-Red Time (s)	2	2.7	0	2
Minimum Initial (s)	20	8	5	20
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7		7
Flash Dont Walk (s)	19	16		19

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 72 (60%), Referenced to phase 2:EBTL and 6:WBT, Start of Green	

Splits and Phases: 258: HWY 2 (KINGSTON RD) & FAIRPORT RD

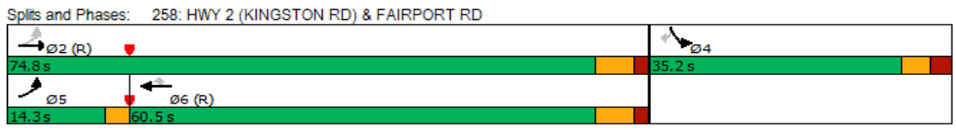


Weekend Peak 08:00 - 21:00

Phase Number	2	4	5	6
Movement	EBTL	SBL	EBL	WBT
Lead/Lag			Lead	Lag
Lead-Lag Optimize			Yes	Yes
Recall Mode	C-Max	None	None	C-Max
Maximum Split (s)	74.8	35.2	14.3	60.5
Maximum Split (%)	68.0%	32.0%	13.0%	55.0%
Minimum Split (s)	33	29	8	33
Yellow Time (s)	4.3	3.3	3	4.3
All-Red Time (s)	2	2.7	0	2
Minimum Initial (s)	20	8	5	20
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7		7
Flash Dont Walk (s)	19	16		19

Intersection Summary	
Cycle Length	110
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 71.5 (65%), Referenced to phase 2:EBTL and 6:WBT, Start of Green	

Splits and Phases: 258: HWY 2 (KINGSTON RD) & FAIRPORT RD



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INTERSECTION SIGNAL TIMING REPORT

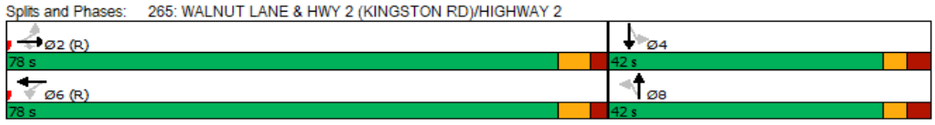
Location	Kingston Rd. and Walnut Ln.				
Date	10-05-24	**C&E No.**	55380908	**Prepared by**	N. Mimay
Prepared for	BA Group				

AM Peak 05:30 - 09:00

Phase Number	2	4	6	8
Movement	EBTL	SBTL	WBTL	NBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	78	42	78	42
Maximum Split (%)	65.0%	35.0%	65.0%	35.0%
Minimum Split (s)	33	36	33	36
Yellow Time (s)	4.4	3.3	4.4	3.3
All-Red Time (s)	2.2	3.2	2.2	3.2
Minimum Initial (s)	20	8	20	8
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	19	22	19	22

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 116.4 (97%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	

Splits and Phases: 265: WALNUT LANE & HWY 2 (KINGSTON RD)/HIGHWAY 2

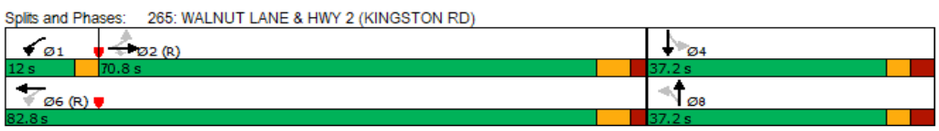


PM Peak 14:30 - 20:00

Phase Number	1	2	4	6	8
Movement	WBL	EBTL	SBTL	WBTL	NBTL
Lead/Lag	Lead	Lag			
Lead-Lag Optimize	Yes	Yes			
Recall Mode	None	C-Max	None	C-Max	None
Maximum Split (s)	12	70.8	37.2	82.8	37.2
Maximum Split (%)	10.0%	59.0%	31.0%	69.0%	31.0%
Minimum Split (s)	8	33	36	33	36
Yellow Time (s)	3	4.4	3.3	4.4	3.3
All-Red Time (s)	0	2.2	3.2	2.2	3.2
Minimum Initial (s)	5	20	8	20	8
Vehicle Extension (s)	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)		7	7	7	7
Flash Dont Walk (s)		19	22	19	22

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 6 (5%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	

Splits and Phases: 265: WALNUT LANE & HWY 2 (KINGSTON RD)

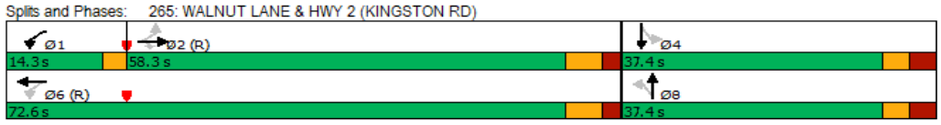


Weekend Peak 08:00 - 21:00

Phase Number	1	2	4	6	8
Movement	WBL	EBTL	SBTL	WBTL	NBTL
Lead/Lag	Lead	Lag			
Lead-Lag Optimize	Yes	Yes			
Recall Mode	None	C-Max	None	C-Max	None
Maximum Split (s)	14.3	58.3	37.4	72.6	37.4
Maximum Split (%)	13.0%	53.0%	34.0%	66.0%	34.0%
Minimum Split (s)	8	33	36	33	36
Yellow Time (s)	3	4.4	3.3	4.4	3.3
All-Red Time (s)	0	2.2	3.2	2.2	3.2
Minimum Initial (s)	5	20	8	20	8
Vehicle Extension (s)	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)		7	7	7	7
Flash Dont Walk (s)		19	22	19	22

Intersection Summary	
Cycle Length	110
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 18.7 (17%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	

Splits and Phases: 265: WALNUT LANE & HWY 2 (KINGSTON RD)



**Please note a concerted effort has been made to ensure the accuracy and completeness of the data provided, however, inadvertent errors or omissions can still occur. Please bring any errors or omissions to the Region's attention.*

Appendix K:
Synchro Results

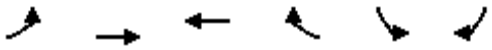
Existing Traffic Conditions



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	745	5	290	635	595	80
Future Volume (vph)	745	5	290	635	595	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.3	3.3	3.5	3.3	3.3
Total Lost time (s)	6.2		2.0	6.2	4.4	4.4
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		1.00	1.00	1.00	1.00
Satd. Flow (prot)	3430		1801	3466	3459	1516
Flt Permitted	1.00		0.29	1.00	1.00	1.00
Satd. Flow (perm)	3430		528	3466	3459	1516
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	776	5	302	661	620	83
RTOR Reduction (vph)	0	0	0	0	0	63
Lane Group Flow (vph)	781	0	302	661	620	20
Heavy Vehicles (%)	4%	0%	2%	3%	3%	3%
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases			6			8
Actuated Green, G (s)	64.5		80.4	80.4	27.0	27.0
Effective Green, g (s)	65.5		81.4	81.4	28.0	28.0
Actuated g/C Ratio	0.55		0.68	0.68	0.23	0.23
Clearance Time (s)	7.2		3.0	7.2	5.4	5.4
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1872		505	2351	807	353
v/s Ratio Prot	c0.23		c0.07	0.19	c0.18	
v/s Ratio Perm			0.34			0.01
v/c Ratio	0.42		0.60	0.28	0.77	0.06
Uniform Delay, d1	16.0		8.6	7.7	43.0	35.7
Progression Factor	1.00		1.24	1.07	1.00	1.00
Incremental Delay, d2	0.7		1.9	0.3	4.4	0.1
Delay (s)	16.7		12.5	8.5	47.4	35.8
Level of Service	B		B	A	D	D
Approach Delay (s)	16.7			9.7	46.0	
Approach LOS	B			A	D	

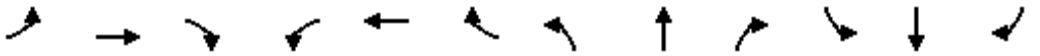
Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.6
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



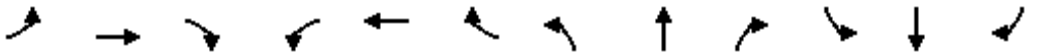
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	110	780	620	120	230	190
Future Volume (vph)	110	780	620	120	230	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.5	3.3	3.3	3.3
Total Lost time (s)	2.0	5.3	5.3	5.3	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1764	3466	3500	1468	1801	1531
Flt Permitted	0.37	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	654	3466	3500	1468	1801	1531
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	115	812	646	125	240	198
RTOR Reduction (vph)	0	0	0	32	0	161
Lane Group Flow (vph)	115	813	646	93	240	37
Confl. Peds. (#/hr)	5			5		
Heavy Vehicles (%)	4%	3%	2%	3%	2%	2%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	86.1	86.1	75.4	75.4	21.6	21.6
Effective Green, g (s)	87.1	87.1	76.4	76.4	22.6	22.6
Actuated g/C Ratio	0.73	0.73	0.64	0.64	0.19	0.19
Clearance Time (s)	3.0	6.3	6.3	6.3	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	555	2515	2228	934	339	288
v/s Ratio Prot	0.02	c0.23	0.18		c0.13	
v/s Ratio Perm	0.14			0.06		0.02
v/c Ratio	0.21	0.32	0.29	0.10	0.71	0.13
Uniform Delay, d1	5.1	5.9	9.7	8.5	45.6	40.5
Progression Factor	0.93	1.36	0.86	0.99	1.00	1.00
Incremental Delay, d2	0.2	0.3	0.3	0.2	6.6	0.2
Delay (s)	4.9	8.4	8.7	8.6	52.2	40.7
Level of Service	A	A	A	A	D	D
Approach Delay (s)		7.9	8.7		47.0	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.3
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



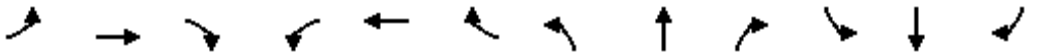
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	760	140	70	520	75	70	15	40	120	45	160
Future Volume (vph)	90	760	140	70	520	75	70	15	40	120	45	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	2.0	5.6	5.6	2.0	5.6	5.6	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95	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	0.97	1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.99	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89		1.00	0.88	
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1814	3433	1508	1816	3466	1493	1739	1548		1693	1616	
Flt Permitted	0.42	1.00	1.00	0.32	1.00	1.00	0.38	1.00		0.72	1.00	
Satd. Flow (perm)	765	3433	1508	578	3466	1493	689	1548		1281	1616	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	97	817	151	75	559	81	75	16	43	129	48	172
RTOR Reduction (vph)	0	0	51	0	0	28	0	36	0	0	124	0
Lane Group Flow (vph)	97	817	100	75	559	53	75	23	0	129	96	0
Confl. Peds. (#/hr)	5		5	5		5	5		10	10		5
Heavy Vehicles (%)	1%	4%	0%	1%	3%	1%	0%	7%	6%	2%	2%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	85.6	78.7	78.7	83.2	77.5	77.5	18.9	18.9		18.9	18.9	
Effective Green, g (s)	87.6	79.7	79.7	85.2	78.5	78.5	19.9	19.9		19.9	19.9	
Actuated g/C Ratio	0.73	0.66	0.66	0.71	0.65	0.65	0.17	0.17		0.17	0.17	
Clearance Time (s)	3.0	6.6	6.6	3.0	6.6	6.6	7.1	7.1		7.1	7.1	
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)	627	2280	1001	479	2267	976	114	256		212	267	
v/s Ratio Prot	c0.01	c0.24		c0.01	0.16			0.01			0.06	
v/s Ratio Perm	0.10		0.07	0.10		0.04	c0.11			0.10		
v/c Ratio	0.15	0.36	0.10	0.16	0.25	0.05	0.66	0.09		0.61	0.36	
Uniform Delay, d1	4.7	8.9	7.2	5.4	8.6	7.4	46.9	42.4		46.4	44.4	
Progression Factor	1.15	1.45	1.75	0.61	0.66	0.43	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.4	0.2	0.2	0.3	0.1	12.9	0.2		4.9	0.8	
Delay (s)	5.5	13.3	12.9	3.5	5.9	3.3	59.8	42.5		51.3	45.2	
Level of Service	A	B	B	A	A	A	E	D		D	D	
Approach Delay (s)		12.5			5.4			52.2			47.5	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



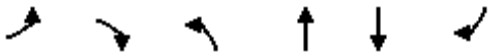
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	840	40	200	565	25	65	10	145	20	15	20
Future Volume (vph)	20	840	40	200	565	25	65	10	145	20	15	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	5.6	5.6	5.6	5.6	5.6		5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00		0.99	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.86		1.00	0.91	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1745	3433	1407	1711	3448		1674	1550		1737	1649	
Flt Permitted	0.42	1.00	1.00	0.31	1.00		0.73	1.00		0.44	1.00	
Satd. Flow (perm)	763	3433	1407	557	3448		1292	1550		808	1649	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	884	42	211	595	26	68	11	153	21	16	21
RTOR Reduction (vph)	0	0	9	0	2	0	0	130	0	0	18	0
Lane Group Flow (vph)	21	884	33	211	619	0	68	34	0	21	19	0
Confl. Peds. (#/hr)			15	15			10		5	5		10
Heavy Vehicles (%)	0%	4%	5%	1%	3%	0%	3%	9%	2%	0%	0%	5%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	92.5	92.5	92.5	92.5	92.5		14.4	14.4		14.4	14.4	
Effective Green, g (s)	93.5	93.5	93.5	93.5	93.5		15.4	15.4		15.4	15.4	
Actuated g/C Ratio	0.78	0.78	0.78	0.78	0.78		0.13	0.13		0.13	0.13	
Clearance Time (s)	6.6	6.6	6.6	6.6	6.6		6.5	6.5		6.5	6.5	
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)	594	2674	1096	433	2686		165	198		103	211	
v/s Ratio Prot		0.26			0.18			0.02			0.01	
v/s Ratio Perm	0.03		0.02	c0.38			c0.05			0.03		
v/c Ratio	0.04	0.33	0.03	0.49	0.23		0.41	0.17		0.20	0.09	
Uniform Delay, d1	3.0	3.9	3.0	4.7	3.6		48.1	46.6		46.8	46.1	
Progression Factor	0.42	0.37	0.40	0.72	0.57		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.3	0.0	3.5	0.2		1.7	0.4		1.0	0.2	
Delay (s)	1.4	1.8	1.3	6.9	2.2		49.8	47.0		47.8	46.3	
Level of Service	A	A	A	A	A		D	D		D	D	
Approach Delay (s)		1.7			3.4			47.8			46.8	
Approach LOS		A			A			D			D	

Intersection Summary					
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A		
HCM 2000 Volume to Capacity ratio	0.48				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.1		
Intersection Capacity Utilization	72.6%	ICU Level of Service	C		
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 (vph)	105	460	225	135	460	45	265	340	135	60	530	105
Future Volume (vph)	105	460	225	135	460	45	265	340	135	60	530	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	2.0	6.1	6.1	2.0	6.1	6.1	0.5	6.0	6.0	2.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.94	1.00	1.00	0.95	1.00	1.00	0.97
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1753	3433	1422	1775	3433	1474	1779	3500	1356	1777	3535	1438
Flt Permitted	0.40	1.00	1.00	0.37	1.00	1.00	0.33	1.00	1.00	0.53	1.00	1.00
Satd. Flow (perm)	695	3433	1422	658	3433	1474	595	3500	1356	948	3535	1438
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	113	495	242	145	495	48	285	366	145	65	570	113
RTOR Reduction (vph)	0	0	162	0	0	32	0	0	88	0	0	74
Lane Group Flow (vph)	113	495	80	145	495	16	285	366	57	65	570	39
Confl. Peds. (#/hr)	35		25	25		35	20		40	40		20
Heavy Vehicles (%)	4%	4%	5%	3%	4%	0%	3%	2%	9%	2%	1%	5%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	47.0	38.5	38.5	49.2	39.6	39.6	54.8	45.8	45.8	46.4	40.4	40.4
Effective Green, g (s)	49.0	39.5	39.5	51.2	40.6	40.6	57.3	46.8	46.8	48.4	41.4	41.4
Actuated g/C Ratio	0.41	0.33	0.33	0.43	0.34	0.34	0.48	0.39	0.39	0.40	0.34	0.34
Clearance Time (s)	3.0	7.1	7.1	3.0	7.1	7.1	3.0	7.0	7.0	3.0	7.0	7.0
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)	367	1130	468	379	1161	498	421	1365	528	430	1219	496
v/s Ratio Prot	0.02	c0.14		c0.03	0.14		c0.08	0.10		0.01	c0.16	
v/s Ratio Perm	0.10		0.06	0.13		0.01	0.24		0.04	0.05		0.03
v/c Ratio	0.31	0.44	0.17	0.38	0.43	0.03	0.68	0.27	0.11	0.15	0.47	0.08
Uniform Delay, d1	22.6	31.6	28.6	21.9	30.7	26.6	20.2	24.9	23.3	22.2	30.7	26.5
Progression Factor	0.88	1.00	2.50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	1.2	0.8	0.6	1.1	0.1	4.3	0.5	0.4	0.2	1.3	0.3
Delay (s)	20.3	32.9	72.1	22.5	31.8	26.7	24.5	25.4	23.7	22.3	32.0	26.8
Level of Service	C	C	E	C	C	C	C	C	C	C	C	C
Approach Delay (s)		42.4			29.5			24.8			30.4	
Approach LOS		D			C			C			C	

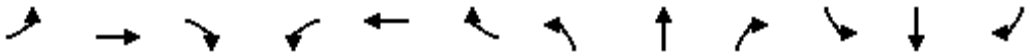
Intersection Summary			
HCM 2000 Control Delay	32.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.1
Intersection Capacity Utilization	90.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	0	0	20	30	20
Future Volume (Veh/h)	15	0	0	20	30	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	20	0	0	26	39	26
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					76	
pX, platoon unblocked						
vC, conflicting volume	78	52	65			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	78	52	65			
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)	930	1021	1550			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	20	26	65
Volume Left	20	0	0
Volume Right	0	0	26
cSH	930	1550	1700
Volume to Capacity	0.02	0.00	0.04
Queue Length 95th (m)	0.5	0.0	0.0
Control Delay (s)	9.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.0	0.0	0.0
Approach LOS	A		

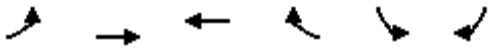
Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	0	0	0	0	0	15	0	0	25	5
Future Volume (Veh/h)	5	0	0	0	0	0	0	15	0	0	25	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Hourly flow rate (vph)	7	0	0	0	0	0	0	22	0	0	37	7
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											142	
pX, platoon unblocked												
vC, conflicting volume	62	62	40	62	66	22	44			22		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	62	62	40	62	66	22	44			22		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	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 %	99	100	100	100	100	100	100			100		
cM capacity (veh/h)	937	832	1036	937	829	1061	1577			1607		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	7	0	22	44
Volume Left	7	0	0	0
Volume Right	0	0	0	7
cSH	937	1700	1577	1607
Volume to Capacity	0.01	0.00	0.00	0.00
Queue Length 95th (m)	0.2	0.0	0.0	0.0
Control Delay (s)	8.9	0.0	0.0	0.0
Lane LOS	A	A		
Approach Delay (s)	8.9	0.0	0.0	0.0
Approach LOS	A	A		

Intersection Summary				
Average Delay	0.9			
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)	5	0	0	10	20	5
Future Volume (Veh/h)	5	0	0	10	20	5
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.56	0.56	0.56	0.56	0.56	0.56
Hourly flow rate (vph)	9	0	0	18	36	9
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)					202	
pX, platoon unblocked						
vC, conflicting volume	94	76	81	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	94	76	81	0	0	
tC, single (s)	7.1	7.0	6.5	6.7	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.5	4.0	3.8	2.2	
p0 queue free %	99	100	100	98	98	
cM capacity (veh/h)	862	715	795	960	1636	

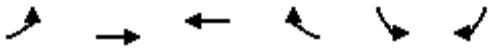
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	9	18	45
Volume Left	9	0	36
Volume Right	0	18	9
cSH	862	960	1636
Volume to Capacity	0.01	0.02	0.02
Queue Length 95th (m)	0.3	0.5	0.5
Control Delay (s)	9.2	8.8	5.8
Lane LOS	A	A	A
Approach Delay (s)	9.2	8.8	5.8
Approach LOS	A	A	

Intersection Summary			
Average Delay	7.0		
Intersection Capacity Utilization	14.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1635	20	185	800	705	105
Future Volume (vph)	1635	20	185	800	705	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.3	3.3	3.5	3.3	3.3
Total Lost time (s)	6.2		1.0	6.2	1.9	4.4
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		1.00	1.00	1.00	1.00
Satd. Flow (prot)	3529		1783	3535	3528	1532
Flt Permitted	1.00		0.06	1.00	1.00	1.00
Satd. Flow (perm)	3529		103	3535	3528	1532
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1703	21	193	833	734	109
RTOR Reduction (vph)	1	0	0	0	0	64
Lane Group Flow (vph)	1723	0	193	833	734	45
Confl. Peds. (#/hr)						5
Heavy Vehicles (%)	1%	0%	3%	1%	1%	0%
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases			6			8
Actuated Green, G (s)	66.1		80.3	80.3	27.1	27.1
Effective Green, g (s)	67.1		82.3	81.3	30.6	28.1
Actuated g/C Ratio	0.56		0.69	0.68	0.26	0.23
Clearance Time (s)	7.2		3.0	7.2	5.4	5.4
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1973		255	2394	899	358
v/s Ratio Prot	c0.49		c0.08	0.24	c0.21	
v/s Ratio Perm			0.43			0.03
v/c Ratio	0.87		0.76	0.35	0.82	0.13
Uniform Delay, d1	22.8		35.2	8.2	42.1	36.3
Progression Factor	1.00		0.91	1.64	1.00	1.00
Incremental Delay, d2	5.7		11.5	0.4	5.8	0.2
Delay (s)	28.5		43.5	13.7	47.9	36.4
Level of Service	C		D	B	D	D
Approach Delay (s)	28.5			19.3	46.4	
Approach LOS	C			B	D	

Intersection Summary			
HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.1
Intersection Capacity Utilization	88.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

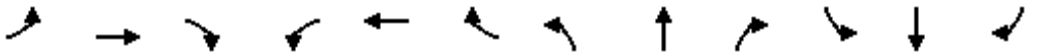


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	225	1520	820	215	255	140
Future Volume (vph)	225	1520	820	215	255	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.5	3.3	3.3	3.3
Total Lost time (s)	2.0	5.3	5.3	5.3	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.97	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1835	3535	3500	1497	1818	1515
Flt Permitted	0.28	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	519	3535	3500	1497	1818	1515
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	230	1551	837	219	260	143
RTOR Reduction (vph)	0	0	0	52	0	115
Lane Group Flow (vph)	230	1551	837	167	260	28
Confl. Peds. (#/hr)	5			5		5
Heavy Vehicles (%)	0%	1%	2%	1%	1%	1%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	85.1	85.1	71.9	71.9	22.6	22.6
Effective Green, g (s)	86.1	86.1	72.9	72.9	23.6	23.6
Actuated g/C Ratio	0.72	0.72	0.61	0.61	0.20	0.20
Clearance Time (s)	3.0	6.3	6.3	6.3	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	495	2536	2126	909	357	297
v/s Ratio Prot	0.04	c0.44	0.24		c0.14	
v/s Ratio Perm	0.29			0.11		0.02
v/c Ratio	0.46	0.61	0.39	0.18	0.73	0.09
Uniform Delay, d1	6.4	8.5	12.1	10.4	45.2	39.5
Progression Factor	0.21	0.03	0.66	0.49	1.00	1.00
Incremental Delay, d2	0.4	0.6	0.5	0.4	7.2	0.1
Delay (s)	1.7	0.9	8.6	5.5	52.4	39.6
Level of Service	A	A	A	A	D	D
Approach Delay (s)		1.0	8.0		47.9	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	9.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.3
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

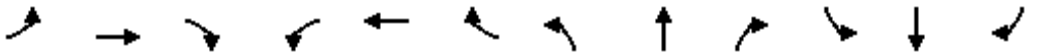
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	1420	165	80	775	145	140	70	80	130	50	100
Future Volume (vph)	225	1420	165	80	775	145	140	70	80	130	50	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	2.0	5.6	5.6	2.0	5.6	5.6	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.97	1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.98	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92		1.00	0.90	
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1835	3535	1486	1783	3500	1508	1720	1697		1699	1671	
Flt Permitted	0.28	1.00	1.00	0.10	1.00	1.00	0.56	1.00		0.56	1.00	
Satd. Flow (perm)	507	3535	1486	170	3500	1508	1017	1697		1004	1671	
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)	245	1543	179	87	842	158	152	76	87	141	54	109
RTOR Reduction (vph)	0	0	40	0	0	66	0	43	0	0	75	0
Lane Group Flow (vph)	245	1543	139	87	842	92	152	120	0	141	88	0
Confl. Peds. (#/hr)	5		10	10		5	5		20	20		5
Heavy Vehicles (%)	0%	1%	0%	3%	2%	0%	1%	0%	0%	1%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	83.0	72.2	72.2	76.9	69.1	69.1	23.3	23.3		23.3	23.3	
Effective Green, g (s)	84.0	73.2	73.2	78.9	70.1	70.1	24.3	24.3		24.3	24.3	
Actuated g/C Ratio	0.70	0.61	0.61	0.66	0.58	0.58	0.20	0.20		0.20	0.20	
Clearance Time (s)	3.0	6.6	6.6	3.0	6.6	6.6	7.1	7.1		7.1	7.1	
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)	486	2156	906	230	2044	880	205	343		203	338	
v/s Ratio Prot	c0.05	c0.44		0.03	0.24			0.07			0.05	
v/s Ratio Perm	0.30		0.09	0.22		0.06	c0.15			0.14		
v/c Ratio	0.50	0.72	0.15	0.38	0.41	0.10	0.74	0.35		0.69	0.26	
Uniform Delay, d1	7.3	16.2	10.1	12.6	13.7	11.1	44.9	41.1		44.4	40.3	
Progression Factor	0.66	1.05	0.81	2.16	0.69	0.29	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	1.8	0.3	1.0	0.6	0.2	13.5	0.6		9.9	0.4	
Delay (s)	5.6	18.8	8.5	28.3	10.0	3.4	58.4	41.7		54.3	40.7	
Level of Service	A	B	A	C	B	A	E	D		D	D	
Approach Delay (s)		16.2			10.5			49.7			47.0	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	19.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



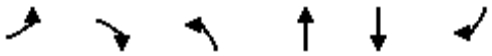
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	1495	50	190	820	35	135	40	200	25	25	25
Future Volume (vph)	45	1495	50	190	820	35	135	40	200	25	25	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	5.6	5.6	5.6	2.0	5.6		5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		0.98	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.88		1.00	0.93	
Flt Protected	0.95	1.00	1.00	1.00	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1739	3535	1477	1837	3477		1705	1612		1739	1706	
Flt Permitted	0.32	1.00	1.00	0.08	1.00		0.72	1.00		0.31	1.00	
Satd. Flow (perm)	585	3535	1477	155	3477		1297	1612		571	1706	
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)	47	1557	52	198	854	36	141	42	208	26	26	26
RTOR Reduction (vph)	0	0	21	0	2	0	0	125	0	0	21	0
Lane Group Flow (vph)	47	1557	31	198	888	0	141	125	0	26	31	0
Confl. Peds. (#/hr)	5		15	15		5	20		5	5		20
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	3%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	71.6	71.6	71.6	86.4	86.4		20.5	20.5		20.5	20.5	
Effective Green, g (s)	72.6	72.6	72.6	87.4	87.4		21.5	21.5		21.5	21.5	
Actuated g/C Ratio	0.60	0.60	0.60	0.73	0.73		0.18	0.18		0.18	0.18	
Clearance Time (s)	6.6	6.6	6.6	3.0	6.6		6.5	6.5		6.5	6.5	
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)	353	2138	893	292	2532		232	288		102	305	
v/s Ratio Prot		c0.44		c0.07	0.26			0.08			0.02	
v/s Ratio Perm	0.08		0.02	0.42			c0.11			0.05		
v/c Ratio	0.13	0.73	0.04	0.68	0.35		0.61	0.43		0.25	0.10	
Uniform Delay, d1	10.2	16.7	9.6	23.7	5.9		45.4	43.8		42.4	41.2	
Progression Factor	1.20	0.80	2.39	1.49	0.48		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	1.6	0.1	5.3	0.3		4.5	1.1		1.3	0.1	
Delay (s)	12.8	15.1	23.0	40.6	3.2		49.8	44.9		43.7	41.3	
Level of Service	B	B	C	D	A		D	D		D	D	
Approach Delay (s)		15.3			10.0			46.7			42.1	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.1
Intersection Capacity Utilization	86.9%	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 (vph)	230	1000	355	225	580	70	345	815	285	100	490	115
Future Volume (vph)	230	1000	355	225	580	70	345	815	285	100	490	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	2.0	6.1	6.1	0.0	6.1	6.1	1.0	6.0	6.0	2.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.94	1.00	1.00	0.91	1.00	1.00	0.89	1.00	1.00	0.94
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	0.99	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1821	3535	1449	1836	3500	1424	1787	3570	1335	1828	3535	1470
Flt Permitted	0.34	1.00	1.00	0.10	1.00	1.00	0.38	1.00	1.00	0.23	1.00	1.00
Satd. Flow (perm)	612	3535	1449	182	3500	1424	683	3570	1335	419	3535	1470
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	230	1000	355	225	580	70	345	815	285	100	490	115
RTOR Reduction (vph)	0	0	176	0	0	46	0	0	144	0	0	76
Lane Group Flow (vph)	230	1000	179	225	580	24	345	815	141	100	490	39
Confl. Peds. (#/hr)	60		40	40		60	45		95	95		45
Heavy Vehicles (%)	0%	1%	1%	0%	2%	0%	2%	0%	4%	0%	1%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	47.5	38.5	38.5	49.9	39.7	39.7	54.2	43.7	43.7	47.3	39.8	39.8
Effective Green, g (s)	49.5	39.5	39.5	54.7	40.7	40.7	56.2	44.7	44.7	49.3	40.8	40.8
Actuated g/C Ratio	0.41	0.33	0.33	0.46	0.34	0.34	0.47	0.37	0.37	0.41	0.34	0.34
Clearance Time (s)	3.0	7.1	7.1	3.0	7.1	7.1	3.0	7.0	7.0	3.0	7.0	7.0
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)	353	1163	476	264	1187	482	443	1329	497	271	1201	499
v/s Ratio Prot	0.05	c0.28		c0.09	0.17		c0.09	c0.23		0.03	0.14	
v/s Ratio Perm	0.21		0.12	0.29		0.02	0.28		0.11	0.13		0.03
v/c Ratio	0.65	0.86	0.38	0.85	0.49	0.05	0.78	0.61	0.28	0.37	0.41	0.08
Uniform Delay, d1	24.3	37.7	30.8	30.4	31.4	26.6	22.5	30.6	26.4	23.0	30.3	26.9
Progression Factor	0.68	0.74	0.59	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.1	6.2	1.6	22.4	1.4	0.2	8.4	2.1	1.4	0.9	1.0	0.3
Delay (s)	19.5	33.9	19.8	52.8	32.8	26.8	30.9	32.7	27.9	23.8	31.4	27.2
Level of Service	B	C	B	D	C	C	C	C	C	C	C	C
Approach Delay (s)		28.7			37.5			31.3			29.6	
Approach LOS		C			D			C			C	

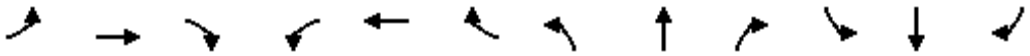
Intersection Summary			
HCM 2000 Control Delay	31.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.1
Intersection Capacity Utilization	104.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	0	0	70	35	35
Future Volume (Veh/h)	25	0	0	70	35	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)	27	0	0	76	38	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)					76	
pX, platoon unblocked						
vC, conflicting volume	133	57	76			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	133	57	76			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	100	100			
cM capacity (veh/h)	866	1015	1536			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	27	76	76
Volume Left	27	0	0
Volume Right	0	0	38
cSH	866	1536	1700
Volume to Capacity	0.03	0.00	0.04
Queue Length 95th (m)	0.8	0.0	0.0
Control Delay (s)	9.3	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.3	0.0	0.0
Approach LOS	A		

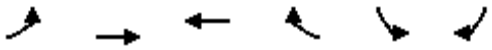
Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	14.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	0	0	5	25	0	30	0	0	25	10
Future Volume (Veh/h)	15	0	0	0	5	25	0	30	0	0	25	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	18	0	0	0	6	30	0	36	0	0	30	12
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											142	
pX, platoon unblocked												
vC, conflicting volume	105	72	36	72	78	36	42			36		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	105	72	36	72	78	36	42			36		
tC, single (s)	7.2	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	100	100	99	97	100			100		
cM capacity (veh/h)	831	822	1042	924	816	1042	1580			1588		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	18	36	36	42
Volume Left	18	0	0	0
Volume Right	0	30	0	12
cSH	831	996	1580	1588
Volume to Capacity	0.02	0.04	0.00	0.00
Queue Length 95th (m)	0.5	0.9	0.0	0.0
Control Delay (s)	9.4	8.7	0.0	0.0
Lane LOS	A	A		
Approach Delay (s)	9.4	8.7	0.0	0.0
Approach LOS	A	A		

Intersection Summary				
Average Delay	3.7			
Intersection Capacity Utilization	17.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	0	0	15	20	5
Future Volume (Veh/h)	15	0	0	15	20	5
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	16	0	0	16	21	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)					202	
pX, platoon unblocked						
vC, conflicting volume	60	44	47	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	60	44	47	0	0	
tC, single (s)	7.1	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.2	
p0 queue free %	98	100	100	99	99	
cM capacity (veh/h)	917	840	838	1091	1636	

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	16	16	26
Volume Left	16	0	21
Volume Right	0	16	5
cSH	917	1091	1636
Volume to Capacity	0.02	0.01	0.01
Queue Length 95th (m)	0.4	0.4	0.3
Control Delay (s)	9.0	8.3	5.9
Lane LOS	A	A	A
Approach Delay (s)	9.0	8.3	5.9
Approach LOS	A	A	

Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	17.5%	ICU Level of Service	A
Analysis Period (min)	15		

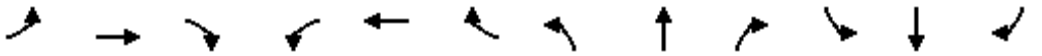
2030 Future Background Traffic Conditions



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	920	50	300	695	630	85
Future Volume (vph)	920	50	300	695	630	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.3	3.3	3.5	3.3	3.3
Total Lost time (s)	6.2		3.0	6.2	6.0	6.0
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		1.00	1.00	1.00	1.00
Satd. Flow (prot)	3413		1801	3466	3459	1516
Flt Permitted	1.00		1.00	1.00	1.00	1.00
Satd. Flow (perm)	3413		1801	3466	3459	1516
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	920	50	300	695	630	85
RTOR Reduction (vph)	3	0	0	0	0	49
Lane Group Flow (vph)	967	0	300	695	630	36
Heavy Vehicles (%)	4%	0%	2%	3%	3%	3%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	63.9		28.1	96.0	29.8	29.8
Effective Green, g (s)	64.9		29.1	97.0	30.8	30.8
Actuated g/C Ratio	0.46		0.21	0.69	0.22	0.22
Clearance Time (s)	7.2		4.0	7.2	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1582		374	2401	760	333
v/s Ratio Prot	c0.28		c0.17	0.20	c0.18	
v/s Ratio Perm						0.02
v/c Ratio	0.61		0.80	0.29	0.83	0.11
Uniform Delay, d1	28.1		52.7	8.3	52.1	43.6
Progression Factor	1.00		1.39	0.79	1.00	1.00
Incremental Delay, d2	1.8		11.4	0.3	7.5	0.1
Delay (s)	29.9		84.7	6.8	59.5	43.8
Level of Service	C		F	A	E	D
Approach Delay (s)	29.9			30.3	57.7	
Approach LOS	C			C	E	

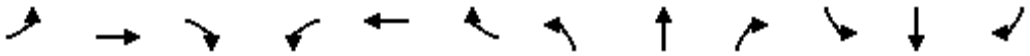
Intersection Summary			
HCM 2000 Control Delay	37.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.2
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



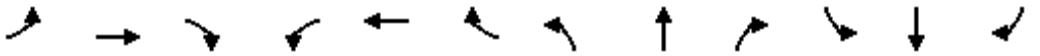
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	890	20	15	615	120	35	5	5	230	5	195
Future Volume (vph)	160	890	20	15	615	120	35	5	5	230	5	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Total Lost time (s)	3.0	5.3		5.3	5.3		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		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	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.98		1.00	0.93		1.00	0.85	
Flt Protected	1.00	1.00		0.95	1.00		0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1766	3455		1711	3390		1711	1666		1801	1537	
Flt Permitted	1.00	1.00		0.31	1.00		0.48	1.00		0.75	1.00	
Satd. Flow (perm)	1766	3455		564	3390		857	1666		1352	1537	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	160	890	20	15	615	120	35	5	5	230	5	195
RTOR Reduction (vph)	0	1	0	0	10	0	0	4	0	0	153	0
Lane Group Flow (vph)	160	909	0	15	725	0	35	6	0	230	47	0
Confl. Peds. (#/hr)	5					5						
Heavy Vehicles (%)	4%	3%	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases				6			8			4		
Actuated Green, G (s)	17.9	97.3		75.4	75.4		29.1	29.1		29.1	29.1	
Effective Green, g (s)	18.9	98.3		76.4	76.4		30.1	30.1		30.1	30.1	
Actuated g/C Ratio	0.13	0.70		0.55	0.55		0.22	0.22		0.22	0.22	
Clearance Time (s)	4.0	6.3		6.3	6.3		7.3	7.3		7.3	7.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	238	2425		307	1849		184	358		290	330	
v/s Ratio Prot	c0.09	0.26			c0.21			0.00			0.03	
v/s Ratio Perm				0.03			0.04			c0.17		
v/c Ratio	0.67	0.37		0.05	0.39		0.19	0.02		0.79	0.14	
Uniform Delay, d1	57.6	8.4		14.8	18.4		45.0	43.3		52.0	44.5	
Progression Factor	0.80	2.29		1.63	1.49		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.2	0.4		0.3	0.6		0.5	0.0		13.8	0.2	
Delay (s)	52.2	19.7		24.5	27.9		45.5	43.3		65.8	44.7	
Level of Service	D	B		C	C		D	D		E	D	
Approach Delay (s)		24.6			27.9			45.0			56.0	
Approach LOS		C			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	31.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.6
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



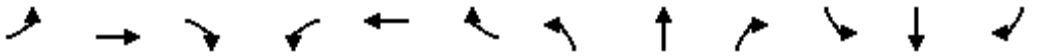
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	145	825	155	70	515	75	70	15	45	125	45	165
Future Volume (vph)	145	825	155	70	515	75	70	15	45	125	45	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.2		3.0	6.2		6.4	6.4		6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.89		1.00	0.88	
Flt Protected	1.00	1.00		1.00	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1818	3352		1818	3392		1738	1541		1692	1615	
Flt Permitted	1.00	1.00		1.00	1.00		0.40	1.00		0.72	1.00	
Satd. Flow (perm)	1818	3352		1818	3392		725	1541		1278	1615	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	145	825	155	70	515	75	70	15	45	125	45	165
RTOR Reduction (vph)	0	7	0	0	6	0	0	37	0	0	114	0
Lane Group Flow (vph)	145	973	0	70	584	0	70	23	0	125	96	0
Confl. Peds. (#/hr)	5		5	5		5	5		10	10		5
Heavy Vehicles (%)	1%	4%	0%	1%	3%	1%	0%	7%	6%	2%	2%	1%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	16.4	88.8		9.4	81.8		23.2	23.2		23.2	23.2	
Effective Green, g (s)	17.4	89.8		10.4	82.8		24.2	24.2		24.2	24.2	
Actuated g/C Ratio	0.12	0.64		0.07	0.59		0.17	0.17		0.17	0.17	
Clearance Time (s)	4.0	7.2		4.0	7.2		7.4	7.4		7.4	7.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	225	2150		135	2006		125	266		220	279	
v/s Ratio Prot	c0.08	c0.29		0.04	0.17			0.01			0.06	
v/s Ratio Perm							0.10			c0.10		
v/c Ratio	0.64	0.45		0.52	0.29		0.56	0.09		0.57	0.34	
Uniform Delay, d1	58.4	12.7		62.4	14.1		53.0	48.6		53.1	50.9	
Progression Factor	1.19	0.37		1.27	0.49		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.8	0.6		3.3	0.4		5.6	0.1		3.3	0.7	
Delay (s)	75.3	5.4		82.5	7.3		58.7	48.8		56.5	51.7	
Level of Service	E	A		F	A		E	D		E	D	
Approach Delay (s)		14.4			15.2			54.1			53.4	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



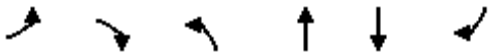
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	935	45	175	605	25	20	10	135	20	15	20
Future Volume (vph)	20	935	45	175	605	25	20	10	135	20	15	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	5.6		3.0	5.6		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.86		1.00	0.91	
Flt Protected	1.00	1.00		1.00	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1837	3398		1818	3449		1673	1550		1736	1646	
Flt Permitted	1.00	1.00		1.00	1.00		0.73	1.00		0.51	1.00	
Satd. Flow (perm)	1837	3398		1818	3449		1293	1550		931	1646	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	935	45	175	605	25	20	10	135	20	15	20
RTOR Reduction (vph)	0	2	0	0	1	0	0	117	0	0	17	0
Lane Group Flow (vph)	20	978	0	175	629	0	20	28	0	20	18	0
Confl. Peds. (#/hr)			15	15			10		5	5		10
Heavy Vehicles (%)	0%	4%	5%	1%	3%	0%	3%	9%	2%	0%	0%	5%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	4.8	85.9		18.6	99.7		17.6	17.6		17.6	17.6	
Effective Green, g (s)	5.8	86.9		19.6	100.7		18.6	18.6		18.6	18.6	
Actuated g/C Ratio	0.04	0.62		0.14	0.72		0.13	0.13		0.13	0.13	
Clearance Time (s)	4.0	6.6		4.0	6.6		7.3	7.3		7.3	7.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	76	2109		254	2480		171	205		123	218	
v/s Ratio Prot	0.01	c0.29		c0.10	0.18			0.02			0.01	
v/s Ratio Perm							0.02			c0.02		
v/c Ratio	0.26	0.46		0.69	0.25		0.12	0.14		0.16	0.08	
Uniform Delay, d1	65.0	14.1		57.3	6.7		53.5	53.6		53.8	53.2	
Progression Factor	0.98	0.94		0.88	1.79		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	0.7		7.0	0.2		0.3	0.3		0.6	0.2	
Delay (s)	65.2	13.9		57.6	12.3		53.8	53.9		54.4	53.4	
Level of Service	E	B		E	B		D	D		D	D	
Approach Delay (s)		15.0			22.2			53.9			53.8	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	22.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
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 (vph)	165	405	300	145	370	45	295	340	135	65	580	145
Future Volume (vph)	165	405	300	145	370	45	295	340	135	65	580	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.1	6.1	3.0	6.1	6.1	0.5	6.8	6.8	2.0	6.8	6.8
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1766	3433	1414	1783	3433	1462	1780	3500	1351	1774	3535	1436
Flt Permitted	1.00	1.00	1.00	1.00	1.00	1.00	0.24	1.00	1.00	0.55	1.00	1.00
Satd. Flow (perm)	1766	3433	1414	1783	3433	1462	434	3500	1351	971	3535	1436
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	165	405	300	145	370	45	295	340	135	65	580	145
RTOR Reduction (vph)	0	0	195	0	0	30	0	0	89	0	0	110
Lane Group Flow (vph)	165	405	105	145	370	15	295	340	46	65	580	35
Confl. Peds. (#/hr)	35		25	25		35	20		40	40		20
Heavy Vehicles (%)	4%	4%	5%	3%	4%	0%	3%	2%	9%	2%	1%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	18.1	47.9	47.9	16.6	46.4	46.4	56.6	46.6	46.6	39.4	32.4	32.4
Effective Green, g (s)	19.1	48.9	48.9	17.6	47.4	47.4	59.1	47.6	47.6	41.4	33.4	33.4
Actuated g/C Ratio	0.14	0.35	0.35	0.13	0.34	0.34	0.42	0.34	0.34	0.30	0.24	0.24
Clearance Time (s)	4.0	7.1	7.1	4.0	7.1	7.1	3.0	7.8	7.8	3.0	7.8	7.8
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)	240	1199	493	224	1162	494	411	1190	459	333	843	342
v/s Ratio Prot	c0.09	c0.12		0.08	0.11		c0.12	0.10		0.01	c0.16	
v/s Ratio Perm			0.07			0.01	0.18		0.03	0.05		0.02
v/c Ratio	0.69	0.34	0.21	0.65	0.32	0.03	0.72	0.29	0.10	0.20	0.69	0.10
Uniform Delay, d1	57.6	33.6	32.0	58.2	34.3	30.9	29.4	33.8	31.6	36.0	48.6	41.6
Progression Factor	1.16	1.22	3.68	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.3	0.7	0.9	6.3	0.7	0.1	5.9	0.1	0.1	0.3	2.4	0.1
Delay (s)	74.3	41.8	118.6	64.5	35.0	31.1	35.3	33.9	31.7	36.3	50.9	41.7
Level of Service	E	D	F	E	D	C	D	C	C	D	D	D
Approach Delay (s)		74.5			42.4			34.0			48.0	
Approach LOS		E			D			C			D	

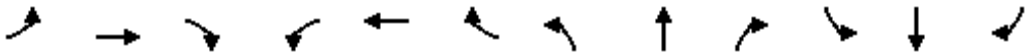
Intersection Summary			
HCM 2000 Control Delay	51.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.9
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	0	0	25	30	20
Future Volume (Veh/h)	15	0	0	25	30	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	0	0	25	30	20
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					76	
pX, platoon unblocked						
vC, conflicting volume	65	40	50			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	65	40	50			
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)	946	1037	1570			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	15	25	50
Volume Left	15	0	0
Volume Right	0	0	20
cSH	946	1570	1700
Volume to Capacity	0.02	0.00	0.03
Queue Length 95th (m)	0.4	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		

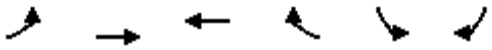
Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	0	0	0	5	0	15	0	0	25	5
Future Volume (Veh/h)	5	0	0	0	0	5	0	15	0	0	25	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	0	0	0	0	5	0	15	0	0	25	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)											142	
pX, platoon unblocked												
vC, conflicting volume	48	42	28	42	45	15	30			15		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	48	42	28	42	45	15	30			15		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	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 %	99	100	100	100	100	100	100			100		
cM capacity (veh/h)	949	849	1048	966	847	1070	1583			1616		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	5	15	30
Volume Left	5	0	0	0
Volume Right	0	5	0	5
cSH	949	1070	1583	1616
Volume to Capacity	0.01	0.00	0.00	0.00
Queue Length 95th (m)	0.1	0.1	0.0	0.0
Control Delay (s)	8.8	8.4	0.0	0.0
Lane LOS	A	A		
Approach Delay (s)	8.8	8.4	0.0	0.0
Approach LOS	A	A		

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	14.2%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	0	0	10	20	5
Future Volume (Veh/h)	5	0	0	10	20	5
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	0	0	10	20	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)					202	
pX, platoon unblocked						
vC, conflicting volume	52	42	45	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	52	42	45	0	0	
tC, single (s)	7.1	7.0	6.5	6.7	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.5	4.0	3.8	2.2	
p0 queue free %	99	100	100	99	99	
cM capacity (veh/h)	933	755	840	960	1636	

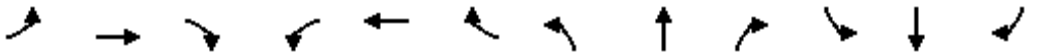
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	5	10	25
Volume Left	5	0	20
Volume Right	0	10	5
cSH	933	960	1636
Volume to Capacity	0.01	0.01	0.01
Queue Length 95th (m)	0.1	0.3	0.3
Control Delay (s)	8.9	8.8	5.8
Lane LOS	A	A	A
Approach Delay (s)	8.9	8.8	5.8
Approach LOS	A	A	

Intersection Summary			
Average Delay	6.9		
Intersection Capacity Utilization	14.2%	ICU Level of Service	A
Analysis Period (min)	15		



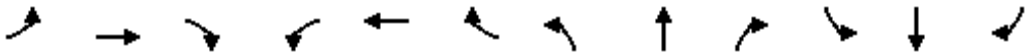
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1755	35	175	925	725	155
Future Volume (vph)	1755	35	175	925	725	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.3	3.3	3.5	3.3	3.3
Total Lost time (s)	6.2		2.0	6.2	3.5	6.0
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		1.00	1.00	1.00	1.00
Satd. Flow (prot)	3525		1783	3535	3528	1531
Flt Permitted	1.00		1.00	1.00	1.00	1.00
Satd. Flow (perm)	3525		1783	3535	3528	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1755	35	175	925	725	155
RTOR Reduction (vph)	1	0	0	0	0	77
Lane Group Flow (vph)	1789	0	175	925	725	78
Confl. Peds. (#/hr)						5
Heavy Vehicles (%)	1%	0%	3%	1%	1%	0%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	77.6		15.4	97.0	28.8	28.8
Effective Green, g (s)	78.6		17.4	98.0	32.3	29.8
Actuated g/C Ratio	0.56		0.12	0.70	0.23	0.21
Clearance Time (s)	7.2		4.0	7.2	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1979		221	2474	813	325
v/s Ratio Prot	c0.51		c0.10	0.26	c0.21	
v/s Ratio Perm						0.05
v/c Ratio	0.90		0.79	0.37	0.89	0.24
Uniform Delay, d1	27.3		59.5	8.5	52.2	45.7
Progression Factor	1.00		1.27	0.38	1.00	1.00
Incremental Delay, d2	7.3		15.3	0.4	12.0	0.4
Delay (s)	34.7		91.1	3.7	64.2	46.1
Level of Service	C		F	A	E	D
Approach Delay (s)	34.7			17.6	61.0	
Approach LOS	C			B	E	

Intersection Summary			
HCM 2000 Control Delay	35.8	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)	11.7
Intersection Capacity Utilization	92.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



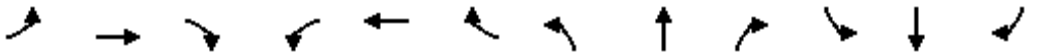
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	295	1580	40	25	825	215	35	10	10	255	10	155
Future Volume (vph)	295	1580	40	25	825	215	35	10	10	255	10	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Total Lost time (s)	3.0	5.3		5.3	5.3		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		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	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.97		1.00	0.93		1.00	0.86	
Flt Protected	1.00	1.00		0.95	1.00		0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1837	3521		1711	3375		1711	1666		1818	1535	
Flt Permitted	1.00	1.00		0.15	1.00		0.56	1.00		0.74	1.00	
Satd. Flow (perm)	1837	3521		262	3375		1004	1666		1354	1535	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	295	1580	40	25	825	215	35	10	10	255	10	155
RTOR Reduction (vph)	0	1	0	0	16	0	0	8	0	0	120	0
Lane Group Flow (vph)	295	1619	0	25	1024	0	35	12	0	255	45	0
Confl. Peds. (#/hr)	5					5						5
Heavy Vehicles (%)	0%	1%	2%	2%	2%	1%	2%	2%	2%	1%	2%	1%
Turn Type	Prot	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases				6			8			4		
Actuated Green, G (s)	26.3	95.7		65.4	65.4		30.7	30.7		30.7	30.7	
Effective Green, g (s)	27.3	96.7		66.4	66.4		31.7	31.7		31.7	31.7	
Actuated g/C Ratio	0.20	0.69		0.47	0.47		0.23	0.23		0.23	0.23	
Clearance Time (s)	4.0	6.3		6.3	6.3		7.3	7.3		7.3	7.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	358	2432		124	1600		227	377		306	347	
v/s Ratio Prot	c0.16	c0.46			0.30			0.01			0.03	
v/s Ratio Perm				0.10			0.03			c0.19		
v/c Ratio	0.82	0.67		0.20	0.64		0.15	0.03		0.83	0.13	
Uniform Delay, d1	54.0	12.4		21.4	27.8		43.4	42.2		51.6	43.2	
Progression Factor	0.76	2.12		1.59	1.43		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.4	0.7		3.2	1.8		0.3	0.0		17.4	0.2	
Delay (s)	48.7	27.0		37.3	41.5		43.7	42.2		69.0	43.3	
Level of Service	D	C		D	D		D	D		E	D	
Approach Delay (s)		30.4			41.4			43.2			58.9	
Approach LOS		C			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	37.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.6
Intersection Capacity Utilization	101.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



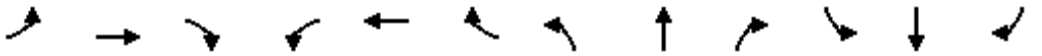
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	245	1415	220	80	765	145	140	70	80	130	50	125
Future Volume (vph)	245	1415	220	80	765	145	140	70	80	130	50	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.2		3.0	6.2		6.4	6.4		6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.98	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.92		1.00	0.89	
Flt Protected	1.00	1.00		1.00	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1837	3443		1783	3407		1720	1696		1696	1656	
Flt Permitted	1.00	1.00		1.00	1.00		0.51	1.00		0.56	1.00	
Satd. Flow (perm)	1837	3443		1783	3407		917	1696		1008	1656	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	245	1415	220	80	765	145	140	70	80	130	50	125
RTOR Reduction (vph)	0	8	0	0	9	0	0	32	0	0	71	0
Lane Group Flow (vph)	245	1627	0	80	901	0	140	118	0	130	104	0
Confl. Peds. (#/hr)	5		10	10		5	5		20	20		5
Heavy Vehicles (%)	0%	1%	0%	3%	2%	0%	1%	0%	0%	1%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	23.8	85.9		9.8	71.9		25.7	25.7		25.7	25.7	
Effective Green, g (s)	24.8	86.9		10.8	72.9		26.7	26.7		26.7	26.7	
Actuated g/C Ratio	0.18	0.62		0.08	0.52		0.19	0.19		0.19	0.19	
Clearance Time (s)	4.0	7.2		4.0	7.2		7.4	7.4		7.4	7.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	325	2137		137	1774		174	323		192	315	
v/s Ratio Prot	c0.13	c0.47		0.04	0.26			0.07			0.06	
v/s Ratio Perm							c0.15			0.13		
v/c Ratio	0.75	0.76		0.58	0.51		0.80	0.36		0.68	0.33	
Uniform Delay, d1	54.7	19.1		62.4	21.9		54.2	49.3		52.6	48.9	
Progression Factor	1.00	1.00		1.01	0.65		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.3	2.0		5.9	1.0		23.0	0.7		9.1	0.6	
Delay (s)	62.3	21.0		68.7	15.1		77.1	50.0		61.7	49.5	
Level of Service	E	C		E	B		E	D		E	D	
Approach Delay (s)		26.4			19.5			63.1			54.7	
Approach LOS		C			B			E			D	

Intersection Summary			
HCM 2000 Control Delay	30.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	96.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



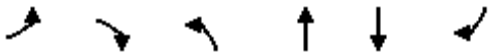
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	1530	55	80	915	35	30	40	90	25	25	25
Future Volume (vph)	45	1530	55	80	915	35	30	40	90	25	25	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	5.6		3.0	5.6		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		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	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.98	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.90		1.00	0.93	
Flt Protected	1.00	1.00		1.00	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1837	3510		1837	3479		1702	1647		1736	1705	
Flt Permitted	1.00	1.00		1.00	1.00		0.72	1.00		0.56	1.00	
Satd. Flow (perm)	1837	3510		1837	3479		1298	1647		1029	1705	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	45	1530	55	80	915	35	30	40	90	25	25	25
RTOR Reduction (vph)	0	1	0	0	1	0	0	66	0	0	22	0
Lane Group Flow (vph)	45	1584	0	80	949	0	30	64	0	25	28	0
Confl. Peds. (#/hr)	5		15	15		5	20		5	5		20
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	3%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	6.7	92.7		11.4	97.4		18.0	18.0		18.0	18.0	
Effective Green, g (s)	7.7	93.7		12.4	98.4		19.0	19.0		19.0	19.0	
Actuated g/C Ratio	0.06	0.67		0.09	0.70		0.14	0.14		0.14	0.14	
Clearance Time (s)	4.0	6.6		4.0	6.6		7.3	7.3		7.3	7.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	101	2349		162	2445		176	223		139	231	
v/s Ratio Prot	0.02	c0.45		c0.04	0.27			c0.04			0.02	
v/s Ratio Perm							0.02			0.02		
v/c Ratio	0.45	0.67		0.49	0.39		0.17	0.29		0.18	0.12	
Uniform Delay, d1	64.1	14.0		60.8	8.5		53.5	54.4		53.6	53.2	
Progression Factor	1.07	0.64		1.02	0.57		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.1	1.1		1.8	0.4		0.5	0.7		0.6	0.2	
Delay (s)	70.6	10.0		63.8	5.2		54.0	55.1		54.2	53.4	
Level of Service	E	B		E	A		D	E		D	D	
Approach Delay (s)		11.7			9.7			54.9			53.7	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	85.4%	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 (vph)	320	860	415	225	510	70	415	820	285	100	500	135
Future Volume (vph)	320	860	415	225	510	70	415	820	285	100	500	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.1	6.1	1.0	6.1	6.1	1.0	6.8	6.8	2.0	6.8	6.8
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.93	1.00	1.00	0.90	1.00	1.00	0.88	1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1837	3535	1436	1837	3500	1405	1790	3570	1324	1824	3535	1464
Flt Permitted	1.00	1.00	1.00	1.00	1.00	1.00	0.31	1.00	1.00	0.26	1.00	1.00
Satd. Flow (perm)	1837	3535	1436	1837	3500	1405	557	3570	1324	474	3535	1464
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	320	860	415	225	510	70	415	820	285	100	500	135
RTOR Reduction (vph)	0	0	182	0	0	52	0	0	125	0	0	102
Lane Group Flow (vph)	320	860	233	225	510	18	415	820	160	100	500	33
Confl. Peds. (#/hr)	60		40	40		60	45		95	95		45
Heavy Vehicles (%)	0%	1%	1%	0%	2%	0%	2%	0%	4%	0%	1%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	27.5	45.0	45.0	17.6	35.1	35.1	58.5	47.3	47.3	41.7	33.5	33.5
Effective Green, g (s)	28.5	46.0	46.0	20.6	36.1	36.1	60.5	48.3	48.3	43.7	34.5	34.5
Actuated g/C Ratio	0.20	0.33	0.33	0.15	0.26	0.26	0.43	0.34	0.34	0.31	0.25	0.25
Clearance Time (s)	4.0	7.1	7.1	4.0	7.1	7.1	3.0	7.8	7.8	3.0	7.8	7.8
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)	373	1161	471	270	902	362	452	1231	456	236	871	360
v/s Ratio Prot	c0.17	c0.24		0.12	0.15		c0.16	c0.23		0.03	0.14	
v/s Ratio Perm			0.16			0.01	0.24		0.12	0.10		0.02
v/c Ratio	0.86	0.74	0.49	0.83	0.57	0.05	0.92	0.67	0.35	0.42	0.57	0.09
Uniform Delay, d1	53.8	41.7	37.7	58.0	45.1	39.1	30.4	39.0	34.2	35.3	46.3	40.7
Progression Factor	1.06	0.77	0.83	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.8	3.3	2.8	19.3	2.6	0.3	23.4	1.4	0.5	1.2	0.9	0.1
Delay (s)	70.8	35.5	34.3	77.3	47.7	39.3	53.8	40.4	34.6	36.6	47.2	40.8
Level of Service	E	D	C	E	D	D	D	D	C	D	D	D
Approach Delay (s)		42.3			55.3			43.0			44.6	
Approach LOS		D			E			D			D	

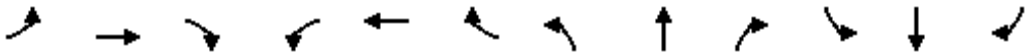
Intersection Summary			
HCM 2000 Control Delay	45.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.9
Intersection Capacity Utilization	108.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	0	0	70	35	35
Future Volume (Veh/h)	25	0	0	70	35	35
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	0	0	70	35	35
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					76	
pX, platoon unblocked						
vC, conflicting volume	122	52	70			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	122	52	70			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	100	100			
cM capacity (veh/h)	878	1021	1544			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	25	70	70
Volume Left	25	0	0
Volume Right	0	0	35
cSH	878	1544	1700
Volume to Capacity	0.03	0.00	0.04
Queue Length 95th (m)	0.7	0.0	0.0
Control Delay (s)	9.2	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.2	0.0	0.0
Approach LOS	A		

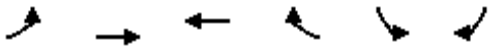
Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	14.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	0	0	5	25	0	30	0	0	25	10
Future Volume (Veh/h)	15	0	0	0	5	25	0	30	0	0	25	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	0	0	0	5	25	0	30	0	0	25	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											142	
pX, platoon unblocked												
vC, conflicting volume	88	60	30	60	65	30	35			30		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	88	60	30	60	65	30	35			30		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	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 %	98	100	100	100	99	98	100			100		
cM capacity (veh/h)	873	831	1044	941	826	1050	1576			1596		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	15	30	30	35
Volume Left	15	0	0	0
Volume Right	0	25	0	10
cSH	873	1005	1576	1596
Volume to Capacity	0.02	0.03	0.00	0.00
Queue Length 95th (m)	0.4	0.7	0.0	0.0
Control Delay (s)	9.2	8.7	0.0	0.0
Lane LOS	A	A		
Approach Delay (s)	9.2	8.7	0.0	0.0
Approach LOS	A	A		

Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	17.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	0	0	15	20	5
Future Volume (Veh/h)	15	0	0	15	20	5
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	0	0	15	20	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)					202	
pX, platoon unblocked						
vC, conflicting volume	58	42	45	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	58	42	45	0	0	
tC, single (s)	7.1	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.2	
p0 queue free %	98	100	100	99	99	
cM capacity (veh/h)	923	843	840	1091	1636	

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	15	15	25
Volume Left	15	0	20
Volume Right	0	15	5
cSH	923	1091	1636
Volume to Capacity	0.02	0.01	0.01
Queue Length 95th (m)	0.4	0.3	0.3
Control Delay (s)	9.0	8.3	5.8
Lane LOS	A	A	A
Approach Delay (s)	9.0	8.3	5.8
Approach LOS	A	A	

Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	17.5%	ICU Level of Service	A
Analysis Period (min)	15		

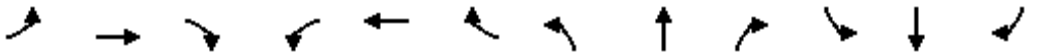
2030 Future Total Traffic Conditions



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	955	50	340	815	630	90
Future Volume (vph)	955	50	340	815	630	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.3	3.3	3.5	3.3	3.3
Total Lost time (s)	6.2		3.0	6.2	6.0	6.0
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		1.00	1.00	1.00	1.00
Satd. Flow (prot)	3414		1801	3466	3459	1516
Flt Permitted	1.00		1.00	1.00	1.00	1.00
Satd. Flow (perm)	3414		1801	3466	3459	1516
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	955	50	340	815	630	90
RTOR Reduction (vph)	3	0	0	0	0	52
Lane Group Flow (vph)	1002	0	340	815	630	38
Heavy Vehicles (%)	4%	0%	2%	3%	3%	3%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	61.9		30.4	96.3	29.5	29.5
Effective Green, g (s)	62.9		31.4	97.3	30.5	30.5
Actuated g/C Ratio	0.45		0.22	0.69	0.22	0.22
Clearance Time (s)	7.2		4.0	7.2	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1533		403	2408	753	330
v/s Ratio Prot	c0.29		c0.19	0.24	c0.18	
v/s Ratio Perm						0.03
v/c Ratio	0.65		0.84	0.34	0.84	0.12
Uniform Delay, d1	30.1		52.0	8.5	52.4	43.9
Progression Factor	1.00		1.41	0.70	1.00	1.00
Incremental Delay, d2	2.2		14.0	0.4	8.0	0.2
Delay (s)	32.2		87.1	6.3	60.4	44.1
Level of Service	C		F	A	E	D
Approach Delay (s)	32.2			30.1	58.4	
Approach LOS	C			C	E	

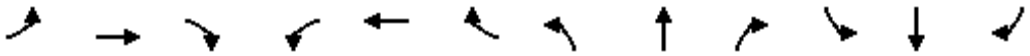
Intersection Summary			
HCM 2000 Control Delay	37.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.2
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



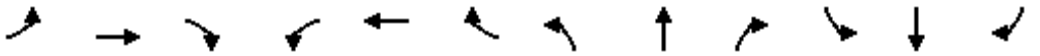
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	930	20	15	775	135	35	5	5	235	5	195
Future Volume (vph)	160	930	20	15	775	135	35	5	5	235	5	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Total Lost time (s)	3.0	5.3		5.3	5.3		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		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	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.98		1.00	0.93		1.00	0.85	
Flt Protected	1.00	1.00		0.95	1.00		0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1766	3456		1711	3400		1711	1666		1801	1537	
Flt Permitted	1.00	1.00		0.30	1.00		0.48	1.00		0.75	1.00	
Satd. Flow (perm)	1766	3456		542	3400		864	1666		1352	1537	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	160	930	20	15	775	135	35	5	5	235	5	195
RTOR Reduction (vph)	0	1	0	0	9	0	0	4	0	0	152	0
Lane Group Flow (vph)	160	949	0	15	901	0	35	6	0	235	48	0
Confl. Peds. (#/hr)	5					5						
Heavy Vehicles (%)	4%	3%	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases				6			8			4		
Actuated Green, G (s)	17.9	96.8		74.9	74.9		29.6	29.6		29.6	29.6	
Effective Green, g (s)	18.9	97.8		75.9	75.9		30.6	30.6		30.6	30.6	
Actuated g/C Ratio	0.13	0.70		0.54	0.54		0.22	0.22		0.22	0.22	
Clearance Time (s)	4.0	6.3		6.3	6.3		7.3	7.3		7.3	7.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	238	2414		293	1843		188	364		295	335	
v/s Ratio Prot	c0.09	0.27			c0.27			0.00			0.03	
v/s Ratio Perm				0.03			0.04			c0.17		
v/c Ratio	0.67	0.39		0.05	0.49		0.19	0.02		0.80	0.14	
Uniform Delay, d1	57.6	8.8		15.1	20.0		44.6	42.9		51.8	44.1	
Progression Factor	0.85	2.04		1.40	1.40		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.1	0.4		0.3	0.8		0.5	0.0		13.8	0.2	
Delay (s)	55.0	18.3		21.5	28.8		45.0	42.9		65.6	44.3	
Level of Service	E	B		C	C		D	D		E	D	
Approach Delay (s)		23.6			28.7			44.6			55.8	
Approach LOS		C			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	31.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.6
Intersection Capacity Utilization	82.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



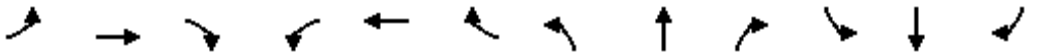
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	145	855	165	65	515	75	245	45	65	125	55	165
Future Volume (vph)	145	855	165	65	515	75	245	45	65	125	55	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.2		3.0	6.2		6.4	6.4		6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.91		1.00	0.89	
Flt Protected	1.00	1.00		1.00	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1818	3350		1818	3392		1738	1587		1693	1625	
Flt Permitted	1.00	1.00		1.00	1.00		0.51	1.00		0.69	1.00	
Satd. Flow (perm)	1818	3350		1818	3392		934	1587		1222	1625	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	145	855	165	65	515	75	245	45	65	125	55	165
RTOR Reduction (vph)	0	10	0	0	7	0	0	39	0	0	80	0
Lane Group Flow (vph)	145	1010	0	65	583	0	245	71	0	125	140	0
Confl. Peds. (#/hr)	5		5	5		5	5		10	10		5
Heavy Vehicles (%)	1%	4%	0%	1%	3%	1%	0%	7%	6%	2%	2%	1%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	15.9	72.0		9.1	65.2		40.3	40.3		40.3	40.3	
Effective Green, g (s)	16.9	73.0		10.1	66.2		41.3	41.3		41.3	41.3	
Actuated g/C Ratio	0.12	0.52		0.07	0.47		0.29	0.29		0.29	0.29	
Clearance Time (s)	4.0	7.2		4.0	7.2		7.4	7.4		7.4	7.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	219	1746		131	1603		275	468		360	479	
v/s Ratio Prot	c0.08	c0.30		0.04	0.17			0.04			0.09	
v/s Ratio Perm							c0.26			0.10		
v/c Ratio	0.66	0.58		0.50	0.36		0.89	0.15		0.35	0.29	
Uniform Delay, d1	58.8	23.0		62.5	23.5		47.2	36.4		38.8	38.1	
Progression Factor	1.02	0.50		1.31	0.83		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.8	1.3		2.9	0.6		28.0	0.2		0.6	0.3	
Delay (s)	67.0	12.7		84.9	20.1		75.2	36.6		39.3	38.4	
Level of Service	E	B		F	C		E	D		D	D	
Approach Delay (s)		19.5			26.5			63.3			38.8	
Approach LOS		B			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	30.1	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)	15.6
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



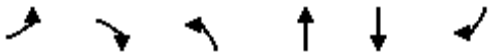
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	985	45	175	600	25	20	10	135	20	15	20
Future Volume (vph)	20	985	45	175	600	25	20	10	135	20	15	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	5.6		3.0	5.6		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.86		1.00	0.91	
Flt Protected	1.00	1.00		1.00	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1837	3400		1818	3449		1673	1550		1736	1646	
Flt Permitted	1.00	1.00		1.00	1.00		0.73	1.00		0.51	1.00	
Satd. Flow (perm)	1837	3400		1818	3449		1293	1550		931	1646	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	985	45	175	600	25	20	10	135	20	15	20
RTOR Reduction (vph)	0	2	0	0	1	0	0	117	0	0	17	0
Lane Group Flow (vph)	20	1028	0	175	624	0	20	28	0	20	18	0
Confl. Peds. (#/hr)			15	15			10		5	5		10
Heavy Vehicles (%)	0%	4%	5%	1%	3%	0%	3%	9%	2%	0%	0%	5%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	4.8	85.9		18.6	99.7		17.6	17.6		17.6	17.6	
Effective Green, g (s)	5.8	86.9		19.6	100.7		18.6	18.6		18.6	18.6	
Actuated g/C Ratio	0.04	0.62		0.14	0.72		0.13	0.13		0.13	0.13	
Clearance Time (s)	4.0	6.6		4.0	6.6		7.3	7.3		7.3	7.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	76	2110		254	2480		171	205		123	218	
v/s Ratio Prot	0.01	c0.30		c0.10	0.18			0.02			0.01	
v/s Ratio Perm							0.02			c0.02		
v/c Ratio	0.26	0.49		0.69	0.25		0.12	0.14		0.16	0.08	
Uniform Delay, d1	65.0	14.4		57.3	6.7		53.5	53.6		53.8	53.2	
Progression Factor	0.81	1.09		0.88	1.69		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	0.7		7.0	0.2		0.3	0.3		0.6	0.2	
Delay (s)	54.0	16.4		57.5	11.6		53.8	53.9		54.4	53.4	
Level of Service	D	B		E	B		D	D		D	D	
Approach Delay (s)		17.1			21.6			53.9			53.8	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
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 (vph)	180	430	310	145	365	45	290	340	135	65	580	150
Future Volume (vph)	180	430	310	145	365	45	290	340	135	65	580	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.1	6.1	3.0	6.1	6.1	0.5	6.8	6.8	2.0	6.8	6.8
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1766	3433	1414	1783	3433	1462	1780	3500	1351	1774	3535	1436
Flt Permitted	1.00	1.00	1.00	1.00	1.00	1.00	0.24	1.00	1.00	0.55	1.00	1.00
Satd. Flow (perm)	1766	3433	1414	1783	3433	1462	434	3500	1351	971	3535	1436
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	180	430	310	145	365	45	290	340	135	65	580	150
RTOR Reduction (vph)	0	0	201	0	0	30	0	0	89	0	0	114
Lane Group Flow (vph)	180	430	109	145	365	15	290	340	46	65	580	36
Confl. Peds. (#/hr)	35		25	25		35	20		40	40		20
Heavy Vehicles (%)	4%	4%	5%	3%	4%	0%	3%	2%	9%	2%	1%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	19.2	48.2	48.2	16.6	45.6	45.6	56.3	46.3	46.3	39.4	32.4	32.4
Effective Green, g (s)	20.2	49.2	49.2	17.6	46.6	46.6	58.8	47.3	47.3	41.4	33.4	33.4
Actuated g/C Ratio	0.14	0.35	0.35	0.13	0.33	0.33	0.42	0.34	0.34	0.30	0.24	0.24
Clearance Time (s)	4.0	7.1	7.1	4.0	7.1	7.1	3.0	7.8	7.8	3.0	7.8	7.8
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)	254	1206	496	224	1142	486	407	1182	456	333	843	342
v/s Ratio Prot	c0.10	c0.13		0.08	0.11		c0.12	0.10		0.01	c0.16	
v/s Ratio Perm			0.08			0.01	0.18		0.03	0.05		0.02
v/c Ratio	0.71	0.36	0.22	0.65	0.32	0.03	0.71	0.29	0.10	0.20	0.69	0.10
Uniform Delay, d1	57.1	33.7	31.9	58.2	34.9	31.5	29.5	34.0	31.8	36.0	48.6	41.6
Progression Factor	1.09	1.41	4.81	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.0	0.7	0.9	6.3	0.7	0.1	5.8	0.1	0.1	0.3	2.4	0.1
Delay (s)	70.1	48.2	154.4	64.5	35.6	31.6	35.3	34.1	31.9	36.3	50.9	41.8
Level of Service	E	D	F	E	D	C	D	C	C	D	D	D
Approach Delay (s)		88.3			42.8			34.2			48.0	
Approach LOS		F			D			C			D	

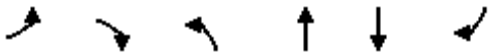
Intersection Summary			
HCM 2000 Control Delay	55.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.9
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	110	0	0	155	40	25
Future Volume (Veh/h)	110	0	0	155	40	25
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	110	0	0	155	40	25
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					76	
pX, platoon unblocked						
vC, conflicting volume	208	52	65			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	208	52	65			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	86	100	100			
cM capacity (veh/h)	785	1021	1550			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	110	155	65
Volume Left	110	0	0
Volume Right	0	0	25
cSH	785	1550	1700
Volume to Capacity	0.14	0.00	0.04
Queue Length 95th (m)	3.9	0.0	0.0
Control Delay (s)	10.3	0.0	0.0
Lane LOS	B		
Approach Delay (s)	10.3	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	20.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	140	0	0	0	0	20
Future Volume (Veh/h)	140	0	0	0	0	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	140	0	0	0	0	20
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					202	
pX, platoon unblocked						
vC, conflicting volume	10	10	20			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	10	10	20			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	86	100	100			
cM capacity (veh/h)	1015	1071	1596			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	140	0	20
Volume Left	140	0	0
Volume Right	0	0	20
cSH	1015	1700	1700
Volume to Capacity	0.14	0.00	0.01
Queue Length 95th (m)	3.8	0.0	0.0
Control Delay (s)	9.1	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.1	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	8.0		
Intersection Capacity Utilization	17.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1135	35	0	945	0	30
Future Volume (Veh/h)	1135	35	0	945	0	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1135	35	0	945	0	30
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				209		
pX, platoon unblocked					0.91	
vC, conflicting volume			1170		1608	568
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1170		1469	568
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	94
cM capacity (veh/h)			604		110	471

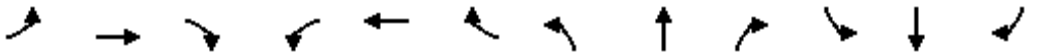
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	568	568	35	472	472	30
Volume Left	0	0	0	0	0	0
Volume Right	0	0	35	0	0	30
cSH	1700	1700	1700	1700	1700	471
Volume to Capacity	0.33	0.33	0.02	0.28	0.28	0.06
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	1.6
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	13.2
Lane LOS						B
Approach Delay (s)	0.0			0.0		13.2
Approach LOS						B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	41.4%	ICU Level of Service	A
Analysis Period (min)	15		



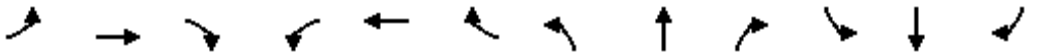
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1850	35	200	980	725	175
Future Volume (vph)	1850	35	200	980	725	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.3	3.3	3.5	3.3	3.3
Total Lost time (s)	6.2		2.0	6.2	3.5	6.0
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		1.00	1.00	1.00	1.00
Satd. Flow (prot)	3525		1783	3535	3528	1531
Flt Permitted	1.00		1.00	1.00	1.00	1.00
Satd. Flow (perm)	3525		1783	3535	3528	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1850	35	200	980	725	175
RTOR Reduction (vph)	1	0	0	0	0	87
Lane Group Flow (vph)	1884	0	200	980	725	88
Confl. Peds. (#/hr)						5
Heavy Vehicles (%)	1%	0%	3%	1%	1%	0%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	77.2		15.9	97.1	28.7	28.7
Effective Green, g (s)	78.2		17.9	98.1	32.2	29.7
Actuated g/C Ratio	0.56		0.13	0.70	0.23	0.21
Clearance Time (s)	7.2		4.0	7.2	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1968		227	2477	811	324
v/s Ratio Prot	c0.53		c0.11	0.28	c0.21	
v/s Ratio Perm						0.06
v/c Ratio	0.96		0.88	0.40	0.89	0.27
Uniform Delay, d1	29.3		60.0	8.7	52.2	46.1
Progression Factor	1.00		1.24	0.44	1.00	1.00
Incremental Delay, d2	12.5		26.3	0.4	12.3	0.5
Delay (s)	41.8		100.7	4.2	64.5	46.5
Level of Service	D		F	A	E	D
Approach Delay (s)	41.8			20.6	61.0	
Approach LOS	D			C	E	

Intersection Summary			
HCM 2000 Control Delay	39.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	96.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



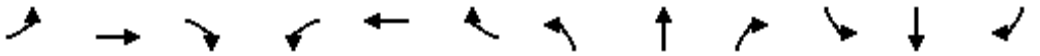
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	295	1695	40	25	905	220	35	10	10	265	10	155
Future Volume (vph)	295	1695	40	25	905	220	35	10	10	265	10	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Total Lost time (s)	3.0	5.3		5.3	5.3		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		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	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.97		1.00	0.93		1.00	0.86	
Flt Protected	1.00	1.00		0.95	1.00		0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1837	3522		1711	3382		1711	1666		1818	1535	
Flt Permitted	1.00	1.00		0.12	1.00		0.56	1.00		0.74	1.00	
Satd. Flow (perm)	1837	3522		208	3382		1008	1666		1354	1535	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	295	1695	40	25	905	220	35	10	10	265	10	155
RTOR Reduction (vph)	0	1	0	0	14	0	0	8	0	0	119	0
Lane Group Flow (vph)	295	1734	0	25	1111	0	35	12	0	265	46	0
Confl. Peds. (#/hr)	5					5						5
Heavy Vehicles (%)	0%	1%	2%	2%	2%	1%	2%	2%	2%	1%	2%	1%
Turn Type	Prot	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases				6			8			4		
Actuated Green, G (s)	25.6	95.2		65.6	65.6		31.2	31.2		31.2	31.2	
Effective Green, g (s)	26.6	96.2		66.6	66.6		32.2	32.2		32.2	32.2	
Actuated g/C Ratio	0.19	0.69		0.48	0.48		0.23	0.23		0.23	0.23	
Clearance Time (s)	4.0	6.3		6.3	6.3		7.3	7.3		7.3	7.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	349	2420		98	1608		231	383		311	353	
v/s Ratio Prot	c0.16	c0.49			0.33			0.01			0.03	
v/s Ratio Perm				0.12			0.03			c0.20		
v/c Ratio	0.85	0.72		0.26	0.69		0.15	0.03		0.85	0.13	
Uniform Delay, d1	54.7	13.5		21.9	28.7		43.0	41.8		51.6	42.8	
Progression Factor	0.78	2.00		1.70	1.62		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.5	0.7		5.0	2.0		0.3	0.0		19.6	0.2	
Delay (s)	50.2	27.8		42.1	48.4		43.3	41.8		71.2	42.9	
Level of Service	D	C		D	D		D	D		E	D	
Approach Delay (s)		31.0			48.2			42.8			60.4	
Approach LOS		C			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	40.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.6
Intersection Capacity Utilization	105.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



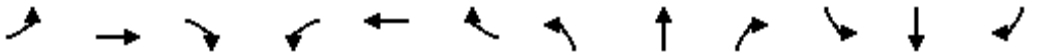
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	245	1440	250	95	770	145	220	90	70	130	70	125
Future Volume (vph)	245	1440	250	95	770	145	220	90	70	130	70	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.2		3.0	6.2		6.4	6.4		6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.98	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.93		1.00	0.90	
Flt Protected	1.00	1.00		1.00	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1837	3434		1783	3408		1720	1728		1696	1679	
Flt Permitted	1.00	1.00		1.00	1.00		0.52	1.00		0.58	1.00	
Satd. Flow (perm)	1837	3434		1783	3408		941	1728		1042	1679	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	245	1440	250	95	770	145	220	90	70	130	70	125
RTOR Reduction (vph)	0	10	0	0	10	0	0	20	0	0	47	0
Lane Group Flow (vph)	245	1680	0	95	905	0	220	140	0	130	148	0
Confl. Peds. (#/hr)	5		10	10		5	5		20	20		5
Heavy Vehicles (%)	0%	1%	0%	3%	2%	0%	1%	0%	0%	1%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	23.6	78.3		9.1	63.8		34.0	34.0		34.0	34.0	
Effective Green, g (s)	24.6	79.3		10.1	64.8		35.0	35.0		35.0	35.0	
Actuated g/C Ratio	0.18	0.57		0.07	0.46		0.25	0.25		0.25	0.25	
Clearance Time (s)	4.0	7.2		4.0	7.2		7.4	7.4		7.4	7.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	322	1945		128	1577		235	432		260	419	
v/s Ratio Prot	c0.13	c0.49		0.05	0.27			0.08			0.09	
v/s Ratio Perm							c0.23			0.12		
v/c Ratio	0.76	0.86		0.74	0.57		0.94	0.32		0.50	0.35	
Uniform Delay, d1	54.9	25.8		63.7	27.5		51.4	42.8		45.0	43.2	
Progression Factor	1.02	0.91		1.08	0.53		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.3	3.9		19.5	1.4		41.1	0.4		1.5	0.5	
Delay (s)	63.1	27.3		88.0	16.1		92.5	43.3		46.5	43.7	
Level of Service	E	C		F	B		F	D		D	D	
Approach Delay (s)		31.8			22.9			71.8			44.8	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	34.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	98.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



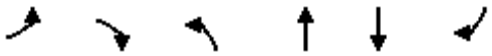
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	1545	55	80	935	35	30	40	90	25	25	25
Future Volume (vph)	45	1545	55	80	935	35	30	40	90	25	25	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	5.6		3.0	5.6		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		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	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.98	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.90		1.00	0.93	
Flt Protected	1.00	1.00		1.00	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1837	3510		1837	3479		1702	1647		1736	1705	
Flt Permitted	1.00	1.00		1.00	1.00		0.72	1.00		0.56	1.00	
Satd. Flow (perm)	1837	3510		1837	3479		1298	1647		1029	1705	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	45	1545	55	80	935	35	30	40	90	25	25	25
RTOR Reduction (vph)	0	1	0	0	1	0	0	66	0	0	22	0
Lane Group Flow (vph)	45	1599	0	80	969	0	30	64	0	25	28	0
Confl. Peds. (#/hr)	5		15	15		5	20		5	5		20
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	3%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	6.7	92.7		11.4	97.4		18.0	18.0		18.0	18.0	
Effective Green, g (s)	7.7	93.7		12.4	98.4		19.0	19.0		19.0	19.0	
Actuated g/C Ratio	0.06	0.67		0.09	0.70		0.14	0.14		0.14	0.14	
Clearance Time (s)	4.0	6.6		4.0	6.6		7.3	7.3		7.3	7.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	101	2349		162	2445		176	223		139	231	
v/s Ratio Prot	0.02	c0.46		c0.04	0.28			c0.04			0.02	
v/s Ratio Perm							0.02			0.02		
v/c Ratio	0.45	0.68		0.49	0.40		0.17	0.29		0.18	0.12	
Uniform Delay, d1	64.1	14.1		60.8	8.6		53.5	54.4		53.6	53.2	
Progression Factor	1.02	0.74		1.03	0.57		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	0.9		1.8	0.4		0.5	0.7		0.6	0.2	
Delay (s)	66.8	11.3		64.3	5.2		54.0	55.1		54.2	53.4	
Level of Service	E	B		E	A		D	E		D	D	
Approach Delay (s)		12.8			9.7			54.9			53.7	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	85.8%	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 (vph)	320	870	420	225	520	70	415	820	285	100	500	145
Future Volume (vph)	320	870	420	225	520	70	415	820	285	100	500	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.1	6.1	1.0	6.1	6.1	1.0	6.8	6.8	2.0	6.8	6.8
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.93	1.00	1.00	0.90	1.00	1.00	0.88	1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1837	3535	1436	1837	3500	1405	1790	3570	1324	1824	3535	1464
Flt Permitted	1.00	1.00	1.00	1.00	1.00	1.00	0.31	1.00	1.00	0.26	1.00	1.00
Satd. Flow (perm)	1837	3535	1436	1837	3500	1405	557	3570	1324	474	3535	1464
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	320	870	420	225	520	70	415	820	285	100	500	145
RTOR Reduction (vph)	0	0	182	0	0	52	0	0	125	0	0	109
Lane Group Flow (vph)	320	870	238	225	520	18	415	820	160	100	500	36
Confl. Peds. (#/hr)	60		40	40		60	45		95	95		45
Heavy Vehicles (%)	0%	1%	1%	0%	2%	0%	2%	0%	4%	0%	1%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	27.5	45.0	45.0	17.6	35.1	35.1	58.5	47.3	47.3	41.7	33.5	33.5
Effective Green, g (s)	28.5	46.0	46.0	20.6	36.1	36.1	60.5	48.3	48.3	43.7	34.5	34.5
Actuated g/C Ratio	0.20	0.33	0.33	0.15	0.26	0.26	0.43	0.34	0.34	0.31	0.25	0.25
Clearance Time (s)	4.0	7.1	7.1	4.0	7.1	7.1	3.0	7.8	7.8	3.0	7.8	7.8
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)	373	1161	471	270	902	362	452	1231	456	236	871	360
v/s Ratio Prot	c0.17	c0.25		0.12	0.15		c0.16	c0.23		0.03	0.14	
v/s Ratio Perm			0.17			0.01	0.24		0.12	0.10		0.02
v/c Ratio	0.86	0.75	0.51	0.83	0.58	0.05	0.92	0.67	0.35	0.42	0.57	0.10
Uniform Delay, d1	53.8	41.9	37.8	58.0	45.3	39.1	30.4	39.0	34.2	35.3	46.3	40.7
Progression Factor	1.16	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.7	3.4	2.9	19.3	2.7	0.3	23.4	1.4	0.5	1.2	0.9	0.1
Delay (s)	76.4	34.8	31.4	77.3	48.0	39.3	53.8	40.4	34.6	36.6	47.2	40.9
Level of Service	E	C	C	E	D	D	D	D	C	D	D	D
Approach Delay (s)		42.1			55.3			43.0			44.6	
Approach LOS		D			E			D			D	

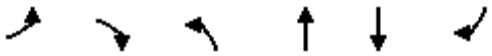
Intersection Summary			
HCM 2000 Control Delay	45.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.9
Intersection Capacity Utilization	108.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	65	0	0	120	65	70
Future Volume (Veh/h)	65	0	0	120	65	70
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	65	0	0	120	65	70
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					76	
pX, platoon unblocked						
vC, conflicting volume	220	100	135			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	220	100	135			
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	100	100			
cM capacity (veh/h)	773	961	1462			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	65	120	135
Volume Left	65	0	0
Volume Right	0	0	70
cSH	773	1462	1700
Volume to Capacity	0.08	0.00	0.08
Queue Length 95th (m)	2.2	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	2.0		
Intersection Capacity Utilization	18.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	80	0	0	0	0	45
Future Volume (Veh/h)	80	0	0	0	0	45
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	80	0	0	0	0	45
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					202	
pX, platoon unblocked						
vC, conflicting volume	22	22	45			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	22	22	45			
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	100	100			
cM capacity (veh/h)	999	1054	1563			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	80	0	45
Volume Left	80	0	0
Volume Right	0	0	45
cSH	999	1700	1700
Volume to Capacity	0.08	0.00	0.03
Queue Length 95th (m)	2.1	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	5.7		
Intersection Capacity Utilization	14.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1920	85	0	1115	0	15
Future Volume (Veh/h)	1920	85	0	1115	0	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1920	85	0	1115	0	15
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		
pX, platoon unblocked					0.82	
vC, conflicting volume			2005		2478	960
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2005		2365	960
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	94
cM capacity (veh/h)			289		25	261

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	960	960	85	558	558	15
Volume Left	0	0	0	0	0	0
Volume Right	0	0	85	0	0	15
cSH	1700	1700	1700	1700	1700	261
Volume to Capacity	0.56	0.56	0.05	0.33	0.33	0.06
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	1.5
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	19.7
Lane LOS						C
Approach Delay (s)	0.0			0.0		19.7
Approach LOS						C

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	63.1%	ICU Level of Service		B
Analysis Period (min)	15			

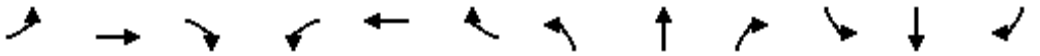
2035 Future Background Traffic Conditions



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	960	45	305	875	630	60
Future Volume (vph)	960	45	305	875	630	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.3	3.3	3.5	3.3	3.3
Total Lost time (s)	6.2		3.0	6.2	6.0	6.0
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		1.00	1.00	1.00	1.00
Satd. Flow (prot)	3415		1801	3466	3459	1516
Flt Permitted	1.00		1.00	1.00	1.00	1.00
Satd. Flow (perm)	3415		1801	3466	3459	1516
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	960	45	305	875	630	60
RTOR Reduction (vph)	2	0	0	0	0	34
Lane Group Flow (vph)	1003	0	305	875	630	26
Heavy Vehicles (%)	4%	0%	2%	3%	3%	3%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	64.0		28.4	96.4	29.4	29.4
Effective Green, g (s)	65.0		29.4	97.4	30.4	30.4
Actuated g/C Ratio	0.46		0.21	0.70	0.22	0.22
Clearance Time (s)	7.2		4.0	7.2	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1585		378	2411	751	329
v/s Ratio Prot	c0.29		c0.17	0.25	c0.18	
v/s Ratio Perm						0.02
v/c Ratio	0.63		0.81	0.36	0.84	0.08
Uniform Delay, d1	28.4		52.6	8.7	52.5	43.6
Progression Factor	1.00		1.28	1.08	1.00	1.00
Incremental Delay, d2	1.9		11.2	0.4	8.2	0.1
Delay (s)	30.4		78.5	9.8	60.6	43.7
Level of Service	C		E	A	E	D
Approach Delay (s)	30.4			27.5	59.2	
Approach LOS	C			C	E	

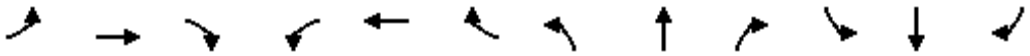
Intersection Summary			
HCM 2000 Control Delay	36.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.2
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



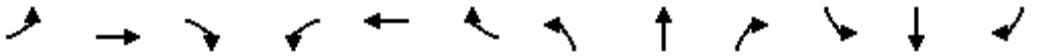
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	905	20	15	795	120	40	5	10	230	5	195
Future Volume (vph)	160	905	20	15	795	120	40	5	10	230	5	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Total Lost time (s)	3.0	5.3		5.3	5.3		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		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	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.98		1.00	0.90		1.00	0.85	
Flt Protected	1.00	1.00		0.95	1.00		0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1766	3455		1711	3412		1711	1621		1801	1537	
Flt Permitted	1.00	1.00		0.31	1.00		0.48	1.00		0.75	1.00	
Satd. Flow (perm)	1766	3455		556	3412		858	1621		1346	1537	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	160	905	20	15	795	120	40	5	10	230	5	195
RTOR Reduction (vph)	0	1	0	0	7	0	0	8	0	0	153	0
Lane Group Flow (vph)	160	924	0	15	908	0	40	7	0	230	47	0
Confl. Peds. (#/hr)	5					5						
Heavy Vehicles (%)	4%	3%	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases				6			8			4		
Actuated Green, G (s)	17.9	97.2		75.3	75.3		29.2	29.2		29.2	29.2	
Effective Green, g (s)	18.9	98.2		76.3	76.3		30.2	30.2		30.2	30.2	
Actuated g/C Ratio	0.13	0.70		0.54	0.54		0.22	0.22		0.22	0.22	
Clearance Time (s)	4.0	6.3		6.3	6.3		7.3	7.3		7.3	7.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	238	2423		303	1859		185	349		290	331	
v/s Ratio Prot	c0.09	0.27			c0.27			0.00			0.03	
v/s Ratio Perm				0.03			0.05			c0.17		
v/c Ratio	0.67	0.38		0.05	0.49		0.22	0.02		0.79	0.14	
Uniform Delay, d1	57.6	8.5		14.9	19.7		45.2	43.2		51.9	44.4	
Progression Factor	0.89	1.87		1.60	1.37		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.1	0.4		0.3	0.9		0.6	0.0		13.8	0.2	
Delay (s)	57.2	16.3		24.1	28.0		45.8	43.3		65.7	44.6	
Level of Service	E	B		C	C		D	D		E	D	
Approach Delay (s)		22.4			27.9			45.1			55.9	
Approach LOS		C			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.6
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



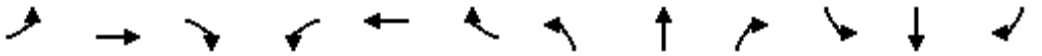
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	145	935	65	20	710	90	50	0	10	145	0	170
Future Volume (vph)	145	935	65	20	710	90	50	0	10	145	0	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.2		3.0	6.2		6.4	6.4		6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.85		1.00	0.85	
Flt Protected	1.00	1.00		1.00	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1818	3400		1818	3401		1737	1471		1690	1553	
Flt Permitted	1.00	1.00		1.00	1.00		0.51	1.00		0.75	1.00	
Satd. Flow (perm)	1818	3400		1818	3401		924	1471		1336	1553	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	145	935	65	20	710	90	50	0	10	145	0	170
RTOR Reduction (vph)	0	2	0	0	5	0	0	8	0	0	140	0
Lane Group Flow (vph)	145	998	0	20	795	0	50	2	0	145	30	0
Confl. Peds. (#/hr)	5		5	5		5	5		10	10		5
Heavy Vehicles (%)	1%	4%	0%	1%	3%	1%	0%	7%	6%	2%	2%	1%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	16.4	92.5		4.8	80.9		24.1	24.1		24.1	24.1	
Effective Green, g (s)	17.4	93.5		5.8	81.9		25.1	25.1		25.1	25.1	
Actuated g/C Ratio	0.12	0.67		0.04	0.59		0.18	0.18		0.18	0.18	
Clearance Time (s)	4.0	7.2		4.0	7.2		7.4	7.4		7.4	7.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	225	2270		75	1989		165	263		239	278	
v/s Ratio Prot	c0.08	c0.29		0.01	0.23			0.00			0.02	
v/s Ratio Perm							0.05			c0.11		
v/c Ratio	0.64	0.44		0.27	0.40		0.30	0.01		0.61	0.11	
Uniform Delay, d1	58.4	10.9		65.0	15.7		49.9	47.2		52.9	48.1	
Progression Factor	1.13	0.57		1.09	0.53		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.7	0.6		1.9	0.6		1.0	0.0		4.3	0.2	
Delay (s)	71.6	6.8		72.8	9.0		50.9	47.2		57.2	48.3	
Level of Service	E	A		E	A		D	D		E	D	
Approach Delay (s)		15.0			10.5			50.3			52.4	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



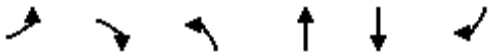
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	1085	25	170	750	25	35	0	275	20	0	20
Future Volume (vph)	20	1085	25	170	750	25	35	0	275	20	0	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	5.6		3.0	5.6		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.85		1.00	0.85	
Flt Protected	1.00	1.00		1.00	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1837	3416		1818	3452		1672	1537		1739	1483	
Flt Permitted	1.00	1.00		1.00	1.00		0.74	1.00		0.21	1.00	
Satd. Flow (perm)	1837	3416		1818	3452		1310	1537		387	1483	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	1085	25	170	750	25	35	0	275	20	0	20
RTOR Reduction (vph)	0	1	0	0	1	0	0	208	0	0	17	0
Lane Group Flow (vph)	20	1109	0	170	774	0	35	67	0	20	3	0
Confl. Peds. (#/hr)			15	15			10		5	5		10
Heavy Vehicles (%)	0%	4%	5%	1%	3%	0%	3%	9%	2%	0%	0%	5%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	4.8	86.0		18.2	99.4		17.9	17.9		17.9	17.9	
Effective Green, g (s)	5.8	87.0		19.2	100.4		18.9	18.9		18.9	18.9	
Actuated g/C Ratio	0.04	0.62		0.14	0.72		0.13	0.13		0.13	0.13	
Clearance Time (s)	4.0	6.6		4.0	6.6		7.3	7.3		7.3	7.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	76	2122		249	2475		176	207		52	200	
v/s Ratio Prot	0.01	c0.32		c0.09	0.22			0.04			0.00	
v/s Ratio Perm							0.03			c0.05		
v/c Ratio	0.26	0.52		0.68	0.31		0.20	0.33		0.38	0.01	
Uniform Delay, d1	65.0	14.9		57.5	7.2		53.8	54.8		55.2	52.5	
Progression Factor	1.16	0.78		0.85	1.81		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	0.9		6.8	0.3		0.6	0.9		4.7	0.0	
Delay (s)	77.3	12.4		55.4	13.4		54.4	55.7		59.9	52.5	
Level of Service	E	B		E	B		D	E		E	D	
Approach Delay (s)		13.5			20.9			55.6			56.2	
Approach LOS		B			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	73.0%	ICU Level of Service	C
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 (vph)	220	460	480	180	480	45	260	340	145	65	640	210
Future Volume (vph)	220	460	480	180	480	45	260	340	145	65	640	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.1	6.1	3.0	6.1	6.1	0.5	6.8	6.8	2.0	6.8	6.8
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1766	3433	1414	1783	3433	1462	1781	3500	1351	1774	3535	1436
Flt Permitted	1.00	1.00	1.00	1.00	1.00	1.00	0.21	1.00	1.00	0.55	1.00	1.00
Satd. Flow (perm)	1766	3433	1414	1783	3433	1462	372	3500	1351	971	3535	1436
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	220	460	480	180	480	45	260	340	145	65	640	210
RTOR Reduction (vph)	0	0	242	0	0	31	0	0	96	0	0	153
Lane Group Flow (vph)	220	460	238	180	480	14	260	340	49	65	640	57
Confl. Peds. (#/hr)	35		25	25		35	20		40	40		20
Heavy Vehicles (%)	4%	4%	5%	3%	4%	0%	3%	2%	9%	2%	1%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	22.1	47.0	47.0	18.5	43.4	43.4	55.6	46.6	46.6	39.7	33.7	33.7
Effective Green, g (s)	23.1	48.0	48.0	19.5	44.4	44.4	58.1	47.6	47.6	41.7	34.7	34.7
Actuated g/C Ratio	0.17	0.34	0.34	0.14	0.32	0.32	0.42	0.34	0.34	0.30	0.25	0.25
Clearance Time (s)	4.0	7.1	7.1	4.0	7.1	7.1	3.0	7.8	7.8	3.0	7.8	7.8
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)	291	1177	484	248	1088	463	369	1190	459	329	876	355
v/s Ratio Prot	c0.12	0.13		0.10	0.14		c0.11	0.10		0.01	c0.18	
v/s Ratio Perm			c0.17			0.01	0.18		0.04	0.05		0.04
v/c Ratio	0.76	0.39	0.49	0.73	0.44	0.03	0.70	0.29	0.11	0.20	0.73	0.16
Uniform Delay, d1	55.8	34.9	36.3	57.7	38.0	33.0	29.8	33.8	31.6	35.8	48.4	41.3
Progression Factor	1.15	1.20	1.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.4	0.9	3.1	10.1	1.3	0.1	6.0	0.1	0.1	0.3	3.2	0.2
Delay (s)	73.7	42.8	75.2	67.8	39.2	33.1	35.9	33.9	31.8	36.1	51.5	41.5
Level of Service	E	D	E	E	D	C	D	C	C	D	D	D
Approach Delay (s)		62.1			46.1			34.2			48.1	
Approach LOS		E			D			C			D	

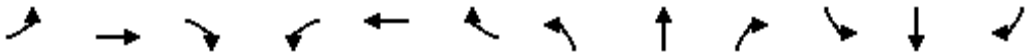
Intersection Summary			
HCM 2000 Control Delay	49.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.9
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	0	0	10	10	20
Future Volume (Veh/h)	15	0	0	10	10	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	0	0	10	10	20
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					76	
pX, platoon unblocked						
vC, conflicting volume	30	20	30			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	30	20	30			
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)	989	1064	1596			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	15	10	30
Volume Left	15	0	0
Volume Right	0	0	20
cSH	989	1596	1700
Volume to Capacity	0.02	0.00	0.02
Queue Length 95th (m)	0.4	0.0	0.0
Control Delay (s)	8.7	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.7	0.0	0.0
Approach LOS	A		

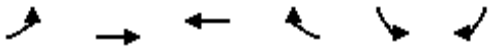
Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	0	0	0	0	0	5	0	0	5	5
Future Volume (Veh/h)	5	0	0	0	0	0	0	5	0	0	5	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	0	0	0	0	0	0	5	0	0	5	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)											142	
pX, platoon unblocked												
vC, conflicting volume	12	12	8	12	15	5	10			5		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	12	12	8	12	15	5	10			5		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	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	100	100	100	100			100		
cM capacity (veh/h)	1004	882	1075	1010	879	1084	1610			1630		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	0	5	10
Volume Left	5	0	0	0
Volume Right	0	0	0	5
cSH	1004	1700	1610	1630
Volume to Capacity	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.1	0.0	0.0	0.0
Control Delay (s)	8.6	0.0	0.0	0.0
Lane LOS	A	A		
Approach Delay (s)	8.6	0.0	0.0	0.0
Approach LOS	A	A		

Intersection Summary				
Average Delay	2.2			
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)	5	0	0	0	0	5
Future Volume (Veh/h)	5	0	0	0	0	5
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	0	0	0	0	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)					202	
pX, platoon unblocked						
vC, conflicting volume	2	2	5	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2	2	5	0	0	
tC, single (s)	7.1	7.0	6.5	6.7	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.5	4.0	3.8	2.2	
p0 queue free %	100	100	100	100	100	
cM capacity (veh/h)	1025	806	894	960	1636	

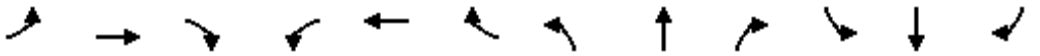
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	5	0	5
Volume Left	5	0	0
Volume Right	0	0	5
cSH	1025	1700	1636
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (m)	0.1	0.0	0.0
Control Delay (s)	8.5	0.0	0.0
Lane LOS	A	A	
Approach Delay (s)	8.5	0.0	0.0
Approach LOS	A	A	

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



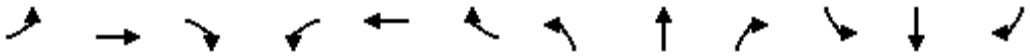
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1790	35	175	1015	725	340
Future Volume (vph)	1790	35	175	1015	725	340
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.3	3.3	3.5	3.3	3.3
Total Lost time (s)	6.2		2.0	6.2	3.5	6.0
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		1.00	1.00	1.00	1.00
Satd. Flow (prot)	3525		1783	3535	3528	1531
Flt Permitted	1.00		1.00	1.00	1.00	1.00
Satd. Flow (perm)	3525		1783	3535	3528	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1790	35	175	1015	725	340
RTOR Reduction (vph)	1	0	0	0	0	157
Lane Group Flow (vph)	1824	0	175	1015	725	183
Confl. Peds. (#/hr)						5
Heavy Vehicles (%)	1%	0%	3%	1%	1%	0%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	77.7		15.4	97.1	28.7	28.7
Effective Green, g (s)	78.7		17.4	98.1	32.2	29.7
Actuated g/C Ratio	0.56		0.12	0.70	0.23	0.21
Clearance Time (s)	7.2		4.0	7.2	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1981		221	2477	811	324
v/s Ratio Prot	c0.52		c0.10	0.29	c0.21	
v/s Ratio Perm						0.12
v/c Ratio	0.92		0.79	0.41	0.89	0.57
Uniform Delay, d1	27.8		59.5	8.8	52.2	49.4
Progression Factor	1.00		1.26	0.45	1.00	1.00
Incremental Delay, d2	8.5		14.8	0.4	12.3	2.3
Delay (s)	36.3		89.7	4.4	64.5	51.6
Level of Service	D		F	A	E	D
Approach Delay (s)	36.3			17.0	60.4	
Approach LOS	D			B	E	

Intersection Summary			
HCM 2000 Control Delay	37.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	93.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



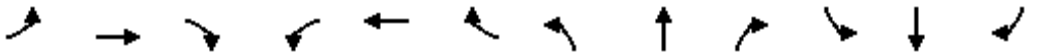
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	295	1800	40	25	915	215	35	10	10	255	10	155
Future Volume (vph)	295	1800	40	25	915	215	35	10	10	255	10	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Total Lost time (s)	3.0	5.3		5.3	5.3		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		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	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.97		1.00	0.93		1.00	0.86	
Flt Protected	1.00	1.00		0.95	1.00		0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1837	3522		1711	3385		1711	1666		1818	1535	
Flt Permitted	1.00	1.00		0.10	1.00		0.55	1.00		0.74	1.00	
Satd. Flow (perm)	1837	3522		172	3385		999	1666		1354	1535	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	295	1800	40	25	915	215	35	10	10	255	10	155
RTOR Reduction (vph)	0	1	0	0	13	0	0	8	0	0	120	0
Lane Group Flow (vph)	295	1839	0	25	1117	0	35	12	0	255	45	0
Confl. Peds. (#/hr)	5					5						5
Heavy Vehicles (%)	0%	1%	2%	2%	2%	1%	2%	2%	2%	1%	2%	1%
Turn Type	Prot	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases				6			8			4		
Actuated Green, G (s)	25.8	96.2		66.4	66.4		30.2	30.2		30.2	30.2	
Effective Green, g (s)	26.8	97.2		67.4	67.4		31.2	31.2		31.2	31.2	
Actuated g/C Ratio	0.19	0.69		0.48	0.48		0.22	0.22		0.22	0.22	
Clearance Time (s)	4.0	6.3		6.3	6.3		7.3	7.3		7.3	7.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	351	2445		82	1629		222	371		301	342	
v/s Ratio Prot	c0.16	c0.52			0.33			0.01			0.03	
v/s Ratio Perm				0.15			0.04			c0.19		
v/c Ratio	0.84	0.75		0.30	0.69		0.16	0.03		0.85	0.13	
Uniform Delay, d1	54.5	13.7		22.1	28.1		43.8	42.6		52.1	43.5	
Progression Factor	0.80	1.82		1.82	1.59		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.0	1.0		8.3	2.1		0.3	0.0		19.3	0.2	
Delay (s)	51.6	25.9		48.4	46.8		44.1	42.6		71.4	43.7	
Level of Service	D	C		D	D		D	D		E	D	
Approach Delay (s)		29.5			46.8			43.6			60.5	
Approach LOS		C			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	38.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.6
Intersection Capacity Utilization	107.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



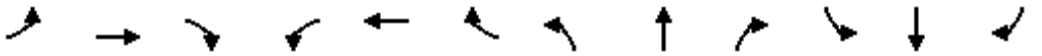
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	240	1535	325	25	905	150	95	0	25	135	0	120
Future Volume (vph)	240	1535	325	25	905	150	95	0	25	135	0	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.2		3.0	6.2		6.4	6.4		6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.96		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.98	1.00	
Frt	1.00	0.97		1.00	0.98		1.00	0.85		1.00	0.85	
Flt Protected	1.00	1.00		1.00	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1837	3416		1783	3417		1719	1540		1688	1569	
Flt Permitted	1.00	1.00		1.00	1.00		0.63	1.00		0.74	1.00	
Satd. Flow (perm)	1837	3416		1783	3417		1138	1540		1316	1569	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	240	1535	325	25	905	150	95	0	25	135	0	120
RTOR Reduction (vph)	0	10	0	0	7	0	0	21	0	0	99	0
Lane Group Flow (vph)	240	1850	0	25	1048	0	95	4	0	135	21	0
Confl. Peds. (#/hr)	5		10	10		5	5		20	20		5
Heavy Vehicles (%)	0%	1%	0%	3%	2%	0%	1%	0%	0%	1%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	23.4	92.9		4.9	74.4		23.6	23.6		23.6	23.6	
Effective Green, g (s)	24.4	93.9		5.9	75.4		24.6	24.6		24.6	24.6	
Actuated g/C Ratio	0.17	0.67		0.04	0.54		0.18	0.18		0.18	0.18	
Clearance Time (s)	4.0	7.2		4.0	7.2		7.4	7.4		7.4	7.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	320	2291		75	1840		199	270		231	275	
v/s Ratio Prot	c0.13	c0.54		0.01	0.31			0.00			0.01	
v/s Ratio Perm							0.08			c0.10		
v/c Ratio	0.75	0.81		0.33	0.57		0.48	0.02		0.58	0.08	
Uniform Delay, d1	54.9	16.6		65.1	21.5		51.9	47.7		53.0	48.2	
Progression Factor	0.92	1.15		1.02	0.50		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.5	2.1		2.5	1.2		1.8	0.0		3.7	0.1	
Delay (s)	56.9	21.2		69.0	12.1		53.7	47.7		56.7	48.3	
Level of Service	E	C		E	B		D	D		E	D	
Approach Delay (s)		25.3			13.4			52.5			52.8	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	24.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	91.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



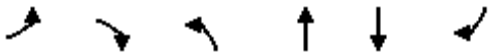
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	1705	50	65	990	35	45	0	235	25	0	25
Future Volume (vph)	45	1705	50	65	990	35	45	0	235	25	0	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	5.6		3.0	5.6		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.97	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	1.00	1.00		1.00	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1837	3514		1837	3480		1701	1568		1738	1537	
Flt Permitted	1.00	1.00		1.00	1.00		0.74	1.00		0.23	1.00	
Satd. Flow (perm)	1837	3514		1837	3480		1326	1568		425	1537	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	45	1705	50	65	990	35	45	0	235	25	0	25
RTOR Reduction (vph)	0	1	0	0	1	0	0	173	0	0	22	0
Lane Group Flow (vph)	45	1754	0	65	1024	0	45	62	0	25	3	0
Confl. Peds. (#/hr)	5		15	15		5	20		5	5		20
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	3%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	6.7	95.0		9.0	97.3		18.1	18.1		18.1	18.1	
Effective Green, g (s)	7.7	96.0		10.0	98.3		19.1	19.1		19.1	19.1	
Actuated g/C Ratio	0.06	0.69		0.07	0.70		0.14	0.14		0.14	0.14	
Clearance Time (s)	4.0	6.6		4.0	6.6		7.3	7.3		7.3	7.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	101	2409		131	2443		180	213		57	209	
v/s Ratio Prot	0.02	c0.50		c0.04	0.29			0.04			0.00	
v/s Ratio Perm							0.03			c0.06		
v/c Ratio	0.45	0.73		0.50	0.42		0.25	0.29		0.44	0.02	
Uniform Delay, d1	64.1	13.8		62.6	8.8		54.0	54.4		55.5	52.3	
Progression Factor	1.13	0.53		1.15	0.57		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.2	1.4		2.2	0.4		0.7	0.8		5.3	0.0	
Delay (s)	74.5	8.7		74.0	5.4		54.8	55.1		60.8	52.4	
Level of Service	E	A		E	A		D	E		E	D	
Approach Delay (s)		10.3			9.5			55.1			56.6	
Approach LOS		B			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	87.6%	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 (vph)	335	1040	540	285	585	45	375	880	345	100	530	160
Future Volume (vph)	335	1040	540	285	585	45	375	880	345	100	530	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.1	6.1	1.0	6.1	6.1	1.0	6.8	6.8	2.0	6.8	6.8
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.93	1.00	1.00	0.90	1.00	1.00	0.88	1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1837	3535	1436	1837	3500	1405	1792	3570	1324	1829	3535	1464
Flt Permitted	1.00	1.00	1.00	1.00	1.00	1.00	0.29	1.00	1.00	0.20	1.00	1.00
Satd. Flow (perm)	1837	3535	1436	1837	3500	1405	515	3570	1324	369	3535	1464
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	335	1040	540	285	585	45	375	880	345	100	530	160
RTOR Reduction (vph)	0	0	199	0	0	33	0	0	143	0	0	120
Lane Group Flow (vph)	335	1040	341	285	585	12	375	880	202	100	530	40
Confl. Peds. (#/hr)	60		40	40		60	45		95	95		45
Heavy Vehicles (%)	0%	1%	1%	0%	2%	0%	2%	0%	4%	0%	1%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	28.1	43.8	43.8	20.4	36.1	36.1	56.9	46.1	46.1	41.5	33.7	33.7
Effective Green, g (s)	29.1	44.8	44.8	23.4	37.1	37.1	58.9	47.1	47.1	43.5	34.7	34.7
Actuated g/C Ratio	0.21	0.32	0.32	0.17	0.27	0.27	0.42	0.34	0.34	0.31	0.25	0.25
Clearance Time (s)	4.0	7.1	7.1	4.0	7.1	7.1	3.0	7.8	7.8	3.0	7.8	7.8
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)	381	1131	459	307	927	372	419	1201	445	206	876	362
v/s Ratio Prot	c0.18	c0.29		c0.16	0.17		c0.14	c0.25		0.03	0.15	
v/s Ratio Perm			0.24			0.01	0.23		0.15	0.12		0.03
v/c Ratio	0.88	0.92	0.74	0.93	0.63	0.03	0.89	0.73	0.45	0.49	0.61	0.11
Uniform Delay, d1	53.7	45.9	42.5	57.5	45.4	38.1	30.9	40.9	36.4	35.9	46.6	40.7
Progression Factor	1.07	0.85	0.77	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.3	10.2	7.7	32.8	3.3	0.2	20.9	2.3	0.7	1.8	1.2	0.1
Delay (s)	73.1	49.4	40.5	90.3	48.7	38.3	51.8	43.3	37.1	37.7	47.8	40.8
Level of Service	E	D	D	F	D	D	D	D	D	D	D	D
Approach Delay (s)		51.0			61.1			43.9			45.1	
Approach LOS		D			E			D			D	

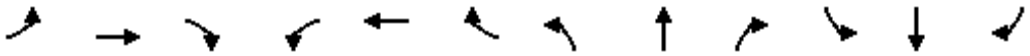
Intersection Summary			
HCM 2000 Control Delay	49.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.9
Intersection Capacity Utilization	110.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	0	0	30	15	35
Future Volume (Veh/h)	25	0	0	30	15	35
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	0	0	30	15	35
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					76	
pX, platoon unblocked						
vC, conflicting volume	62	32	50			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	62	32	50			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	100	100			
cM capacity (veh/h)	949	1047	1570			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	25	30	50
Volume Left	25	0	0
Volume Right	0	0	35
cSH	949	1570	1700
Volume to Capacity	0.03	0.00	0.03
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		

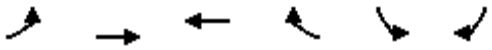
Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	0	0	5	0	0	15	0	0	5	10
Future Volume (Veh/h)	15	0	0	0	5	0	0	15	0	0	5	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	0	0	0	5	0	0	15	0	0	5	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											142	
pX, platoon unblocked												
vC, conflicting volume	28	25	10	25	30	15	15			15		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	28	25	10	25	30	15	15			15		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	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 %	98	100	100	100	99	100	100			100		
cM capacity (veh/h)	978	868	1071	991	863	1070	1603			1616		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	15	5	15	15
Volume Left	15	0	0	0
Volume Right	0	0	0	10
cSH	978	863	1603	1616
Volume to Capacity	0.02	0.01	0.00	0.00
Queue Length 95th (m)	0.4	0.1	0.0	0.0
Control Delay (s)	8.7	9.2	0.0	0.0
Lane LOS	A	A		
Approach Delay (s)	8.7	9.2	0.0	0.0
Approach LOS	A	A		

Intersection Summary				
Average Delay	3.5			
Intersection Capacity Utilization	17.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	0	0	0	0	5
Future Volume (Veh/h)	15	0	0	0	0	5
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	0	0	0	0	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)					202	
pX, platoon unblocked						
vC, conflicting volume	2	2	5	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2	2	5	0	0	
tC, single (s)	7.1	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.2	
p0 queue free %	99	100	100	100	100	
cM capacity (veh/h)	1025	897	894	1091	1636	

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	15	0	5
Volume Left	15	0	0
Volume Right	0	0	5
cSH	1025	1700	1636
Volume to Capacity	0.01	0.00	0.00
Queue Length 95th (m)	0.4	0.0	0.0
Control Delay (s)	8.6	0.0	0.0
Lane LOS	A	A	
Approach Delay (s)	8.6	0.0	0.0
Approach LOS	A	A	

Intersection Summary			
Average Delay	6.4		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

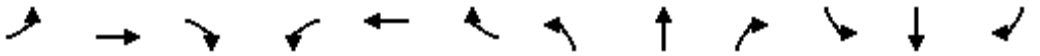
2035 Future Total Traffic Conditions



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	990	45	340	995	630	65
Future Volume (vph)	990	45	340	995	630	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.3	3.3	3.5	3.3	3.3
Total Lost time (s)	6.2		3.0	6.2	6.0	6.0
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		1.00	1.00	1.00	1.00
Satd. Flow (prot)	3416		1801	3466	3459	1516
Flt Permitted	1.00		1.00	1.00	1.00	1.00
Satd. Flow (perm)	3416		1801	3466	3459	1516
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	990	45	340	995	630	65
RTOR Reduction (vph)	2	0	0	0	0	38
Lane Group Flow (vph)	1033	0	340	995	630	27
Heavy Vehicles (%)	4%	0%	2%	3%	3%	3%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	62.1		30.4	96.5	29.3	29.3
Effective Green, g (s)	63.1		31.4	97.5	30.3	30.3
Actuated g/C Ratio	0.45		0.22	0.70	0.22	0.22
Clearance Time (s)	7.2		4.0	7.2	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1539		403	2413	748	328
v/s Ratio Prot	c0.30		c0.19	0.29	c0.18	
v/s Ratio Perm						0.02
v/c Ratio	0.67		0.84	0.41	0.84	0.08
Uniform Delay, d1	30.3		52.0	9.0	52.6	43.8
Progression Factor	1.00		1.23	1.37	1.00	1.00
Incremental Delay, d2	2.3		13.5	0.5	8.5	0.1
Delay (s)	32.6		77.3	12.8	61.1	43.9
Level of Service	C		E	B	E	D
Approach Delay (s)	32.6			29.2	59.5	
Approach LOS	C			C	E	

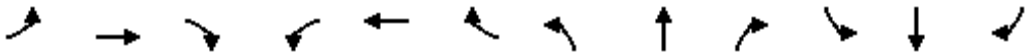
Intersection Summary			
HCM 2000 Control Delay	37.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.2
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



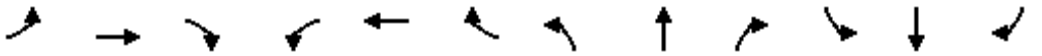
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	940	20	15	950	135	40	5	10	235	5	195
Future Volume (vph)	160	940	20	15	950	135	40	5	10	235	5	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Total Lost time (s)	3.0	5.3		5.3	5.3		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		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	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.98		1.00	0.90		1.00	0.85	
Flt Protected	1.00	1.00		0.95	1.00		0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1766	3456		1711	3416		1711	1621		1801	1537	
Flt Permitted	1.00	1.00		0.30	1.00		0.48	1.00		0.75	1.00	
Satd. Flow (perm)	1766	3456		537	3416		865	1621		1346	1537	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	160	940	20	15	950	135	40	5	10	235	5	195
RTOR Reduction (vph)	0	1	0	0	7	0	0	8	0	0	152	0
Lane Group Flow (vph)	160	959	0	15	1078	0	40	7	0	235	48	0
Confl. Peds. (#/hr)	5					5						
Heavy Vehicles (%)	4%	3%	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases				6			8			4		
Actuated Green, G (s)	17.5	96.7		75.2	75.2		29.7	29.7		29.7	29.7	
Effective Green, g (s)	18.5	97.7		76.2	76.2		30.7	30.7		30.7	30.7	
Actuated g/C Ratio	0.13	0.70		0.54	0.54		0.22	0.22		0.22	0.22	
Clearance Time (s)	4.0	6.3		6.3	6.3		7.3	7.3		7.3	7.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	233	2411		292	1859		189	355		295	337	
v/s Ratio Prot	c0.09	0.28			c0.32			0.00			0.03	
v/s Ratio Perm				0.03			0.05			c0.17		
v/c Ratio	0.69	0.40		0.05	0.58		0.21	0.02		0.80	0.14	
Uniform Delay, d1	58.0	8.8		15.0	21.2		44.7	42.9		51.7	44.0	
Progression Factor	0.96	1.54		1.68	1.37		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.6	0.4		0.3	1.2		0.6	0.0		13.8	0.2	
Delay (s)	62.3	14.1		25.4	30.2		45.3	42.9		65.5	44.2	
Level of Service	E	B		C	C		D	D		E	D	
Approach Delay (s)		20.9			30.2			44.6			55.7	
Approach LOS		C			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.6
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



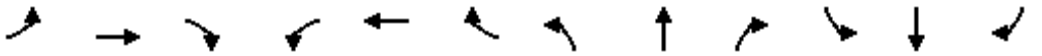
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	145	960	75	15	710	90	220	30	25	145	10	170
Future Volume (vph)	145	960	75	15	710	90	220	30	25	145	10	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.2		3.0	6.2		6.4	6.4		6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		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	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.93		1.00	0.86	
Flt Protected	1.00	1.00		1.00	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1818	3396		1818	3401		1737	1625		1692	1569	
Flt Permitted	1.00	1.00		1.00	1.00		0.55	1.00		0.72	1.00	
Satd. Flow (perm)	1818	3396		1818	3401		1001	1625		1284	1569	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	145	960	75	15	710	90	220	30	25	145	10	170
RTOR Reduction (vph)	0	3	0	0	6	0	0	19	0	0	127	0
Lane Group Flow (vph)	145	1032	0	15	794	0	220	36	0	145	53	0
Confl. Peds. (#/hr)	5		5	5		5	5		10	10		5
Heavy Vehicles (%)	1%	4%	0%	1%	3%	1%	0%	7%	6%	2%	2%	1%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	16.4	84.1		3.2	70.9		34.1	34.1		34.1	34.1	
Effective Green, g (s)	17.4	85.1		4.2	71.9		35.1	35.1		35.1	35.1	
Actuated g/C Ratio	0.12	0.61		0.03	0.51		0.25	0.25		0.25	0.25	
Clearance Time (s)	4.0	7.2		4.0	7.2		7.4	7.4		7.4	7.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	225	2064		54	1746		250	407		321	393	
v/s Ratio Prot	c0.08	c0.30		0.01	0.23			0.02			0.03	
v/s Ratio Perm							c0.22			0.11		
v/c Ratio	0.64	0.50		0.28	0.45		0.88	0.09		0.45	0.13	
Uniform Delay, d1	58.4	15.5		66.4	21.6		50.4	40.2		44.3	40.7	
Progression Factor	0.98	0.62		1.28	0.65		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.7	0.8		2.7	0.8		28.1	0.1		1.0	0.2	
Delay (s)	62.8	10.4		88.0	14.9		78.5	40.3		45.3	40.8	
Level of Service	E	B		F	B		E	D		D	D	
Approach Delay (s)		16.9			16.2			70.9			42.8	
Approach LOS		B			B			E			D	

Intersection Summary			
HCM 2000 Control Delay	25.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	78.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



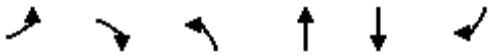
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	1125	25	170	745	25	35	0	275	20	0	20
Future Volume (vph)	20	1125	25	170	745	25	35	0	275	20	0	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	5.6		3.0	5.6		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.85		1.00	0.85	
Flt Protected	1.00	1.00		1.00	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1837	3416		1818	3452		1672	1537		1739	1483	
Flt Permitted	1.00	1.00		1.00	1.00		0.74	1.00		0.21	1.00	
Satd. Flow (perm)	1837	3416		1818	3452		1310	1537		387	1483	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	1125	25	170	745	25	35	0	275	20	0	20
RTOR Reduction (vph)	0	1	0	0	1	0	0	203	0	0	17	0
Lane Group Flow (vph)	20	1149	0	170	769	0	35	72	0	20	3	0
Confl. Peds. (#/hr)			15	15			10		5	5		10
Heavy Vehicles (%)	0%	4%	5%	1%	3%	0%	3%	9%	2%	0%	0%	5%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	4.8	86.0		18.2	99.4		17.9	17.9		17.9	17.9	
Effective Green, g (s)	5.8	87.0		19.2	100.4		18.9	18.9		18.9	18.9	
Actuated g/C Ratio	0.04	0.62		0.14	0.72		0.13	0.13		0.13	0.13	
Clearance Time (s)	4.0	6.6		4.0	6.6		7.3	7.3		7.3	7.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	76	2122		249	2475		176	207		52	200	
v/s Ratio Prot	0.01	c0.34		c0.09	0.22			0.05			0.00	
v/s Ratio Perm							0.03			c0.05		
v/c Ratio	0.26	0.54		0.68	0.31		0.20	0.35		0.38	0.01	
Uniform Delay, d1	65.0	15.1		57.5	7.2		53.8	54.9		55.2	52.5	
Progression Factor	1.06	0.84		0.85	1.77		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	0.9		6.8	0.3		0.6	1.0		4.7	0.0	
Delay (s)	70.4	13.6		55.7	13.0		54.4	56.0		59.9	52.5	
Level of Service	E	B		E	B		D	E		E	D	
Approach Delay (s)		14.6			20.7			55.8			56.2	
Approach LOS		B			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	74.1%	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 (vph)	235	475	490	180	475	45	255	340	145	65	640	215
Future Volume (vph)	235	475	490	180	475	45	255	340	145	65	640	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.1	6.1	3.0	6.1	6.1	0.5	6.8	6.8	2.0	6.8	6.8
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1766	3433	1414	1783	3433	1462	1781	3500	1351	1774	3535	1436
Flt Permitted	1.00	1.00	1.00	1.00	1.00	1.00	0.21	1.00	1.00	0.55	1.00	1.00
Satd. Flow (perm)	1766	3433	1414	1783	3433	1462	372	3500	1351	971	3535	1436
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	235	475	490	180	475	45	255	340	145	65	640	215
RTOR Reduction (vph)	0	0	242	0	0	31	0	0	96	0	0	156
Lane Group Flow (vph)	235	475	248	180	475	14	255	340	49	65	640	59
Confl. Peds. (#/hr)	35		25	25		35	20		40	40		20
Heavy Vehicles (%)	4%	4%	5%	3%	4%	0%	3%	2%	9%	2%	1%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	24.3	47.3	47.3	18.5	41.5	41.5	55.3	46.3	46.3	39.7	33.7	33.7
Effective Green, g (s)	25.3	48.3	48.3	19.5	42.5	42.5	57.8	47.3	47.3	41.7	34.7	34.7
Actuated g/C Ratio	0.18	0.34	0.34	0.14	0.30	0.30	0.41	0.34	0.34	0.30	0.25	0.25
Clearance Time (s)	4.0	7.1	7.1	4.0	7.1	7.1	3.0	7.8	7.8	3.0	7.8	7.8
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)	319	1184	487	248	1042	443	365	1182	456	329	876	355
v/s Ratio Prot	c0.13	0.14		0.10	0.14		c0.11	0.10		0.01	c0.18	
v/s Ratio Perm			c0.18			0.01	0.18		0.04	0.05		0.04
v/c Ratio	0.74	0.40	0.51	0.73	0.46	0.03	0.70	0.29	0.11	0.20	0.73	0.16
Uniform Delay, d1	54.2	34.9	36.4	57.7	39.4	34.3	29.9	34.0	31.8	35.8	48.4	41.3
Progression Factor	1.17	1.23	1.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.5	0.9	3.3	10.1	1.4	0.1	5.7	0.1	0.1	0.3	3.2	0.2
Delay (s)	71.0	43.8	75.5	67.8	40.8	34.4	35.7	34.1	32.0	36.1	51.5	41.5
Level of Service	E	D	E	E	D	C	D	C	C	D	D	D
Approach Delay (s)		62.1			47.4			34.2			48.1	
Approach LOS		E			D			C			D	

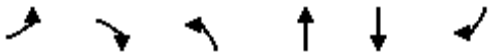
Intersection Summary			
HCM 2000 Control Delay	49.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.9
Intersection Capacity Utilization	92.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	110	0	0	130	15	30
Future Volume (Veh/h)	110	0	0	130	15	30
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	110	0	0	130	15	30
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					76	
pX, platoon unblocked						
vC, conflicting volume	160	30	45			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	160	30	45			
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)	836	1050	1576			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	110	130	45
Volume Left	110	0	0
Volume Right	0	0	30
cSH	836	1576	1700
Volume to Capacity	0.13	0.00	0.03
Queue Length 95th (m)	3.6	0.0	0.0
Control Delay (s)	10.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	10.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	19.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	130	0	0	0	0	15
Future Volume (Veh/h)	130	0	0	0	0	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	130	0	0	0	0	15
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					202	
pX, platoon unblocked						
vC, conflicting volume	8	8	15			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	8	8	15			
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)	1019	1075	1603			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	130	0	15
Volume Left	130	0	0
Volume Right	0	0	15
cSH	1019	1700	1700
Volume to Capacity	0.13	0.00	0.01
Queue Length 95th (m)	3.5	0.0	0.0
Control Delay (s)	9.1	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.1	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	8.1		
Intersection Capacity Utilization	17.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1155	30	0	1120	0	25
Future Volume (Veh/h)	1155	30	0	1120	0	25
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1155	30	0	1120	0	25
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				209		
pX, platoon unblocked					0.87	
vC, conflicting volume			1185		1715	578
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1185		1517	578
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	95
cM capacity (veh/h)			596		97	464

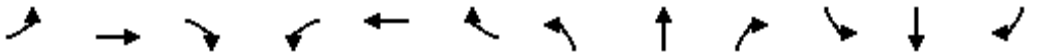
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	578	578	30	560	560	25
Volume Left	0	0	0	0	0	0
Volume Right	0	0	30	0	0	25
cSH	1700	1700	1700	1700	1700	464
Volume to Capacity	0.34	0.34	0.02	0.33	0.33	0.05
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	1.4
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	13.2
Lane LOS						B
Approach Delay (s)	0.0			0.0		13.2
Approach LOS						B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	41.9%	ICU Level of Service	A
Analysis Period (min)	15		



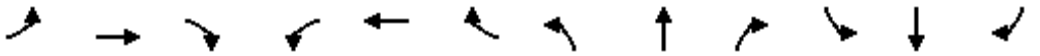
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1875	35	200	1065	725	360
Future Volume (vph)	1875	35	200	1065	725	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.3	3.3	3.5	3.3	3.3
Total Lost time (s)	6.2		2.0	6.2	3.5	6.0
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		1.00	1.00	1.00	1.00
Satd. Flow (prot)	3525		1783	3535	3528	1531
Flt Permitted	1.00		1.00	1.00	1.00	1.00
Satd. Flow (perm)	3525		1783	3535	3528	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1875	35	200	1065	725	360
RTOR Reduction (vph)	1	0	0	0	0	155
Lane Group Flow (vph)	1909	0	200	1065	725	205
Confl. Peds. (#/hr)						5
Heavy Vehicles (%)	1%	0%	3%	1%	1%	0%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	77.2		15.9	97.1	28.7	28.7
Effective Green, g (s)	78.2		17.9	98.1	32.2	29.7
Actuated g/C Ratio	0.56		0.13	0.70	0.23	0.21
Clearance Time (s)	7.2		4.0	7.2	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1968		227	2477	811	324
v/s Ratio Prot	c0.54		c0.11	0.30	c0.21	
v/s Ratio Perm						0.13
v/c Ratio	0.97		0.88	0.43	0.89	0.63
Uniform Delay, d1	29.8		60.0	9.0	52.2	50.2
Progression Factor	1.00		1.19	0.61	1.00	1.00
Incremental Delay, d2	14.4		25.3	0.4	12.3	4.0
Delay (s)	44.1		97.0	5.9	64.5	54.2
Level of Service	D		F	A	E	D
Approach Delay (s)	44.1			20.3	61.1	
Approach LOS	D			C	E	

Intersection Summary			
HCM 2000 Control Delay	41.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	97.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



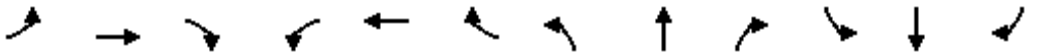
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	295	1905	40	25	990	220	35	10	10	265	10	155
Future Volume (vph)	295	1905	40	25	990	220	35	10	10	265	10	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Total Lost time (s)	3.0	5.3		5.3	5.3		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		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	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.97		1.00	0.93		1.00	0.86	
Flt Protected	1.00	1.00		0.95	1.00		0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1837	3523		1711	3390		1711	1666		1818	1535	
Flt Permitted	1.00	1.00		0.07	1.00		0.56	1.00		0.74	1.00	
Satd. Flow (perm)	1837	3523		132	3390		1004	1666		1354	1535	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	295	1905	40	25	990	220	35	10	10	265	10	155
RTOR Reduction (vph)	0	1	0	0	12	0	0	8	0	0	120	0
Lane Group Flow (vph)	295	1944	0	25	1198	0	35	12	0	265	45	0
Confl. Peds. (#/hr)	5					5						5
Heavy Vehicles (%)	0%	1%	2%	2%	2%	1%	2%	2%	2%	1%	2%	1%
Turn Type	Prot	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases				6			8			4		
Actuated Green, G (s)	25.4	95.6		66.2	66.2		30.8	30.8		30.8	30.8	
Effective Green, g (s)	26.4	96.6		67.2	67.2		31.8	31.8		31.8	31.8	
Actuated g/C Ratio	0.19	0.69		0.48	0.48		0.23	0.23		0.23	0.23	
Clearance Time (s)	4.0	6.3		6.3	6.3		7.3	7.3		7.3	7.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	346	2430		63	1627		228	378		307	348	
v/s Ratio Prot	c0.16	c0.55			0.35			0.01			0.03	
v/s Ratio Perm				0.19			0.03			c0.20		
v/c Ratio	0.85	0.80		0.40	0.74		0.15	0.03		0.86	0.13	
Uniform Delay, d1	54.9	15.0		23.4	29.3		43.3	42.1		52.0	43.1	
Progression Factor	0.81	1.74		1.74	1.64		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.3	1.0		15.0	2.5		0.3	0.0		21.3	0.2	
Delay (s)	51.6	27.2		55.7	50.5		43.6	42.2		73.3	43.3	
Level of Service	D	C		E	D		D	D		E	D	
Approach Delay (s)		30.4			50.6			43.1			61.8	
Approach LOS		C			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	40.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.6
Intersection Capacity Utilization	111.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



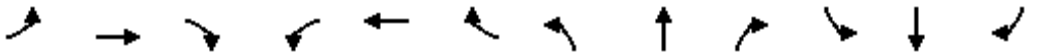
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	240	1560	350	35	910	150	170	15	15	135	20	120
Future Volume (vph)	240	1560	350	35	910	150	170	15	15	135	20	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.2		3.0	6.2		6.4	6.4		6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.98	1.00	
Frt	1.00	0.97		1.00	0.98		1.00	0.93		1.00	0.87	
Flt Protected	1.00	1.00		1.00	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1837	3410		1783	3417		1719	1707		1688	1612	
Flt Permitted	1.00	1.00		1.00	1.00		0.60	1.00		0.74	1.00	
Satd. Flow (perm)	1837	3410		1783	3417		1078	1707		1310	1612	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	240	1560	350	35	910	150	170	15	15	135	20	120
RTOR Reduction (vph)	0	11	0	0	8	0	0	12	0	0	96	0
Lane Group Flow (vph)	240	1899	0	35	1052	0	170	18	0	135	44	0
Confl. Peds. (#/hr)	5		10	10		5	5		20	20		5
Heavy Vehicles (%)	0%	1%	0%	3%	2%	0%	1%	0%	0%	1%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	23.3	88.1		6.2	71.0		27.1	27.1		27.1	27.1	
Effective Green, g (s)	24.3	89.1		7.2	72.0		28.1	28.1		28.1	28.1	
Actuated g/C Ratio	0.17	0.64		0.05	0.51		0.20	0.20		0.20	0.20	
Clearance Time (s)	4.0	7.2		4.0	7.2		7.4	7.4		7.4	7.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	318	2170		91	1757		216	342		262	323	
v/s Ratio Prot	c0.13	c0.56		0.02	0.31			0.01			0.03	
v/s Ratio Perm							c0.16			0.10		
v/c Ratio	0.75	0.87		0.38	0.60		0.79	0.05		0.52	0.14	
Uniform Delay, d1	55.0	20.9		64.3	23.9		53.1	45.2		49.9	46.0	
Progression Factor	0.91	1.10		1.07	0.44		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.1	3.3		2.5	1.4		17.0	0.1		1.7	0.2	
Delay (s)	56.3	26.2		71.1	12.0		70.2	45.3		51.6	46.2	
Level of Service	E	C		E	B		E	D		D	D	
Approach Delay (s)		29.6			13.9			66.4			48.8	
Approach LOS		C			B			E			D	

Intersection Summary			
HCM 2000 Control Delay	28.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	102.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



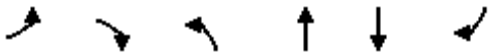
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	1720	50	65	1005	35	45	0	235	25	0	25
Future Volume (vph)	45	1720	50	65	1005	35	45	0	235	25	0	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	5.6		3.0	5.6		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.97	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	1.00	1.00		1.00	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1837	3515		1837	3481		1701	1568		1738	1537	
Flt Permitted	1.00	1.00		1.00	1.00		0.74	1.00		0.23	1.00	
Satd. Flow (perm)	1837	3515		1837	3481		1326	1568		425	1537	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	45	1720	50	65	1005	35	45	0	235	25	0	25
RTOR Reduction (vph)	0	1	0	0	1	0	0	173	0	0	22	0
Lane Group Flow (vph)	45	1769	0	65	1039	0	45	62	0	25	3	0
Confl. Peds. (#/hr)	5		15	15		5	20		5	5		20
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	3%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	6.7	95.0		9.0	97.3		18.1	18.1		18.1	18.1	
Effective Green, g (s)	7.7	96.0		10.0	98.3		19.1	19.1		19.1	19.1	
Actuated g/C Ratio	0.06	0.69		0.07	0.70		0.14	0.14		0.14	0.14	
Clearance Time (s)	4.0	6.6		4.0	6.6		7.3	7.3		7.3	7.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	101	2410		131	2444		180	213		57	209	
v/s Ratio Prot	0.02	c0.50		c0.04	0.30			0.04			0.00	
v/s Ratio Perm							0.03			c0.06		
v/c Ratio	0.45	0.73		0.50	0.43		0.25	0.29		0.44	0.02	
Uniform Delay, d1	64.1	13.9		62.6	8.9		54.0	54.4		55.5	52.3	
Progression Factor	1.06	0.57		1.15	0.57		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	1.2		2.2	0.4		0.7	0.8		5.3	0.0	
Delay (s)	70.1	9.2		74.3	5.5		54.8	55.1		60.8	52.4	
Level of Service	E	A		E	A		D	E		E	D	
Approach Delay (s)		10.7			9.5			55.1			56.6	
Approach LOS		B			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	87.6%	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 (vph)	340	1045	545	285	590	45	375	880	345	100	530	170
Future Volume (vph)	340	1045	545	285	590	45	375	880	345	100	530	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.1	6.1	1.0	6.1	6.1	1.0	6.8	6.8	2.0	6.8	6.8
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.93	1.00	1.00	0.90	1.00	1.00	0.88	1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1837	3535	1436	1837	3500	1405	1792	3570	1324	1829	3535	1464
Flt Permitted	1.00	1.00	1.00	1.00	1.00	1.00	0.29	1.00	1.00	0.20	1.00	1.00
Satd. Flow (perm)	1837	3535	1436	1837	3500	1405	515	3570	1324	369	3535	1464
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	340	1045	545	285	590	45	375	880	345	100	530	170
RTOR Reduction (vph)	0	0	199	0	0	33	0	0	143	0	0	128
Lane Group Flow (vph)	340	1045	346	285	590	12	375	880	202	100	530	42
Confl. Peds. (#/hr)	60		40	40		60	45		95	95		45
Heavy Vehicles (%)	0%	1%	1%	0%	2%	0%	2%	0%	4%	0%	1%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	28.3	43.8	43.8	20.4	35.9	35.9	56.9	46.1	46.1	41.5	33.7	33.7
Effective Green, g (s)	29.3	44.8	44.8	23.4	36.9	36.9	58.9	47.1	47.1	43.5	34.7	34.7
Actuated g/C Ratio	0.21	0.32	0.32	0.17	0.26	0.26	0.42	0.34	0.34	0.31	0.25	0.25
Clearance Time (s)	4.0	7.1	7.1	4.0	7.1	7.1	3.0	7.8	7.8	3.0	7.8	7.8
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)	384	1131	459	307	922	370	419	1201	445	206	876	362
v/s Ratio Prot	c0.19	c0.30		c0.16	0.17		c0.14	c0.25		0.03	0.15	
v/s Ratio Perm			0.24			0.01	0.23		0.15	0.12		0.03
v/c Ratio	0.89	0.92	0.75	0.93	0.64	0.03	0.89	0.73	0.45	0.49	0.61	0.12
Uniform Delay, d1	53.7	46.0	42.6	57.5	45.7	38.3	30.9	40.9	36.4	35.9	46.6	40.8
Progression Factor	1.11	0.84	0.72	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	16.0	10.6	8.0	32.8	3.4	0.2	20.9	2.3	0.7	1.8	1.2	0.1
Delay (s)	75.4	49.0	38.6	90.3	49.1	38.4	51.8	43.3	37.1	37.7	47.8	40.9
Level of Service	E	D	D	F	D	D	D	D	D	D	D	D
Approach Delay (s)		50.7			61.3			43.9			45.1	
Approach LOS		D			E			D			D	

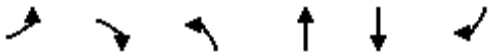
Intersection Summary			
HCM 2000 Control Delay	49.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.9
Intersection Capacity Utilization	110.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	60	0	0	75	45	60
Future Volume (Veh/h)	60	0	0	75	45	60
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	60	0	0	75	45	60
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					76	
pX, platoon unblocked						
vC, conflicting volume	150	75	105			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	150	75	105			
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)	847	992	1499			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	60	75	105
Volume Left	60	0	0
Volume Right	0	0	60
cSH	847	1499	1700
Volume to Capacity	0.07	0.00	0.06
Queue Length 95th (m)	1.8	0.0	0.0
Control Delay (s)	9.6	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.6	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	16.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	75	0	0	0	0	45
Future Volume (Veh/h)	75	0	0	0	0	45
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	75	0	0	0	0	45
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					202	
pX, platoon unblocked						
vC, conflicting volume	22	22	45			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	22	22	45			
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	100	100			
cM capacity (veh/h)	999	1054	1563			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	75	0	45
Volume Left	75	0	0
Volume Right	0	0	45
cSH	999	1700	1700
Volume to Capacity	0.08	0.00	0.03
Queue Length 95th (m)	1.9	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	5.6		
Intersection Capacity Utilization	14.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	2135	80	0	1200	0	15
Future Volume (Veh/h)	2135	80	0	1200	0	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	2135	80	0	1200	0	15
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		
pX, platoon unblocked					0.80	
vC, conflicting volume			2215		2735	1068
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2215		2668	1068
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	93
cM capacity (veh/h)			240		15	221

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	1068	1068	80	600	600	15
Volume Left	0	0	0	0	0	0
Volume Right	0	0	80	0	0	15
cSH	1700	1700	1700	1700	1700	221
Volume to Capacity	0.63	0.63	0.05	0.35	0.35	0.07
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	1.7
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	22.5
Lane LOS						C
Approach Delay (s)	0.0			0.0		22.5
Approach LOS						C

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		

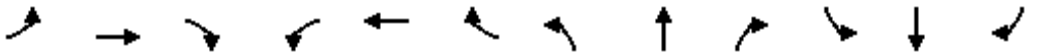
2040 Future Background Traffic Conditions



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	995	45	310	925	625	60
Future Volume (vph)	995	45	310	925	625	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.3	3.3	3.5	3.3	3.3
Total Lost time (s)	6.2		3.0	6.2	6.0	6.0
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		1.00	1.00	1.00	1.00
Satd. Flow (prot)	3416		1801	3466	3459	1516
Flt Permitted	1.00		1.00	1.00	1.00	1.00
Satd. Flow (perm)	3416		1801	3466	3459	1516
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	995	45	310	925	625	60
RTOR Reduction (vph)	2	0	0	0	0	35
Lane Group Flow (vph)	1038	0	310	925	625	25
Heavy Vehicles (%)	4%	0%	2%	3%	3%	3%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	64.0		28.7	96.7	29.1	29.1
Effective Green, g (s)	65.0		29.7	97.7	30.1	30.1
Actuated g/C Ratio	0.46		0.21	0.70	0.22	0.22
Clearance Time (s)	7.2		4.0	7.2	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1586		382	2418	743	325
v/s Ratio Prot	c0.30		c0.17	0.27	c0.18	
v/s Ratio Perm						0.02
v/c Ratio	0.65		0.81	0.38	0.84	0.08
Uniform Delay, d1	28.9		52.5	8.7	52.7	43.9
Progression Factor	1.00		1.27	1.05	1.00	1.00
Incremental Delay, d2	2.1		11.5	0.4	8.5	0.1
Delay (s)	31.0		78.2	9.6	61.2	44.0
Level of Service	C		E	A	E	D
Approach Delay (s)	31.0			26.8	59.7	
Approach LOS	C			C	E	

Intersection Summary			
HCM 2000 Control Delay	35.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.2
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

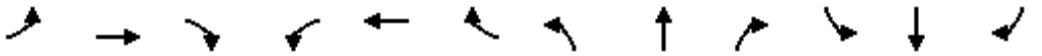


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	940	20	15	845	120	40	5	5	230	5	200
Future Volume (vph)	160	940	20	15	845	120	40	5	5	230	5	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Total Lost time (s)	3.0	5.3		5.3	5.3		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		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	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.98		1.00	0.93		1.00	0.85	
Flt Protected	1.00	1.00		0.95	1.00		0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1766	3456		1711	3416		1711	1666		1801	1537	
Flt Permitted	1.00	1.00		0.30	1.00		0.47	1.00		0.75	1.00	
Satd. Flow (perm)	1766	3456		537	3416		839	1666		1352	1537	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	160	940	20	15	845	120	40	5	5	230	5	200
RTOR Reduction (vph)	0	1	0	0	7	0	0	4	0	0	157	0
Lane Group Flow (vph)	160	959	0	15	958	0	40	6	0	230	48	0
Confl. Peds. (#/hr)	5					5						
Heavy Vehicles (%)	4%	3%	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases				6			8			4		
Actuated Green, G (s)	17.9	97.3		75.4	75.4		29.1	29.1		29.1	29.1	
Effective Green, g (s)	18.9	98.3		76.4	76.4		30.1	30.1		30.1	30.1	
Actuated g/C Ratio	0.13	0.70		0.55	0.55		0.22	0.22		0.22	0.22	
Clearance Time (s)	4.0	6.3		6.3	6.3		7.3	7.3		7.3	7.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	238	2426		293	1864		180	358		290	330	
v/s Ratio Prot	c0.09	0.28			c0.28			0.00			0.03	
v/s Ratio Perm				0.03			0.05			c0.17		
v/c Ratio	0.67	0.40		0.05	0.51		0.22	0.02		0.79	0.15	
Uniform Delay, d1	57.6	8.6		14.9	20.1		45.3	43.3		52.0	44.5	
Progression Factor	0.89	1.85		1.63	1.36		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.0	0.4		0.3	1.0		0.6	0.0		13.8	0.2	
Delay (s)	57.1	16.3		24.5	28.3		45.9	43.3		65.8	44.7	
Level of Service	E	B		C	C		D	D		E	D	
Approach Delay (s)		22.1			28.3			45.4			55.9	
Approach LOS		C			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	30.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.6
Intersection Capacity Utilization	82.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

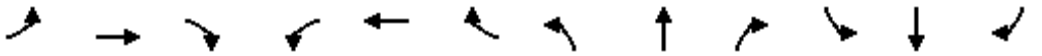
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	975	65	20	760	85	50	0	10	145	0	170
Future Volume (vph)	135	975	65	20	760	85	50	0	10	145	0	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.2		3.0	6.2		6.4	6.4		6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.85		1.00	0.85	
Flt Protected	1.00	1.00		1.00	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1818	3401		1818	3408		1737	1471		1690	1553	
Flt Permitted	1.00	1.00		1.00	1.00		0.51	1.00		0.75	1.00	
Satd. Flow (perm)	1818	3401		1818	3408		924	1471		1336	1553	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	135	975	65	20	760	85	50	0	10	145	0	170
RTOR Reduction (vph)	0	2	0	0	4	0	0	8	0	0	140	0
Lane Group Flow (vph)	135	1038	0	20	841	0	50	2	0	145	30	0
Confl. Peds. (#/hr)	5		5	5		5	5		10	10		5
Heavy Vehicles (%)	1%	4%	0%	1%	3%	1%	0%	7%	6%	2%	2%	1%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	15.6	92.5		4.8	81.7		24.1	24.1		24.1	24.1	
Effective Green, g (s)	16.6	93.5		5.8	82.7		25.1	25.1		25.1	25.1	
Actuated g/C Ratio	0.12	0.67		0.04	0.59		0.18	0.18		0.18	0.18	
Clearance Time (s)	4.0	7.2		4.0	7.2		7.4	7.4		7.4	7.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	215	2271		75	2013		165	263		239	278	
v/s Ratio Prot	c0.07	c0.31		0.01	0.25			0.00			0.02	
v/s Ratio Perm							0.05			c0.11		
v/c Ratio	0.63	0.46		0.27	0.42		0.30	0.01		0.61	0.11	
Uniform Delay, d1	58.8	11.1		65.0	15.6		49.9	47.2		52.9	48.1	
Progression Factor	1.16	0.61		1.06	0.56		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.2	0.6		1.8	0.6		1.0	0.0		4.3	0.2	
Delay (s)	73.5	7.4		70.9	9.3		50.9	47.2		57.2	48.3	
Level of Service	E	A		E	A		D	D		E	D	
Approach Delay (s)		15.0			10.7			50.3			52.4	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



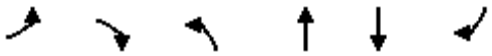
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	1130	25	170	795	25	35	0	275	20	0	20
Future Volume (vph)	20	1130	25	170	795	25	35	0	275	20	0	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	5.6		3.0	5.6		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.85		1.00	0.85	
Flt Protected	1.00	1.00		1.00	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1837	3416		1818	3453		1672	1537		1739	1483	
Flt Permitted	1.00	1.00		1.00	1.00		0.74	1.00		0.21	1.00	
Satd. Flow (perm)	1837	3416		1818	3453		1310	1537		385	1483	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	1130	25	170	795	25	35	0	275	20	0	20
RTOR Reduction (vph)	0	1	0	0	1	0	0	202	0	0	17	0
Lane Group Flow (vph)	20	1154	0	170	819	0	35	73	0	20	3	0
Confl. Peds. (#/hr)			15	15			10		5	5		10
Heavy Vehicles (%)	0%	4%	5%	1%	3%	0%	3%	9%	2%	0%	0%	5%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	4.8	85.9		18.2	99.3		18.0	18.0		18.0	18.0	
Effective Green, g (s)	5.8	86.9		19.2	100.3		19.0	19.0		19.0	19.0	
Actuated g/C Ratio	0.04	0.62		0.14	0.72		0.14	0.14		0.14	0.14	
Clearance Time (s)	4.0	6.6		4.0	6.6		7.3	7.3		7.3	7.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	76	2120		249	2473		177	208		52	201	
v/s Ratio Prot	0.01	c0.34		c0.09	0.24			0.05			0.00	
v/s Ratio Perm							0.03			c0.05		
v/c Ratio	0.26	0.54		0.68	0.33		0.20	0.35		0.38	0.01	
Uniform Delay, d1	65.0	15.2		57.5	7.4		53.7	54.9		55.2	52.4	
Progression Factor	1.18	0.75		0.85	1.88		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	0.9		6.7	0.3		0.6	1.0		4.7	0.0	
Delay (s)	78.5	12.3		55.3	14.2		54.3	55.9		59.8	52.4	
Level of Service	E	B		E	B		D	E		E	D	
Approach Delay (s)		13.4			21.2			55.7			56.1	
Approach LOS		B			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	74.2%	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 (vph)	220	505	480	180	530	45	260	340	145	65	640	205
Future Volume (vph)	220	505	480	180	530	45	260	340	145	65	640	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.1	6.1	3.0	6.1	6.1	0.5	6.8	6.8	2.0	6.8	6.8
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1766	3433	1414	1783	3433	1462	1781	3500	1351	1774	3535	1436
Flt Permitted	1.00	1.00	1.00	1.00	1.00	1.00	0.21	1.00	1.00	0.55	1.00	1.00
Satd. Flow (perm)	1766	3433	1414	1783	3433	1462	371	3500	1351	971	3535	1436
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	220	505	480	180	530	45	260	340	145	65	640	205
RTOR Reduction (vph)	0	0	242	0	0	31	0	0	96	0	0	149
Lane Group Flow (vph)	220	505	238	180	530	14	260	340	49	65	640	56
Confl. Peds. (#/hr)	35		25	25		35	20		40	40		20
Heavy Vehicles (%)	4%	4%	5%	3%	4%	0%	3%	2%	9%	2%	1%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	22.1	47.1	47.1	18.5	43.5	43.5	55.5	46.5	46.5	39.6	33.6	33.6
Effective Green, g (s)	23.1	48.1	48.1	19.5	44.5	44.5	58.0	47.5	47.5	41.6	34.6	34.6
Actuated g/C Ratio	0.17	0.34	0.34	0.14	0.32	0.32	0.41	0.34	0.34	0.30	0.25	0.25
Clearance Time (s)	4.0	7.1	7.1	4.0	7.1	7.1	3.0	7.8	7.8	3.0	7.8	7.8
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)	291	1179	485	248	1091	464	369	1187	458	328	873	354
v/s Ratio Prot	c0.12	0.15		0.10	0.15		c0.11	0.10		0.01	c0.18	
v/s Ratio Perm			c0.17			0.01	0.18		0.04	0.05		0.04
v/c Ratio	0.76	0.43	0.49	0.73	0.49	0.03	0.70	0.29	0.11	0.20	0.73	0.16
Uniform Delay, d1	55.8	35.4	36.3	57.7	38.5	32.9	29.9	33.8	31.7	35.9	48.5	41.3
Progression Factor	1.13	1.20	2.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.3	1.0	3.0	10.1	1.5	0.1	6.0	0.1	0.1	0.3	3.2	0.2
Delay (s)	72.2	43.5	76.0	67.8	40.1	33.0	35.9	34.0	31.8	36.2	51.7	41.5
Level of Service	E	D	E	E	D	C	D	C	C	D	D	D
Approach Delay (s)		61.7			46.3			34.2			48.3	
Approach LOS		E			D			C			D	

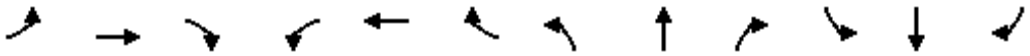
Intersection Summary			
HCM 2000 Control Delay	49.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.9
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	0	0	10	10	20
Future Volume (Veh/h)	15	0	0	10	10	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	0	0	10	10	20
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					76	
pX, platoon unblocked						
vC, conflicting volume	30	20	30			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	30	20	30			
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)	989	1064	1596			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	15	10	30
Volume Left	15	0	0
Volume Right	0	0	20
cSH	989	1596	1700
Volume to Capacity	0.02	0.00	0.02
Queue Length 95th (m)	0.4	0.0	0.0
Control Delay (s)	8.7	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.7	0.0	0.0
Approach LOS	A		

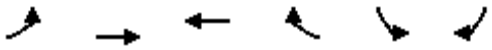
Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	0	0	0	0	0	5	0	0	5	5
Future Volume (Veh/h)	5	0	0	0	0	0	0	5	0	0	5	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	0	0	0	0	0	0	5	0	0	5	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)											142	
pX, platoon unblocked												
vC, conflicting volume	12	12	8	12	15	5	10			5		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	12	12	8	12	15	5	10			5		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	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	100	100	100	100			100		
cM capacity (veh/h)	1004	882	1075	1010	879	1084	1610			1630		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	0	5	10
Volume Left	5	0	0	0
Volume Right	0	0	0	5
cSH	1004	1700	1610	1630
Volume to Capacity	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.1	0.0	0.0	0.0
Control Delay (s)	8.6	0.0	0.0	0.0
Lane LOS	A	A		
Approach Delay (s)	8.6	0.0	0.0	0.0
Approach LOS	A	A		

Intersection Summary				
Average Delay	2.2			
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)	5	0	0	0	0	5
Future Volume (Veh/h)	5	0	0	0	0	5
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	0	0	0	0	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)					202	
pX, platoon unblocked						
vC, conflicting volume	2	2	5	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2	2	5	0	0	
tC, single (s)	7.1	7.0	6.5	6.7	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.5	4.0	3.8	2.2	
p0 queue free %	100	100	100	100	100	
cM capacity (veh/h)	1025	806	894	960	1636	

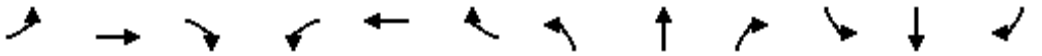
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	5	0	5
Volume Left	5	0	0
Volume Right	0	0	5
cSH	1025	1700	1636
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (m)	0.1	0.0	0.0
Control Delay (s)	8.5	0.0	0.0
Lane LOS	A	A	
Approach Delay (s)	8.5	0.0	0.0
Approach LOS	A	A	

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



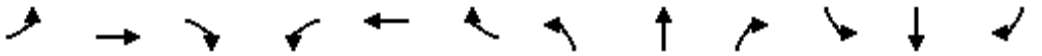
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1825	35	175	1050	725	340
Future Volume (vph)	1825	35	175	1050	725	340
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.3	3.3	3.5	3.3	3.3
Total Lost time (s)	6.2		2.0	6.2	3.5	6.0
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		1.00	1.00	1.00	1.00
Satd. Flow (prot)	3525		1783	3535	3528	1531
Flt Permitted	1.00		1.00	1.00	1.00	1.00
Satd. Flow (perm)	3525		1783	3535	3528	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1825	35	175	1050	725	340
RTOR Reduction (vph)	1	0	0	0	0	156
Lane Group Flow (vph)	1859	0	175	1050	725	184
Confl. Peds. (#/hr)						5
Heavy Vehicles (%)	1%	0%	3%	1%	1%	0%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	77.7		15.4	97.1	28.7	28.7
Effective Green, g (s)	78.7		17.4	98.1	32.2	29.7
Actuated g/C Ratio	0.56		0.12	0.70	0.23	0.21
Clearance Time (s)	7.2		4.0	7.2	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1981		221	2477	811	324
v/s Ratio Prot	c0.53		c0.10	0.30	c0.21	
v/s Ratio Perm						0.12
v/c Ratio	0.94		0.79	0.42	0.89	0.57
Uniform Delay, d1	28.4		59.5	8.9	52.2	49.4
Progression Factor	1.00		1.25	0.50	1.00	1.00
Incremental Delay, d2	10.1		14.5	0.4	12.3	2.3
Delay (s)	38.6		88.8	4.9	64.5	51.7
Level of Service	D		F	A	E	D
Approach Delay (s)	38.6			16.9	60.4	
Approach LOS	D			B	E	

Intersection Summary			
HCM 2000 Control Delay	37.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	94.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



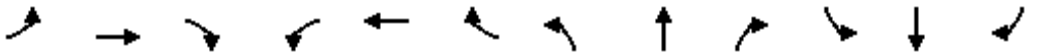
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	290	1840	40	25	955	215	30	10	10	255	10	155
Future Volume (vph)	290	1840	40	25	955	215	30	10	10	255	10	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Total Lost time (s)	3.0	5.3		5.3	5.3		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		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	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.97		1.00	0.93		1.00	0.86	
Flt Protected	1.00	1.00		0.95	1.00		0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1837	3523		1711	3389		1711	1666		1818	1535	
Flt Permitted	1.00	1.00		0.09	1.00		0.55	1.00		0.74	1.00	
Satd. Flow (perm)	1837	3523		157	3389		999	1666		1354	1535	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	290	1840	40	25	955	215	30	10	10	255	10	155
RTOR Reduction (vph)	0	1	0	0	13	0	0	8	0	0	120	0
Lane Group Flow (vph)	290	1879	0	25	1157	0	30	12	0	255	45	0
Confl. Peds. (#/hr)	5					5						5
Heavy Vehicles (%)	0%	1%	2%	2%	2%	1%	2%	2%	2%	1%	2%	1%
Turn Type	Prot	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases				6			8			4		
Actuated Green, G (s)	25.3	96.2		66.9	66.9		30.2	30.2		30.2	30.2	
Effective Green, g (s)	26.3	97.2		67.9	67.9		31.2	31.2		31.2	31.2	
Actuated g/C Ratio	0.19	0.69		0.49	0.49		0.22	0.22		0.22	0.22	
Clearance Time (s)	4.0	6.3		6.3	6.3		7.3	7.3		7.3	7.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	345	2445		76	1643		222	371		301	342	
v/s Ratio Prot	c0.16	c0.53			0.34			0.01			0.03	
v/s Ratio Perm				0.16			0.03			c0.19		
v/c Ratio	0.84	0.77		0.33	0.70		0.14	0.03		0.85	0.13	
Uniform Delay, d1	54.8	14.0		22.1	28.2		43.6	42.6		52.1	43.5	
Progression Factor	0.80	1.78		1.83	1.66		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.7	1.0		9.8	2.2		0.3	0.0		19.3	0.2	
Delay (s)	51.4	26.0		50.3	49.0		43.9	42.6		71.4	43.7	
Level of Service	D	C		D	D		D	D		E	D	
Approach Delay (s)		29.4			49.0			43.4			60.5	
Approach LOS		C			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	39.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.6
Intersection Capacity Utilization	107.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



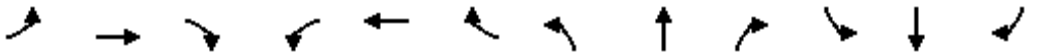
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	245	1570	325	25	950	150	95	0	25	135	0	115
Future Volume (vph)	245	1570	325	25	950	150	95	0	25	135	0	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.2		2.0	6.2		6.4	6.4		6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.96		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		0.98	1.00	
Frt	1.00	0.97		1.00	0.98		1.00	0.85		1.00	0.85	
Flt Protected	1.00	1.00		1.00	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1837	3418		1783	3420		1719	1540		1688	1569	
Flt Permitted	1.00	1.00		1.00	1.00		0.64	1.00		0.74	1.00	
Satd. Flow (perm)	1837	3418		1783	3420		1162	1540		1316	1569	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	245	1570	325	25	950	150	95	0	25	135	0	115
RTOR Reduction (vph)	0	9	0	0	7	0	0	21	0	0	95	0
Lane Group Flow (vph)	245	1886	0	25	1093	0	95	4	0	135	20	0
Confl. Peds. (#/hr)	5		10	10		5	5		20	20		5
Heavy Vehicles (%)	0%	1%	0%	3%	2%	0%	1%	0%	0%	1%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	23.8	93.7		5.1	74.0		23.6	23.6		23.6	23.6	
Effective Green, g (s)	24.8	94.7		6.1	75.0		24.6	24.6		24.6	24.6	
Actuated g/C Ratio	0.18	0.68		0.04	0.54		0.18	0.18		0.18	0.18	
Clearance Time (s)	4.0	7.2		3.0	7.2		7.4	7.4		7.4	7.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	325	2312		77	1832		204	270		231	275	
v/s Ratio Prot	c0.13	c0.55		0.01	0.32			0.00			0.01	
v/s Ratio Perm							0.08			c0.10		
v/c Ratio	0.75	0.82		0.32	0.60		0.47	0.02		0.58	0.07	
Uniform Delay, d1	54.7	16.4		65.0	22.2		51.8	47.7		53.0	48.2	
Progression Factor	0.92	1.16		1.04	0.48		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.3	2.2		2.3	1.3		1.7	0.0		3.7	0.1	
Delay (s)	56.5	21.2		69.5	12.0		53.5	47.7		56.7	48.3	
Level of Service	E	C		E	B		D	D		E	D	
Approach Delay (s)		25.2			13.3			52.3			52.9	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	92.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



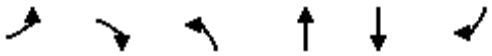
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	1745	50	65	1035	35	45	0	230	25	0	25
Future Volume (vph)	45	1745	50	65	1035	35	45	0	230	25	0	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	5.6		3.0	5.6		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.97	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.85		1.00	0.85	
Flt Protected	1.00	1.00		1.00	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1837	3515		1837	3481		1701	1568		1738	1537	
Flt Permitted	1.00	1.00		1.00	1.00		0.74	1.00		0.25	1.00	
Satd. Flow (perm)	1837	3515		1837	3481		1326	1568		453	1537	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	45	1745	50	65	1035	35	45	0	230	25	0	25
RTOR Reduction (vph)	0	1	0	0	1	0	0	172	0	0	22	0
Lane Group Flow (vph)	45	1794	0	65	1069	0	45	58	0	25	3	0
Confl. Peds. (#/hr)	5		15	15		5	20		5	5		20
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	3%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	6.7	95.0		9.0	97.3		18.1	18.1		18.1	18.1	
Effective Green, g (s)	7.7	96.0		10.0	98.3		19.1	19.1		19.1	19.1	
Actuated g/C Ratio	0.06	0.69		0.07	0.70		0.14	0.14		0.14	0.14	
Clearance Time (s)	4.0	6.6		4.0	6.6		7.3	7.3		7.3	7.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	101	2410		131	2444		180	213		61	209	
v/s Ratio Prot	0.02	c0.51		c0.04	0.31			0.04			0.00	
v/s Ratio Perm							0.03			c0.06		
v/c Ratio	0.45	0.74		0.50	0.44		0.25	0.27		0.41	0.02	
Uniform Delay, d1	64.1	14.1		62.6	9.0		54.0	54.2		55.3	52.3	
Progression Factor	1.13	0.51		1.19	0.57		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.1	1.5		2.1	0.4		0.7	0.7		4.4	0.0	
Delay (s)	74.5	8.6		76.9	5.5		54.8	54.9		59.7	52.4	
Level of Service	E	A		E	A		D	D		E	D	
Approach Delay (s)		10.2			9.6			54.9			56.0	
Approach LOS		B			A			D			E	

Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	87.6%	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 (vph)	330	1080	540	285	630	45	375	880	345	100	530	160
Future Volume (vph)	330	1080	540	285	630	45	375	880	345	100	530	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.1	6.1	1.0	6.1	6.1	1.0	6.8	6.8	2.0	6.8	6.8
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.93	1.00	1.00	0.90	1.00	1.00	0.88	1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1837	3535	1436	1837	3500	1405	1792	3570	1324	1829	3535	1464
Flt Permitted	1.00	1.00	1.00	1.00	1.00	1.00	0.29	1.00	1.00	0.20	1.00	1.00
Satd. Flow (perm)	1837	3535	1436	1837	3500	1405	515	3570	1324	365	3535	1464
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	330	1080	540	285	630	45	375	880	345	100	530	160
RTOR Reduction (vph)	0	0	191	0	0	33	0	0	144	0	0	120
Lane Group Flow (vph)	330	1080	349	285	630	12	375	880	201	100	530	40
Confl. Peds. (#/hr)	60		40	40		60	45		95	95		45
Heavy Vehicles (%)	0%	1%	1%	0%	2%	0%	2%	0%	4%	0%	1%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	27.9	44.0	44.0	20.4	36.5	36.5	56.7	45.9	45.9	41.5	33.7	33.7
Effective Green, g (s)	28.9	45.0	45.0	23.4	37.5	37.5	58.7	46.9	46.9	43.5	34.7	34.7
Actuated g/C Ratio	0.21	0.32	0.32	0.17	0.27	0.27	0.42	0.33	0.33	0.31	0.25	0.25
Clearance Time (s)	4.0	7.1	7.1	4.0	7.1	7.1	3.0	7.8	7.8	3.0	7.8	7.8
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)	379	1136	461	307	937	376	416	1195	443	205	876	362
v/s Ratio Prot	c0.18	c0.31		c0.16	0.18		c0.14	c0.25		0.03	0.15	
v/s Ratio Perm			0.24			0.01	0.24		0.15	0.12		0.03
v/c Ratio	0.87	0.95	0.76	0.93	0.67	0.03	0.90	0.74	0.45	0.49	0.61	0.11
Uniform Delay, d1	53.7	46.4	42.6	57.5	45.8	37.8	31.1	41.1	36.5	35.9	46.6	40.7
Progression Factor	1.08	0.85	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.3	13.4	8.0	32.8	3.8	0.2	22.2	2.4	0.7	1.8	1.2	0.1
Delay (s)	72.6	52.7	39.9	90.3	49.6	38.0	53.2	43.5	37.3	37.8	47.8	40.8
Level of Service	E	D	D	F	D	D	D	D	D	D	D	D
Approach Delay (s)		52.5			61.1			44.4			45.1	
Approach LOS		D			E			D			D	

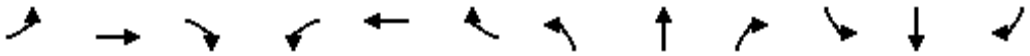
Intersection Summary			
HCM 2000 Control Delay	50.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.9
Intersection Capacity Utilization	111.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	0	0	30	15	35
Future Volume (Veh/h)	25	0	0	30	15	35
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	0	0	30	15	35
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					76	
pX, platoon unblocked						
vC, conflicting volume	62	32	50			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	62	32	50			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	100	100			
cM capacity (veh/h)	949	1047	1570			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	25	30	50
Volume Left	25	0	0
Volume Right	0	0	35
cSH	949	1570	1700
Volume to Capacity	0.03	0.00	0.03
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		

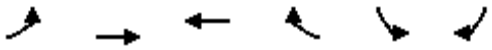
Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	0	0	5	0	0	15	0	0	5	10
Future Volume (Veh/h)	15	0	0	0	5	0	0	15	0	0	5	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	0	0	0	5	0	0	15	0	0	5	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											142	
pX, platoon unblocked												
vC, conflicting volume	28	25	10	25	30	15	15			15		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	28	25	10	25	30	15	15			15		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	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 %	98	100	100	100	99	100	100			100		
cM capacity (veh/h)	978	868	1071	991	863	1070	1603			1616		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	15	5	15	15
Volume Left	15	0	0	0
Volume Right	0	0	0	10
cSH	978	863	1603	1616
Volume to Capacity	0.02	0.01	0.00	0.00
Queue Length 95th (m)	0.4	0.1	0.0	0.0
Control Delay (s)	8.7	9.2	0.0	0.0
Lane LOS	A	A		
Approach Delay (s)	8.7	9.2	0.0	0.0
Approach LOS	A	A		

Intersection Summary				
Average Delay	3.5			
Intersection Capacity Utilization	17.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	0	0	0	0	5
Future Volume (Veh/h)	15	0	0	0	0	5
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	0	0	0	0	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)					202	
pX, platoon unblocked						
vC, conflicting volume	2	2	5	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2	2	5	0	0	
tC, single (s)	7.1	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.2	
p0 queue free %	99	100	100	100	100	
cM capacity (veh/h)	1025	897	894	1091	1636	

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	15	0	5
Volume Left	15	0	0
Volume Right	0	0	5
cSH	1025	1700	1636
Volume to Capacity	0.01	0.00	0.00
Queue Length 95th (m)	0.4	0.0	0.0
Control Delay (s)	8.6	0.0	0.0
Lane LOS	A	A	
Approach Delay (s)	8.6	0.0	0.0
Approach LOS	A	A	

Intersection Summary			
Average Delay	6.4		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

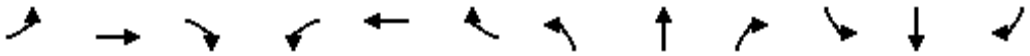
2040 Future Total Traffic Conditions



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1045	45	345	1025	625	85
Future Volume (vph)	1045	45	345	1025	625	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.3	3.3	3.5	3.3	3.3
Total Lost time (s)	6.2		3.0	6.2	6.0	6.0
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		1.00	1.00	1.00	1.00
Satd. Flow (prot)	3417		1801	3466	3459	1516
Flt Permitted	1.00		1.00	1.00	1.00	1.00
Satd. Flow (perm)	3417		1801	3466	3459	1516
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1045	45	345	1025	625	85
RTOR Reduction (vph)	2	0	0	0	0	50
Lane Group Flow (vph)	1088	0	345	1025	625	35
Heavy Vehicles (%)	4%	0%	2%	3%	3%	3%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	62.4		30.6	97.0	28.8	28.8
Effective Green, g (s)	63.4		31.6	98.0	29.8	29.8
Actuated g/C Ratio	0.45		0.23	0.70	0.21	0.21
Clearance Time (s)	7.2		4.0	7.2	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1547		406	2426	736	322
v/s Ratio Prot	c0.32		c0.19	0.30	c0.18	
v/s Ratio Perm						0.02
v/c Ratio	0.70		0.85	0.42	0.85	0.11
Uniform Delay, d1	30.7		51.9	8.9	52.9	44.4
Progression Factor	1.00		1.31	0.92	1.00	1.00
Incremental Delay, d2	2.7		13.8	0.5	9.0	0.2
Delay (s)	33.4		81.8	8.7	62.0	44.6
Level of Service	C		F	A	E	D
Approach Delay (s)	33.4			27.1	59.9	
Approach LOS	C			C	E	

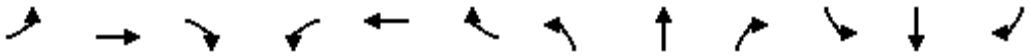
Intersection Summary			
HCM 2000 Control Delay	36.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.2
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	1015	20	15	980	135	40	5	5	235	5	200
Future Volume (vph)	160	1015	20	15	980	135	40	5	5	235	5	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Total Lost time (s)	3.0	5.3		5.3	5.3		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		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	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.98		1.00	0.93		1.00	0.85	
Flt Protected	1.00	1.00		0.95	1.00		0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1766	3457		1711	3418		1711	1666		1801	1537	
Flt Permitted	1.00	1.00		0.28	1.00		0.47	1.00		0.75	1.00	
Satd. Flow (perm)	1766	3457		498	3418		846	1666		1352	1537	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	160	1015	20	15	980	135	40	5	5	235	5	200
RTOR Reduction (vph)	0	1	0	0	6	0	0	4	0	0	156	0
Lane Group Flow (vph)	160	1034	0	15	1109	0	40	6	0	235	49	0
Confl. Peds. (#/hr)	5					5						
Heavy Vehicles (%)	4%	3%	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases				6			8			4		
Actuated Green, G (s)	17.3	96.8		75.5	75.5		29.6	29.6		29.6	29.6	
Effective Green, g (s)	18.3	97.8		76.5	76.5		30.6	30.6		30.6	30.6	
Actuated g/C Ratio	0.13	0.70		0.55	0.55		0.22	0.22		0.22	0.22	
Clearance Time (s)	4.0	6.3		6.3	6.3		7.3	7.3		7.3	7.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	230	2414		272	1867		184	364		295	335	
v/s Ratio Prot	c0.09	0.30			c0.32			0.00			0.03	
v/s Ratio Perm				0.03			0.05			c0.17		
v/c Ratio	0.70	0.43		0.06	0.59		0.22	0.02		0.80	0.15	
Uniform Delay, d1	58.2	9.1		14.8	21.3		44.9	42.9		51.8	44.1	
Progression Factor	0.93	1.62		1.71	1.64		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.9	0.4		0.3	1.2		0.6	0.0		13.8	0.2	
Delay (s)	61.2	15.1		25.7	36.2		45.5	42.9		65.6	44.3	
Level of Service	E	B		C	D		D	D		E	D	
Approach Delay (s)		21.3			36.1			45.0			55.7	
Approach LOS		C			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	33.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.6
Intersection Capacity Utilization	84.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

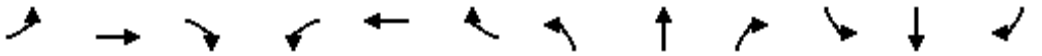


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	910	205	65	700	85	260	40	55	145	50	170
Future Volume (vph)	135	910	205	65	700	85	260	40	55	145	50	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.2		3.0	6.2		6.4	6.4		6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.97		1.00	0.98		1.00	0.91		1.00	0.88	
Flt Protected	1.00	1.00		1.00	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1818	3339		1818	3403		1738	1590		1693	1618	
Flt Permitted	1.00	1.00		1.00	1.00		0.52	1.00		0.70	1.00	
Satd. Flow (perm)	1818	3339		1818	3403		947	1590		1239	1618	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	135	910	205	65	700	85	260	40	55	145	50	170
RTOR Reduction (vph)	0	12	0	0	6	0	0	36	0	0	89	0
Lane Group Flow (vph)	135	1103	0	65	779	0	260	59	0	145	131	0
Confl. Peds. (#/hr)	5		5	5		5	5		10	10		5
Heavy Vehicles (%)	1%	4%	0%	1%	3%	1%	0%	7%	6%	2%	2%	1%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	15.4	70.4		9.1	64.1		41.9	41.9		41.9	41.9	
Effective Green, g (s)	16.4	71.4		10.1	65.1		42.9	42.9		42.9	42.9	
Actuated g/C Ratio	0.12	0.51		0.07	0.46		0.31	0.31		0.31	0.31	
Clearance Time (s)	4.0	7.2		4.0	7.2		7.4	7.4		7.4	7.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	212	1702		131	1582		290	487		379	495	
v/s Ratio Prot	c0.07	c0.33		0.04	0.23			0.04			0.08	
v/s Ratio Perm							c0.27			0.12		
v/c Ratio	0.64	0.65		0.50	0.49		0.90	0.12		0.38	0.27	
Uniform Delay, d1	59.0	25.1		62.5	26.0		46.4	35.0		38.1	36.7	
Progression Factor	0.94	0.65		1.29	0.90		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.6	1.7		2.9	1.1		27.8	0.1		0.6	0.3	
Delay (s)	61.0	17.9		83.4	24.4		74.2	35.1		38.8	36.9	
Level of Service	E	B		F	C		E	D		D	D	
Approach Delay (s)		22.6			29.0			63.7			37.7	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	31.6	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)	15.6
Intersection Capacity Utilization	85.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

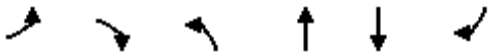
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	1120	45	260	770	25	45	10	345	20	15	20
Future Volume (vph)	20	1120	45	260	770	25	45	10	345	20	15	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	5.6		3.0	5.6		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.85		1.00	0.91	
Flt Protected	1.00	1.00		1.00	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1837	3404		1818	3453		1673	1542		1740	1646	
Flt Permitted	1.00	1.00		1.00	1.00		0.73	1.00		0.20	1.00	
Satd. Flow (perm)	1837	3404		1818	3453		1293	1542		368	1646	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	1120	45	260	770	25	45	10	345	20	15	20
RTOR Reduction (vph)	0	2	0	0	1	0	0	202	0	0	17	0
Lane Group Flow (vph)	20	1163	0	260	794	0	45	153	0	20	18	0
Confl. Peds. (#/hr)			15	15			10		5	5		10
Heavy Vehicles (%)	0%	4%	5%	1%	3%	0%	3%	9%	2%	0%	0%	5%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	4.8	76.2		27.0	98.4		18.9	18.9		18.9	18.9	
Effective Green, g (s)	5.8	77.2		28.0	99.4		19.9	19.9		19.9	19.9	
Actuated g/C Ratio	0.04	0.55		0.20	0.71		0.14	0.14		0.14	0.14	
Clearance Time (s)	4.0	6.6		4.0	6.6		7.3	7.3		7.3	7.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	76	1877		363	2451		183	219		52	233	
v/s Ratio Prot	0.01	c0.34		c0.14	0.23			c0.10			0.01	
v/s Ratio Perm							0.03			0.05		
v/c Ratio	0.26	0.62		0.72	0.32		0.25	0.70		0.38	0.08	
Uniform Delay, d1	65.0	21.4		52.3	7.6		53.4	57.2		54.5	52.1	
Progression Factor	0.88	0.67		0.81	1.66		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	1.3		5.6	0.3		0.7	9.7		4.7	0.1	
Delay (s)	58.6	15.7		47.8	13.0		54.1	66.9		59.2	52.2	
Level of Service	E	B		D	B		D	E		E	D	
Approach Delay (s)		16.4			21.6			65.5			54.8	
Approach LOS		B			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	83.2%	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 (vph)	250	500	515	180	515	45	310	340	145	65	640	235
Future Volume (vph)	250	500	515	180	515	45	310	340	145	65	640	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.1	6.1	3.0	6.1	6.1	0.5	6.8	6.8	2.0	6.8	6.8
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1766	3433	1414	1783	3433	1462	1781	3500	1351	1774	3535	1436
Flt Permitted	1.00	1.00	1.00	1.00	1.00	1.00	0.21	1.00	1.00	0.55	1.00	1.00
Satd. Flow (perm)	1766	3433	1414	1783	3433	1462	372	3500	1351	971	3535	1436
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	250	500	515	180	515	45	310	340	145	65	640	235
RTOR Reduction (vph)	0	0	248	0	0	32	0	0	93	0	0	171
Lane Group Flow (vph)	250	500	267	180	515	13	310	340	52	65	640	64
Confl. Peds. (#/hr)	35		25	25		35	20		40	40		20
Heavy Vehicles (%)	4%	4%	5%	3%	4%	0%	3%	2%	9%	2%	1%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	24.5	45.0	45.0	18.5	39.0	39.0	57.6	49.4	49.4	38.9	33.7	33.7
Effective Green, g (s)	25.5	46.0	46.0	19.5	40.0	40.0	60.1	50.4	50.4	40.9	34.7	34.7
Actuated g/C Ratio	0.18	0.33	0.33	0.14	0.29	0.29	0.43	0.36	0.36	0.29	0.25	0.25
Clearance Time (s)	4.0	7.1	7.1	4.0	7.1	7.1	3.0	7.8	7.8	3.0	7.8	7.8
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)	321	1127	464	248	980	417	395	1260	486	319	876	355
v/s Ratio Prot	c0.14	0.15		0.10	0.15		c0.13	0.10		0.01	c0.18	
v/s Ratio Perm			c0.19			0.01	0.21		0.04	0.05		0.04
v/c Ratio	0.78	0.44	0.58	0.73	0.53	0.03	0.78	0.27	0.11	0.20	0.73	0.18
Uniform Delay, d1	54.6	36.9	38.9	57.7	42.0	36.0	29.6	31.8	29.8	36.4	48.4	41.5
Progression Factor	0.95	1.33	2.30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.1	1.0	4.1	10.1	2.0	0.1	9.8	0.1	0.1	0.3	3.2	0.2
Delay (s)	61.1	50.0	93.6	67.8	44.0	36.2	39.4	31.9	29.9	36.7	51.5	41.7
Level of Service	E	D	F	E	D	D	D	C	C	D	D	D
Approach Delay (s)		70.0			49.3			34.5			48.0	
Approach LOS		E			D			C			D	

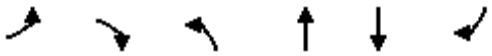
Intersection Summary			
HCM 2000 Control Delay	52.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.9
Intersection Capacity Utilization	95.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	100	0	0	135	35	25
Future Volume (Veh/h)	100	0	0	135	35	25
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	100	0	0	135	35	25
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					76	
pX, platoon unblocked						
vC, conflicting volume	182	48	60			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	182	48	60			
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	100	100			
cM capacity (veh/h)	812	1027	1556			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	100	135	60
Volume Left	100	0	0
Volume Right	0	0	25
cSH	812	1556	1700
Volume to Capacity	0.12	0.00	0.04
Queue Length 95th (m)	3.4	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	3.4		
Intersection Capacity Utilization	19.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	125	0	0	0	0	15
Future Volume (Veh/h)	125	0	0	0	0	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	125	0	0	0	0	15
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					202	
pX, platoon unblocked						
vC, conflicting volume	8	8	15			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	8	8	15			
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	100	100			
cM capacity (veh/h)	1019	1075	1603			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	125	0	15
Volume Left	125	0	0
Volume Right	0	0	15
cSH	1019	1700	1700
Volume to Capacity	0.12	0.00	0.01
Queue Length 95th (m)	3.3	0.0	0.0
Control Delay (s)	9.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	8.1		
Intersection Capacity Utilization	16.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1225	30	0	1150	0	25
Future Volume (Veh/h)	1225	30	0	1150	0	25
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1225	30	0	1150	0	25
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				209		
pX, platoon unblocked					0.86	
vC, conflicting volume			1255		1800	612
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1255		1597	612
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	94
cM capacity (veh/h)			561		85	441

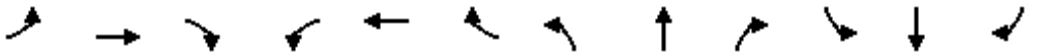
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	612	612	30	575	575	25
Volume Left	0	0	0	0	0	0
Volume Right	0	0	30	0	0	25
cSH	1700	1700	1700	1700	1700	441
Volume to Capacity	0.36	0.36	0.02	0.34	0.34	0.06
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	1.4
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	13.7
Lane LOS						B
Approach Delay (s)	0.0			0.0		13.7
Approach LOS						B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		



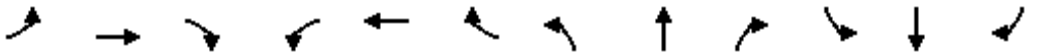
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1900	35	195	1100	725	360
Future Volume (vph)	1900	35	195	1100	725	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.3	3.3	3.5	3.3	3.3
Total Lost time (s)	6.2		2.0	6.2	3.5	6.0
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		1.00	1.00	1.00	1.00
Satd. Flow (prot)	3526		1783	3535	3528	1531
Flt Permitted	1.00		1.00	1.00	1.00	1.00
Satd. Flow (perm)	3526		1783	3535	3528	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1900	35	195	1100	725	360
RTOR Reduction (vph)	1	0	0	0	0	154
Lane Group Flow (vph)	1934	0	195	1100	725	206
Confl. Peds. (#/hr)						5
Heavy Vehicles (%)	1%	0%	3%	1%	1%	0%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	77.3		15.8	97.1	28.7	28.7
Effective Green, g (s)	78.3		17.8	98.1	32.2	29.7
Actuated g/C Ratio	0.56		0.13	0.70	0.23	0.21
Clearance Time (s)	7.2		4.0	7.2	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1972		226	2477	811	324
v/s Ratio Prot	c0.55		c0.11	0.31	c0.21	
v/s Ratio Perm						0.13
v/c Ratio	0.98		0.86	0.44	0.89	0.63
Uniform Delay, d1	30.1		59.9	9.1	52.2	50.2
Progression Factor	1.00		1.18	0.64	1.00	1.00
Incremental Delay, d2	16.2		22.0	0.4	12.3	4.0
Delay (s)	46.3		92.6	6.3	64.5	54.2
Level of Service	D		F	A	E	D
Approach Delay (s)	46.3			19.3	61.1	
Approach LOS	D			B	E	

Intersection Summary			
HCM 2000 Control Delay	41.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	97.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



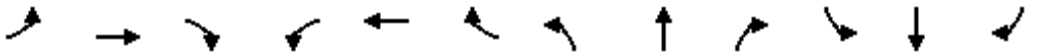
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	290	1935	40	25	1025	220	30	10	10	265	10	155
Future Volume (vph)	290	1935	40	25	1025	220	30	10	10	265	10	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Total Lost time (s)	3.0	5.3		5.3	5.3		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		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	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.97		1.00	0.93		1.00	0.86	
Flt Protected	1.00	1.00		0.95	1.00		0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1837	3523		1711	3393		1711	1666		1818	1535	
Flt Permitted	1.00	1.00		0.07	1.00		0.56	1.00		0.74	1.00	
Satd. Flow (perm)	1837	3523		121	3393		1004	1666		1354	1535	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	290	1935	40	25	1025	220	30	10	10	265	10	155
RTOR Reduction (vph)	0	1	0	0	12	0	0	8	0	0	120	0
Lane Group Flow (vph)	290	1974	0	25	1233	0	30	12	0	265	45	0
Confl. Peds. (#/hr)	5					5						5
Heavy Vehicles (%)	0%	1%	2%	2%	2%	1%	2%	2%	2%	1%	2%	1%
Turn Type	Prot	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases				6			8			4		
Actuated Green, G (s)	25.1	95.7		66.6	66.6		30.7	30.7		30.7	30.7	
Effective Green, g (s)	26.1	96.7		67.6	67.6		31.7	31.7		31.7	31.7	
Actuated g/C Ratio	0.19	0.69		0.48	0.48		0.23	0.23		0.23	0.23	
Clearance Time (s)	4.0	6.3		6.3	6.3		7.3	7.3		7.3	7.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	342	2433		58	1638		227	377		306	347	
v/s Ratio Prot	c0.16	c0.56			0.36			0.01			0.03	
v/s Ratio Perm				0.21			0.03			c0.20		
v/c Ratio	0.85	0.81		0.43	0.75		0.13	0.03		0.87	0.13	
Uniform Delay, d1	55.0	15.2		23.6	29.4		43.2	42.2		52.1	43.2	
Progression Factor	0.81	1.71		1.74	1.61		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.7	1.1		18.2	2.7		0.3	0.0		21.7	0.2	
Delay (s)	51.4	27.1		59.4	50.1		43.4	42.2		73.8	43.3	
Level of Service	D	C		E	D		D	D		E	D	
Approach Delay (s)		30.2			50.3			43.0			62.1	
Approach LOS		C			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	40.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.6
Intersection Capacity Utilization	110.4%	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 (vph)	245	1595	345	35	955	150	165	15	15	135	20	115
Future Volume (vph)	245	1595	345	35	955	150	165	15	15	135	20	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.2		3.0	6.2		6.4	6.4		6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.98	1.00	
Frt	1.00	0.97		1.00	0.98		1.00	0.93		1.00	0.87	
Flt Protected	1.00	1.00		1.00	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1837	3414		1783	3421		1719	1707		1688	1614	
Flt Permitted	1.00	1.00		1.00	1.00		0.60	1.00		0.74	1.00	
Satd. Flow (perm)	1837	3414		1783	3421		1093	1707		1310	1614	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	245	1595	345	35	955	150	165	15	15	135	20	115
RTOR Reduction (vph)	0	11	0	0	7	0	0	12	0	0	92	0
Lane Group Flow (vph)	245	1929	0	35	1098	0	165	18	0	135	43	0
Confl. Peds. (#/hr)	5		10	10		5	5		20	20		5
Heavy Vehicles (%)	0%	1%	0%	3%	2%	0%	1%	0%	0%	1%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	23.8	88.6		6.4	71.2		26.4	26.4		26.4	26.4	
Effective Green, g (s)	24.8	89.6		7.4	72.2		27.4	27.4		27.4	27.4	
Actuated g/C Ratio	0.18	0.64		0.05	0.52		0.20	0.20		0.20	0.20	
Clearance Time (s)	4.0	7.2		4.0	7.2		7.4	7.4		7.4	7.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	325	2184		94	1764		213	334		256	315	
v/s Ratio Prot	c0.13	c0.57		0.02	0.32			0.01			0.03	
v/s Ratio Perm							c0.15			0.10		
v/c Ratio	0.75	0.88		0.37	0.62		0.77	0.05		0.53	0.13	
Uniform Delay, d1	54.7	20.9		64.1	24.2		53.4	45.8		50.5	46.5	
Progression Factor	0.90	1.10		1.06	0.40		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.8	3.5		2.3	1.5		16.0	0.1		2.0	0.2	
Delay (s)	55.3	26.4		70.2	11.2		69.4	45.8		52.5	46.7	
Level of Service	E	C		E	B		E	D		D	D	
Approach Delay (s)		29.6			13.0			65.8			49.6	
Approach LOS		C			B			E			D	

Intersection Summary			
HCM 2000 Control Delay	27.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	103.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

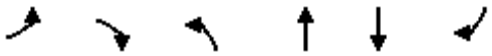


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	1760	50	65	1050	35	45	0	230	25	0	25
Future Volume (vph)	45	1760	50	65	1050	35	45	0	230	25	0	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	5.6		3.0	5.6		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.97	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.85		1.00	0.85	
Flt Protected	1.00	1.00		1.00	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1837	3515		1837	3481		1701	1568		1738	1537	
Flt Permitted	1.00	1.00		1.00	1.00		0.74	1.00		0.25	1.00	
Satd. Flow (perm)	1837	3515		1837	3481		1326	1568		453	1537	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	45	1760	50	65	1050	35	45	0	230	25	0	25
RTOR Reduction (vph)	0	1	0	0	1	0	0	172	0	0	22	0
Lane Group Flow (vph)	45	1809	0	65	1084	0	45	58	0	25	3	0
Confl. Peds. (#/hr)	5		15	15		5	20		5	5		20
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	3%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	6.7	95.0		9.0	97.3		18.1	18.1		18.1	18.1	
Effective Green, g (s)	7.7	96.0		10.0	98.3		19.1	19.1		19.1	19.1	
Actuated g/C Ratio	0.06	0.69		0.07	0.70		0.14	0.14		0.14	0.14	
Clearance Time (s)	4.0	6.6		4.0	6.6		7.3	7.3		7.3	7.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	101	2410		131	2444		180	213		61	209	
v/s Ratio Prot	0.02	c0.51		c0.04	0.31			0.04			0.00	
v/s Ratio Perm							0.03			c0.06		
v/c Ratio	0.45	0.75		0.50	0.44		0.25	0.27		0.41	0.02	
Uniform Delay, d1	64.1	14.2		62.6	9.0		54.0	54.2		55.3	52.3	
Progression Factor	1.08	0.53		1.21	0.57		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	1.3		2.1	0.4		0.7	0.7		4.4	0.0	
Delay (s)	71.1	8.8		78.0	5.5		54.8	54.9		59.7	52.4	
Level of Service	E	A		E	A		D	D		E	D	
Approach Delay (s)		10.3			9.6			54.9			56.0	
Approach LOS		B			A			D			E	

Intersection Summary			
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	87.6%	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 (vph)	330	1095	540	285	635	45	375	880	345	100	530	170
Future Volume (vph)	330	1095	540	285	635	45	375	880	345	100	530	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.1	6.1	1.0	6.1	6.1	1.0	6.8	6.8	2.0	6.8	6.8
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.93	1.00	1.00	0.90	1.00	1.00	0.88	1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1837	3535	1436	1837	3500	1405	1792	3570	1324	1829	3535	1464
Flt Permitted	1.00	1.00	1.00	1.00	1.00	1.00	0.29	1.00	1.00	0.20	1.00	1.00
Satd. Flow (perm)	1837	3535	1436	1837	3500	1405	515	3570	1324	365	3535	1464
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	330	1095	540	285	635	45	375	880	345	100	530	170
RTOR Reduction (vph)	0	0	188	0	0	33	0	0	144	0	0	128
Lane Group Flow (vph)	330	1095	352	285	635	12	375	880	201	100	530	42
Confl. Peds. (#/hr)	60		40	40		60	45		95	95		45
Heavy Vehicles (%)	0%	1%	1%	0%	2%	0%	2%	0%	4%	0%	1%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	27.9	44.0	44.0	20.4	36.5	36.5	56.7	45.9	45.9	41.5	33.7	33.7
Effective Green, g (s)	28.9	45.0	45.0	23.4	37.5	37.5	58.7	46.9	46.9	43.5	34.7	34.7
Actuated g/C Ratio	0.21	0.32	0.32	0.17	0.27	0.27	0.42	0.33	0.33	0.31	0.25	0.25
Clearance Time (s)	4.0	7.1	7.1	4.0	7.1	7.1	3.0	7.8	7.8	3.0	7.8	7.8
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)	379	1136	461	307	937	376	416	1195	443	205	876	362
v/s Ratio Prot	c0.18	c0.31		c0.16	0.18		c0.14	c0.25		0.03	0.15	
v/s Ratio Perm			0.25			0.01	0.24		0.15	0.12		0.03
v/c Ratio	0.87	0.96	0.76	0.93	0.68	0.03	0.90	0.74	0.45	0.49	0.61	0.12
Uniform Delay, d1	53.7	46.7	42.7	57.5	45.8	37.8	31.1	41.1	36.5	35.9	46.6	40.8
Progression Factor	1.12	0.84	0.68	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.2	15.2	8.2	32.8	3.9	0.2	22.2	2.4	0.7	1.8	1.2	0.1
Delay (s)	74.6	54.4	37.2	90.3	49.8	38.0	53.2	43.5	37.3	37.8	47.8	40.9
Level of Service	E	D	D	F	D	D	D	D	D	D	D	D
Approach Delay (s)		53.1			61.2			44.4			45.1	
Approach LOS		D			E			D			D	

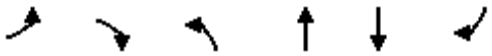
Intersection Summary			
HCM 2000 Control Delay	50.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.9
Intersection Capacity Utilization	111.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	60	0	0	70	40	60
Future Volume (Veh/h)	60	0	0	70	40	60
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	60	0	0	70	40	60
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					76	
pX, platoon unblocked						
vC, conflicting volume	140	70	100			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	140	70	100			
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)	858	998	1505			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	60	70	100
Volume Left	60	0	0
Volume Right	0	0	60
cSH	858	1505	1700
Volume to Capacity	0.07	0.00	0.06
Queue Length 95th (m)	1.8	0.0	0.0
Control Delay (s)	9.5	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.5	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	2.5		
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)	70	0	0	0	0	40
Future Volume (Veh/h)	70	0	0	0	0	40
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	70	0	0	0	0	40
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					202	
pX, platoon unblocked						
vC, conflicting volume	20	20	40			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	20	20	40			
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)	1002	1058	1570			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	70	0	40
Volume Left	70	0	0
Volume Right	0	0	40
cSH	1002	1700	1700
Volume to Capacity	0.07	0.00	0.02
Queue Length 95th (m)	1.8	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	5.6		
Intersection Capacity Utilization	13.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	2170	75	0	1235	0	15
Future Volume (Veh/h)	2170	75	0	1235	0	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	2170	75	0	1235	0	15
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		
pX, platoon unblocked					0.78	
vC, conflicting volume			2245		2788	1085
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2245		2729	1085
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	93
cM capacity (veh/h)			233		13	215

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	1085	1085	75	618	618	15
Volume Left	0	0	0	0	0	0
Volume Right	0	0	75	0	0	15
cSH	1700	1700	1700	1700	1700	215
Volume to Capacity	0.64	0.64	0.04	0.36	0.36	0.07
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	1.8
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	23.0
Lane LOS						C
Approach Delay (s)	0.0			0.0		23.0
Approach LOS						C

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		