BA Group

MACVILLE COMMUNITY SECONDARY PLAN TOWN OF CALEDON

Transportation Study

Prepared For: Bolton Option 3 Landowners Group

February 11, 2021

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1.0 INTRODUCTION

1.1 BACKGROUND

BA Consulting Group Ltd. represents the Bolton Option 3 Landowners Group in connection with seeking the necessary approvals required to permit the development of the Macville Community lands for urban development including residential, commercial, mixed uses, community uses and related servicing and infrastructure. The lands subject to this proposal consist of approximately 182 hectares (450 acres) of land and are generally located north of King Street, east of The Gore Road and west of the CP Railway tracks. The subject lands are municipally known as 14396 Humber Station Road; 14384 Humber Station Road; 14226 Humber Station Road; 14206 Humber Station Road; 14196 Humber Station Road; 14166 Humber Station Road; 14100 Humber Station Road; 14042 Humber Station Road; 14155 The Gore Road; 0 The Gore Road; 0 The Gore Road; 14211 The Gore Road; 14275 The Gore Road; 0 Humber Station Road; 14389 The Gore Road; 0 King Street; 0 King Street; 7844 King Street; 7816 King Street; 0 King Street; 7640 King Street (herein referred to as the "Subject Lands").

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

The eastern portion of the Macville Community lands, consisting of lands on both sides of Humber Station Road, north of King Street, have been the subject of Regional Official Plan Amendment 30 (ROPA 30) which was recently approved by LPAT and succeeds in bringing these lands into the Bolton Rural Service Centre Settlement Area Boundary. Accordingly, the eastern portion of these lands are designated "Rural Service Centre" in the Region of Peel Official Plan. The western portion of the Macville Community lands, consisting of lands north of King Street and east of The Gore Road are currently designated "Rural Area" within the Region of Peel's Rural System in the Region of Peel Official Plan and "Prime Agricultural Area" in the Town of Caledon's Official Plan. It is recognized that the western portion of the Macville Community lands are currently located outside of the Settlement Area Boundary of the Bolton Rural Service Centre and accordingly, in order to permit development of these lands for urban-related land uses, these lands will need to brought into the Bolton Rural Service Centre Settlement Area Boundary. This review is currently underway at the Region of Peel through the Region's 2051 Municipal Comprehensive Review of the Region's Official Plan and the balance of the Macville Community is currently proposed to be included in the "Rural Service Centre" by the Region, with the final Regional adoption of the new Regional Official Plan, which is anticipated to occur before the end of 2021. Further, a local Official Plan Amendment is required to assign urban land use designations to all of the Macville Community lands.

The site context is illustrated in **Figure 2**.

Paul M Sarjeant, P.Eng
Senior Transportation Engineer
BA Consulting Group

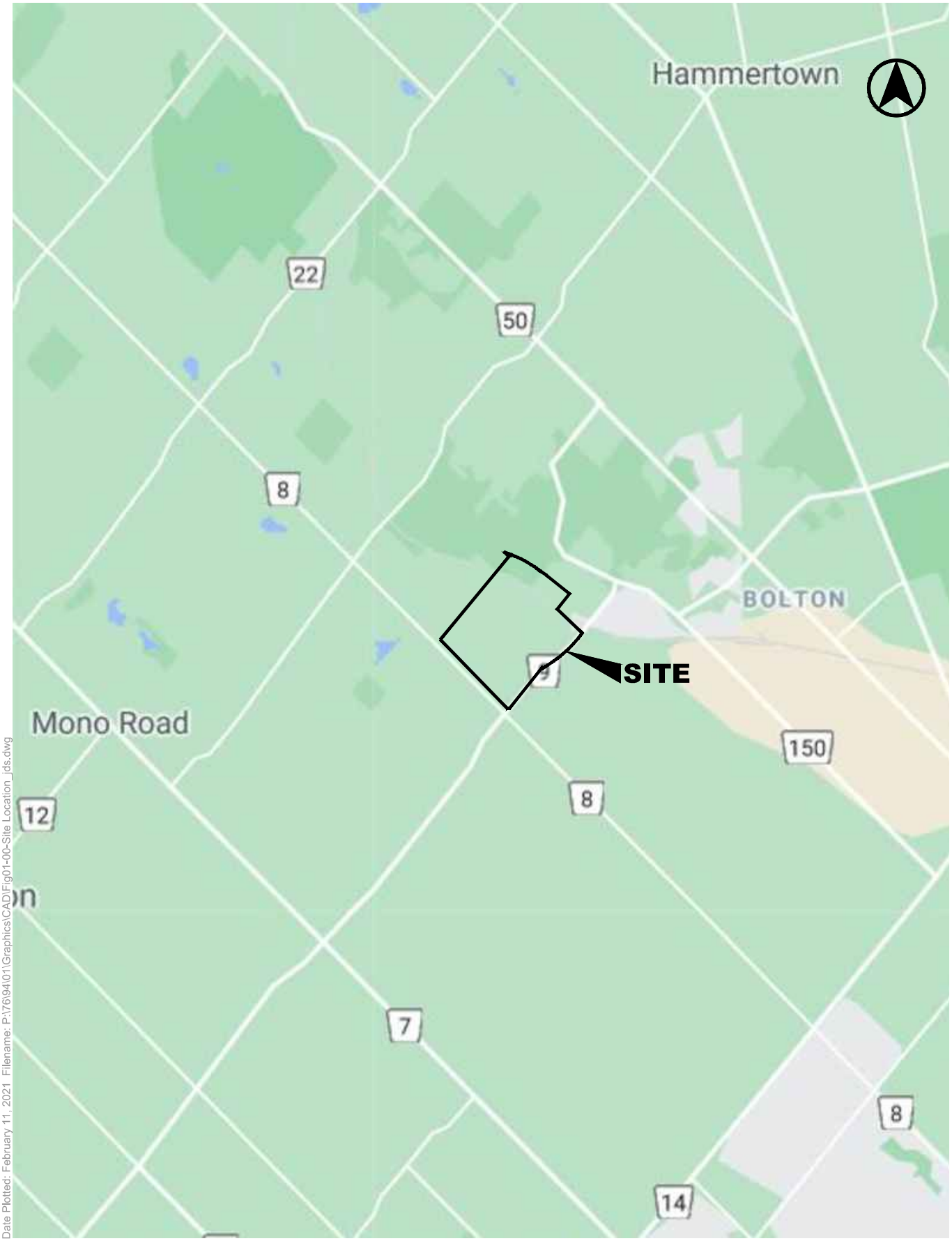

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FIGURE 1 SITE LOCATION

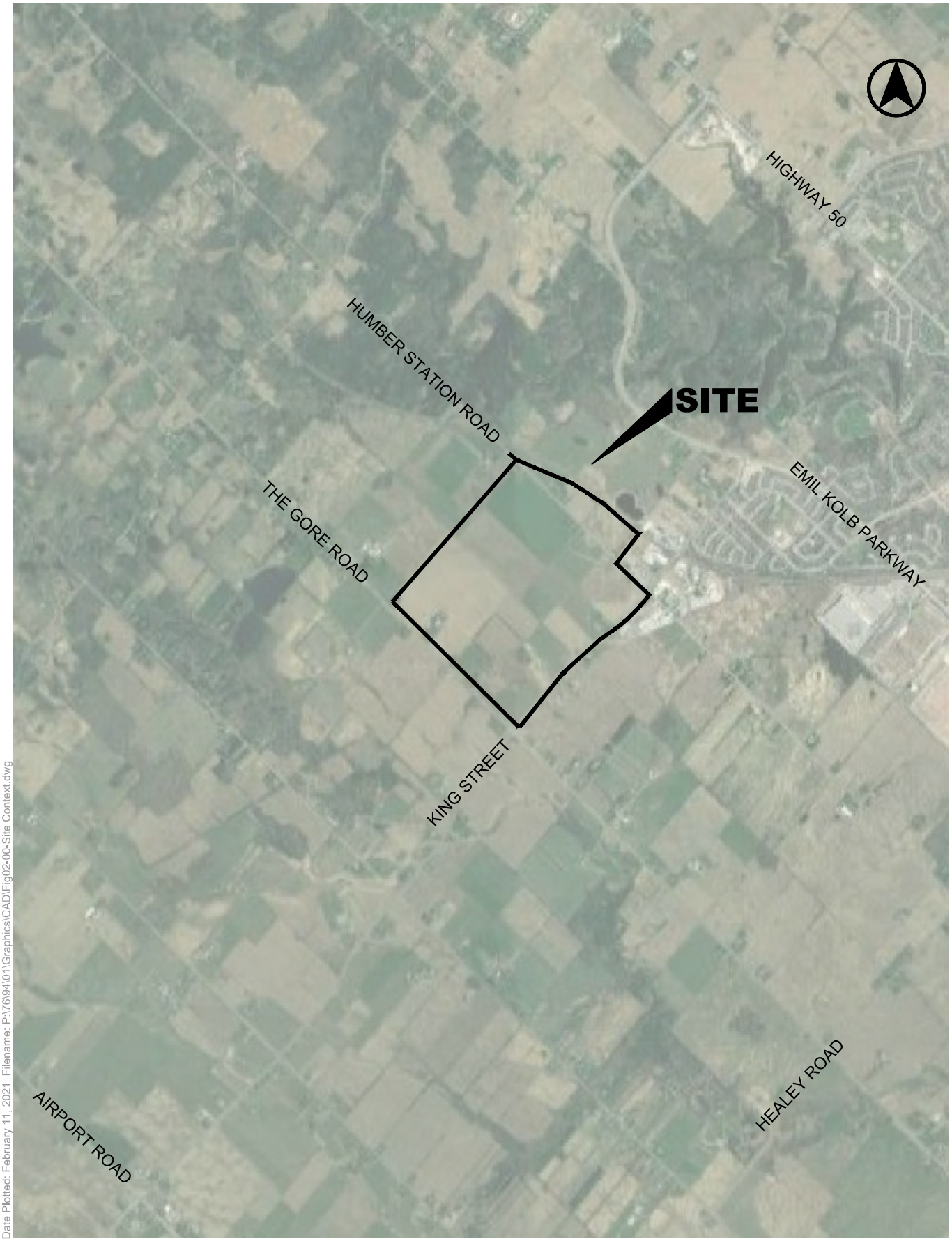

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FIGURE 2 SITE CONTEXT

1.2 THIS STUDY

This Transportation Study Report (the "Report") is prepared in support of a Local Official Plan Amendment (LOPA) to establish a Secondary Plan for the Macville Community in Bolton. The Secondary Plan will facilitate the development of these lands for residential and mixed-use development with related complimentary uses, such as open spaces, parks, trails, commercial uses, the future GO Station, the Natural Heritage System (NHS), and stormwater management facilities. This report has been prepared in support of the LOPA process to create the Macville Community Secondary Plan for the subject lands.

The LOPA Transportation Study will focus on the impacts of the proposed community on the existing adjacent road network, namely King Street, The Gore Road, Humber Station Road, and Emil Kolb Parkway. There is a proposed new east-west road link connecting Humber Station Road within the community to Emil Kolb Parkway which will also be assessed.

Planning and design of the internal community road network is still underway as the project is reviewed through the Secondary Plan process, and as such will not be analyzed in this report. A subsequent and more comprehensive transportation study will be prepared in coordination with later submissions.

A Terms of Reference was circulated to the Town on December 16, 2020 identifying the scope of this study. A copy of the Terms of Reference is provided in **Appendix A**.

The transportation issues to be examined in this study are set out below.

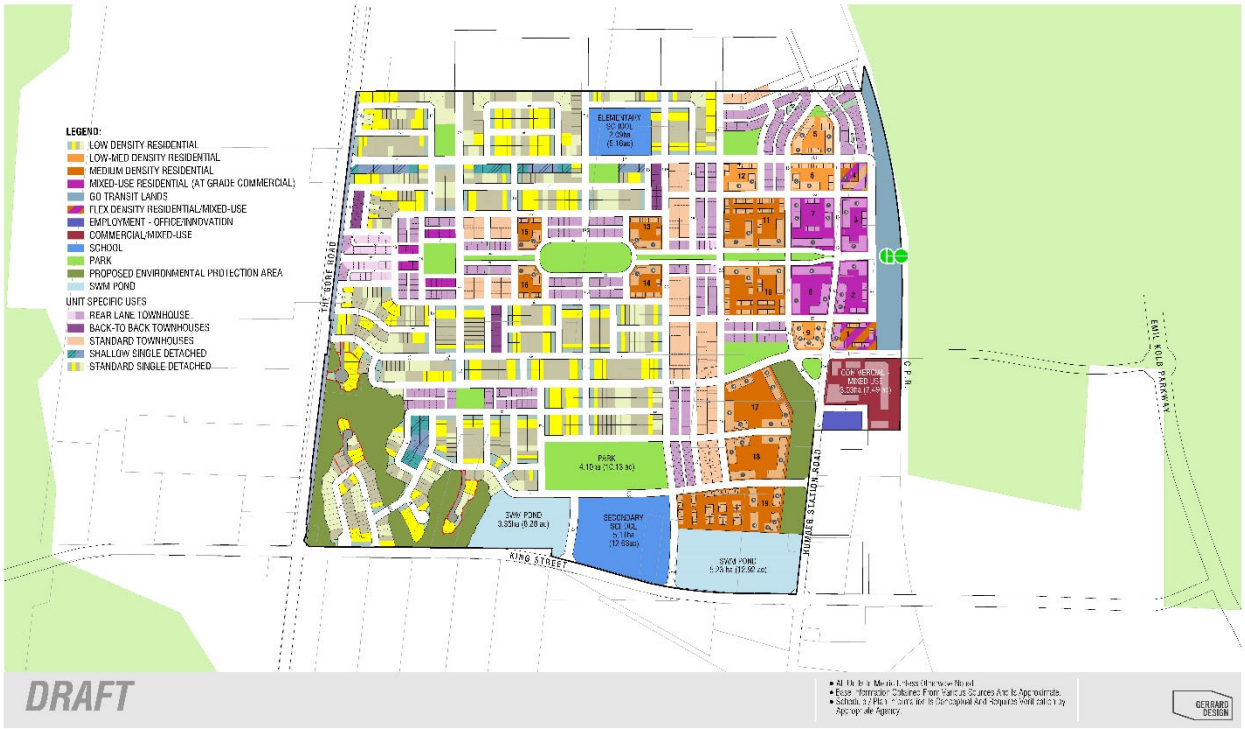
- Arterial road network requirements.
- Traffic controls at major road intersections.
- Roles of the arterial, community and neighbourhood streets within the community.
- External arterial road and internal community road patterns.
- Traffic distribution.
- Transit and active transportation strategy to reduce single-occupant auto use during the peak periods and to optimize/minimize transportation infrastructure.
- Integration with GO rail transit and the resulting impacts on trip generation rates.
- Mode split assumptions for auto, transit, walk, and cycling.
- Bicycle routes and pedestrian trail network, and integration with the rest of Caledon.
- Traffic calming on internal roads.
- On street and off street parking strategy and parking standards to support TDM and to encourage transit usage.

1.3 PRELIMINARY FRAMEWORK PLAN

The group is proposing to construct a new residential community, Macville, on these lands, comprising about 6,871 dwellings units. The community will also include two schools, and local retail and employment uses.

The Preliminary Framework Plan and Road Hierarchy for Macville are provided in **Appendix B**.

The proposed Macville Community is bounded to the east by the Canadian Pacific (CP) MacTier subdivision rail line. This line has been identified by Metrolinx as providing an opportunity to create a new GO rail service to Bolton. The location of the Macville Community immediately adjacent not only to this rail line but also to the preferred location for the Caledon GO station creates an opportunity to develop a transit oriented community that will create an ideal impetus for implementing this new GO line in a staged manner, providing a new level of transit service to not just the Bolton area but also to northeast Brampton, and communities such as Woodbridge, Vaughan, and Kleinburg in the west of York Region.



MACVILLE | Caledon, Ontario
PRELIMINARY FRAMEWORK PLAN

JAN 12, 2021

As such, it is critical that the design of this community be undertaken in a manner that promotes multi-modal, sustainable transportation that is not just focused on the future GO station, but leverages the opportunity to develop it as a key transportation hub servicing the broader Bolton and north east Brampton areas.

This report provides a transportation perspective on the work that has been undertaken to develop this community, as well as a preliminary assessment of the impact of this development on the surrounding road network and the need for transportation network improvements to support the development.

2.0 COMMUNITY TRANSPORTATION CONTEXT

2.1 A NEW GO RAIL LINE

The impetus for the development of a community in this location is both its proximity to the existing community of Bolton and its direct adjacency to the CPR MacTier subdivision. This key rail line located along the east boundary of the proposed Macville Community, carries exclusively freight rail traffic today. In 2010, Metrolinx completed the *"Bolton Commuter Rail Service Feasibility Study"* which explored options for developing GO service in this corridor. The report concluded that such a service was entirely feasible. The Macville team has since built on the Metrolinx findings to determine that such a service can be implemented in a staged fashion, starting with peak period peak direction service on the existing rail line with minimal infrastructure improvements required, and ultimately building up to a full service line as the community grows and the ridership demand warrants.

The implementation of a new high order regional rail service creates an opportunity to develop the lands adjacent to the future station in a transit supportive manner. This opportunity extends to supporting the clean environment & sustainable development initiatives of the Province of Ontario, the Region of Peel, and the Town of Caledon.

The opportunity for the Macville team is therefore to design and implement a community that doesn't just support transit, but integrates into the design of the entire community:

- facilities to accommodate alternative modes of transportation;
- encouragement of alternative transportation behaviours;
- encouragement of clean transportation technologies; and
- new and advanced technologies that promote the above.

2.2 MACVILLE TRANSIT HUB

The development of the future GO station on the east flank of the community will be the centrepiece of the community's transit infrastructure, as well as a focus for active transportation modes.

Transit terminals are supported by robust active transportation connections, an appropriate mix of commercial uses, and higher density residential and employment uses. Metrolinx highlights six important aspects of Transit Oriented Development, which support the creation of transit hubs and transit terminals:

1. Multi-modal transportation allowing transportation choice;
2. Urban density and use intensity;
3. High levels of pedestrian priority, including spaces designed for pedestrian priority;
4. Embedded technology (i.e. access to real time transit information, internet, and seamless transfers between transportation modes);
5. Economic vitality and competitiveness, consisting of significant development potential and strong economic anchors; and
6. A strong sense of place – a vibrant and vital place to support the transportation experience.

Within the context of Macville, it is appropriate to locate the transit terminal in a location that accommodates intra and inter-city transit services and associated transfer activity, in proximity to public amenity, and high density and mixed land uses.

In addition to GO Rail service, an onsite bus terminal will support GO bus services such as the existing Bolton service. It is anticipated that as the community develops, additional bus connections to the station will be established by Brampton Transit. Such a service could operate on the existing north-south routes connecting Brampton to this area, namely Highway 50/Coleraine Drive, or ultimately Humber Station Road as development to the south of Macville proceeds. As the GTA West corridor is implemented with an integral transitway corridor to the south of Macville Community, the presence of a full interchange at Humber Station Road will provide an additional opportunity to connect Macville to the broader GTA wide transit network.

These north-south routes will also directly serve the existing and growing Provincially Significant Employment Zone (PSEZ) located between Macville Community and Mayfield Road. Not only will these bus services provide employees in the PSEZ convenient access to high order rail transit, they will allow existing residents of the Bolton area and future residents of Macville to commute to work by transit instead of driving.

The Town of Caledon does not currently operate a bus transit service, but the opportunity represented by this Bolton transportation hub may certainly provide some impetus to initiate such a service in the Macville and Bolton communities.

2.3 CYCLING

The future GO station will also become the focus of active transportation infrastructure. The community road network will support cycling on most of the collector roads and many of the local roads. The goal of this network is to connect the community to the transit facilities at the GO station as conveniently and safely as possible.

As a community, Macville will be a designed to fully support several types of cycling.

Recreational cycling connections will allow residents to fully utilize existing and future cycling facilities along Emil Kolb Parkway, the Humber Valley Heritage Trail, the Caledon Trailway and facilities in the Bolton Resource Management Tract (TRCA) located immediately north of Bolton and Albion Hills Conservation Area.

Short distance commuting by bicycle will be accommodated by the network of cycle lanes and paths associated with the collector and local road network

Longer distance commuting by bicycle will be accommodated by connections from the community to existing and future cycling infrastructure developed by the Region of Peel (such as the paved multi-use trails on Emil Kolb Parkway) and the Town of Caledon. The Town's TMP also identifies proposed active transportation facilities along The Gore Road (paved shoulder), King Street (buffered bike lane), and Emil-Kolb (existing multi-use trail), and Coleraine Drive (proposed buffered bike lane).

Design and development of the Macville cycling infrastructure will be done so as to be consistent with and coordinated with (as appropriate) Region of Peel active transportation initiatives such as Walk+Roll , as well as Town of Caledon initiatives and guidelines.

As opportunities present themselves, initiatives such as bike sharing can be accommodated onsite at the future GO station, as well as other nodes within the community as appropriate.

2.4 PEDESTRIAN

Pedestrian traffic will be accommodated as in all communities by the presence of sidewalks on every collector and local road. What will set Macville apart is:

- A focus on pedestrian safety at intersections.
    - Road cross sections are being proposed that minimize crossing distances.
    - Roads are generally developed to minimize vehicular speeds through the neighbourhoods, which inherently enhances pedestrian safety.
    - Pedestrian crossings will be prioritized at signalized intersections and along major active transportation routes.
- Exploration of the use of “living street” designs in selected locations to promote safe multi-modal travel

As with the cycling network, the focus of pedestrian movement will be safely and conveniently accessing the future GO Station.

Macville is located immediately adjacent to a number of recreational hiking areas including the Humber Valley Heritage Trail and the Bolton Resource Management Tract, both located directly north of Macville and Bolton. Active transportation connections from Macville to Emil Kolb Parkway as well as to the section of Humber Station Road to the north of Macville will allow ambitious hikers to access these greenbelt resources directly from their homes.

2.5 ADVANCED TECHNOLOGIES

The Macville design team is contemplating the manner in which new and advanced transportation technologies might be incorporated into and supported by the community.

2.5.1 Electric Vehicles

Electric vehicle (EV) charging stations will be implemented within residential, mixed use, and retail developments that have shared parking facilities so as to meet to meet or exceed current bylaw requirements.

Charging stations will also be a key feature at the future GO station.

2.5.2 Ride Sharing

While ridesharing services (such as Uber and Lyft) are no longer new technologies per se, they are technologies that present particular challenges, and that can be explicitly recognized and accommodated. The development of higher density residential sites, in particular, can be done so as to accommodate space for ridesharing services to pick up or deliver passengers without impeding other users of the community's streets.

2.5.3 Self Driving Vehicles

Self driving vehicles present a particularly new challenge for transportation users. Privately owned fully or partially self driving automobiles are already available and in use in many jurisdictions. While these will no doubt operate in Macville, there is no particular need to accommodate them explicitly.

Of particular interest to the Macville team, however, is the prospect of being able to operate a self driving community transit shuttle, a technology often dubbed "Micro Transit". This service would connect the entire community to the future GO Station with a fleet of relatively small, automated electrically powered vehicles.

A system such as this could be operated on a predetermined schedule and set of routes. Alternatively, the service could be implemented as an on demand service, much like a driverless ridesharing service but operating entirely within the community and focused on the GO station as a home base.

The City of Toronto and Metrolinx are in the process of trying out a service of exactly this nature serving the West Rouge neighbourhood, coordinated with GO train schedules, and based on the Rouge Hill GO Station. The test vehicle, which will be put in service in spring of 2021, is a new version of the Olli vehicle developed by a US based company, Local Motors. It has previously been demonstrated and tested in numerous US cities including Washington DC, Miami, and Las Vegas. The vehicles have a capacity of eight passengers, an accessibility ramp, and audio and visual announcements.

The Toronto test will adhere to a fixed route through the community and will be operated as a free service.

This technology (amongst others that have been demonstrated around the world) is a perfect fit for a transportation hub based community, where the goal is to provide a clean and efficient travel option to move passengers between their homes and the hub.

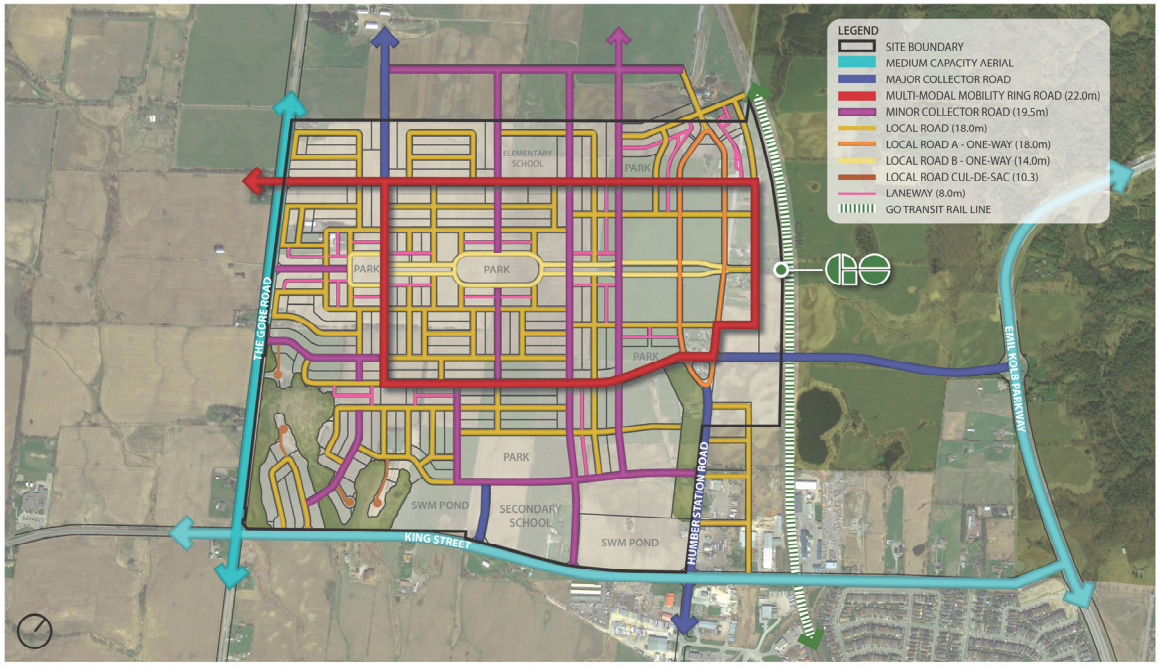
3.0 TRANSPORTATION INFRASTRUCTURE

The key transportation infrastructure proposed for the community includes the specific road cross sections that have been developed by the Macville team, as well as a pair of road-rail grade separations.

The Preliminary Framework Plan and Road Hierarchy for Macville are described in this section and provided in **Appendix B**, including individual road cross-sections for the community's hierarchy.

3.1 COMMUNITY ROAD NETWORK

MACVILLE COMMUNITY | Road Hierarchy Plan *(Updated)*



JANUARY 28, 2021 | FOR DISCUSSION PURPOSES ONLY

NAK design strategies

The proposed Macville Community road plan comprises a logical hierarchy of collector and local roads that provide for:

- internal movement in a manner that is supportive of non automobile modes of transportation,
- appropriate connectivity to the existing higher order road network, and
- convenient access to the significant transit facilities centred on the future GO station.

Throughout the network, thought has been given to prioritizing active transportation facilities on key routes, and in a manner that allows users to move to key destinations quickly and conveniently. At the same time, the lanes provided for automobile traffic have been kept to an absolute minimum so as to reinforce the message that this is not a traditional automobile dependent community.

A key feature is a Multi-Modal Mobility Ring Road that serves the entire community and provides important direct access to the entire frontage of the GO station transit hub. This road will carry automobile and internal transit vehicular traffic, and includes a dedicated 2-way cycle track and double sidewalks. This ring road also provides a key connection to The Gore Road to the west, and to Humber Station Road which is a key connection to the south and southeast.

Another key feature is the east-west Central Promenade, which is also focused on the GO station transit hub. This green corridor provides a central active transportation spine as well as support for on road cycling in shared lanes. The provision of a one way single lane traffic loop and ample provision for active transportation modes is key to ensuring early adoption of non-automobile modes of travel in this community. At the east end of this corridor the potential for implementing a "Woonerf" style shared street system is being explored as a means of reinforcing the message that automobiles are not the priority, but rather creating a community space energized by pedestrian friendly street activity.

A north axis is defined through the core of the community on the more densely built eastern area (adjacent to the GO station transit hub) by a one way pair of single lane roads with wide lanes to accommodate shared cycling use.

A new east-west collector connection is proposed to tie the community to Emil Kolb Parkway. This important link will provide access to the GO station transit hub for traffic originating outside of MacVille, in the Bolton North Hill area and beyond. This link, which will be grade separated from the CP rail line, will provide a completely new route to the GO Station and Macville itself, providing access for much of the external automobile and bus traffic without impacting the internal community roads. This link will also limit additional traffic demands on King Street and the intersections to the south of the Macville during busy peak periods.

The east-west road connection will also provide a key link for cyclists. In addition to providing area cyclists with convenient access to the GO Station, it will allow cyclists from across the region to take advantage of the GO train service to gain access to the excellent existing cycle facilities in this area, including the Humber Valley Heritage Trail, and the Caledon Trailway and facilities in the Bolton Resource Management Tract (TRCA) located immediately north of Bolton and Albion Hills Conservation Area.

3.2 COMMUNITY ROAD CROSS SECTIONS

The community road network will be comprised of a hierarchy of roads that are custom tailored to the various demands placed on them. This has meant re-thinking the cross sections typically used in communities that do not have such a transit and active transportation focus.

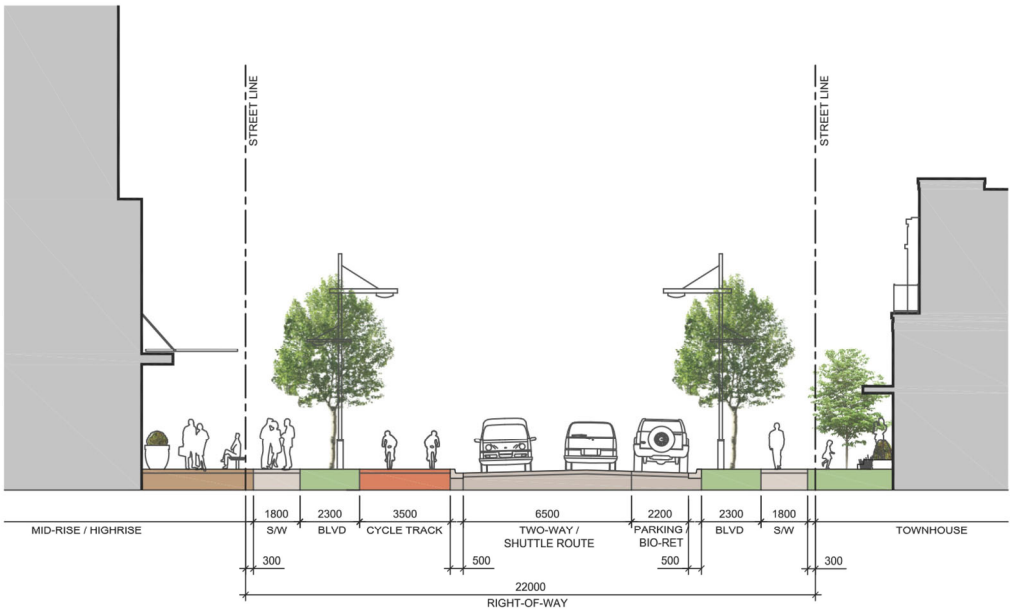
3.2.1 Multi-Modal Ring Road

The design being considered for this facility sits in a 22.0m right of way, and is key to facilitating community connectivity to the GO station transit hub.

Cyclists are provided with a two-way 3.5m cycle track on one side of the roadway. Positioning the cycle track on the opposite side of the roadway from the layby parking lane ensures that conflicts between passengers egressing from parked cars and cyclists will not be a problem.

The cross section also provides full 1.8m sidewalks on both sides, and appropriate landscaped areas separating the cyclists from the pedestrians. Parked vehicles on one side of the road are allocated 2.2m.

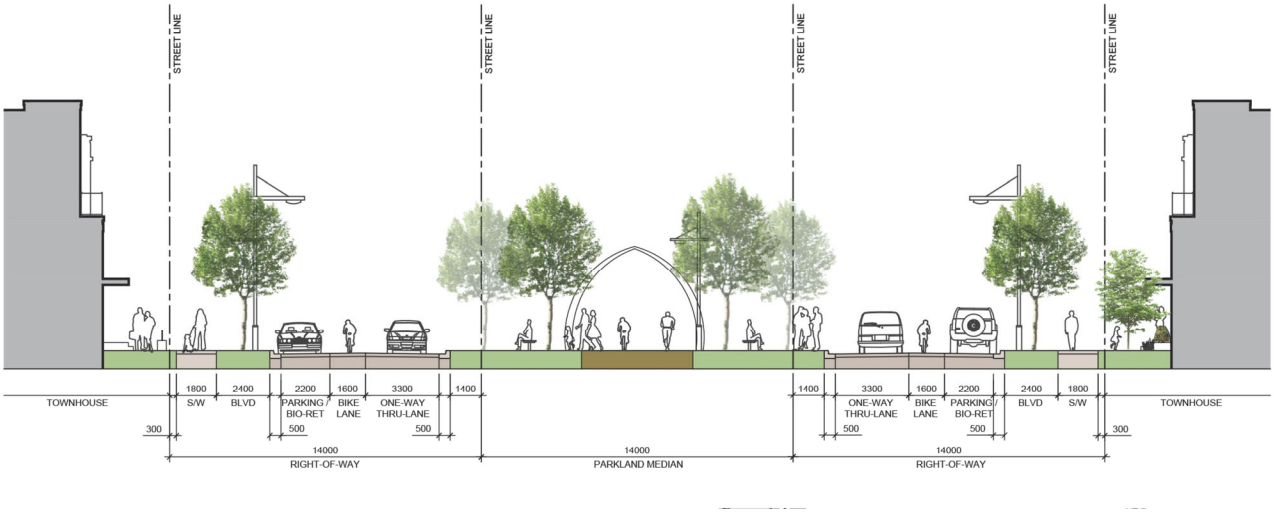
This leaves 6.5m for the two-way travel lanes. There is ample room in these lanes to accommodate the smaller to mid-size vehicles of the community scale transit service that is planned for Macville.



3.2.2 Central Promenade & Green Link

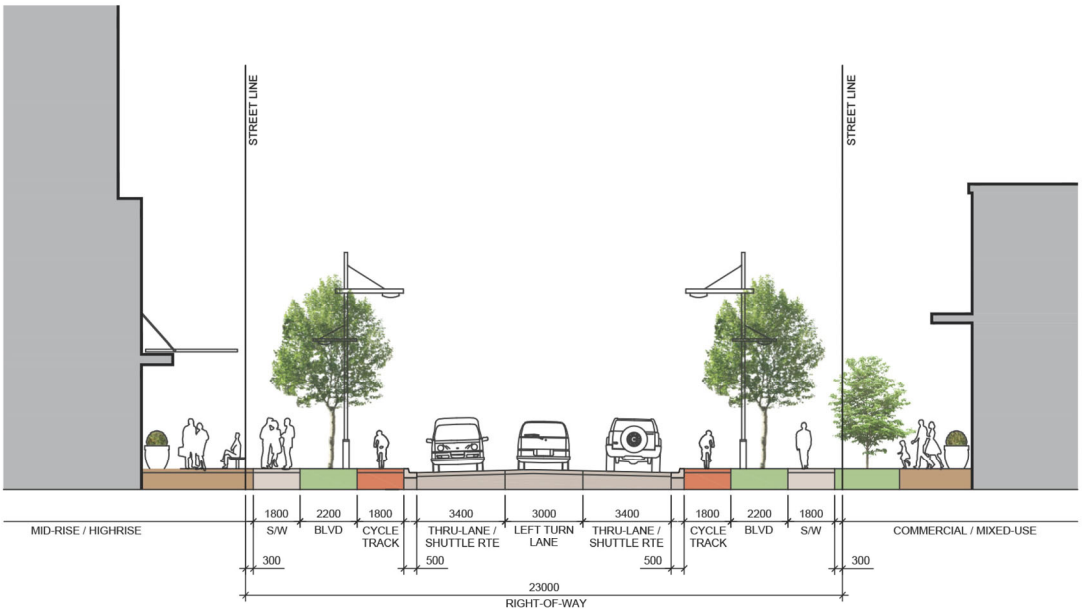
This connection defines the central east-west axis of the community, connecting it to the GO station transit hub in the east, and almost as far as The Gore Road which borders the community to the west. The central feature of this link is a 14 metre parkland median, which provides not just landscaping and open space but also a significant multi-modal active transportation spine.

The road system comprises one way roadways on each side of the spine. Each directional roadway includes an outside layby parking lane, and a generous 4.6m shared vehicle and bicycle lane. These lanes will easily accommodate cyclists as well as automobiles and the small to mid-size vehicles of the community scale transit service. Landscaped areas and 1.8m sidewalks on each side of the promenade complete the section.



3.2.3 Major Collector Roads: Humber Station Road

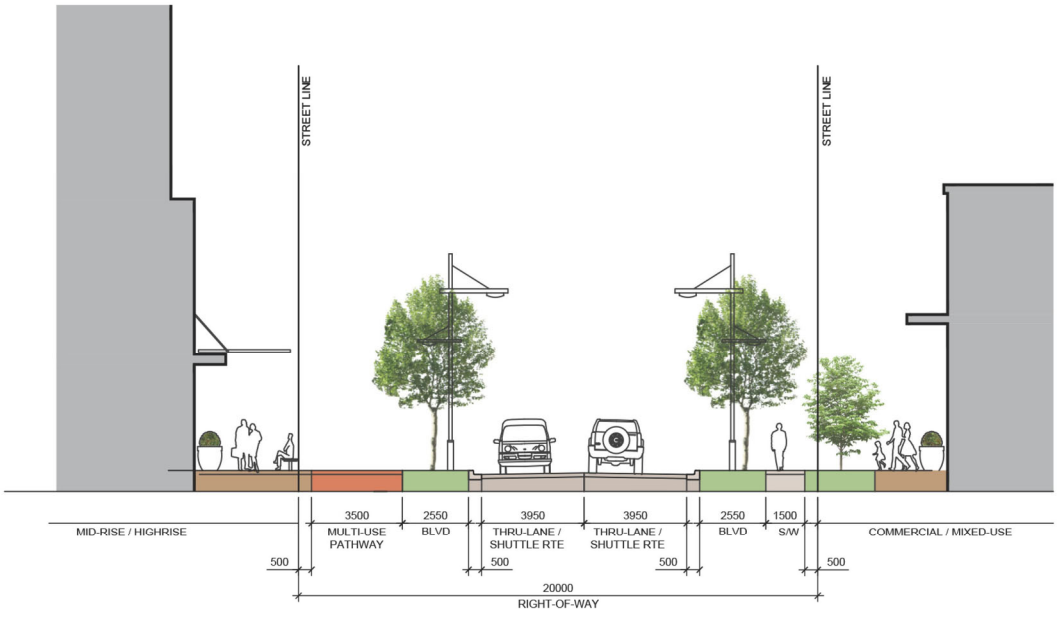
Humber Station Road, to the north of King Street, will be the major connection from the heart of Macville to the south. This road, designed to accommodate larger volumes of traffic and larger transit vehicles on regular service will be provided with 3.4m wide travel lanes, and a 3.0m centre left turn lane as needed to provide for turns into side streets and driveways. As with the other roads in the community, this has been limited to a single lane in each direction consistent with the need to promote alternative transportation modes. Due to the need to move more traffic on this road, no provision is made for layby parking.



Cyclists are accommodated in dedicated 1.8m cycle tracks on each side of the road, and pedestrians on 1.8m sidewalks.

3.2.4 Major Collector Roads: East-West Link

The East-West road link connects the heart of Macville to the Emil Kolb Parkway to the east, passing below the CP rail line to provide a grade separated east-west connection. To the east of the CP rail line, this roadway will comprise two 3.95m travel lanes, a 1.5m sidewalk on the south side, and a 3.5m multi-use pathway on the north side to provide the key cycling connection to the existing multi-use pathways on Emil Kolb Parkway. From here cyclists can travel south into Bolton, or north to cycling trail facilities in the Greenbelt.

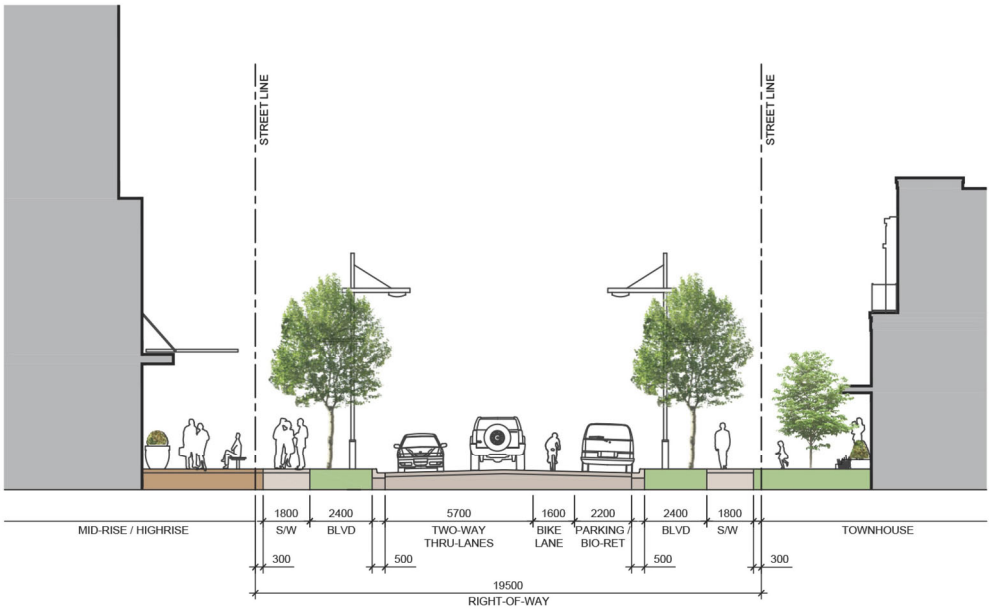


To the west of the CP rail line, this cross section will be augmented with turn lanes as necessary to facilitate automobile and bus traffic to and from the GO station.

3.2.5 Minor Collector Roads

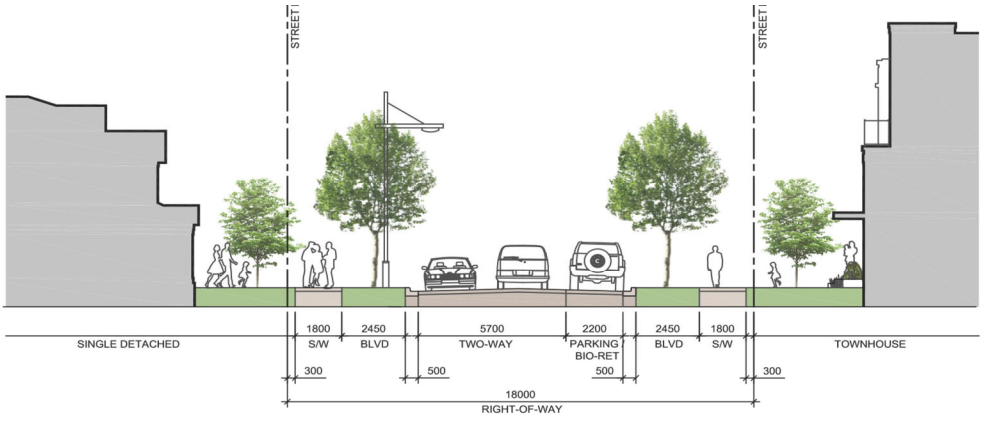
Aside from the major road elements described above, the minor collector road network planned for the community is more traditional, in a 19.5m right of way. It is not anticipated that cyclist volumes on these roads will justify providing dedicated cycling lanes as they are seen as “feeder” roads to get cyclists to the major active transportation facilities on the Multi-Modal Ring Road and the Central Promenade. As such, these roads provide for 2 way vehicular traffic in 5.7m of roadway, which is sufficient to support shared use by cyclists. Parking is provided on one side in 2.2m layby lanes.

On the side of the road with parking, 1.6m cycling lanes will be designated so as to reduce the risk of conflict between parked cars and cyclists. On the opposite side of the road, cyclists and vehicles will share the roadway. 1.8m sidewalks are provided on both sides of the road.



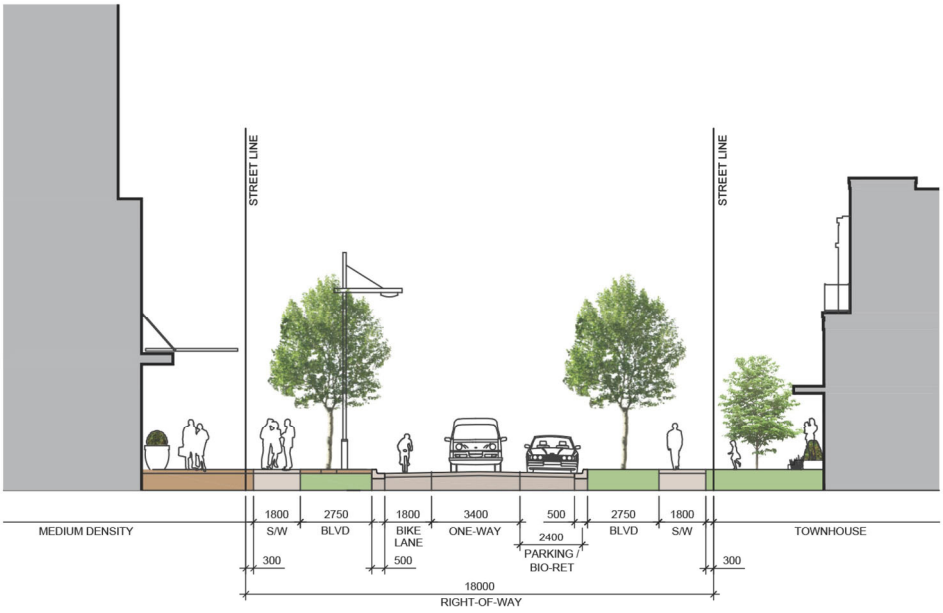
3.2.6 Local Roads

Two way local roads are again more traditional in section as they are seen as feeding cyclists to the major facilities, and do not therefore have to provide specifically for significant cycling volumes at any given time. Local Roads will have an 18.0m cross section. They will generally comprise two travel lanes for automobiles and cyclists in 5.7m, with 2.2m layby parking on one side. 1.8m sidewalks are planned for both sides.



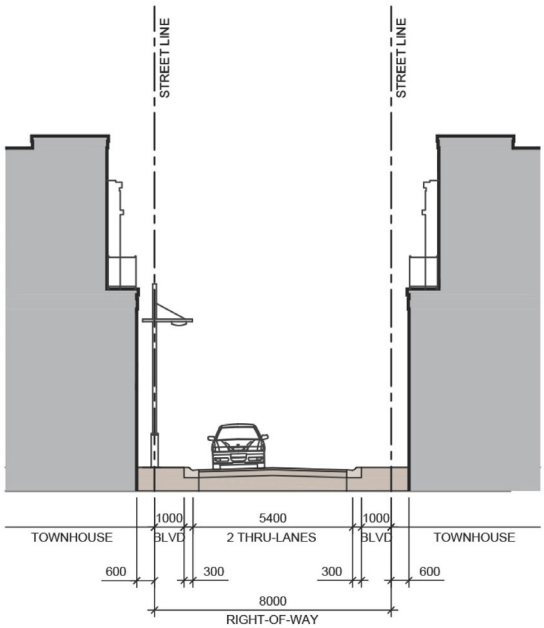
A hybrid option has been developed for application in certain circumstances, particularly where non-residential uses create destinations along the street. This option provides a very wide 3.4m one way lane, a

2.4m layby parking lane, and a 1.8m designated cycle lane on one side. This option also includes the sidewalks and landscaping on both sides of the right-of-way.



3.2.7 Laneways

A number of key medium density areas of the community will comprise row based residential developments with rear lane access. The plan allows for 8.0m wide laneways in these areas, which include a 5.4m travel width for two way traffic, and 1.9m of space to each side of the roadway which includes curb/gutter, boulevards and setbacks.



3.3 ROAD-RAIL GRADE SEPARATIONS

In addition to the internal community roads there are two specific pieces of infrastructure that are required to ensure that the Macville Community is appropriately accessible and connected to the existing road network and the community of Bolton. These are road-rail grade separations on the two key east-west roads that serve the community and that cross the CP MacTier subdivision rail line. The purpose of a road-rail grade separation is simply to eliminate the potential conflict between road vehicles and rail traffic. In this manner two important objectives are achieved:

- the elimination of rail related delays as vehicles wait for trains to pass; and
- the elimination of any risk of collision between road vehicles and rail traffic.

In addition to these general objectives for the roadways that cross the rail line, in the case of the Macville Community there is an additional specific need, which relates to the provision of reliable emergency service (EMS) access. At present, the Town of Caledon and Region of Peel have no plans to implement fire or ambulance facilities within the future Macville Community. The nearest existing and planned stations are located within the community of Bolton, which lies to the east of the CP rail line.

The nearest fire station to the west of the CP rail line is in Caledon East. The nearest paramedic station is on The Gore Road to the south of Countryside Drive. Both of these stations are about a 10-15 minute drive from Macville under ideal conditions. The target response time for Peel paramedics is 6 – 10 minutes depending on the type of call. The fire and paramedic stations to the west of the CP rail line are thus too far from the Macville Community to provide appropriate response times.

It is therefore vital to ensure that emergency vehicles can respond to calls within Macville from stations in Bolton without any risk of delay due to rail traffic on level crossings. The current situation with the level crossing on King Street means that emergency vehicles from Bolton responding to calls in Macville are at risk of being blocked by freight rail traffic for as much as 5 to 10 minutes.

3.3.1 King Street Grade Separation

The King Street corridor to the south of Macville is the primary existing east-west road connection in the area. It provides access to Bolton, as well as to Coleraine Drive, which becomes Emil Kolb Parkway to the north of King Street and is configured as a north-south bypass of Bolton.

Between Humber Station Road and Emil Kolb Parkway, King Street currently crosses the CPR line at a level crossing. As an important future link between Bolton and the BRES Option 3 community, it will be vital that this crossing be grade separated. This particular grade separation of King Street from the CPR MacTier Subdivision is a project that has been identified as being needed for over 10 years. The *Bolton Commuter Rail Feasibility Study* completed by Metrolinx in 2010 concluded that this grade separation was already warranted on the basis of existing traffic and train volumes and the arterial classification of King Street (pg 85, para 1):

> *"The exposure index indicates that grade-separation is needed now. The arterial classification of this two-lane road also supports grade separation."*

A 2014 Region of Peel Recommendation Report, completed as part of the *Goods Movement Study*, studied 12 at-grade rail crossings on Peel roads using 9 criteria, with a view to prioritizing those locations that came closest to warranting grade separation. This study found that the King Street rail crossing was one of 2 high priority locations identified as being needed in the near term, and recommended proceeding with a Feasibility Study.

A further *Feasibility Assessment* of the 2 high priority locations was completed in 2015 by CIMA. This study concluded that a grade separation on King Street had the highest cost-benefit ratio of the options considered. It recommended proceeding with an Environmental Assessment, which, if initiated immediately, could mean that the grade separation would be completed in about 5 years.

This King Street rail grade separation was also identified as a project in the current Region of Peel Development Charges Bylaw, with an estimated capital cost of $15 million, and an estimated completion date of 2026. The update to this DC Bylaw (which is currently underway) identifies an estimated capital cost of $22 million for this crossing, and an estimated completion date of 2027.

3.3.2 East-West Road Link Grade Separation

The second road-rail grade separation related to Macville will be where the future east-west road connection connecting Emil Kolb Parkway to Humber Station Road crosses the CPR line, adjacent to the future GO transit station.

The purpose of this road link is to provide an alternative route to connect the GO transit station to the Bolton area and beyond. This will provide some redundancy in the road network in this area, ensuring that vehicular access to the station is not constrained to a single route and providing drivers with alternative routes in potentially busy peak periods. It will also provide a route for traffic external to Macville to bypass the active transportation friendly corridors within the community as far as possible.

Given the volume of peak period traffic on this proposed east-west link road, and the importance of this line as a freight traffic line in addition to the future GO Rail service, CPR will likely insist that this road be grade separated from the rail line.

A grade separation for the East-West Road Link is also completely consistent with the objectives for the Macville Community. To be consistent with the active transportation and pedestrian friendly nature of the community, the proposed road network in the core area around the GO transit station has a relatively limited capacity to move vehicular traffic. It is anticipated that under normal circumstances, the road network will move an appropriate amount of vehicular traffic, while at the same time ensuring that transit and active transportation users are fully supported. However, a level rail crossing at this location would mean that every time a train passes, traffic would queue up right back into the core of the community, blocking roads and intersections, and negatively impacting bus transit and active transportation users.

As such the importance of this road necessitates that it be grade separated from the CP line for the same reasons as the King Street crossing.

4.0 TRANSPORTATION CONTEXT

4.1 EXISTING TRANSPORTATION SYSTEM

4.1.1 Existing Road Network

4.1.1.1 King Street

King Street (Regional Road 9) is a regional arterial that provides an east-west connection from Winston Churchill Boulevard at Peel Region's west boundary with Halton Region to Caledon King Townline South at Peel Region's east boundary with York Region. King Street continues through York Region as King Road.

At the west end of Bolton, King Street is separated into two sections approximately 1 kilometre apart, connected by Emil Kolb Parkway. The section of King Street to the east of Emil Kolb Parkway is herein referred to as the east section of King Street, whilst the section of King Street to the west of Emil Kolb Parkway will continue to be referred to as King Street for the purpose of this study.

King Street extends along the southern boundary of the site, along which it operates with a single traffic lane in each direction. Localized widening along King Street at The Gore Road provides for the provision of left turn lanes. King Street is classified in the Town of Caledon Official Plan as a medium capacity arterial.

Adjacent the site, King Street has a posted speed limit of 80 kilometres per hour. There are no sidewalks along King Street in the vicinity of the site. A level rail crossing is located on King Street between Humber Station Road and Emil Kolb Parkway, operating with crossing gates and flashing lights.

4.1.1.2 The Gore Road

The Gore Road (Regional Road 8) is a north-south regional arterial extending from Highway 9 at Peel Region's north boundary with Simcoe County to Highway 50 at Peel Region's east boundary with York Region.

The Gore Road extends along the western boundary of the site, along which it operates with a single traffic lane in each direction. Localized widening along The Gore Road at King Street provides for the provision of left turn lanes. The Gore Road is classified in the Town of Caledon Official Plan as a medium capacity arterial.

Adjacent the site, The Gore Road has a posted speed limit of 70 kilometres per hour. There are no sidewalks along The Gore Road in the vicinity of the site.

The King Street / The Gore Road intersection is signalized.

4.1.1.3 Humber Station Road

Humber Station Road extends from Highway 9 at Caledon's north boundary with Simcoe County to Mayfield Road at Caledon's south boundary with Brampton.

Humber Station Road extends partially along the site's eastern boundary and partially through the site, where it operates with a single traffic lane in each direction. Humber Station Road is classified in the Town of Caledon Official Plan as a collector.

There are no sidewalks along Humber Station Road in the vicinity of the site. A level rail crossing is located on Humber Station Road to the north of the site, operating with flashing lights.

The King Street / Humber Station Road intersection is signalized.

4.1.1.4 Emil Kolb Parkway

Emil Kolb Parkway is a recently constructed arterial connection extending between Highway 50 to the north of Bolton and the east section of King Street in the west end of Bolton. Emil Kolb Parkway continues south of the east section of King Street as Coleraine Drive.

In the vicinity of the west section of King Street, Emil Kolb Parkway operates with two traffic lanes in each direction. Further north of the west section of King Street, Emil Kolb Parkway reduces to a single traffic lane in each direction. The Town of Caledon Official Plan identifies Emil Kolb Parkway as an arterial route.

In the vicinity of the west section of King Street, Emil Kolb Parkway has a posted speed limit of 60 kilometres per hour. There are no sidewalks along Emil Kolb Parkway to the north of the west section of King Street, whilst a sidewalk is provided on the west side of Emil Kolb Parkway to the south of the west section of King Street.

The King Street / Emil Kolb Parkway intersection is a roundabout.

4.1.2 Existing Transit Network

Bolton is serviced by a single bus route in the AM and PM peak hours, operated by Voyago. The nearest stop on the route is approximately 2 km southeast of the site.

Services on the Caledon GO bus route 38 are accessible through stops along Highway 50, approximately 3 kilometres to the east of the site. GO bus route 38 provides access to Malton Station on the Kitchener GO Train Line.

5.0 TRAFFIC VOLUME PROJECTIONS

5.1 SCOPE

Analysis has been completed for the following scenarios during the AM and PM peak hour:

- Existing Conditions
- Future Background Conditions (10 year horizon – 2031)
- Future Total Conditions (10 year horizon – 2031)

Intersections included within the analysis study area are listed below:

Existing Intersections

- King Street / The Gore Road (Signalized);
- King Street / Humber Station Road (Signalized);
- King Street / Emil Kolb Parkway (Unsignalized – Roundabout);

Proposed Intersections

- Emil Kolb Parkway / East-West Link (Unsignalized – Roundabout);
- King Street / West Site Access (Unsignalized);
- King Street / Middle Site Access (Signalized);
- King Street / East Site Access (Signalized);
- The Gore Road / North Site Access (Signalized);
- The Gore Road / Middle Site Access (Signalized); and
- The Gore Road / South Site Access (Signalized).

Existing lane configurations are shown in **Figure 3** and future lane configurations are shown in **Figure 4**.

5.2 EXISTING TRAFFIC VOLUMES

Existing peak hour traffic volumes have been established based on traffic counts undertaken by Spectrum Traffic Data on behalf of BA Group. The intersections which were counted are summarized in **Table 1**.

Existing traffic volumes are shown in Figure 5 and the raw data is attached in **Appendix C**.

TABLE 1 EXISTING TRAFFIC DATA SOURCES

Intersection	Count Date	Count Times	Source
King St / Emil Kolb Pkwy	Tuesday, October 8, 2019	7:00am-9:00am 3:00pm-6:00pm	Spectrum Traffic Data
King St / The Gore Rd	Tuesday, April 10, 2018		
King St / Humber Station Rd			

5.3 FUTURE BACKGROUND TRAFFIC VOLUMES

5.3.1 Background Development Growth

No background developments are currently proposed in the vicinity of the site.

5.3.2 Corridor Growth

The Caledon Transportation Master Plan provides growth rate forecasts along King Street based on scenarios with or without the implementation of the GTA West corridor. The growth rates for the relevant sections of King Street are provided in **Table 2**. The corridor growth rates adopted for the purpose of this analysis are outlined in **Table 3**.

TABLE 2 CORRIDOR GROWTH RATES OUTLINED IN CTMP

Screenline	With GTA West	Without GTA West
King Street from Innis Lake Road to The Gore Road	2.3%	4.3%
King Street from Humber Station Road to Albion Vaughan Road	2.1%	2.7%

TABLE 3 ADOPTED CORRIDOR GROWTH RATES

Road	Direction	AM Peak	PM Peak
King Street	Eastbound	2.0%	2.0%
	Westbound	2.0%	2.0%
The Gore Road	Northbound	1.0%	1.0%
	Southbound	1.0%	1.0%
Emil Kolb Parkway	Northbound	2.0%	2.0%
	Southbound	2.0%	2.0%

5.3.3 GO Station

Projected vehicle trip generation associated with the proposed GO station for trips travelling to and from the existing catchment area around Bolton are based on projections that were prepared as part of the Metrolinx Feasibility Study for a Bolton GO line and summarized in **Table 4**.

TABLE 4 GO STATION VEHICLE TRIP GENERATION

	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Total	**280**	**2**	**282**	**2**	**280**	**282**

Notes:
1. Source: Bolton Commuter Rail Service – Feasibility Study, Prepared by MMM Group for Metrolinx, November 2010

External GO Station traffic travelling to/from existing Bolton was assigned onto the area road network based on the distribution of residential population within Bolton. Go Transit trips related to the planned Macville Community will occur internally on the planned collector and local road network, including connections for pedestrians and cyclists.

5.3.4 Future Background Traffic Volumes

The future background traffic volumes were determined by adding existing traffic volumes, corridor growth traffic volumes and GO Station traffic volumes and are shown in **Figure 6** for the 2031 analysis horizon year.

5.4 SITE TRAFFIC FORECASTS

5.4.1 Site Vehicle Trip Generation

5.4.1.1 Residential

Base residential vehicle trip generation rates were adopted based on the ITE 10th Edition, as outlined in **Table 5**. These rates were applied to the proposed development, as shown in **Table 6**. A 15% reduction was applied to account for a projected mode shift to GO Transit, following construction of the proposed future GO Station.

TABLE 5 BASE RESIDENTIAL VEHICLE TRIP GENERATION RATES (ITE 10TH EDITION)

Land Use	Land Use Code (ITE 10th Edition)	Vehicle Trip Generation Rate *(vehicle trips per dwelling)*					
		AM Peak Hour			PM Peak Hour		
		In	Out	2-Way	In	Out	2-Way
Detached Dwelling	LUC 210 (Single-Family Detached Housing)	0.19	0.55	0.74	0.62	0.37	0.99
Low-Rise Residential	LUC 220 (Multifamily Housing (Low-Rise))	0.11	0.35	0.46	0.35	0.21	0.56
Mid-Rise Residential	LUC 221 (Multifamily Housing (Mid-Rise))	0.09	0.27	0.36	0.27	0.17	0.44
High-Rise Residential	LUC 222 (Multifamily Housing (High-Rise))	0.07	0.24	0.31	0.22	0.14	0.36

TABLE 6 SITE RESIDENTIAL VEHICLE TRIP GENERATION

Land Use	Number	AM Peak Hour			PM Peak Hour		
		In	Out	2-Way	In	Out	2-Way
Detached Dwelling	2,339 dwellings	*0.19*	*0.55*	*0.74*	*0.62*	*0.37*	*0.99*
		433	**1,298**	**1,731**	**1,459**	**857**	**2,316**
Low-Rise Residential	1,434 dwellings	*0.11*	*0.35*	*0.46*	*0.35*	*0.21*	*0.56*
		152	**508**	**660**	**506**	**297**	**803**
Mid-Rise Residential	2,406 dwellings	*0.09*	*0.27*	*0.36*	*0.27*	*0.17*	*0.44*
		225	**641**	**866**	**646**	**413**	**1,059**
High-Rise Residential	692 dwellings	*0.07*	*0.24*	*0.31*	*0.22*	*0.14*	*0.36*
		51	**163**	**214**	**152**	**97**	**249**
Total	**6,871 dwellings**	**861**	**2,610**	**3,471**	**2,763**	**1,664**	**4,427**
15% GO Train Reduction		**-129**	**-392**	**-521**	**-414**	**-250**	**-664**
Vehicle Trips		**732**	**2,218**	**2,950**	**2,349**	**1,414**	**3,763**

5.4.1.2 Retail

The proposed ground floor commercial and commercial associated with the GO Station lands are expected to operate ancillary to the surrounding development, and is expected to generate minimal traffic from external to the site. As such, no external traffic generation has been assumed for these retail components.

The retail in the commercial mixed-use block is also expected to primarily service residents of the proposed development, however an allowance has been made for some external traffic generation associated with this component,

Base retail vehicle trip generation rates for the mixed-use block were adopted based on the ITE 10th Edition, as outlined in **Table 7**. These rates were applied to the proposed mixed-use block, as shown in **Table 8**. Pass-by percentages of 0% and 34% were adopted in the AM and PM peaks respectively, based on the ITE Trip Generation Handbook 3rd Edition.

TABLE 7 RETAIL VEHICLE TRIP GENERATION RATE (ITE 10TH EDITION)

Land Use	Land Use Code (ITE 10th Edition)	Vehicle Trip Generation Rate *(vehicle trips per 1,000 ft²)*					
		AM Peak Hour			PM Peak Hour		
		In	Out	2-Way	In	Out	2-Way
Commercial	LUC 820 (Shopping Centre)	0.58	0.36	0.94	1.83	1.98	3.81

TABLE 8 SITE RETAIL VEHICLE TRIP GENERATION

Land Use	Number	AM Peak Hour			PM Peak Hour		
		In	Out	2-Way	In	Out	2-Way
Commercial	85,000 ft²	0.58	0.36	0.94	1.83	1.98	3.81
Vehicle Trips		**50**	**30**	**80**	**155**	**168**	**323**
Pass-by Trips[1]		*0*	*0*	*0*	*53*	*57*	*110*
Primary Trips[1]		*50*	*30*	*80*	*102*	*111*	*213*

Notes:
1. Assumes 0% pass-by in the AM and 34% pass-by in the PM, based on ITE Trip Generation Handbook 3rd Edition

5.4.1.3 Employment

Base employment vehicle trip generation rates were adopted based on the ITE 10th Edition, as outlined in **Table 9**. These rates were applied to the proposed development, as shown in **Table 10**.

TABLE 9 BASE EMPLOYMENT VEHICLE TRIP GENERATION RATES (ITE 10TH EDITION)

Land Use	Land Use Code (ITE 10th Edition)	Vehicle Trip Generation Rate *(vehicle trips per 1,000 ft²)*					
		AM Peak Hour			PM Peak Hour		
		In	Out	2-Way	In	Out	2-Way
Employment	LUC 710 (General Office Building)	1.00	0.16	1.16	0.18	0.97	1.15

TABLE 10 SITE EMPLOYMENT VEHICLE TRIP GENERATION

Land Use	Number	AM Peak Hour			PM Peak Hour		
		In	Out	2-Way	In	Out	2-Way
Employment		1.00	0.16	1.16	0.18	0.97	1.15
Vehicle Trips	**15,000 ft²**	**15**	**2**	**17**	**3**	**14**	**17**

5.4.1.4 School

It is expected that the proposed schools will primarily service residents of the proposed site and in this respect, the majority of vehicle trips associated with these uses are expected to be internal to the community. For the purpose of this analysis, it has been assumed that all trips associated with the proposed schools and are internal to the site and have not been assigned externally.

5.4.1.5 Internal Interaction

An allowance has been made for internal interaction between the proposed residential, retail and employment using the methodology outlined in the ITE Trip Generation Handbook 3rd Edition.

The interaction trip rates by land use, as outlined in the ITE Handbook are reproduced in **Table 11**. Application these rates to the projected vehicle trip generation yields the potential interaction for each land use, as summarized in **Table 12**. The resultant interaction trips by land use is summarized in **Table 13**.

TABLE 11 INTERACTION TRIP RATE BY LAND USE

Land Use	AM Peak		PM Peak	
	In	Out	In	Out
Residential				
With Retail	2%	1%	46%	42%
With Employment	0%	2%	4%	4%
Retail				
With Residential	17%	14%	10%	26%
With Employment	32%	29%	8%	2%
Employment				
With Residential	3%	1%	57%	2%
With Retail	4%	28%	31%	20%

TABLE 12 INTERACTION TRIP POTENTIAL BY LAND USE

Land Use	AM Peak		PM Peak	
	In	Out	In	Out
Residential				
With Retail	15	22	1,059	587
With Employment	0	44	92	56
Retail				
With Residential	8	4	16	44
With Employment	16	9	12	3
Employment				
With Residential	0	0	2	0
With Retail	1	1	1	3

TABLE 13 INTERACTION TRIPS BY LAND USE

Land Use	AM Peak		PM Peak	
	In	Out	In	Out
Residential				
With Retail	4	8	44	16
With Employment	0	0	0	2
Retail				
With Residential	8	4	16	44
With Employment	1	1	3	1
Employment				
With Residential	0	0	2	0
With Retail	1	1	1	3

5.4.1.6 Total Trip Generation

The resultant projected vehicle trip generation for the residential and mixed-use block after internal interaction allowances are summarized in **Table 14**.

TABLE 14 SITE TOTAL VEHICLE TRIP GENERATION

Land Use	Number	AM Peak Hour			PM Peak Hour		
		In	Out	2-Way	In	Out	2-Way
Residential							
Base Residential Vehicle Trips	6,871 dwellings	732	2,218	2,950	2,349	1,414	3,763
Minus Interaction		4	8	12	44	18	62
Total Residential Vehicle Trips		**728**	**2,210**	**2,938**	**2,305**	**1,396**	**3,701**
Retail							
Base Retail Vehicle Trips	85,000 ft^2	50	30	80	155	168	323
Minus Interaction		9	5	14	19	45	64
Vehicle Trips		**41**	**25**	**66**	**136**	**123**	**259**
Pass-by Trips		*0*	*0*	*0*	*53*	*57*	*110*
Primary Trips		*41*	*25*	*66*	*83*	*66*	*149*
Employment							
Base Employment Vehicle Trips	15,000 ft^2	15	2	17	3	14	17
Minus Interaction		1	1	2	3	3	6
Total Employment Vehicle Trips		**14**	**1**	**15**	**0**	**11**	**11**

5.4.2 Site Vehicle Trip Distribution

5.4.2.1 Residential

Residential site traffic was assigned onto the area road network based on the results of the 2016 Transportation Tomorrow Survey (TTS), prevailing traffic patterns and area turn restrictions. General direction of approach percentages was based on the results of the TTS and is summarized in **Table 15**.

TABLE 15 RESIDENTIAL SITE TRAFFIC DISTRIBUTION

Direction	Roadway	Inbound	Outbound
North	The Gore Road	2.5%	2.5%
	Humber Station Road	2.5%	2.5%
	Emil Kolb Parkway	5%	5%
South	The Gore Road	25%	25%
	Humber Station Road	30%	30%
	Emil Kolb Parkway	25%	25%
West	King Street	10%	10%
Total		**100%**	**100%**

Notes:
1. Based on TTS zones 3153, 3190, 3191, 3192, 3193, and 3194

5.4.2.2 Retail and Employment

Retail and employment site traffic was assigned onto the area road network based on the distribution of residential population within Bolton and is summarized in **Table 16**.

TABLE 16 RETAIL AND EMPLOYMENT SITE TRAFFIC DISTRIBUTION

Direction	Roadway	Inbound	Outbound
North	The Gore Road	0%	0%
	Humber Station Road	0%	0%
	Emil Kolb Parkway	15%	15%
South	The Gore Road	0%	0%
	Humber Station Road	5%	5%
	Emil Kolb Parkway	80%	80%
West	King Street	0%	0%
Total		**100%**	**100%**

5.4.3 Future Total Traffic Volumes

Future total traffic volumes were determined by adding the future background traffic volumes with the residential site traffic volumes and are shown in **Figure 7** for the 2031 analysis horizon year.

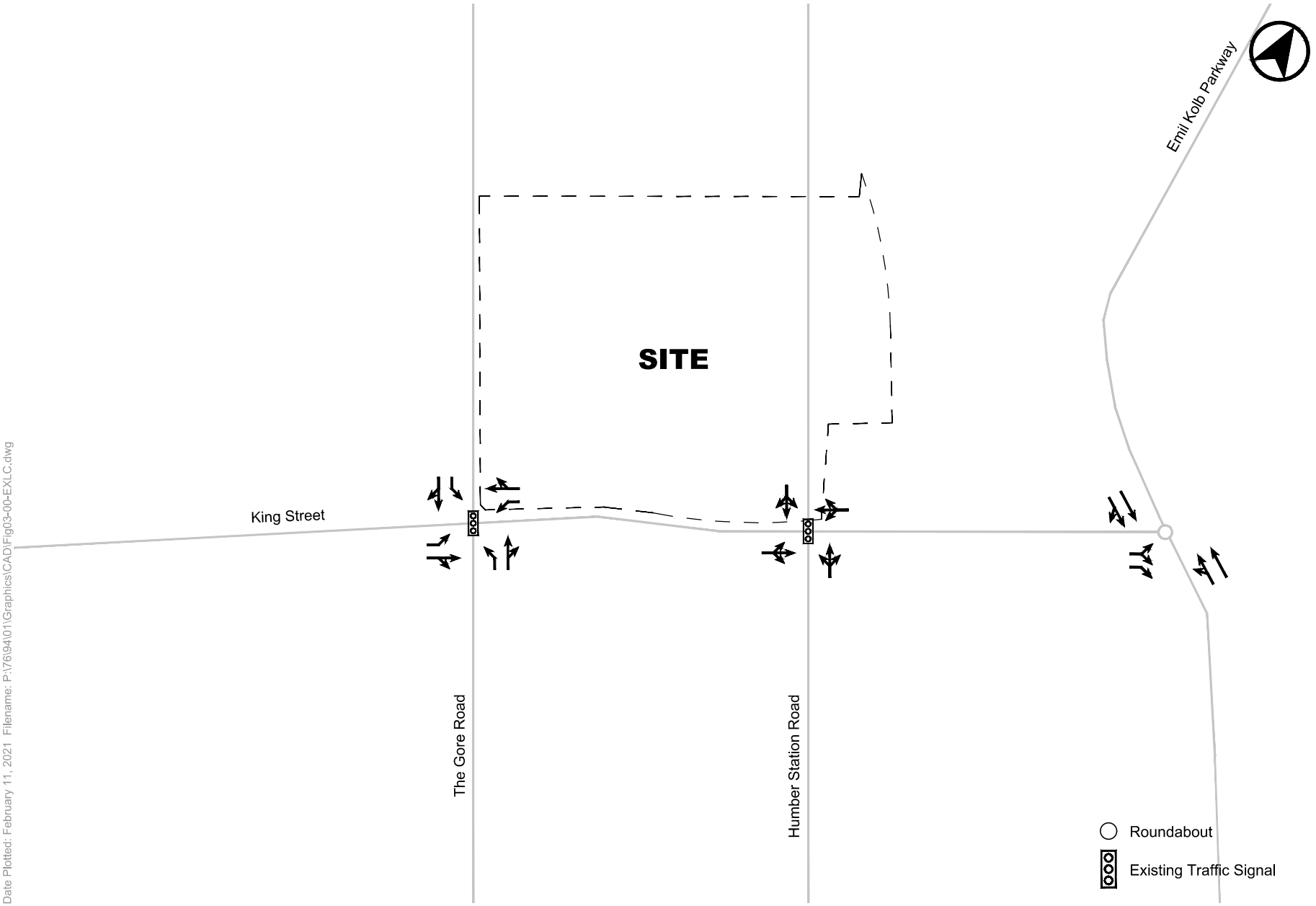


FIGURE 3 EXISTING LANE CONFIGURATION

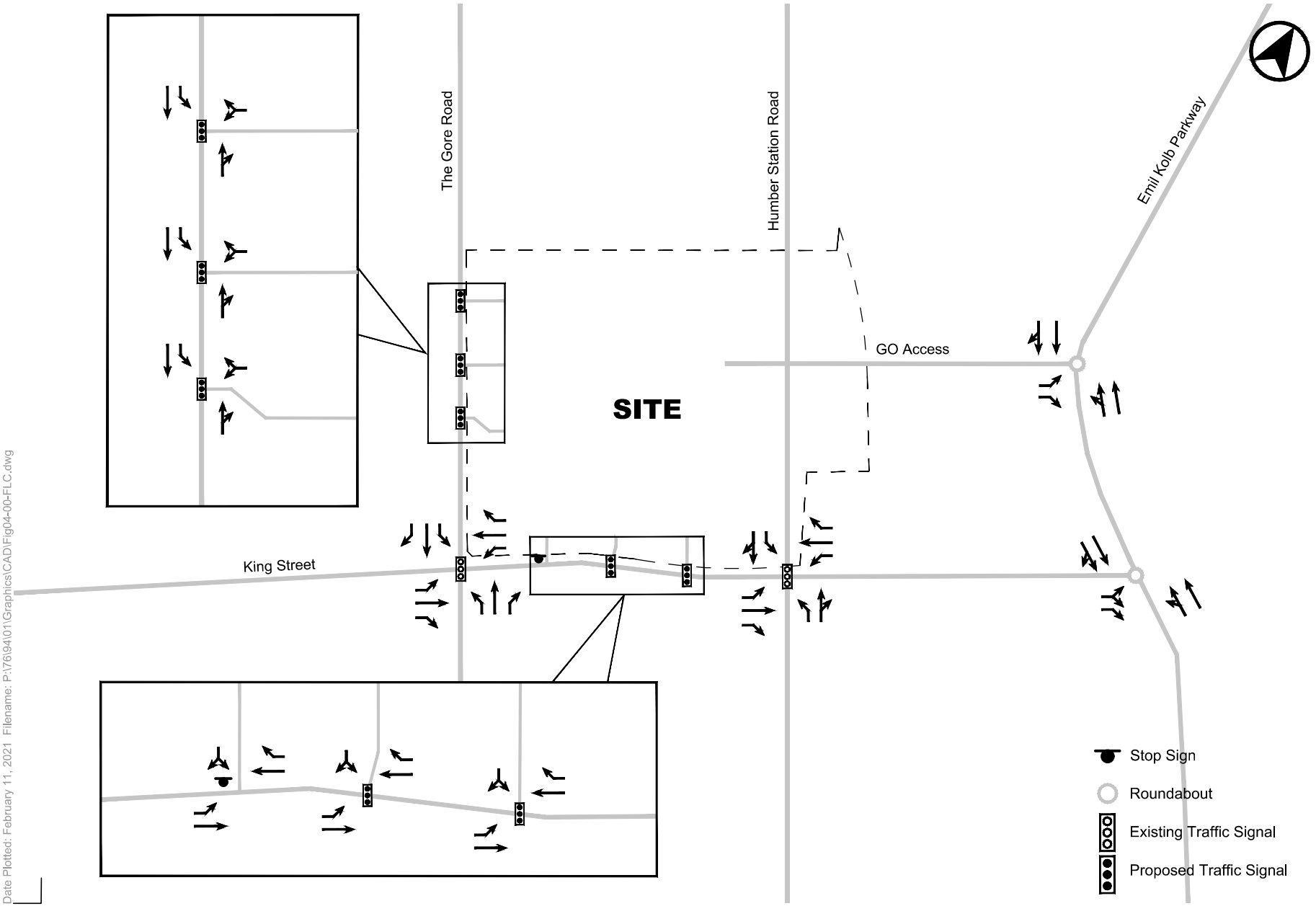


FIGURE 4 FUTURE LANE CONFIGURATION

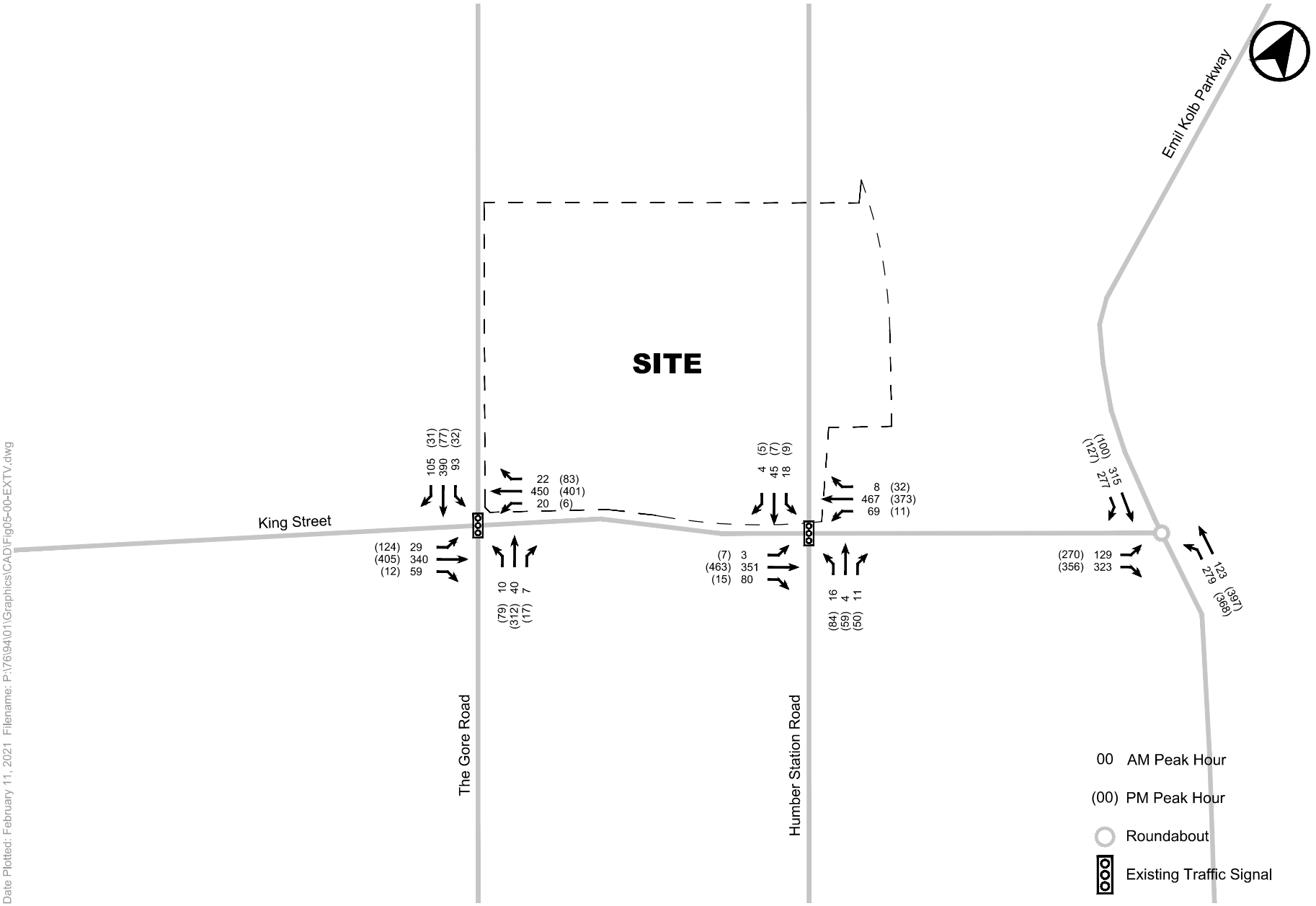


FIGURE 5 EXISTING TRAFFIC VOLUMES

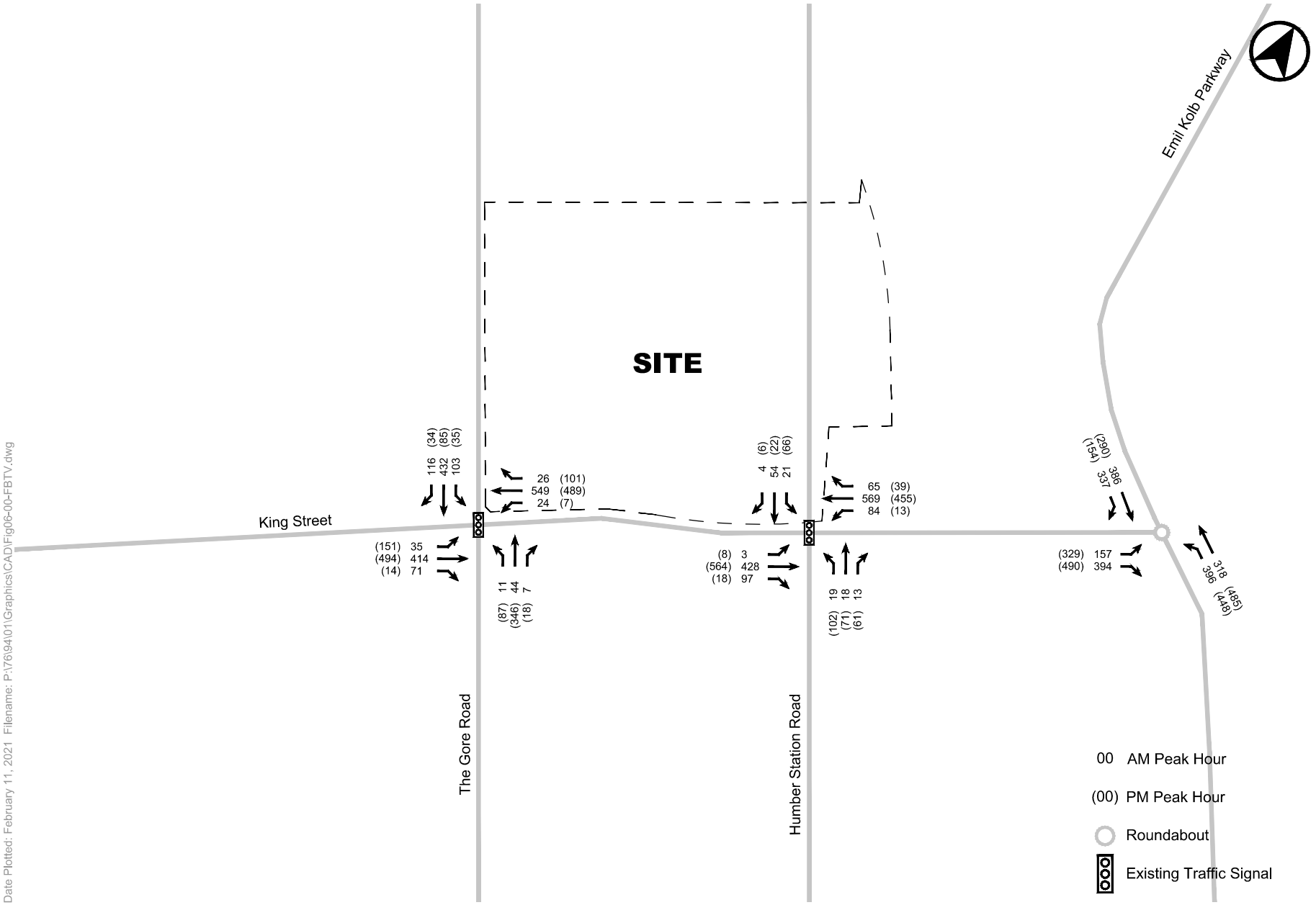


FIGURE 6 FUTURE BACKGROUND TRAFFIC VOLUMES

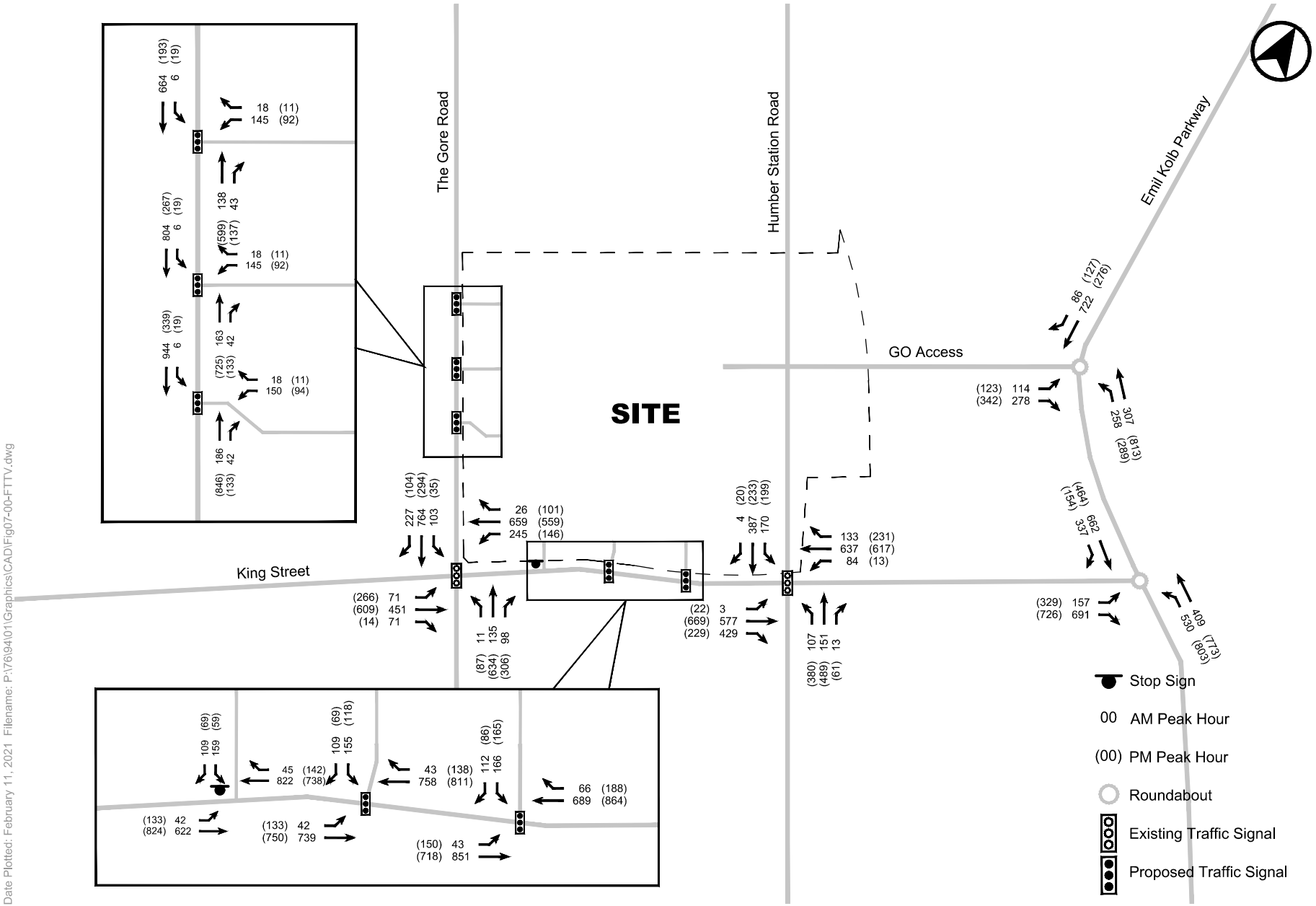


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FIGURE 7 FUTURE TOTAL TRAFFIC VOLUMES

6.0 OPERATION ANALYSIS

6.1 ANALYSIS METHODOLOGY

Synchro Version 9.1 and the Highway Capacity Manual (HCM) methodology were used to analyze the study area signalized and unsignalized stop-controlled intersections and site access points. In order to assess the unsignalized roundabout intersections, Arcady was used.

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 a traffic movement through an intersection is operating at or near maximum capacity.

For unsignalized intersections, level of service (LOS) characterizes operational conditions for key movements in terms of average delay experienced by vehicles attempting to complete a manoeuvre through the intersection. LOS ‘A’ represents a good level of service with short delays, while LOS ‘F’ represents a poor level of service with extended delays.

Analysis summary tables are provided in **Appendix D** and detailed analysis worksheets are attached in **Appendix E**.

6.2 ANALYSIS ASSUMPTIONS AND PARAMETERS

Synchro analyses performed conform to the requirements of the Region of Peel’s Guidelines for Using Synchro, December 2010. A base saturation flow of 1,900 vehicles per hour per lane was assumed as per the Region’s Synchro guidelines. Peak hour factors and heavy vehicle percentages were calculated based on existing traffic volume data extracted from the traffic counts utilized in this study.

Existing traffic signal timing plans for the signalized intersections within the study area were obtained from the Region of Peel and are attached in **Appendix C** Analyses were undertaken using these signal timing plans.

A summary of Future Operations is illustrated in **Figure 8**.

A summary of Recommended Road Improvements are described in **Section 6.3**.

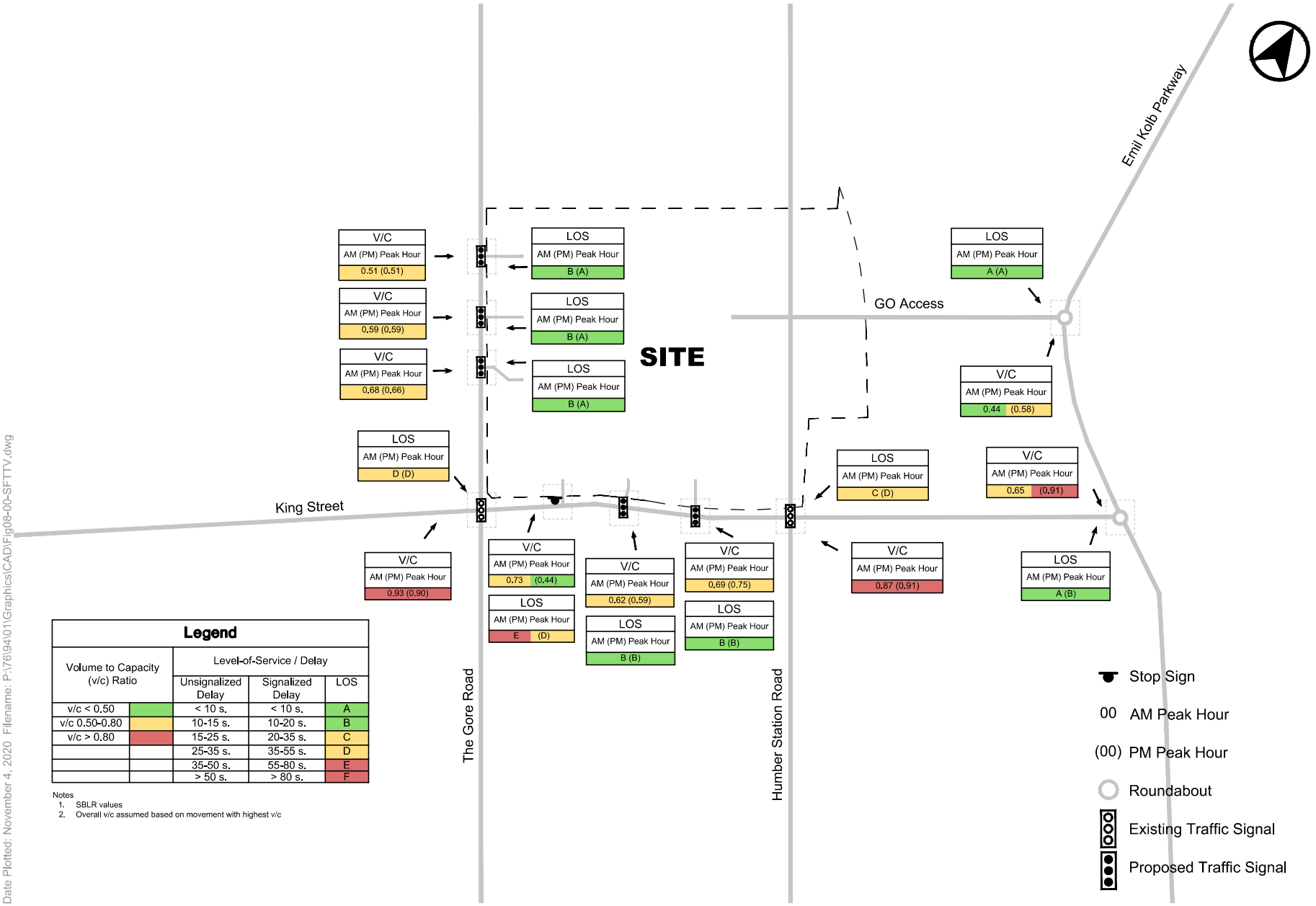


FIGURE 8 SUMMARY OF FUTURE TOTAL TRAFFIC VOLUMES

6.3 RECOMMENDED ROAD IMPROVEMENTS

Recommended area road improvements are summarized in **Table 17** for the road network surrounding the Macvillle Community based on background growth and community traffic projections.

TABLE 17 RECOMMENDED ROAD NETWORK IMPROVEMENTS

Road	Recommended Improvements	Segment
King Street	• Signals at arterial/collector road intersections • Widen intersection approaches at King Street / Humber Station Road to include exclusive turning lanes. • Widen intersection approaches at King Street / The Gore Road to include exclusive turning lanes. • Monitor roundabout intersection operations at King Street / Emil Kolb Parkway as community grows	West of Gore Road to Emil Kolb Parkway
Gore Road	• Provide exclusive left turn lanes at site accesses • Widen intersection approaches at King Street / The Gore Road to include exclusive turning lanes. • Minimum of two signals along Gore Road, to be located at arterial/collector road intersections and/or at Multi-Mobility Road connection	New Collector to south of King Street
Go Access / Emil Kolb Parkway	• New Collector Road Connection between GO station and Emil Kolb Parkway • Introduce Grade-separated crossing of rail line • New roundabout or signal at GO Access Road and Emil Kolb Parkway	

It is noted that Peel Region is currently planning to grade separate King Street at the CP rail line (south and east of Macville. It should be noted that the need for this grade separation has been determined (by the Region of Peel) on the basis of existing and future traffic growth in the King Street corridor. This project would be necessary whether or not the Macville Community is built. Notwithstanding, BA Group is aware that there are concerns related to emergency vehicle access to Macville with the existing level crossing in place, and for this reason there may be a need to consider the timing of full development of the community as it relates to timing of the grade separation project.

7.0 FUTURE STUDIES

Based on the work done to date before and during this traffic study in support of the MacVille Local Official Plan Amendment, the following future transportation studies have been identified as being necessary or potentially needed as they relate to transportation facilities within or in the vicinity of the Macville Community:

- Studies necessary for approval of developments in Macville:
    - Secondary Plan Collector Road Network study. In addition to fulfilling environmental assessment (EA) requirements for the collector road network (including the East-West Link) it is anticipated that this study would support all future plan of subdivision applications.
    - Site specific traffic studies for non-residential uses, including schools.

- Studies potentially necessary before development of Macville commences:
    - Environmental Study Report (ESR) for the grade separation of the East-West road and the CP rail line.
    - Traffic study for development of the GO station transit hub.

- Studies related to but not relevant to timing of Macville approval or development:
    - ESR for the King Street Grade Separation. This will presumably be undertaken by the Region of Peel. As noted above, it is not necessary that this work commence or be completed prior to the commencement of development of Macville.
    - ESR's for the widening of King Street and The Gore Road. While not yet planned, and not necessary for the development of Macville, the fact that these roads are boundary roads means that there may be some shared concerns with the Region of Peel with respect to the future rights-of-way, and the handling of storm water an and adjacent to the rights-of-way.

APPENDIX A:
LOPA Transportation Study Terms of Reference

LOPA Transportation Study
TERMS OF REFERENCE

In support of the
Macville Community
Local Official Plan Amendment

December 2020

Town of Caledon

1.0 INTRODUCTION

1.1 Planning Background

BA Consulting Group represents the Bolton Option 3 Landowners Group in connection with seeking the necessary approvals required to permit the development of the Macville Community lands for urban development including residential, commercial, mixed uses, community uses and related servicing and infrastructure. The lands subject to this proposal consist of approximately 182 hectares (450 acres) of land and are generally located north of King Street, east of The Gore Road and west of the CP Railway tracks. The subject lands are municipally known as 14396 Humber Station Road; 14384 Humber Station Road; 14226 Humber Station Road; 14206 Humber Station Road; 14196 Humber Station Road; 14166 Humber Station Road; 14100 Humber Station Road; 14042 Humber Station Road; 14155 The Gore Road; 0 The Gore Road; 0 The Gore Road; 14211 The Gore Road; 14275 The Gore Road; 0 Humber Station Road; 14389 The Gore Road; 0 King Street; 0 King Street; 7844 King Street; 7816 King Street; 0 King Street; 7640 King Street (herein referred to as the "Subject Lands").

The eastern portion of the Macville Community lands, consisting of lands on both sides of Humber Station Road, north of King Street, have been the subject of Regional Official Plan Amendment 30 (ROPA 30) which was recently approved by LPAT and succeeds in bringing these lands into the Bolton Rural Service Centre Settlement Area Boundary. Accordingly, the eastern portion of these lands are designated "Urban Area" in the Region of Peel Official Plan. The western portion of the Macville Community lands, consisting of lands north of King Street and east of The Gore Road are currently designated "Rural Area" within the Region of Peel's Rural System in the Region of Peel Official Plan and "Prime Agricultural Area" in the Town of Caledon's Official Plan. It is recognized that the western portion of the Macville Community lands are currently located outside of the Settlement Area Boundary of the Bolton Rural Service Centre and accordingly, in order to permit development of these lands for urban-related land uses, these lands will need to brought into the Bolton Rural Service Centre Settlement Area Boundary. This review is currently underway at the Region of Peel through the Region's 2051 Municipal Comprehensive Review of the Region's Official Plan and it expected that final Regional adoption of the new Regional Official Plan will occur before the end of 2021. Further, a local Official Plan Amendment is required to assign urban land use designations to all of the Macville Community lands.

This Terms of Reference for a Transportation Study represents one of several component studies to be undertaken as input to the Local Official Plan Amendment process to establish a Secondary Plan for the Macville Community in Bolton. This Secondary Plan will facilitate the development of these lands for residential and mixed-use development with related complimentary uses, such as open spaces, parks, trails, commercial uses, the Bolton GO Station, the Natural Heritage System (NHS), and stormwater management facilities.

This Terms of Reference sets out the tasks to be addressed and the expected deliverables of the study. The results of the study will contribute to the approval of the LOPA.

1.2 STUDY AREA

The Macville community lands are bounded to the west by The Gore Road, to the east by Humber Station Road and the Canadian Pacific (CP) MacTier subdivision rail line, and to the south by King Street, as shown in the figure on the following page.

The LOPA Transportation Study will focus on the impacts of the proposed community on the existing adjacent road network, namely King Street, The Gore Road, Humber Station Road, and Emil Kolb Parkway. There is a proposed new road link connecting the community to Emil Kolb Parkway to the north of King Street which will also be assessed.

Planning and design of the internal community road network is still underway, and as such will not be analyzed in this report. A subsequent and more comprehensive transportation study will be prepared in coordination with later submissions.

2.0 STUDY PURPOSE

The purpose of the Transportation Background Study is to assess and recommend the transportation infrastructure required to support the development of the Macville community.

The transportation analysis will be undertaken at a relatively high level to assess the road network impacts of the traffic generated and attracted by the development. The study will be of sufficient detail to assess arterial road network performance.

The determination of the transportation impacts will be undertaken in conjunction with an evaluation of through traffic growth on the existing arterial road corridors.

In addition, the report will speak in a qualitative way to the proposed character of the internal road network and cross sections, the significant role of integrating high order and community transit into the planning and design of Macville right from the start of development, the role of the community in supporting both Caledon and Peel active transportation and sustainability objectives, and the need for infrastructure such as grade separated access across the adjacent CP rail line.

The transportation issues to be examined in this study are set out below.

- Arterial road network requirements.
- Traffic controls at major road intersections.
- Roles of the arterial, community and neighbourhood streets within the community.
- External arterial road and internal community road patterns.
- Traffic distribution.
- Transit and active transportation strategy to reduce single-occupant auto use during the peak periods and to optimize/minimize transportation infrastructure.
- Integration with GO rail transit and the resulting impacts on trip generation rates.
- Mode split assumptions for auto, transit, walk, and cycling.
- Bicycle routes and pedestrian trail network, and integration with the rest of Caledon.
- Traffic calming on internal roads.

- On street and off street parking strategy and parking standards to support TDM and to encourage transit usage.

3.0 LOPA TRANSPORTATION STUDY

The transportation study will include principles, goals, and objectives with respect to transportation, consistent with the community vision.

Review of Past and Current Studies

The consultant will review past and current studies related to Macville with regards to their relevant policies, conclusions, and recommendations. Relevant data will be extracted from previous studies and applied to this study, if appropriate.

Transportation Network

Information on the existing and planned transportation system, including all surface transportation modes –highways, arterial roads, collector roads, pedestrian, trail, and bicycle networks and surface transit routes will be reviewed. Existing rights-of-way, designated rights-of-way, and roadway classifications will also be reviewed. The study will also discuss the manner in which innovative and alternative right-of-way solutions are being contemplated for the Macville community, in support of the Town of Caledon and Region of Peel's objectives with respect to sustainability and reduced environmental burdens.

Traffic Counts

All relevant traffic counts currently available from Peel Region, and the Town of Caledon will be collected. Any missing traffic data that is not available through these sources will require additional counts to be undertaken. This information will be used to assess existing conditions and to provide input into forecasting future travel demand.

Existing Transportation Network Constraints and Opportunities

The existing road transportation network will be analyzed (as measured using level of service/volume to capacity ratios) during the weekday AM and PM peak hours to identify existing capacity deficiencies. This will be conducted at the intersection level. This analysis will identify existing capacity problems and the magnitude of these problems.

Study Horizon

Forecasting and analysis of the future road network traffic patterns in the study area will be undertaken for an ultimate build-out horizon of 2031. The weekday AM and weekday PM peak hour travel demand will be evaluated.

Traffic Generation and Mode Split

Forecasts of future traffic generated by the Secondary Plan Area will be based on vehicle trip generation rates for each type of land use and will reflect expected transit modal splits, adjustments for live/work targets, adjustments for TDM strategies, proportion of walking/cycling trips, and auto occupancy.

Sources for trip generation rates will include TTS, ITE Trip Generation publication.

The expected transit mode splits for this development and for background traffic growth will be rationalized based on consideration of several factors. The factors that will be reviewed, but not limited to, include:

- proposed transit network;
- expected service frequencies/headways;
- land use densities;
- average walking distances to bus stops and stations, and;
- built-form.

Traffic Distribution

The distribution of traffic generated by the Secondary Plan Area will rely on TTS data. The distribution will be documented and expressed as percentages via cardinal direction and routes used for review.

Land Use Scenarios

Background traffic growth in the study area will be accounted for by determining appropriate corridor growth percentage based on historic traffic count data for King Street, The Gore Road, and Humber Station Road.

Forecast traffic growth will be determined from the most current residential and commercial development estimates developed for the community.

Network Scenarios

The planned 2031 arterial road network will be utilized as the base future transportation network and will reflect current municipal and regional capital programs, and other studies as appropriate.

Future Transportation Network Problems and Needs

Selected intersection analysis will also be performed as required to assess the operation of major road intersections and identify any deficiencies. Intersection analysis will be conducted through use of Trafficware's Synchro Capacity Analysis software, version 9.0 and the Arcady software for Roundabouts. Mitigation measures and timing of improvements to the transportation network will be recommended to alleviate impacts to the adjacent

neighbourhoods and road network. The analyses will follow the Region of Peel Synchro Guidelines.

Future Studies
The need for and scope of specific future Environmental Assessment and/or Secondary Plan studies will be identified and summarized. Where possible the desired timing of these studies will be identified.

4.0 COMMUNITY TRANSPORTATION REQUIREMENTS

Internal Transportation Network Requirements

The Macville community planning team have developed a preliminary transportation network and community plan, including a set of proposed road cross sections. These will be discussed with respect to:

- adherence to the principles, goals and objectives established;
- compliance to Town and Region standards and bylaws;
- sustainability;
- support for the development, through transportation accessibility and service;
- network connectivity and continuity;
- community impacts;
- impacts on the natural environment; and
- feasibility of the improvements.

Sustainability and Support for Transit and Active Transportation

The integration of a high order transit hub into the community is of great significance in determining the location and structure of Macville. The:

- early integration of high order and community transit into the planning and design of Macville right from the beginning,
- role of the community in supporting both Caledon and Peel active transportation and sustainability objectives, and
- the need for investment to provide grade separated access across the adjacent CP rail line will be addressed.

5.0 TRANSPORTATION STUDY REPORT

The findings, conclusions, and recommendations of the Transportation study will be documented in a draft summary report that will be prepared for review and approval by the Town of Caledon. Once all comments from interested parties have been reviewed and resolved the summary report will be finalized and submitted to the Town of Caledon.

The draft and final reports will consist of the following:

- an executive summary;
- a description of the report methodology;
- an explanation of the various assumptions, considerations, evaluation criteria and overall assessment that lead to the conclusions and recommendations of the study;
- all relevant maps and tables as required to illustrate data, analytical findings, and recommendations respecting all the key issues identified in the Terms of Reference.

APPENDIX B:
Macville Preliminary Framework Plan, Land Use Plan, and Road Hierarchy Plan

DRAFT

- All Units In Metric Unless Otherwise Noted.
- Base Information Obtained From Various Sources And Is Approximate.
- Schedule / Plan Information Is Conceptual And Requires Verification by Appropriate Agency.

GERRARD DESIGN

MACVILLE | Caledon, Ontario

PRELIMINARY FRAMEWORK PLAN

JAN 12, 2021

PROJECT 1420

SCALE 1:8000

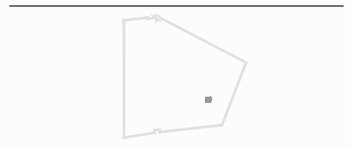
TOWN OF CALEDON

Schedule C-8

(A Subschedule to Schedule "C")

MACVILLE SECONDARY PLAN: LAND USE PLAN

- Low Density Residential
- Medium Density Residential
- Mixed-Use
- GO Transit Hub
- Commercial/Mixed Use
- Institutional
- Employment
- Open Space Policy Area
- Environmental Policy Area
- Boundary of Greenbelt Plan Area
- Stormwater Pond Facility
- Settlement Boundary
- Elementary School
- S Secondary School
- Conceptual Road Network (22m R.O.W.)
- Conceptual Road Network (19.5m R.O.W.)
- One-Way Local Loop R.O.W.
- Railway



Base Data Source: Teranet, 2013

0 0.125 0.25 0.5 km

HUMBER STATION RD.

THE GORE ROAD

KING STREET

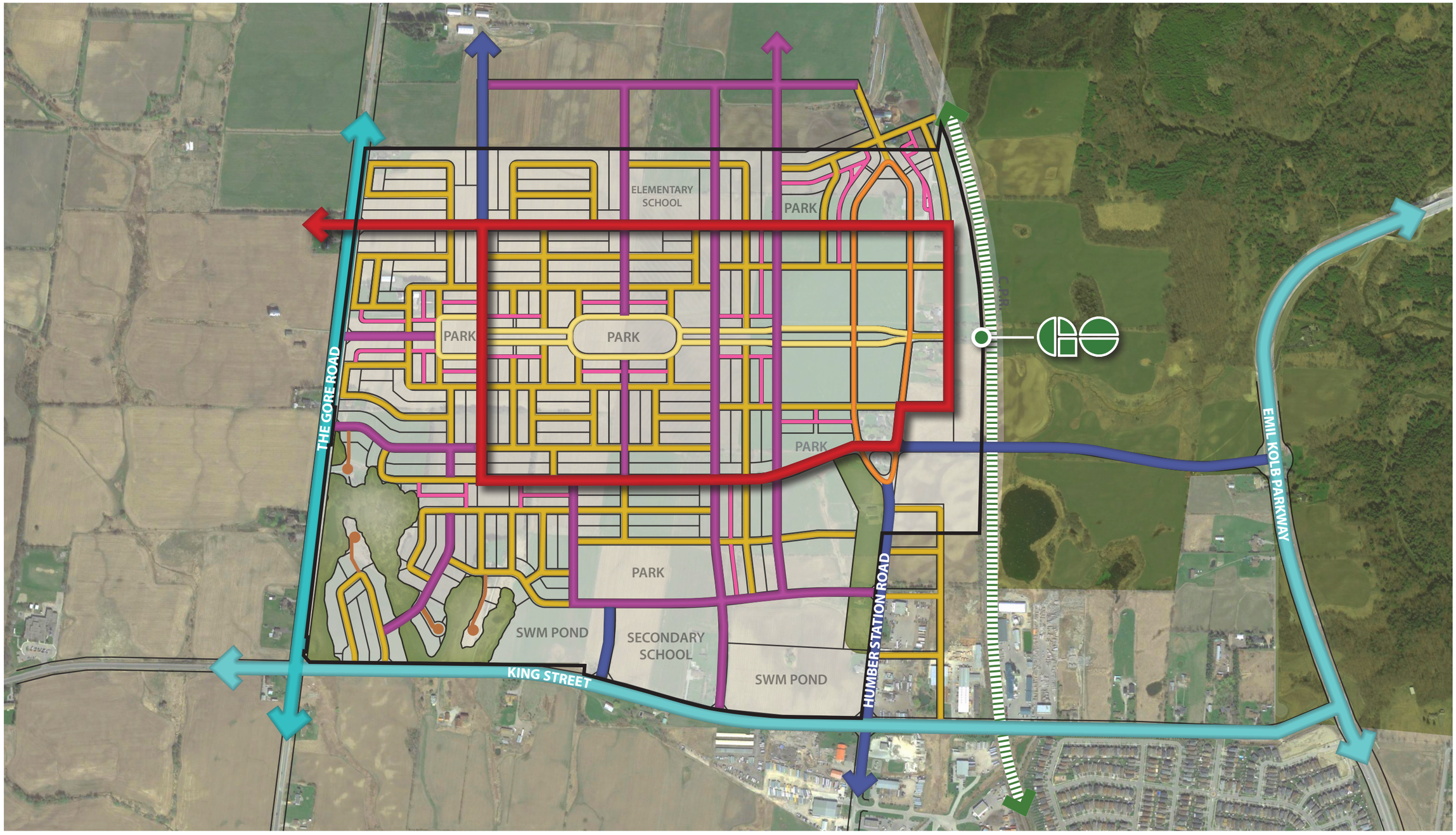
S

HUMBER STATION RD.

CP RAILWAY

KING STREET

MACVILLE COMMUNITY | Road Hierarchy Plan *(Updated)*



JANUARY 28, 2021 | FOR DISCUSSION PURPOSES ONLY

NAK design strategies

APPENDIX C:
Turning Movement Counts and Signal Timing Plans

Turning Movement Count (3 . KING ST & COLERAINE / EMIL KOLB PKWY) CustID: 00904510 MioID:

Start Time	Westbound EMIL KOLB PKWY					Northbound KING ST					Eastbound EMIL KOLB PKWY					Int. Total (15 min)	Int. Total (1 hr)
	Left	Thru	UTurn	Peds	Approach Total	Left	Right	UTurn	Peds	Approach Total	Thru	Right	UTurn	Peds	Approach Total		
07:00:00	66	34	0	0	100	30	62	0	0	92	73	63	0	0	136	328	
07:15:00	67	23	0	0	90	22	74	0	0	96	80	79	0	0	159	345	
07:30:00	75	36	0	0	111	27	77	0	0	104	73	58	0	0	131	346	
07:45:00	71	30	0	0	101	50	110	0	0	160	89	77	0	0	166	427	1446
08:00:00	58	25	0	0	83	27	89	0	0	116	60	57	0	0	117	316	1434
08:15:00	65	16	0	0	81	21	90	0	0	111	81	67	0	0	148	340	1429
08:30:00	67	25	0	0	92	12	65	0	0	77	58	41	0	0	99	268	1351
08:45:00	53	21	0	0	74	12	67	0	0	79	69	35	0	0	104	257	1181
BREAK																	
11:00:00	37	18	0	0	55	13	56	0	1	69	25	14	0	0	39	163	
11:15:00	53	19	0	0	72	16	42	0	0	58	29	15	0	0	44	174	
11:30:00	34	29	0	0	63	13	41	0	0	54	25	13	0	0	38	155	
11:45:00	44	27	0	0	71	17	52	0	0	69	21	11	0	0	32	172	664
12:00:00	52	32	0	0	84	12	36	0	0	48	15	19	0	0	34	166	667
12:15:00	47	29	0	0	76	13	56	0	0	69	17	19	0	0	36	181	674
12:30:00	44	28	0	0	72	12	52	0	0	64	22	21	0	0	43	179	698
12:45:00	38	25	0	0	63	8	52	0	0	60	28	11	0	0	39	162	688
13:00:00	39	36	0	0	75	12	42	0	0	54	24	19	0	0	43	172	694
13:15:00	46	40	0	0	86	20	50	0	0	70	18	16	0	0	34	190	703
13:30:00	42	19	0	0	61	18	48	0	0	66	17	12	0	0	29	156	680
13:45:00	47	34	0	0	81	22	68	0	0	90	22	14	0	0	36	207	725
BREAK																	
15:00:00	70	61	0	0	131	37	75	0	0	112	24	20	0	0	44	287	
15:15:00	81	39	0	0	120	37	68	0	0	105	15	23	0	0	38	263	
15:30:00	71	81	0	0	152	39	63	0	0	102	24	32	0	0	56	310	
15:45:00	67	59	0	0	126	48	87	0	0	135	28	25	0	0	53	314	1174
16:00:00	78	82	0	0	160	45	93	0	0	138	18	29	0	0	47	345	1232
16:15:00	86	64	0	0	150	50	85	0	0	135	19	26	0	0	45	330	1299
16:30:00	93	93	0	0	186	62	89	0	0	151	23	37	0	0	60	397	1386
16:45:00	91	99	0	0	190	46	73	0	0	119	29	26	0	0	55	364	1436
17:00:00	85	77	0	0	162	81	105	0	0	186	23	24	0	0	47	395	1486
17:15:00	99	128	0	0	227	81	89	0	0	170	25	40	0	0	65	462	1618
17:30:00	91	87	0	0	178	65	100	0	0	165	18	29	0	0	47	390	1611
17:45:00	67	85	0	0	152	58	71	0	0	129	23	31	0	0	54	335	1582

Grand Total	2024	1501	0	0	3525	1026	2227	0	1	3253	1115	1003	0	0	2118	**8896**	-
Approach%	57.4%	42.6%	0%		-	31.5%	68.5%	0%		-	52.6%	47.4%	0%		-	**-**	-
Totals %	22.8%	16.9%	0%		39.6%	11.5%	25%	0%		36.6%	12.5%	11.3%	0%		23.8%	**-**	-
Heavy	201	228	0		-	76	210	0		-	229	98	0		-	**-**	-
Heavy %	9.9%	15.2%	0%		-	7.4%	9.4%	0%		-	20.5%	9.8%	0%		-	**-**	-
Bicycles	0	1	0		-	1	0	0		-	0	0	0		-	**-**	-
Bicycle %	0%	0.1%	0%		-	0.1%	0%	0%		-	0%	0%	0%		-	**-**	-

Spectrum

Turning Movement Count
Location Name: KING ST & COLERAINE / EMIL KOLB PKWY
Date: Tue, Oct 08, 2019 Deployment Lead: David Chu

Peak Hour: 07:00 AM - 08:00 AM Weather: Mist (5.43 °C)

Start Time	Westbound EMIL KOLB PKWY					Northbound KING ST					Eastbound EMIL KOLB PKWY					Int. Total (15 min)
	Left	Thru	UTurn	Peds	Approach Total	Left	Right	UTurn	Peds	Approach Total	Thru	Right	UTurn	Peds	Approach Total	
07:00:00	66	34	0	0	100	30	62	0	0	92	73	63	0	0	136	328
07:15:00	67	23	0	0	90	22	74	0	0	96	80	79	0	0	159	345
07:30:00	75	36	0	0	111	27	77	0	0	104	73	58	0	0	131	346
07:45:00	71	30	0	0	101	50	110	0	0	160	89	77	0	0	166	427
Grand Total	279	123	0	0	402	129	323	0	0	452	315	277	0	0	592	**1446**
Approach%	69.4%	30.6%	0%		-	28.5%	71.5%	0%		-	53.2%	46.8%	0%		-	**-**
Totals %	19.3%	8.5%	0%		27.8%	8.9%	22.3%	0%		31.3%	21.8%	19.2%	0%		40.9%	**-**
PHF	0.93	0.85	0		0.91	0.65	0.73	0		0.71	0.88	0.88	0		0.89	**-**
Heavy	22	31	0		53	8	40	0		48	29	10	0		39	**-**
Heavy %	7.9%	25.2%	0%		13.2%	6.2%	12.4%	0%		10.6%	9.2%	3.6%	0%		6.6%	**-**
Lights	257	92	0		349	121	283	0		404	286	267	0		553	**-**
Lights %	92.1%	74.8%	0%		86.8%	93.8%	87.6%	0%		89.4%	90.8%	96.4%	0%		93.4%	**-**
Single-Unit Trucks	12	18	0		30	4	21	0		25	15	6	0		21	**-**
Single-Unit Trucks %	4.3%	14.6%	0%		7.5%	3.1%	6.5%	0%		5.5%	4.8%	2.2%	0%		3.5%	**-**
Buses	4	2	0		6	2	10	0		12	4	3	0		7	**-**
Buses %	1.4%	1.6%	0%		1.5%	1.6%	3.1%	0%		2.7%	1.3%	1.1%	0%		1.2%	**-**
Articulated Trucks	6	11	0		17	2	9	0		11	10	1	0		11	**-**
Articulated Trucks %	2.2%	8.9%	0%		4.2%	1.6%	2.8%	0%		2.4%	3.2%	0.4%	0%		1.9%	**-**
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%		**-**

Spectrum

Turning Movement Count
Location Name: KING ST & COLERAINE / EMIL KOLB PKWY
Date: Tue, Oct 08, 2019 Deployment Lead: David Chu

Peak Hour: 01:00 PM - 02:00 PM Weather: Few Clouds (13.99 °C)

Start Time	Westbound EMIL KOLB PKWY					Northbound KING ST					Eastbound EMIL KOLB PKWY					Int. Total (15 min)
	Left	Thru	UTurn	Peds	Approach Total	Left	Right	UTurn	Peds	Approach Total	Thru	Right	UTurn	Peds	Approach Total	
13:00:00	39	36	0	0	75	12	42	0	0	54	24	19	0	0	43	172
13:15:00	46	40	0	0	86	20	50	0	0	70	18	16	0	0	34	190
13:30:00	42	19	0	0	61	18	48	0	0	66	17	12	0	0	29	156
13:45:00	47	34	0	0	81	22	68	0	0	90	22	14	0	0	36	207
Grand Total	174	129	0	0	303	72	208	0	0	280	81	61	0	0	142	**725**
Approach%	57.4%	42.6%	0%		-	25.7%	74.3%	0%		-	57%	43%	0%		-	**-**
Totals %	24%	17.8%	0%		41.8%	9.9%	28.7%	0%		38.6%	11.2%	8.4%	0%		19.6%	**-**
PHF	0.93	0.81	0		0.88	0.82	0.76	0		0.78	0.84	0.8	0		0.83	**-**
Heavy	16	35	0		51	9	25	0		34	31	14	0		45	**-**
Heavy %	9.2%	27.1%	0%		16.8%	12.5%	12%	0%		12.1%	38.3%	23%	0%		31.7%	**-**
Lights	158	94	0		252	63	183	0		246	50	47	0		97	**-**
Lights %	90.8%	72.9%	0%		83.2%	87.5%	88%	0%		87.9%	61.7%	77%	0%		68.3%	**-**
Single-Unit Trucks	8	24	0		32	4	14	0		18	26	10	0		36	**-**
Single-Unit Trucks %	4.6%	18.6%	0%		10.6%	5.6%	6.7%	0%		6.4%	32.1%	16.4%	0%		25.4%	**-**
Buses	0	0	0		0	4	2	0		6	0	2	0		2	**-**
Buses %	0%	0%	0%		0%	5.6%	1%	0%		2.1%	0%	3.3%	0%		1.4%	**-**
Articulated Trucks	8	11	0		19	1	9	0		10	5	2	0		7	**-**
Articulated Trucks %	4.6%	8.5%	0%		6.3%	1.4%	4.3%	0%		3.6%	6.2%	3.3%	0%		4.9%	**-**
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%		**-**

Spectrum

Turning Movement Count
Location Name: KING ST & COLERAINE / EMIL KOLB PKWY
Date: Tue, Oct 08, 2019 Deployment Lead: David Chu

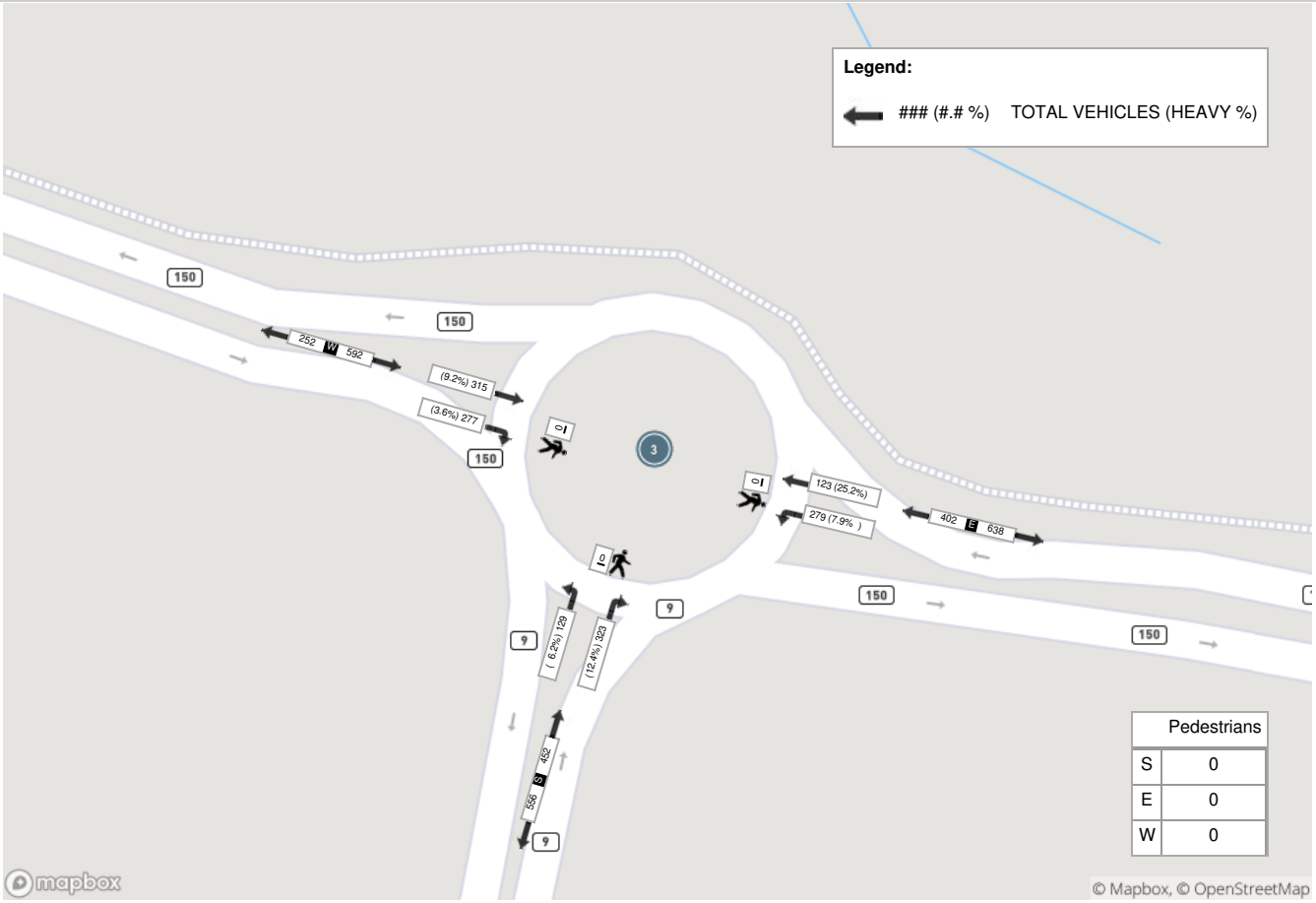
Peak Hour: 04:30 PM - 05:30 PM Weather: Few Clouds (17.07 °C)

Start Time	Westbound EMIL KOLB PKWY					Northbound KING ST					Eastbound EMIL KOLB PKWY					Int. Total (15 min)
	Left	Thru	UTurn	Peds	Approach Total	Left	Right	UTurn	Peds	Approach Total	Thru	Right	UTurn	Peds	Approach Total	
16:30:00	93	93	0	0	186	62	89	0	0	151	23	37	0	0	60	397
16:45:00	91	99	0	0	190	46	73	0	0	119	29	26	0	0	55	364
17:00:00	85	77	0	0	162	81	105	0	0	186	23	24	0	0	47	395
17:15:00	99	128	0	0	227	81	89	0	0	170	25	40	0	0	65	462
Grand Total	368	397	0	0	765	270	356	0	0	626	100	127	0	0	227	**1618**
Approach%	48.1%	51.9%	0%		-	43.1%	56.9%	0%		-	44.1%	55.9%	0%		-	**-**
Totals %	22.7%	24.5%	0%		47.3%	16.7%	22%	0%		38.7%	6.2%	7.8%	0%		14%	**-**
PHF	0.93	0.78	0		0.84	0.83	0.85	0		0.84	0.86	0.79	0		0.87	**-**
Heavy	28	25	0		53	19	23	0		42	22	11	0		33	**-**
Heavy %	7.6%	6.3%	0%		6.9%	7%	6.5%	0%		6.7%	22%	8.7%	0%		14.5%	**-**
Lights	340	372	0		712	251	333	0		584	78	116	0		194	**-**
Lights %	92.4%	93.7%	0%		93.1%	93%	93.5%	0%		93.3%	78%	91.3%	0%		85.5%	**-**
Single-Unit Trucks	20	12	0		32	14	11	0		25	14	5	0		19	**-**
Single-Unit Trucks %	5.4%	3%	0%		4.2%	5.2%	3.1%	0%		4%	14%	3.9%	0%		8.4%	**-**
Buses	1	0	0		1	3	2	0		5	0	0	0		0	**-**
Buses %	0.3%	0%	0%		0.1%	1.1%	0.6%	0%		0.8%	0%	0%	0%		0%	**-**
Articulated Trucks	7	13	0		20	2	10	0		12	8	6	0		14	**-**
Articulated Trucks %	1.9%	3.3%	0%		2.6%	0.7%	2.8%	0%		1.9%	8%	4.7%	0%		6.2%	**-**
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%		**-**

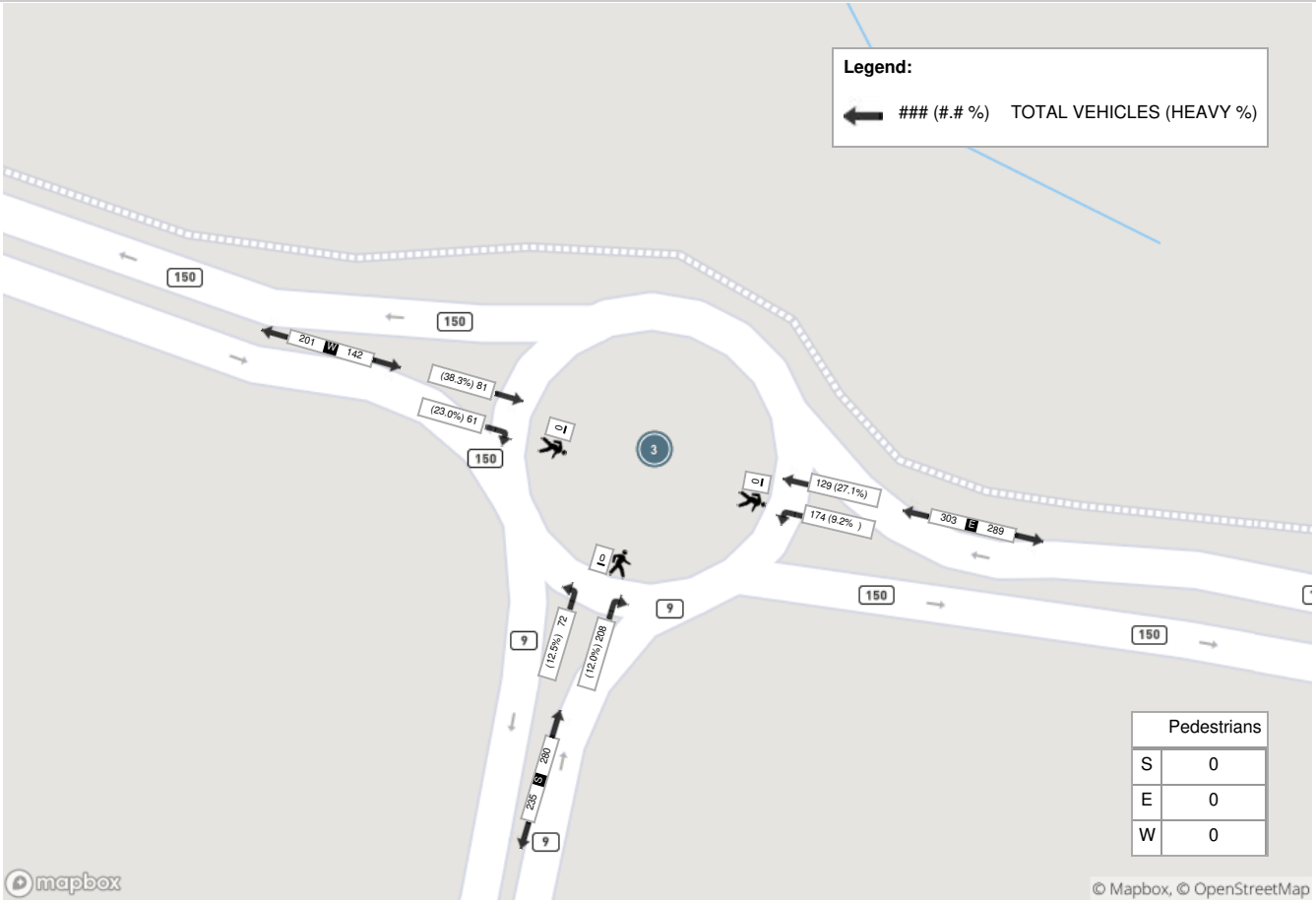
Spectrum

Turning Movement Count
Location Name: KING ST & COLERAINE / EMIL KOLB PKWY
Date: Tue, Oct 08, 2019 Deployment Lead: David Chu

Peak Hour: 07:00 AM - 08:00 AM Weather: Mist (5.43 °C)



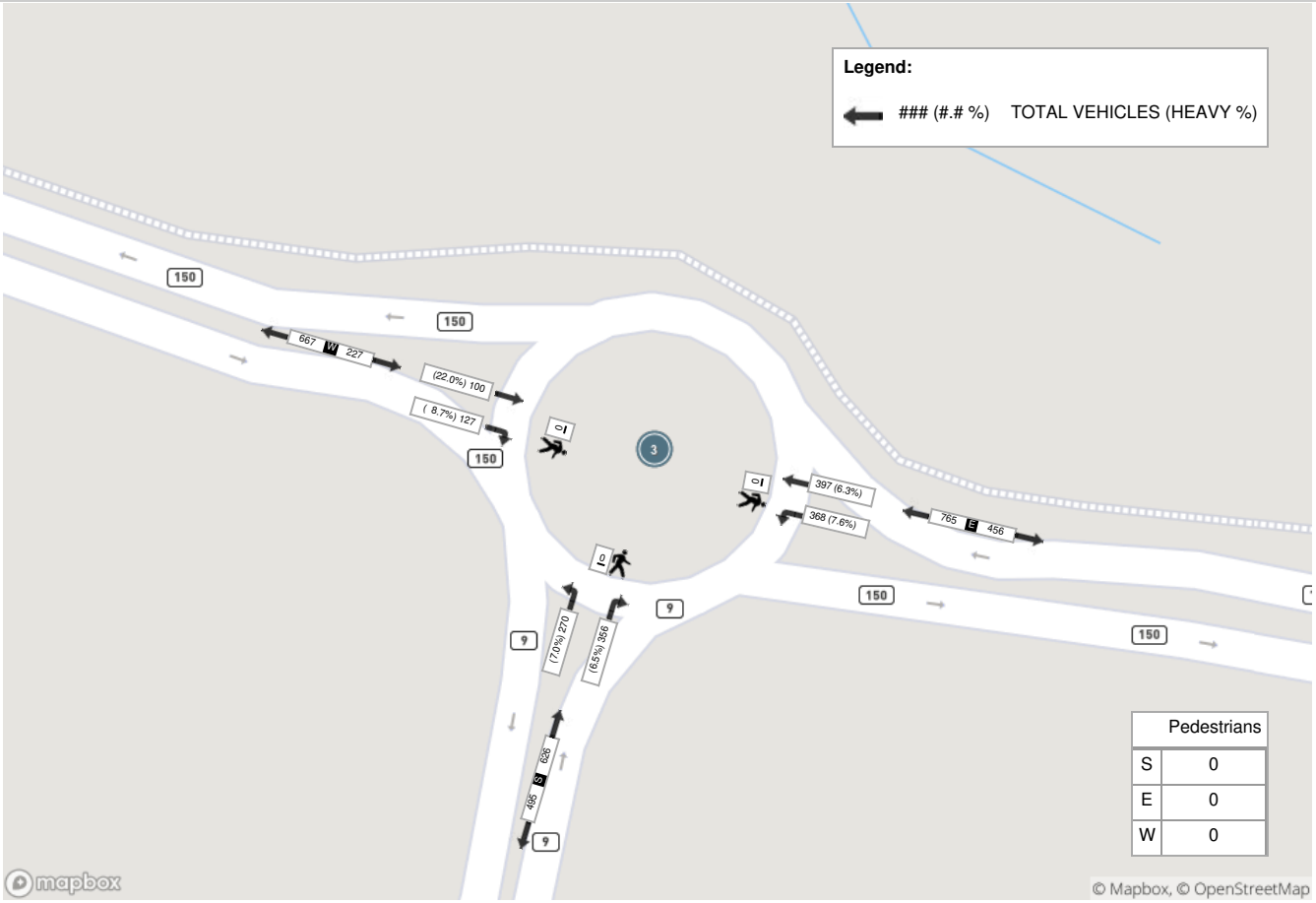
Peak Hour: 01:00 PM - 02:00 PM Weather: Few Clouds (13.99 °C)



Spectrum

Turning Movement Count
Location Name: KING ST & COLERAINE / EMIL KOLB PKWY
Date: Tue, Oct 08, 2019 Deployment Lead: David Chu

Peak Hour: 04:30 PM - 05:30 PM Weather: Few Clouds (17.07 °C)



Spectrum

Turning Movement Count
Location Name: KING ST & GORE RD
Date: Tue, Apr 10, 2018 Deployment Lead: Theo Daglis

Turning Movement Count (7 . KING ST & GORE RD) CustID: 00815910 MioID: 512977

Start Time	Southbound GORE RD						Westbound KING ST						Northbound GORE RD						Eastbound KING ST						Int. Total (15 min)	Int. Total (1 hr)
	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total		
07:00:00	15	81	22	0	0	118	6	99	8	0	0	113	0	12	0	0	0	12	5	49	12	0	0	66	309	
07:15:00	21	93	26	0	0	140	4	117	4	0	0	125	4	9	2	0	0	15	5	76	13	0	0	94	374	
07:30:00	19	100	30	0	0	149	6	125	6	0	0	137	4	14	2	0	0	20	3	82	15	0	0	100	406	
07:45:00	29	97	22	0	0	148	3	123	8	0	0	134	1	9	2	0	0	12	12	105	14	0	0	131	425	1514
08:00:00	24	100	27	0	0	151	7	85	4	0	0	96	1	8	1	0	0	10	9	77	17	0	0	103	360	1565
08:15:00	18	55	9	0	0	82	4	88	8	0	0	100	1	8	1	0	0	10	10	64	12	0	0	86	278	1469
08:30:00	13	66	21	0	0	100	1	68	10	0	0	79	2	7	2	0	0	11	12	63	10	0	0	85	275	1338
08:45:00	16	57	14	0	0	87	4	65	6	0	0	75	8	21	0	0	0	29	6	65	9	0	0	80	271	1184
BREAK																										
11:00:00	8	22	8	0	0	38	3	41	9	0	0	53	4	5	4	0	0	13	4	42	5	0	0	51	155	
11:15:00	7	17	4	0	0	28	1	39	4	0	0	44	3	16	1	0	0	20	5	23	1	0	0	29	121	
11:30:00	9	17	6	0	0	32	3	43	7	0	0	53	4	11	2	0	0	17	9	47	2	0	0	58	160	
11:45:00	4	17	6	0	0	27	2	38	6	0	0	46	3	15	1	0	0	19	4	32	3	0	0	39	131	567
12:00:00	9	12	5	0	0	26	0	48	2	0	0	50	5	13	1	0	0	19	5	42	4	0	0	51	146	558
12:15:00	9	12	5	0	0	26	0	40	10	0	0	50	5	17	2	0	0	24	1	37	5	0	0	43	143	580
12:30:00	6	16	2	0	0	24	0	50	3	0	0	53	3	17	2	0	0	22	4	43	4	0	0	51	150	570
12:45:00	7	17	5	0	0	29	0	36	3	0	0	39	6	10	2	0	0	18	5	30	5	0	0	40	126	565
13:00:00	3	20	6	0	0	29	0	41	6	0	0	47	5	13	0	0	0	18	6	41	6	0	0	53	147	566
13:15:00	4	12	7	0	0	23	3	44	8	0	0	55	5	21	1	0	0	27	5	51	6	0	0	62	167	590
13:30:00	10	15	3	0	0	28	1	39	4	0	0	44	3	14	2	0	0	19	5	43	3	0	0	51	142	582
13:45:00	10	23	6	0	0	39	0	46	9	0	0	55	3	18	4	0	0	25	8	39	2	0	0	49	168	624
BREAK																										
15:00:00	8	11	5	0	0	24	2	63	13	0	0	78	15	33	7	0	0	55	14	54	1	0	0	69	226	
15:15:00	10	18	7	0	0	35	3	69	19	0	0	91	9	40	2	0	0	51	23	59	9	0	0	91	268	
15:30:00	4	19	8	0	0	31	2	73	12	0	0	87	15	45	1	0	0	61	15	101	13	0	0	129	308	
15:45:00	7	20	10	0	0	37	2	69	20	0	0	91	8	38	5	0	0	51	18	112	12	0	0	142	321	1123
16:00:00	8	11	10	0	0	29	3	97	35	0	0	135	19	53	2	0	0	74	26	91	6	0	0	123	361	1258
16:15:00	6	16	7	0	0	29	3	74	14	0	0	91	13	51	5	0	0	69	27	92	8	0	0	127	316	1306
16:30:00	5	16	10	0	0	31	0	80	27	0	0	107	19	73	8	0	0	100	22	103	2	0	0	127	365	1363
16:45:00	9	18	7	0	0	34	2	92	16	0	0	110	15	63	10	0	0	88	32	108	3	0	0	143	375	1417
17:00:00	4	23	8	0	0	35	1	116	26	0	0	143	24	86	3	0	0	113	22	95	1	0	0	118	409	1465
17:15:00	9	21	8	0	0	38	1	92	22	0	0	115	24	85	3	0	0	112	28	117	3	0	0	148	413	1562
17:30:00	10	15	8	0	0	33	2	101	19	0	0	122	16	78	1	0	0	95	42	85	5	0	0	132	382	1579
17:45:00	3	18	7	0	0	28	1	81	20	0	0	102	16	60	3	0	0	79	13	83	6	0	0	102	311	1515
Grand Total	324	1055	329	0	0	1708	70	2282	368	0	0	2720	263	963	82	0	0	1308	405	2151	217	0	0	2773	**8509**	-
Approach%	19%	61.8%	19.3%	0%		-	2.6%	83.9%	13.5%	0%		-	20.1%	73.6%	6.3%	0%		-	14.6%	77.6%	7.8%	0%		-	**-**	-
Totals %	3.8%	12.4%	3.9%	0%		20.1%	0.8%	26.8%	4.3%	0%		32%	3.1%	11.3%	1%	0%		15.4%	4.8%	25.3%	2.6%	0%		32.6%	**-**	-
Heavy	17	16	16	0		-	8	202	16	0		-	16	7	9	0		-	11	207	17	0		-	**-**	-
Heavy %	5.2%	1.5%	4.9%	0%		-	11.4%	8.9%	4.3%	0%		-	6.1%	0.7%	11%	0%		-	2.7%	9.6%	7.8%	0%		-	**-**	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-

Spectrum

Turning Movement Count
Location Name: KING ST & GORE RD
Date: Tue, Apr 10, 2018 Deployment Lead: Theo Daglis

Peak Hour: 07:15 AM - 08:15 AM Weather: Partly Cloudy (-6.1 °C)

Start Time	Southbound GORE RD						Westbound KING ST						Northbound GORE RD						Eastbound KING ST						Int. Total (15 min)
	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	
07:15:00	21	93	26	0	0	140	4	117	4	0	0	125	4	9	2	0	0	15	5	76	13	0	0	94	374
07:30:00	19	100	30	0	0	149	6	125	6	0	0	137	4	14	2	0	0	20	3	82	15	0	0	100	406
07:45:00	29	97	22	0	0	148	3	123	8	0	0	134	1	9	2	0	0	12	12	105	14	0	0	131	425
08:00:00	24	100	27	0	0	151	7	85	4	0	0	96	1	8	1	0	0	10	9	77	17	0	0	103	360
Grand Total	93	390	105	0	0	588	20	450	22	0	0	492	10	40	7	0	0	57	29	340	59	0	0	428	**1565**
Approach%	15.8%	66.3%	17.9%	0%		-	4.1%	91.5%	4.5%	0%		-	17.5%	70.2%	12.3%	0%		-	6.8%	79.4%	13.8%	0%		-	**-**
Totals %	5.9%	24.9%	6.7%	0%		37.6%	1.3%	28.8%	1.4%	0%		31.4%	0.6%	2.6%	0.4%	0%		3.6%	1.9%	21.7%	3.8%	0%		27.3%	**-**
PHF	0.8	0.98	0.88	0		0.97	0.71	0.9	0.69	0		0.9	0.63	0.71	0.88	0		0.71	0.6	0.81	0.87	0		0.82	**-**
Heavy	5	2	0	0		7	1	36	0	0		37	4	0	1	0		5	4	36	2	0		42	**-**
Heavy %	5.4%	0.5%	0%	0%		1.2%	5%	8%	0%	0%		7.5%	40%	0%	14.3%	0%		8.8%	13.8%	10.6%	3.4%	0%		9.8%	**-**
Lights	88	388	105	0		581	19	414	22	0		455	6	40	6	0		52	25	304	57	0		386	**-**
Lights %	94.6%	99.5%	100%	0%		98.8%	95%	92%	100%	0%		92.5%	60%	100%	85.7%	0%		91.2%	86.2%	89.4%	96.6%	0%		90.2%	**-**
Single-Unit Trucks	2	2	0	0		4	0	15	0	0		15	1	0	1	0		2	2	12	1	0		15	**-**
Single-Unit Trucks %	2.2%	0.5%	0%	0%		0.7%	0%	3.3%	0%	0%		3%	10%	0%	14.3%	0%		3.5%	6.9%	3.5%	1.7%	0%		3.5%	**-**
Buses	3	0	0	0		3	0	7	0	0		7	2	0	0	0		2	2	9	1	0		12	**-**
Buses %	3.2%	0%	0%	0%		0.5%	0%	1.6%	0%	0%		1.4%	20%	0%	0%	0%		3.5%	6.9%	2.6%	1.7%	0%		2.8%	**-**
Articulated Trucks	0	0	0	0		0	1	14	0	0		15	1	0	0	0		1	0	15	0	0		15	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	5%	3.1%	0%	0%		3%	10%	0%	0%	0%		1.8%	0%	4.4%	0%	0%		3.5%	**-**

Spectrum

Turning Movement Count
Location Name: KING ST & GORE RD
Date: Tue, Apr 10, 2018 Deployment Lead: Theo Daglis

Peak Hour: 01:00 PM - 02:00 PM Weather: Partly Cloudy (4.4 °C)

Start Time	Southbound GORE RD						Westbound KING ST						Northbound GORE RD						Eastbound KING ST						Int. Total (15 min)
	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	
13:00:00	3	20	6	0	0	29	0	41	6	0	0	47	5	13	0	0	0	18	6	41	6	0	0	53	147
13:15:00	4	12	7	0	0	23	3	44	8	0	0	55	5	21	1	0	0	27	5	51	6	0	0	62	167
13:30:00	10	15	3	0	0	28	1	39	4	0	0	44	3	14	2	0	0	19	5	43	3	0	0	51	142
13:45:00	10	23	6	0	0	39	0	46	9	0	0	55	3	18	4	0	0	25	8	39	2	0	0	49	168
Grand Total	27	70	22	0	0	119	4	170	27	0	0	201	16	66	7	0	0	89	24	174	17	0	0	215	**624**
Approach%	22.7%	58.8%	18.5%	0%		-	2%	84.6%	13.4%	0%		-	18%	74.2%	7.9%	0%		-	11.2%	80.9%	7.9%	0%		-	**-**
Totals %	4.3%	11.2%	3.5%	0%		19.1%	0.6%	27.2%	4.3%	0%		32.2%	2.6%	10.6%	1.1%	0%		14.3%	3.8%	27.9%	2.7%	0%		34.5%	**-**
PHF	0.68	0.76	0.79	0		0.76	0.33	0.92	0.75	0		0.91	0.8	0.79	0.44	0		0.82	0.75	0.85	0.71	0		0.87	**-**
Heavy	2	1	1	0		4	2	15	1	0		18	1	1	1	0		3	1	28	1	0		30	**-**
Heavy %	7.4%	1.4%	4.5%	0%		3.4%	50%	8.8%	3.7%	0%		9%	6.3%	1.5%	14.3%	0%		3.4%	4.2%	16.1%	5.9%	0%		14%	**-**
Lights	25	69	21	0		115	2	155	26	0		183	15	65	6	0		86	23	146	16	0		185	**-**
Lights %	92.6%	98.6%	95.5%	0%		96.6%	50%	91.2%	96.3%	0%		91%	93.8%	98.5%	85.7%	0%		96.6%	95.8%	83.9%	94.1%	0%		86%	**-**
Single-Unit Trucks	1	0	1	0		2	1	6	1	0		8	0	1	1	0		2	1	15	1	0		17	**-**
Single-Unit Trucks %	3.7%	0%	4.5%	0%		1.7%	25%	3.5%	3.7%	0%		4%	0%	1.5%	14.3%	0%		2.2%	4.2%	8.6%	5.9%	0%		7.9%	**-**
Buses	1	0	0	0		1	0	2	0	0		2	0	0	0	0		0	0	4	0	0		4	**-**
Buses %	3.7%	0%	0%	0%		0.8%	0%	1.2%	0%	0%		1%	0%	0%	0%	0%		0%	0%	2.3%	0%	0%		1.9%	**-**
Articulated Trucks	0	1	0	0		1	1	7	0	0		8	1	0	0	0		1	0	9	0	0		9	**-**
Articulated Trucks %	0%	1.4%	0%	0%		0.8%	25%	4.1%	0%	0%		4%	6.3%	0%	0%	0%		1.1%	0%	5.2%	0%	0%		4.2%	**-**

Spectrum

Turning Movement Count
Location Name: KING ST & GORE RD
Date: Tue, Apr 10, 2018 Deployment Lead: Theo Daglis

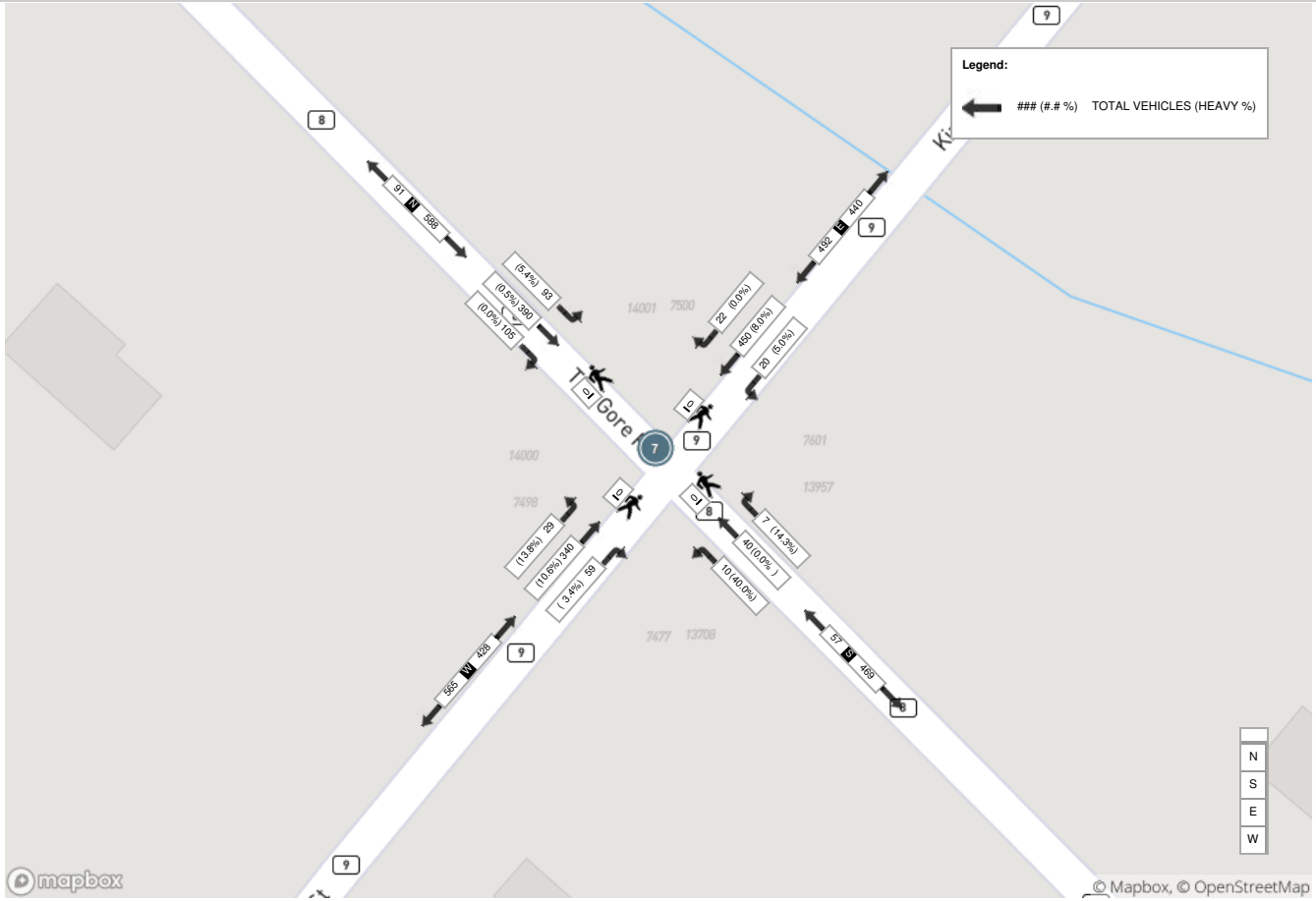
Peak Hour: 04:45 PM - 05:45 PM Weather: Overcast (5.9 °C)

Start Time	Southbound GORE RD						Westbound KING ST						Northbound GORE RD						Eastbound KING ST						Int. Total (15 min)
	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	
16:45:00	9	18	7	0	0	34	2	92	16	0	0	110	15	63	10	0	0	88	32	108	3	0	0	143	375
17:00:00	4	23	8	0	0	35	1	116	26	0	0	143	24	86	3	0	0	113	22	95	1	0	0	118	409
17:15:00	9	21	8	0	0	38	1	92	22	0	0	115	24	85	3	0	0	112	28	117	3	0	0	148	413
17:30:00	10	15	8	0	0	33	2	101	19	0	0	122	16	78	1	0	0	95	42	85	5	0	0	132	382
Grand Total	32	77	31	0	0	140	6	401	83	0	0	490	79	312	17	0	0	408	124	405	12	0	0	541	**1579**
Approach%	22.9%	55%	22.1%	0%		-	1.2%	81.8%	16.9%	0%		-	19.4%	76.5%	4.2%	0%		-	22.9%	74.9%	2.2%	0%		-	**-**
Totals %	2%	4.9%	2%	0%		8.9%	0.4%	25.4%	5.3%	0%		31%	5%	19.8%	1.1%	0%		25.8%	7.9%	25.6%	0.8%	0%		34.3%	**-**
PHF	0.8	0.84	0.97	0		0.92	0.75	0.86	0.8	0		0.86	0.82	0.91	0.43	0		0.9	0.74	0.87	0.6	0		0.91	**-**
Heavy	2	3	2	0		7	1	14	3	0		18	0	1	1	0		2	0	19	0	0		19	**-**
Heavy %	6.3%	3.9%	6.5%	0%		5%	16.7%	3.5%	3.6%	0%		3.7%	0%	0.3%	5.9%	0%		0.5%	0%	4.7%	0%	0%		3.5%	**-**
Lights	30	74	29	0		133	5	387	80	0		472	79	311	16	0		406	124	386	12	0		522	**-**
Lights %	93.8%	96.1%	93.5%	0%		95%	83.3%	96.5%	96.4%	0%		96.3%	100%	99.7%	94.1%	0%		99.5%	100%	95.3%	100%	0%		96.5%	**-**
Single-Unit Trucks	1	3	2	0		6	1	7	2	0		10	0	1	1	0		2	0	9	0	0		9	**-**
Single-Unit Trucks %	3.1%	3.9%	6.5%	0%		4.3%	16.7%	1.7%	2.4%	0%		2%	0%	0.3%	5.9%	0%		0.5%	0%	2.2%	0%	0%		1.7%	**-**
Buses	1	0	0	0		1	0	1	0	0		1	0	0	0	0		0	0	2	0	0		2	**-**
Buses %	3.1%	0%	0%	0%		0.7%	0%	0.2%	0%	0%		0.2%	0%	0%	0%	0%		0%	0%	0.5%	0%	0%		0.4%	**-**
Articulated Trucks	0	0	0	0		0	0	6	1	0		7	0	0	0	0		0	0	8	0	0		8	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	1.5%	1.2%	0%		1.4%	0%	0%	0%	0%		0%	0%	2%	0%	0%		1.5%	**-**

Spectrum

Turning Movement Count
Location Name: KING ST & GORE RD
Date: Tue, Apr 10, 2018 Deployment Lead: Theo Daglis

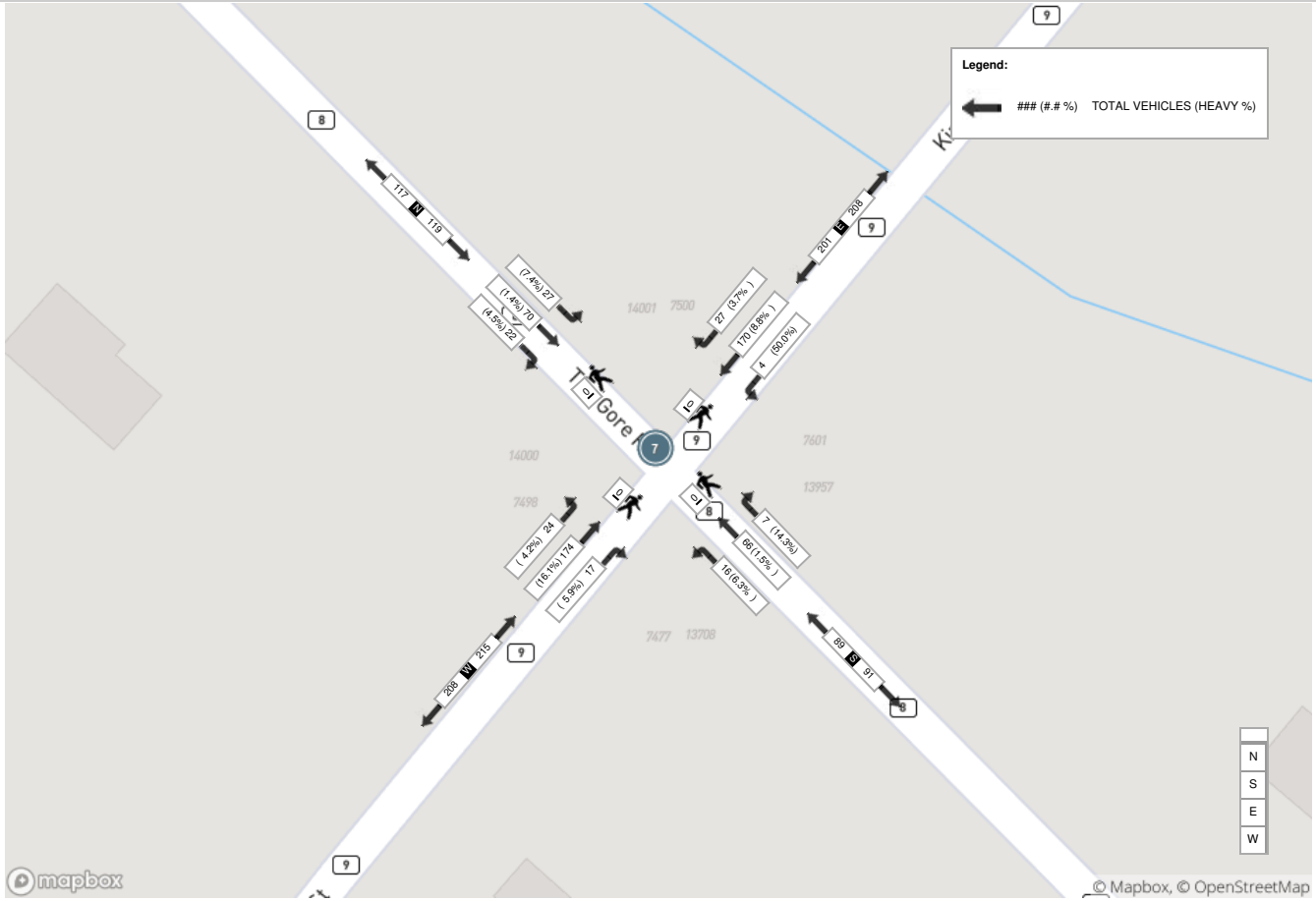
Peak Hour: 07:15 AM - 08:15 AM Weather: Partly Cloudy (-6.1 °C)



Spectrum

Turning Movement Count
Location Name: KING ST & GORE RD
Date: Tue, Apr 10, 2018 Deployment Lead: Theo Daglis

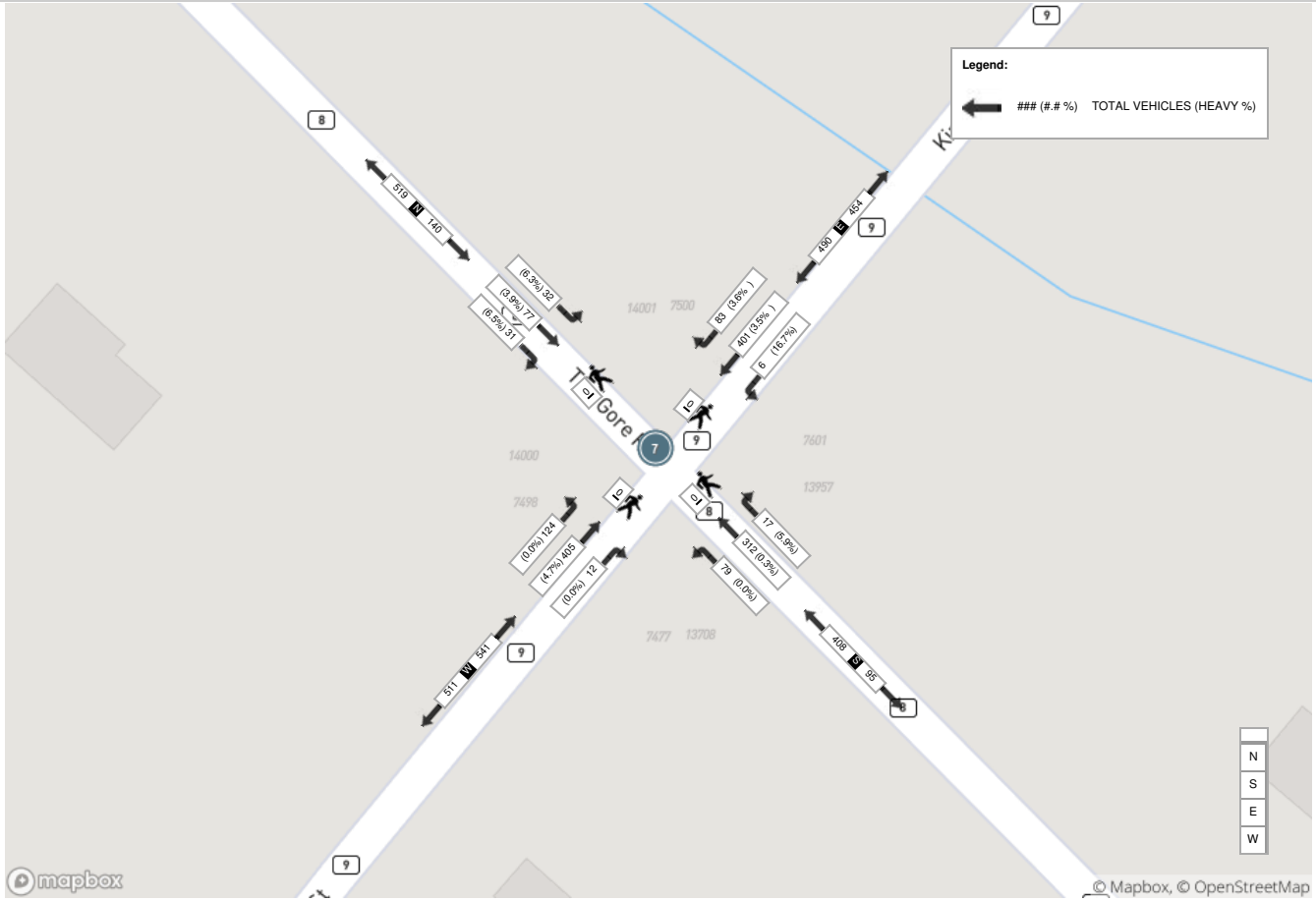
Peak Hour: 01:00 PM - 02:00 PM **Weather: Partly Cloudy (4.4 °C)**



Spectrum

Turning Movement Count
Location Name: KING ST & GORE RD
Date: Tue, Apr 10, 2018 Deployment Lead: Theo Daglis

Peak Hour: 04:45 PM - 05:45 PM Weather: Overcast (5.9 °C)



Spectrum

Turning Movement Count
Location Name: KING ST & HUMBER STATION RD
Date: Tue, Apr 10, 2018 Deployment Lead: Theo Daglis

Turning Movement Count (6 . KING ST & HUMBER STATION RD) CustID: 00905322 MioID: 513576

Start Time	Southbound HUMBER STATION RD						Westbound KING ST						Northbound HUMBER STATION RD						Eastbound KING ST						Int. Total (15 min)	Int. Total (1 hr)
	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total		
07:00:00	3	11	3	0	0	17	17	109	2	0	0	128	1	1	5	0	0	7	1	52	13	0	0	66	218	
07:15:00	10	14	1	0	0	25	17	118	1	0	0	136	1	1	5	0	0	7	2	79	17	0	0	98	266	
07:30:00	5	10	2	0	0	17	18	136	1	0	0	155	4	1	1	0	0	6	1	78	25	0	0	104	282	
07:45:00	1	17	0	0	0	18	14	123	5	0	0	142	5	1	3	0	0	9	0	111	23	0	0	134	303	1069
08:00:00	2	4	1	0	0	7	20	90	1	0	0	111	6	1	2	0	0	9	0	83	15	0	0	98	225	1076
08:15:00	2	4	3	0	0	9	15	91	2	0	0	108	2	0	2	0	0	4	1	65	15	0	0	81	202	1012
08:30:00	5	9	0	0	0	14	5	83	3	0	0	91	2	4	2	0	0	8	1	71	12	0	0	84	197	927
08:45:00	4	2	0	0	0	6	8	76	1	0	0	85	4	1	7	0	0	12	1	63	12	0	0	76	179	803
BREAK																										
11:00:00	4	4	1	0	0	9	2	48	2	0	0	52	8	2	7	0	0	17	2	48	5	0	0	55	133	
11:15:00	2	2	1	0	0	5	3	41	1	0	0	45	2	4	7	0	0	13	0	25	8	0	0	33	96	
11:30:00	2	1	2	0	0	5	2	47	2	0	0	51	0	2	4	0	0	6	1	48	7	0	0	56	118	
11:45:00	1	2	0	0	0	3	6	42	3	0	0	51	4	3	3	0	0	10	1	32	2	0	0	35	99	446
12:00:00	2	5	1	0	0	8	5	50	0	0	0	55	1	4	5	0	0	10	0	48	5	0	0	53	126	439
12:15:00	2	2	3	0	0	7	4	46	1	0	0	51	4	4	4	0	0	12	0	48	3	0	0	51	121	464
12:30:00	3	2	2	0	0	7	0	44	1	0	0	45	4	5	3	0	0	12	1	53	2	0	0	56	120	466
12:45:00	3	3	0	0	0	6	2	36	2	0	0	40	4	7	4	0	0	15	0	39	4	0	0	43	104	471
13:00:00	2	2	0	0	0	4	4	46	6	0	0	56	4	8	5	0	0	17	0	41	5	0	0	46	123	468
13:15:00	3	2	0	0	0	5	4	47	10	0	0	61	6	4	1	0	0	11	0	46	6	0	0	52	129	476
13:30:00	2	2	2	0	1	6	4	43	6	0	0	53	1	1	2	0	0	4	0	48	6	0	0	54	117	473
13:45:00	5	3	0	0	0	8	5	55	2	0	0	62	6	3	5	0	0	14	1	54	4	0	0	59	143	512
BREAK																										
15:00:00	2	4	1	0	5	7	4	67	3	0	0	74	8	2	6	0	0	16	0	61	6	0	0	67	164	
15:15:00	0	3	2	0	0	5	2	78	3	0	0	83	11	8	8	0	0	27	0	71	4	0	0	75	190	
15:30:00	3	3	1	0	0	7	4	83	6	0	0	93	8	10	6	0	0	24	1	96	7	0	0	104	228	
15:45:00	0	2	1	0	0	3	5	64	4	0	0	73	20	13	7	0	0	40	2	112	9	0	0	123	239	821
16:00:00	5	3	1	0	0	9	4	110	8	0	0	122	22	14	9	0	0	45	1	89	7	0	0	97	273	930
16:15:00	5	4	2	0	0	11	2	75	4	0	0	81	15	13	11	0	0	39	1	95	6	0	0	102	233	973
16:30:00	1	1	0	0	0	2	6	91	8	0	0	105	13	19	12	0	0	44	0	122	2	0	0	124	275	1020
16:45:00	3	1	0	0	0	4	4	99	13	0	0	116	12	6	9	0	0	27	2	119	4	0	0	125	272	1053
17:00:00	4	2	1	0	0	7	1	111	8	0	0	120	31	19	16	0	0	66	1	106	6	0	0	113	306	1086
17:15:00	1	3	4	0	0	8	0	72	3	0	0	75	28	15	13	0	0	56	4	116	3	0	0	123	262	1115
17:30:00	4	5	2	0	0	11	1	94	11	0	0	106	14	12	18	0	0	44	0	95	4	0	0	99	260	1100
17:45:00	4	2	3	0	0	9	1	72	5	0	0	78	12	12	17	0	0	41	2	87	1	0	0	90	218	1046
Grand Total	95	134	40	0	6	269	189	2387	128	0	0	2704	263	200	209	0	0	672	27	2301	248	0	0	2576	**6221**	-
Approach%	35.3%	49.8%	14.9%	0%		-	7%	88.3%	4.7%	0%		-	39.1%	29.8%	31.1%	0%		-	1%	89.3%	9.6%	0%		-	**-**	-
Totals %	1.5%	2.2%	0.6%	0%		4.3%	3%	38.4%	2.1%	0%		43.5%	4.2%	3.2%	3.4%	0%		10.8%	0.4%	37%	4%	0%		41.4%	**-**	-
Heavy	18	4	9	0		-	42	176	38	0		-	46	6	48	0		-	7	183	43	0		-	**-**	-
Heavy %	18.9%	3%	22.5%	0%		-	22.2%	7.4%	29.7%	0%		-	17.5%	3%	23%	0%		-	25.9%	8%	17.3%	0%		-	**-**	-
Bicycles	0	0	0	0		-	0	1	1	0		-	0	0	1	0		-	0	0	0	0		-	**-**	-
Bicycle %	0%	0%	0%	0%		-	0%	0%	0.8%	0%		-	0%	0%	0.5%	0%		-	0%	0%	0%	0%		-	**-**	-

Spectrum

Turning Movement Count
Location Name: KING ST & HUMBER STATION RD
Date: Tue, Apr 10, 2018 Deployment Lead: Theo Daglis

Peak Hour: 07:15 AM - 08:15 AM Weather: Partly Cloudy (-6.1 °C)

Start Time	Southbound HUMBER STATION RD						Westbound KING ST						Northbound HUMBER STATION RD						Eastbound KING ST						Int. Total (15 min)
	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	
07:15:00	10	14	1	0	0	25	17	118	1	0	0	136	1	1	5	0	0	7	2	79	17	0	0	98	266
07:30:00	5	10	2	0	0	17	18	136	1	0	0	155	4	1	1	0	0	6	1	78	25	0	0	104	282
07:45:00	1	17	0	0	0	18	14	123	5	0	0	142	5	1	3	0	0	9	0	111	23	0	0	134	303
08:00:00	2	4	1	0	0	7	20	90	1	0	0	111	6	1	2	0	0	9	0	83	15	0	0	98	225
Grand Total	18	45	4	0	0	67	69	467	8	0	0	544	16	4	11	0	0	31	3	351	80	0	0	434	**1076**
Approach%	26.9%	67.2%	6%	0%		-	12.7%	85.8%	1.5%	0%		-	51.6%	12.9%	35.5%	0%		-	0.7%	80.9%	18.4%	0%		-	**-**
Totals %	1.7%	4.2%	0.4%	0%		6.2%	6.4%	43.4%	0.7%	0%		50.6%	1.5%	0.4%	1%	0%		2.9%	0.3%	32.6%	7.4%	0%		40.3%	**-**
PHF	0.45	0.66	0.5	0		0.67	0.86	0.86	0.4	0		0.88	0.67	1	0.55	0		0.86	0.38	0.79	0.8	0		0.81	**-**
Heavy	8	3	1	0		12	3	25	0	0		28	10	0	7	0		17	0	34	4	0		38	**-**
Heavy %	44.4%	6.7%	25%	0%		17.9%	4.3%	5.4%	0%	0%		5.1%	62.5%	0%	63.6%	0%		54.8%	0%	9.7%	5%	0%		8.8%	**-**
Lights	10	42	3	0		55	66	442	8	0		516	6	4	4	0		14	3	317	76	0		396	**-**
Lights %	55.6%	93.3%	75%	0%		82.1%	95.7%	94.6%	100%	0%		94.9%	37.5%	100%	36.4%	0%		45.2%	100%	90.3%	95%	0%		91.2%	**-**
Single-Unit Trucks	6	3	0	0		9	1	13	0	0		14	2	0	4	0		6	0	9	0	0		9	**-**
Single-Unit Trucks %	33.3%	6.7%	0%	0%		13.4%	1.4%	2.8%	0%	0%		2.6%	12.5%	0%	36.4%	0%		19.4%	0%	2.6%	0%	0%		2.1%	**-**
Buses	0	0	1	0		1	1	6	0	0		7	0	0	1	0		1	0	12	0	0		12	**-**
Buses %	0%	0%	25%	0%		1.5%	1.4%	1.3%	0%	0%		1.3%	0%	0%	9.1%	0%		3.2%	0%	3.4%	0%	0%		2.8%	**-**
Articulated Trucks	2	0	0	0		2	1	6	0	0		7	8	0	2	0		10	0	13	4	0		17	**-**
Articulated Trucks %	11.1%	0%	0%	0%		3%	1.4%	1.3%	0%	0%		1.3%	50%	0%	18.2%	0%		32.3%	0%	3.7%	5%	0%		3.9%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Spectrum

Turning Movement Count
Location Name: KING ST & HUMBER STATION RD
Date: Tue, Apr 10, 2018 Deployment Lead: Theo Daglis

Peak Hour: 01:00 PM - 02:00 PM Weather: Partly Cloudy (4.4 °C)

Start Time	Southbound HUMBER STATION RD						Westbound KING ST						Northbound HUMBER STATION RD						Eastbound KING ST						Int. Total (15 min)
	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	
13:00:00	2	2	0	0	0	4	4	46	6	0	0	56	4	8	5	0	0	17	0	41	5	0	0	46	123
13:15:00	3	2	0	0	0	5	4	47	10	0	0	61	6	4	1	0	0	11	0	46	6	0	0	52	129
13:30:00	2	2	2	0	1	6	4	43	6	0	0	53	1	1	2	0	0	4	0	48	6	0	0	54	117
13:45:00	5	3	0	0	0	8	5	55	2	0	0	62	6	3	5	0	0	14	1	54	4	0	0	59	143
Grand Total	12	9	2	0	1	23	17	191	24	0	0	232	17	16	13	0	0	46	1	189	21	0	0	211	**512**
Approach%	52.2%	39.1%	8.7%	0%		-	7.3%	82.3%	10.3%	0%		-	37%	34.8%	28.3%	0%		-	0.5%	89.6%	10%	0%		-	**-**
Totals %	2.3%	1.8%	0.4%	0%		4.5%	3.3%	37.3%	4.7%	0%		45.3%	3.3%	3.1%	2.5%	0%		9%	0.2%	36.9%	4.1%	0%		41.2%	**-**
PHF	0.6	0.75	0.25	0		0.72	0.85	0.87	0.6	0		0.94	0.71	0.5	0.65	0		0.68	0.25	0.88	0.88	0		0.89	**-**
Heavy	1	0	1	0		2	6	13	4	0		23	6	1	6	0		13	0	23	7	0		30	**-**
Heavy %	8.3%	0%	50%	0%		8.7%	35.3%	6.8%	16.7%	0%		9.9%	35.3%	6.3%	46.2%	0%		28.3%	0%	12.2%	33.3%	0%		14.2%	**-**
Lights	11	9	1	0		21	11	178	20	0		209	11	15	7	0		33	1	166	14	0		181	**-**
Lights %	91.7%	100%	50%	0%		91.3%	64.7%	93.2%	83.3%	0%		90.1%	64.7%	93.8%	53.8%	0%		71.7%	100%	87.8%	66.7%	0%		85.8%	**-**
Single-Unit Trucks	1	0	0	0		1	3	7	3	0		13	2	1	3	0		6	0	12	4	0		16	**-**
Single-Unit Trucks %	8.3%	0%	0%	0%		4.3%	17.6%	3.7%	12.5%	0%		5.6%	11.8%	6.3%	23.1%	0%		13%	0%	6.3%	19%	0%		7.6%	**-**
Buses	0	0	1	0		1	0	1	0	0		1	0	0	0	0		0	0	5	0	0		5	**-**
Buses %	0%	0%	50%	0%		4.3%	0%	0.5%	0%	0%		0.4%	0%	0%	0%	0%		0%	0%	2.6%	0%	0%		2.4%	**-**
Articulated Trucks	0	0	0	0		0	3	5	1	0		9	4	0	3	0		7	0	6	3	0		9	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	17.6%	2.6%	4.2%	0%		3.9%	23.5%	0%	23.1%	0%		15.2%	0%	3.2%	14.3%	0%		4.3%	**-**
Pedestrians	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	100%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Spectrum

Turning Movement Count
Location Name: KING ST & HUMBER STATION RD
Date: Tue, Apr 10, 2018 Deployment Lead: Theo Daglis

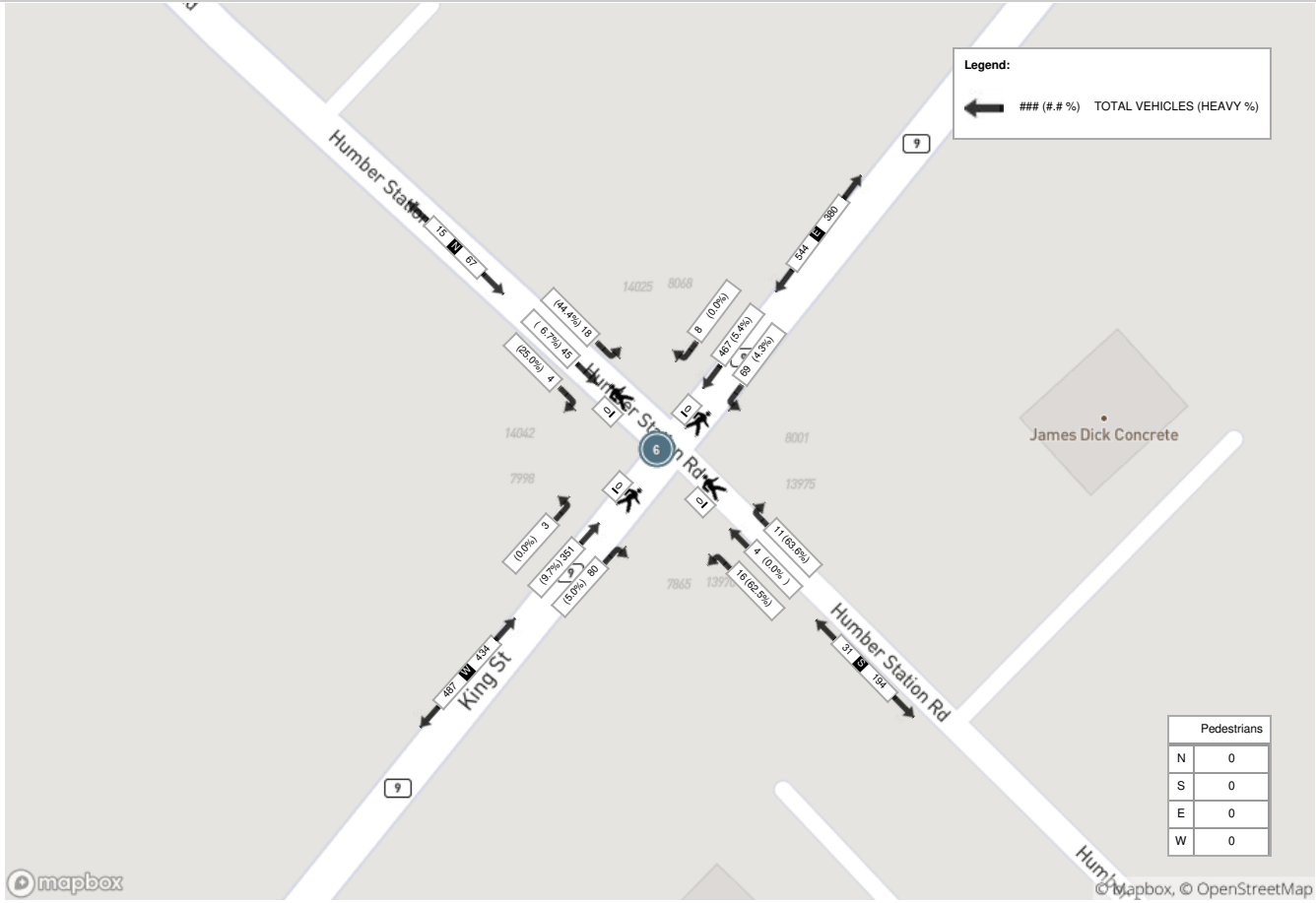
Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast (5.9 °C)

Start Time	Southbound HUMBER STATION RD						Westbound KING ST						Northbound HUMBER STATION RD						Eastbound KING ST						Int. Total (15 min)
	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	
16:30:00	1	1	0	0	0	2	6	91	8	0	0	105	13	19	12	0	0	44	0	122	2	0	0	124	275
16:45:00	3	1	0	0	0	4	4	99	13	0	0	116	12	6	9	0	0	27	2	119	4	0	0	125	272
17:00:00	4	2	1	0	0	7	1	111	8	0	0	120	31	19	16	0	0	66	1	106	6	0	0	113	306
17:15:00	1	3	4	0	0	8	0	72	3	0	0	75	28	15	13	0	0	56	4	116	3	0	0	123	262
Grand Total	9	7	5	0	0	21	11	373	32	0	0	416	84	59	50	0	0	193	7	463	15	0	0	485	**1115**
Approach%	42.9%	33.3%	23.8%	0%		-	2.6%	89.7%	7.7%	0%		-	43.5%	30.6%	25.9%	0%		-	1.4%	95.5%	3.1%	0%		-	**-**
Totals %	0.8%	0.6%	0.4%	0%		1.9%	1%	33.5%	2.9%	0%		37.3%	7.5%	5.3%	4.5%	0%		17.3%	0.6%	41.5%	1.3%	0%		43.5%	**-**
PHF	0.56	0.58	0.31	0		0.66	0.46	0.84	0.62	0		0.87	0.68	0.78	0.78	0		0.73	0.44	0.95	0.63	0		0.97	**-**
Heavy	0	0	0	0		0	7	11	11	0		29	3	3	1	0		7	1	24	4	0		29	**-**
Heavy %	0%	0%	0%	0%		0%	63.6%	2.9%	34.4%	0%		7%	3.6%	5.1%	2%	0%		3.6%	14.3%	5.2%	26.7%	0%		6%	**-**
Lights	9	7	5	0		21	4	362	21	0		387	81	56	49	0		186	6	439	11	0		456	**-**
Lights %	100%	100%	100%	0%		100%	36.4%	97.1%	65.6%	0%		93%	96.4%	94.9%	98%	0%		96.4%	85.7%	94.8%	73.3%	0%		94%	**-**
Single-Unit Trucks	0	0	0	0		0	4	6	9	0		19	1	3	0	0		4	1	11	1	0		13	**-**
Single-Unit Trucks %	0%	0%	0%	0%		0%	36.4%	1.6%	28.1%	0%		4.6%	1.2%	5.1%	0%	0%		2.1%	14.3%	2.4%	6.7%	0%		2.7%	**-**
Buses	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	5	0	0		5	**-**
Buses %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	1.1%	0%	0%		1%	**-**
Articulated Trucks	0	0	0	0		0	3	5	2	0		10	2	0	1	0		3	0	8	3	0		11	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	27.3%	1.3%	6.3%	0%		2.4%	2.4%	0%	2%	0%		1.6%	0%	1.7%	20%	0%		2.3%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**
Bicycles on Road	0	0	0	0	0	-	0	1	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Spectrum

Turning Movement Count
Location Name: KING ST & HUMBER STATION RD
Date: Tue, Apr 10, 2018 Deployment Lead: Theo Daglis

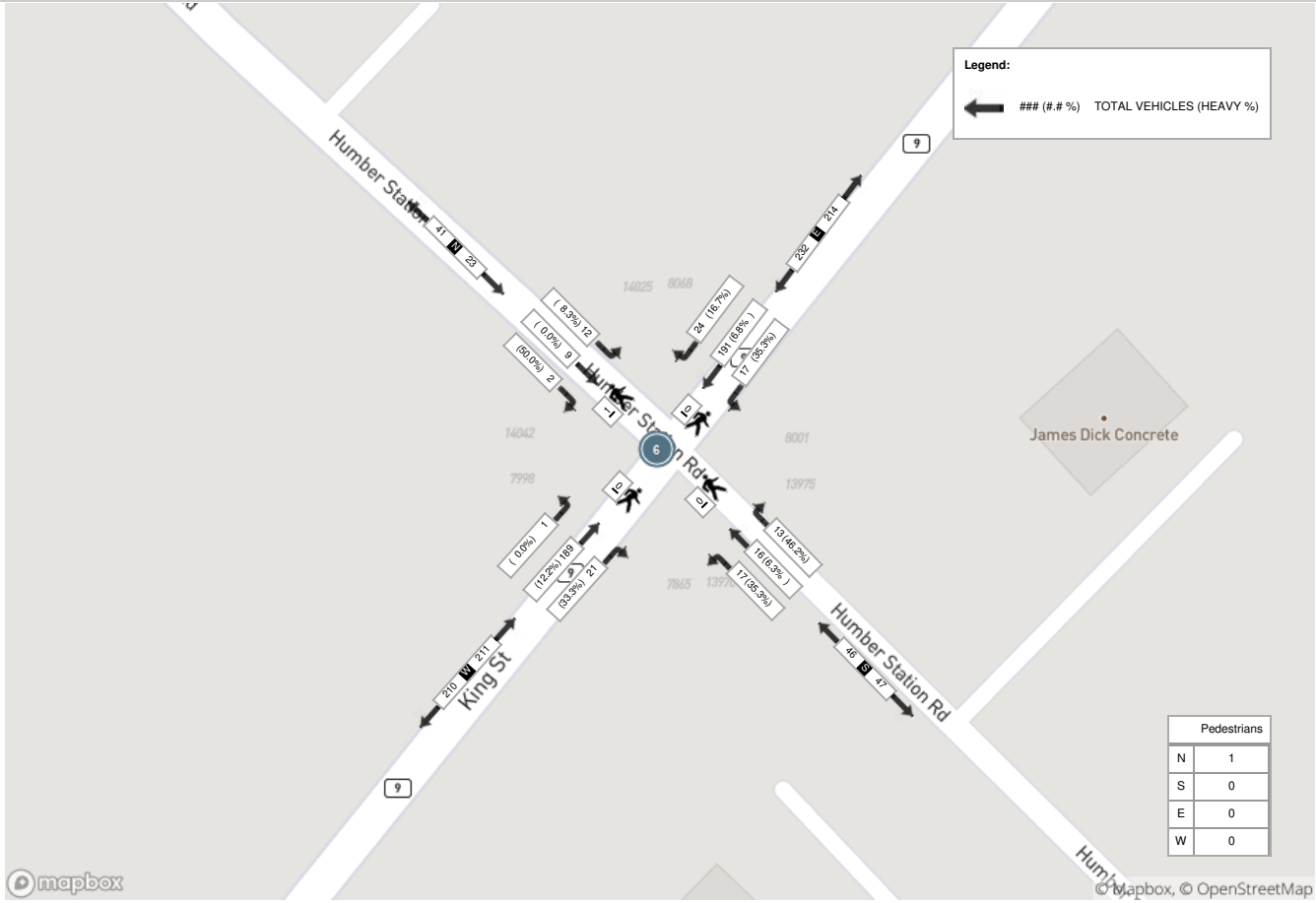
Peak Hour: 07:15 AM - 08:15 AM Weather: Partly Cloudy (-6.1 °C)



Spectrum

Turning Movement Count
Location Name: KING ST & HUMBER STATION RD
Date: Tue, Apr 10, 2018 Deployment Lead: Theo Daglis

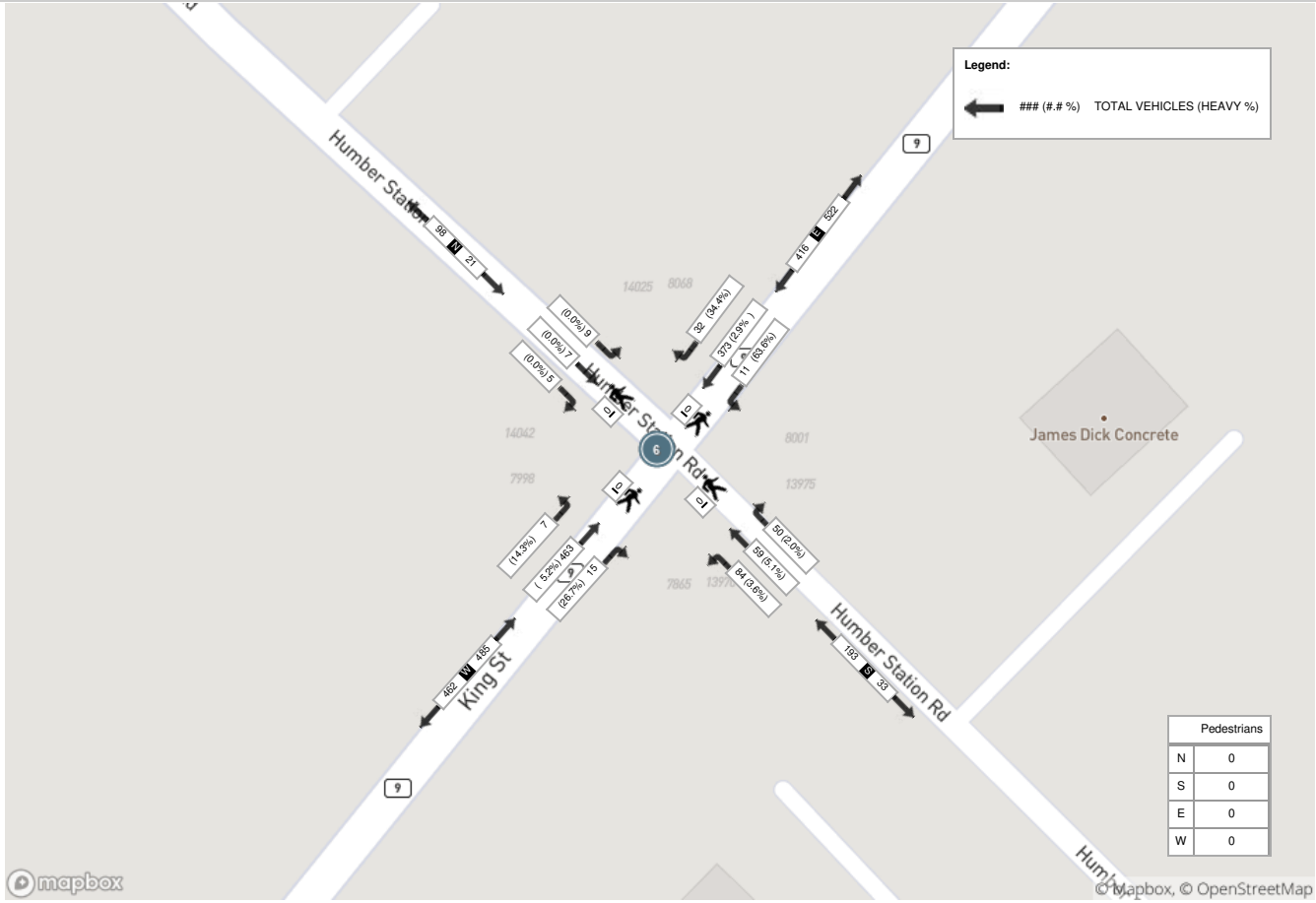
Peak Hour: 01:00 PM - 02:00 PM Weather: Partly Cloudy (4.4 °C)



Spectrum

Turning Movement Count
Location Name: KING ST & HUMBER STATION RD
Date: Tue, Apr 10, 2018 Deployment Lead: Theo Daglis

Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast (5.9 °C)



REGIONAL MUNICIPALITY OF PEEL

Traffic Signal Timing Parameters

Database Date	**November 20, 2020**		**Prepared Date**	**November 20, 2020**
Database Rev	**iNET**		**Completed By**	**JP**
Timing Card / Field rev	**-**		**Checked By**	**BL**

Location	**King Street at The Gore Road**						
Phase #	**Street Name - Direction**	**Vehicle Minimum (s)**	**Pedestrian Minimum (s)**		**Amber (s)**	**All Red (s)**	**TIME PERIOD (s) (Green+Amber+All Red)**
			WALK	**FDWALK**			**AM/OFF/PM**
1							
2	King Street - EB Green	12	8	12	4.6	2	48.6 (MAX)
3							
4	The Gore Road - NB Green	12	8	12	4.6	2	18.6 (MIN), 36.6 (MAX)
5							
6	King Street - WB Green	12	8	12	4.6	2	48.6 (MAX)
7							
8	The Gore Road - SB Green	12	8	12	4.6	2	18.6 (MIN), 36.6 (MAX)

System Control No, Local

Semi-Actuated Mode Yes

TIME (M-F)	**PEAK**	**CYCLE LENGTH (s)**	**OFFSET (s)**
AM/OFF/PM	FREE	FREE	FREE

REGIONAL MUNICIPALITY OF PEEL

Traffic Signal Timing Parameters

Database Date	**November 19, 2020**		**Prepared Date**	**November 19, 2020**
Database Rev	**iNET**		**Completed By**	**JP**
Timing Card / Field rev	**-**		**Checked By**	**BL**

Location	**King Street at Humber Station Road**

Phase #	**Street Name - Direction**	**Vehicle Minimum (s)**	**Pedestrian Minimum (s)**		**Amber (s)**	**All Red (s)**	**TIME PERIOD (s) (Green+Amber+All Red)**
			WALK	**FDWALK**			**AM/OFF/PM**
1							
2	King Street - EB/WB Green	12	8	7	5.4	2	54.4 (MAX)
3							
4	Humber Station Road - NB/SB Green	8	8	7	4	2.4	14.4 (MIN), 31.4 (MAX)
5							
6							
7							
8							

System Control No, Local

Semi-Actuated Mode Yes

TIME (M-F)	**PEAK**	**CYCLE LENGTH (s)**	**OFFSET (s)**
AM/OFF/PM	FREE	FREE	FREE

APPENDIX D:
Analysis Output Summary

SIGNALIZED INTERSECTIONS

Movement	Existing Conditions					Future Total				
	V/C	Delay (Sec)	LOS	50thQueue	95thQueue	V/C	Delay (Sec)	LOS	50thQueue	95thQueue
The Gore Rd & n/King St										
EBL	0.08 (0.28)	9.9 (10.3)	A (B)	2.20 (8.40)	7.30 (21.90)	0.54 (0.84)	43.1 (37.1)	D (D)	11.9 (29.2)	#29.3 (#73.3)
EBT	0.43 (0.41)	13.3 (10.7)	B (B)	36.50 (30.80)	65.20 (59.80)	0.82 (0.81)	44.6 (35.5)	D (D)	84.5 (108.4)	#133.3 (#168.6)
EBR	-	-	-	-	-	0.04 (0.01)	24.0 (17.7)	C (B)	0.0 (0.0)	7.9 (0.0)
NBL	0.12 (0.23)	20.4 (21.9)	C (C)	1.10 (9.20)	5.10 (19.80)	0.21 (0.27)	20.3 (23.3)	C (C)	1.4 (12.1)	6.7 (24.6)
NBT	0.07 (0.64)	19.5 (27.2)	B (C)	4.50 (43.00)	11.70 (68.70)	0.17 (0.93)	18.1 (49.3)	B (D)	16.4 (119.1)	29.2 (#186.0)
NBR	-	-	-	-	-	0.07 (0.32)	17.2 (23.7)	B (C)	0.0 (14.2)	9.5 (36.4)
SBL	0.23 (0.17)	20.8 (21.6)	C (C)	11.00 (3.70)	22.30 (10.60)	0.20 (0.49)	18.5 (30.4)	B (C)	12.7 (5.3)	24.8 (#20.0)
SBT	0.83 (0.19)	35.7 (21.5)	D (C)	70.80 (9.40)	108.50 (21.30)	0.94 (0.44)	46.8 (25.0)	D (C)	142.5 (43.9)	#224.4 (67.6)
SBR	-	-	-	-	-	0.22 (0.07)	18.5 (21.2)	B (C)	11.0 (0.0)	27.1 (7.6)
WBL	0.05 (0.01)	9.5 (7.5)	A (A)	1.50 (0.40)	5.40 (2.20)	0.84 (0.67)	40.4 (28.2)	D (C)	30.6 (15.1)	#65.8 (#34.7)
WBT	0.51 (0.47)	14.3 (11.5)	B (B)	46.80 (36.30)	81.10 (70.60)	0.83 (0.84)	34.3 (41.1)	C (D)	117.8 (104.0)	#181.9 (#163.5)
WBR	-	-	-	-	-	0.02 (0.06)	15.5 (21.2)	B (C)	0.0 (0.0)	3.3 (7.1)
OVERALL	0.63 (0.53)	21.3 (15.9)	C (B)			0.93 (0.90)	36.4 (35.5)	D (D)		
Humber Station Rd & King St										
EBL	-	-	-	-	-	0.01 (0.19)	18.7 (25.2)	B (C)	0.4 (3.3)	2.3 (m7.1)
EBT	0.40 (0.59)	8.1 (13.5)	A (B)	26.90 (32.70)	43.90 (57.50)	0.84 (0.91)	39.0 (47.3)	D (D)	107.5 (131.2)	#171.5 (#210.0)
EBR	-	-	-	-	-	0.53 (0.30)	26.6 (28.1)	C (C)	40.4 (19.4)	74.1 (43.7)
NBL	-	-	-	-	-	0.79 (0.74)	51.4 (25.1)	D (C)	14.7 (46.5)	#43.2 (70.1)
NBT	0.12 (0.40)	25.4 (16.0)	C (B)	2.50 (12.70)	9.70 (28.00)	0.24 (0.91)	21.4 (50.0)	C (D)	21.6 (101.2)	36.5 (#161.6)
SBL	-	-	-	-	-	0.80 (0.80)	53.6 (43.3)	D (D)	31.6 (21.4)	#64.3 (#51.8)
SBT	0.22 (0.04)	26.1 (13.9)	C (B)	8.00 (1.20)	18.80 (5.20)	0.86 (0.55)	51.2 (34.5)	D (C)	74.1 (43.7)	#117.8 (69.8)
WBL	-	-	-	-	-	0.38 (0.23)	18.7 (29.3)	B (C)	8.5 (1.8)	16.9 (8.0)
WBT	0.53 (0.51)	9.9 (12.3)	A (B)	40.10 (26.50)	64.60 (47.50)	0.71 (0.82)	24.9 (36.5)	C (D)	99.3 (115.1)	145.7 (#180.2)
WBR	-	-	-	-	-	0.10 (0.32)	14.0 (22.4)	B (C)	3.1 (14.7)	13.2 (35.9)
OVERALL	0.46 (0.52)	10.6 (13.5)	B (B)			0.87 (0.91)	33.9 (38.3)	C (D)		
King St & SC Access										
EBL	-	-	-	-	-	0.12 (0.35)	5.8 (7.4)	A (A)	2.4 (7.7)	8.0 (22.5)
EBT	-	-	-	-	-	0.58 (0.54)	9.7 (7.4)	A (A)	63.2 (52.9)	119.7 (100.8)
SBLR	-	-	-	-	-	0.71 (0.61)	40.8 (40.1)	D (D)	38.9 (26.8)	60.2 (45.3)
WBT	-	-	-	-	-	0.60 (0.59)	7.3 (8.0)	A (A)	88.6 (60.3)	138.5 (115.0)
WBR	-	-	-	-	-	0.03 (0.10)	1.4 (4.0)	A (A)	0.2 (3.0)	m0.7 (10.2)
OVERALL	-	-	-	-	-	0.62 (0.59)	12.9 (10.4)	B (B)		
King St & SE Access										
EBL	-	-	-	-	-	0.11 (0.49)	5.6 (14.8)	A (B)	3.9 (8.1)	m5.9 (17.6)
EBT	-	-	-	-	-	0.68 (0.53)	14.5 (8.7)	B (A)	117.4 (61.5)	181.7 (109.3)
SBLR	-	-	-	-	-	0.73 (0.73)	41.4 (46.8)	D (D)	41.6 (44.0)	63.7 (66.5)
WBT	-	-	-	-	-	0.55 (0.77)	9.5 (17.9)	A (B)	58.1 (135.2)	107.1 (#230.6)
WBR	-	-	-	-	-	0.05 (0.17)	5.2 (5.9)	A (A)	1.4 (7.3)	6.8 (m15.3)
OVERALL	-	-	-	-	-	0.69 (0.75)	16.1 (16.9)	B (B)		
The Gore Rd & WS Access										
NBTR	-	-	-	-	-	0.17 (0.67)	4.4 (7.6)	A (A)	10.0 (72.1)	21.5 (138.3)
SBL	-	-	-	-	-	0.01 (0.06)	2.2 (2.8)	A (A)	0.2 (1.0)	m0.4 (3.1)
SBT	-	-	-	-	-	0.70 (0.23)	7.3 (3.3)	A (A)	36.3 (18.8)	42.8 (26.0)
WBLR	-	-	-	-	-	0.61 (0.55)	39.9 (42.2)	D (D)	28.0 (17.2)	45.7 (32.0)
OVERALL	-	-	-	-	-	0.68 (0.66)	10.8 (9.0)	B (A)		
The Gore Rd & WC Access										
NBTR	-	-	-	-	-	0.15 (0.59)	3.6 (5.0)	A (A)	6.7 (41.5)	12.3 (70.2)
SBL	-	-	-	-	-	0.01 (0.05)	2.6 (2.8)	A (A)	0.2 (0.4)	m0.6 (4.1)
SBT	-	-	-	-	-	0.59 (0.18)	6.1 (3.2)	A (A)	43.2 (5.1)	43.1 (28.8)
WBLR	-	-	-	-	-	0.60 (0.55)	39.9 (42.0)	D (D)	26.9 (16.8)	44.3 (31.4)
OVERALL	-	-	-	-	-	0.59 (0.59)	10.3 (7.6)	B (A)		
The Gore Rd & WN Access										
NBTR	-	-	-	-	-	0.13 (0.51)	3.4 (5.8)	A (A)	4.9 (33.1)	13.2 (81.6)
SBL	-	-	-	-	-	0.01 (0.04)	3.6 (2.7)	A (A)	0.3 (0.7)	1.6 (2.9)
SBT	-	-	-	-	-	0.49 (0.13)	6.7 (2.9)	A (A)	43.9 (7.7)	82.1 (16.3)
WBLR	-	-	-	-	-	0.60 (0.55)	39.9 (42.0)	D (D)	26.9 (16.8)	44.3 (31.4)
OVERALL	-	-	-	-	-	0.51 (0.51)	11.4 (8.8)	B (A)		

UNSIGNALIZED INTERSECTIONS

Movement	Future Total			
	V/C	Delay (Sec)	LOS	95thQueue
King St & SW Access				
EBL	0.06 (0.19)	10.50 (11.20)	B (B)	1.50 (5.50)
SBLR	0.73 (0.44)	37.50 (26.60)	E (D)	45.00 (16.90)

ROUNDABOUTS (ARCADY)

Movement	Scenario: Existing Conditions					Scenario: Future Total Conditions				
	V/C	Delay	LOS	50thQueue	95thQueue	V/C	Delay	LOS	50thQueue	95thQueue
King St & Emil Kolb Parkway										
EB	0.27 (0.36)	4.0 (4.1)	A (A)	4.5 (6.0)	20.3 (21.0)	0.54 (0.63)	6.2 (6.3)	A (A)	12.0 (15.0)	33.8 (40.5)
NB	0.32 (0.50)	4.8 (5.4)	A (A)	3.8 (7.5)	12.8 (19.5)	0.65 (0.91)	7.1 (18.3)	A (C)	14.3 (54.8)	32.3 (154.5)
SB	0.35 (0.16)	4.0 (4.0)	A (A)	5.3 (1.5)	18.0 (6.0)	0.61 (0.42)	6.3 (5.6)	A (A)	13.5 (8.3)	37.5 (23.3)
OVERALL	0.35 (0.50)	4.3 (4.7)	A (A)			0.65 (0.91)	6.6 (11.8)	A (B)		
Emil Kolb Parkway & GO station access										
EB	-	-	-	-	-	0.34 (0.32)	6.1 (4.8)	A (A)	5.3 (4.5)	16.5 (13.5)
NB	-	-	-	-	-	0.38 (0.58)	4.9 (5.5)	A (A)	6.8 (14.3)	21.8 (42.0)
SB	-	-	-	-	-	0.44 (0.24)	4.6 (4.0)	A (A)	7.5 (3.8)	24.8 (12.0)
OVERALL	-	-	-	-	-	0.44 (0.58)	5.0 (5.0)	A (A)		

Notes:

1. Queue length assumes vehicle + headway length of 7.5m
2. Approach V/C assumed as maximum of each lane V/C for that approach as reported by ARCADY
3. Overall V/C assumed as maximum of each approach V/C

APPENDIX E:
Synchro and Arcady Worksheets

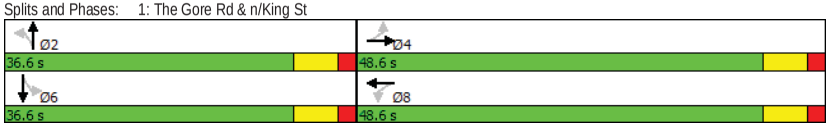
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	135.0		0.0	140.0		0.0	200.0		0.0	175.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			20.0			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.978			0.993			0.978			0.968	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1580	1724	0	1700	1772	0	1275	1840	0	1700	1860	0
Flt Permitted	0.411			0.473			0.205			0.726		
Satd. Flow (perm)	683	1724	0	846	1772	0	275	1840	0	1299	1860	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			4			7			18	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		363.2			560.5			628.5			762.7	
Travel Time (s)		26.2			40.4			45.3			54.9	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	29	340	20	450	10	40	93	390
Future Volume (vph)	29	340	20	450	10	40	93	390
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	18.6	18.6	18.6	18.6
Minimum Split (s)	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6
Total Split (s)	48.6	48.6	48.6	48.6	36.6	36.6	36.6	36.6
Total Split (%)	57.0%	57.0%	57.0%	57.0%	43.0%	43.0%	43.0%	43.0%
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Max	Max	Max	Max	Min	Min	Min	Min
Act Effct Green (s)	42.1	42.1	42.1	42.1	25.0	25.0	25.0	25.0
Actuated g/C Ratio	0.52	0.52	0.52	0.52	0.31	0.31	0.31	0.31
v/c Ratio	0.08	0.44	0.05	0.51	0.12	0.08	0.23	0.84
Control Delay	11.8	14.1	11.3	15.6	22.8	17.0	21.6	38.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.8	14.1	11.3	15.6	22.8	17.0	21.6	38.4
LOS	B	B	B	B	C	B	C	D
Approach Delay		14.0		15.4		18.0		35.7
Approach LOS		B		B		B		D

Intersection Summary		
Cycle Length: 85.2		
Actuated Cycle Length: 80.4		
Natural Cycle: 60		
Control Type: Semi Act-Uncoord		
Maximum v/c Ratio: 0.84		
Intersection Signal Delay: 22.8	Intersection LOS: C	
Intersection Capacity Utilization 62.9%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 1: The Gore Rd & n/King St



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	29	399	20	472	10	47	93	495
v/c Ratio	0.08	0.44	0.05	0.51	0.12	0.08	0.23	0.84
Control Delay	11.8	14.1	11.3	15.6	22.8	17.0	21.6	38.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.8	14.1	11.3	15.6	22.8	17.0	21.6	38.4
Queue Length 50th (m)	2.2	36.5	1.5	46.8	1.1	4.5	11.0	70.8
Queue Length 95th (m)	7.3	65.2	5.4	81.1	5.1	11.7	22.3	108.5
Internal Link Dist (m)		339.2		536.5		604.5		738.7
Turn Bay Length (m)	135.0		140.0		200.0		175.0	
Base Capacity (vph)	357	909	443	930	102	693	486	707
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.44	0.05	0.51	0.10	0.07	0.19	0.70

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	340	59	20	450	22	10	40	7	93	390	105
Future Volume (vph)	29	340	59	20	450	22	10	40	7	93	390	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Total Lost time (s)	6.6	6.6		6.6	6.6		6.6	6.6		6.6	6.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1580	1724		1700	1772		1275	1840		1700	1860	
Flt Permitted	0.41	1.00		0.47	1.00		0.20	1.00		0.73	1.00	
Satd. Flow (perm)	684	1724		847	1772		275	1840		1300	1860	
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)	29	340	59	20	450	22	10	40	7	93	390	105
RTOR Reduction (vph)	0	7	0	0	2	0	0	5	0	0	12	0
Lane Group Flow (vph)	29	392	0	20	470	0	10	42	0	93	483	0
Heavy Vehicles (%)	13%	10%	3%	5%	8%	0%	40%	0%	14%	5%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	42.1	42.1		42.1	42.1		25.0	25.0		25.0	25.0	
Effective Green, g (s)	42.1	42.1		42.1	42.1		25.0	25.0		25.0	25.0	
Actuated g/C Ratio	0.52	0.52		0.52	0.52		0.31	0.31		0.31	0.31	
Clearance Time (s)	6.6	6.6		6.6	6.6		6.6	6.6		6.6	6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	358	903		444	929		85	572		404	579	
v/s Ratio Prot		0.23			c0.27			0.02			c0.26	
v/s Ratio Perm	0.04			0.02			0.04			0.07		
v/c Ratio	0.08	0.43		0.05	0.51		0.12	0.07		0.23	0.83	
Uniform Delay, d1	9.5	11.8		9.3	12.4		19.8	19.5		20.5	25.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	1.5		0.2	2.0		0.6	0.1		0.3	10.0	
Delay (s)	9.9	13.3		9.5	14.3		20.4	19.5		20.8	35.7	
Level of Service	A	B		A	B		C	B		C	D	
Approach Delay (s)		13.1			14.1			19.7			33.4	
Approach LOS		B			B			B			C	

Intersection Summary					
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.63				
Actuated Cycle Length (s)	80.3	Sum of lost time (s)		13.2	
Intersection Capacity Utilization	62.9%	ICU Level of Service		B	
Analysis Period (min)	15				

c Critical Lane Group

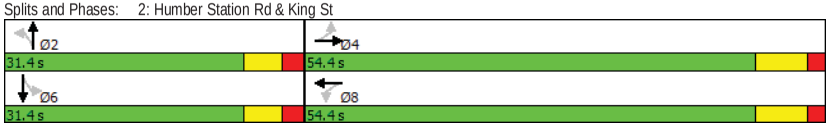
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	10.0		0.0	10.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	15.0			15.0			0.0			0.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.975			0.998			0.952			0.992	
Flt Protected					0.994			0.975			0.987	
Satd. Flow (prot)	0	1731	0	0	1818	0	0	1155	0	0	1603	0
Flt Permitted		0.997			0.896			0.843			0.917	
Satd. Flow (perm)	0	1726	0	0	1639	0	0	999	0	0	1489	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			1			11			4	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		342.4			840.4			348.4			739.7	
Travel Time (s)		24.7			60.5			25.1			53.3	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	3	351	69	467	16	4	18	45
Future Volume (vph)	3	351	69	467	16	4	18	45
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	14.4	14.4	14.4	14.4
Minimum Split (s)	22.4	22.4	22.4	22.4	21.4	21.4	21.4	21.4
Total Split (s)	54.4	54.4	54.4	54.4	31.4	31.4	31.4	31.4
Total Split (%)	63.4%	63.4%	63.4%	63.4%	36.6%	36.6%	36.6%	36.6%
Yellow Time (s)	5.4	5.4	5.4	5.4	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.4	2.4	2.4	2.4
Lost Time Adjust (s)		0.0		0.0		0.0		0.0
Total Lost Time (s)		7.4		7.4		6.4		6.4
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Max	Max	Max	Max	Min	Min	Min	Min
Act Effct Green (s)		47.0		47.0		14.4		14.4
Actuated g/C Ratio		0.62		0.62		0.19		0.19
v/c Ratio		0.40		0.53		0.15		0.23
Control Delay		8.0		10.3		21.0		27.0
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		8.0		10.3		21.0		27.0
LOS		A		B		C		C
Approach Delay		8.0		10.3		21.0		27.0
Approach LOS		A		B		C		C

Intersection Summary		
Cycle Length: 85.8		
Actuated Cycle Length: 75.2		
Natural Cycle: 60		
Control Type: Semi Act-Uncoord		
Maximum v/c Ratio: 0.53		
Intersection Signal Delay: 10.7	Intersection LOS: B	
Intersection Capacity Utilization 82.0%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 2: Humber Station Rd & King St



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	434	544	31	67
v/c Ratio	0.40	0.53	0.15	0.23
Control Delay	8.0	10.3	21.0	27.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	8.0	10.3	21.0	27.0
Queue Length 50th (m)	26.9	40.1	2.5	8.0
Queue Length 95th (m)	43.9	64.6	9.7	18.8
Internal Link Dist (m)	318.4	816.4	324.4	715.7
Turn Bay Length (m)				
Base Capacity (vph)	1086	1024	339	497
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.40	0.53	0.09	0.13

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	351	80	69	467	8	16	4	11	18	45	4
Future Volume (vph)	3	351	80	69	467	8	16	4	11	18	45	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.4			7.4			6.4			6.4	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.98			1.00			0.95			0.99	
Flt Protected		1.00			0.99			0.97			0.99	
Satd. Flow (prot)		1731			1818			1155			1602	
Flt Permitted		1.00			0.90			0.84			0.92	
Satd. Flow (perm)		1726			1638			999			1489	
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)	3	351	80	69	467	8	16	4	11	18	45	4
RTOR Reduction (vph)	0	8	0	0	0	0	0	9	0	0	3	0
Lane Group Flow (vph)	0	426	0	0	544	0	0	22	0	0	64	0
Heavy Vehicles (%)	0%	9%	5%	4%	5%	0%	62%	0%	63%	44%	6%	25%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		47.0			47.0			14.4			14.4	
Effective Green, g (s)		47.0			47.0			14.4			14.4	
Actuated g/C Ratio		0.62			0.62			0.19			0.19	
Clearance Time (s)		7.4			7.4			6.4			6.4	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1078			1023			191			285	
v/s Ratio Prot												
v/s Ratio Perm		0.25			c0.33			0.02			c0.04	
v/c Ratio		0.40			0.53			0.12			0.22	
Uniform Delay, d1		7.0			7.9			25.1			25.7	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.1			2.0			0.3			0.4	
Delay (s)		8.1			9.9			25.4			26.1	
Level of Service		A			A			C			C	
Approach Delay (s)		8.1			9.9			25.4			26.1	
Approach LOS		A			A			C			C	

Intersection Summary					
HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.46				
Actuated Cycle Length (s)	75.2	Sum of lost time (s)	13.8		
Intersection Capacity Utilization	82.0%	ICU Level of Service	E		
Analysis Period (min)	15				
c Critical Lane Group					

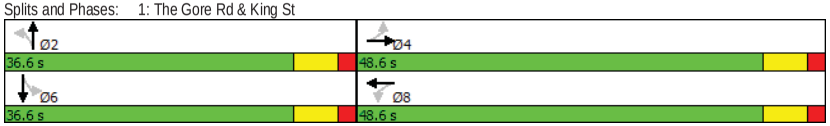
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	135.0		0.0	140.0		0.0	200.0		0.0	175.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			20.0			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.996			0.974			0.992			0.957	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	1842	0	1539	1817	0	1785	1901	0	1684	1770	0
Flt Permitted	0.422			0.476			0.687			0.401		
Satd. Flow (perm)	793	1842	0	771	1817	0	1291	1901	0	711	1770	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			17			4			26	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		363.2			560.5			628.5			762.7	
Travel Time (s)		26.2			40.4			45.3			54.9	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	124	405	6	401	79	312	32	77
Future Volume (vph)	124	405	6	401	79	312	32	77
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	18.6	18.6	18.6	18.6
Minimum Split (s)	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6
Total Split (s)	48.6	48.6	48.6	48.6	36.6	36.6	36.6	36.6
Total Split (%)	57.0%	57.0%	57.0%	57.0%	43.0%	43.0%	43.0%	43.0%
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Max	Max	Max	Max	Min	Min	Min	Min
Act Effct Green (s)	42.1	42.1	42.1	42.1	20.1	20.1	20.1	20.1
Actuated g/C Ratio	0.56	0.56	0.56	0.56	0.27	0.27	0.27	0.27
v/c Ratio	0.28	0.41	0.01	0.47	0.23	0.65	0.17	0.22
Control Delay	11.5	11.3	8.5	11.9	23.3	30.7	23.5	17.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	11.3	8.5	11.9	23.3	30.7	23.5	17.7
LOS	B	B	A	B	C	C	C	B
Approach Delay		11.4		11.9		29.3		19.0
Approach LOS		B		B		C		B

Intersection Summary		
Cycle Length: 85.2		
Actuated Cycle Length: 75.4		
Natural Cycle: 55		
Control Type: Semi Act-Uncoord		
Maximum v/c Ratio: 0.65		
Intersection Signal Delay: 16.8	Intersection LOS: B	
Intersection Capacity Utilization 76.1%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 1: The Gore Rd & King St



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	124	417	6	484	79	329	32	108
v/c Ratio	0.28	0.41	0.01	0.47	0.23	0.65	0.17	0.22
Control Delay	11.5	11.3	8.5	11.9	23.3	30.7	23.5	17.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	11.3	8.5	11.9	23.3	30.7	23.5	17.7
Queue Length 50th (m)	8.4	30.8	0.4	36.3	9.2	43.0	3.7	9.4
Queue Length 95th (m)	21.9	59.8	2.2	70.6	19.8	68.7	10.6	21.3
Internal Link Dist (m)		339.2		536.5		604.5		738.7
Turn Bay Length (m)	135.0		140.0		200.0		175.0	
Base Capacity (vph)	442	1028	429	1021	514	760	283	720
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.41	0.01	0.47	0.15	0.43	0.11	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	124	405	12	6	401	83	79	312	17	32	77	31
Future Volume (vph)	124	405	12	6	401	83	79	312	17	32	77	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Total Lost time (s)	6.6	6.6		6.6	6.6		6.6	6.6		6.6	6.6	
Lane Util. Factor	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	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1785	1841		1539	1817		1785	1901		1684	1770	
Flt Permitted	0.42	1.00		0.48	1.00		0.69	1.00		0.40	1.00	
Satd. Flow (perm)	792	1841		771	1817		1291	1901		711	1770	
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)	124	405	12	6	401	83	79	312	17	32	77	31
RTOR Reduction (vph)	0	1	0	0	8	0	0	3	0	0	19	0
Lane Group Flow (vph)	124	416	0	6	476	0	79	326	0	32	89	0
Heavy Vehicles (%)	0%	4%	0%	16%	3%	3%	0%	0%	5%	6%	3%	6%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	42.0	42.0		42.0	42.0		20.1	20.1		20.1	20.1	
Effective Green, g (s)	42.0	42.0		42.0	42.0		20.1	20.1		20.1	20.1	
Actuated g/C Ratio	0.56	0.56		0.56	0.56		0.27	0.27		0.27	0.27	
Clearance Time (s)	6.6	6.6		6.6	6.6		6.6	6.6		6.6	6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	441	1026		430	1013		344	507		189	472	
v/s Ratio Prot		0.23			c0.26			c0.17			0.05	
v/s Ratio Perm	0.16			0.01			0.06			0.04		
v/c Ratio	0.28	0.41		0.01	0.47		0.23	0.64		0.17	0.19	
Uniform Delay, d1	8.7	9.5		7.4	10.0		21.6	24.4		21.2	21.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	1.2		0.1	1.6		0.3	2.8		0.4	0.2	
Delay (s)	10.3	10.7		7.5	11.5		21.9	27.2		21.6	21.5	
Level of Service	B	B		A	B		C	C		C	C	
Approach Delay (s)		10.6			11.5			26.2			21.5	
Approach LOS		B			B			C			C	

Intersection Summary					
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.53				
Actuated Cycle Length (s)	75.3	Sum of lost time (s)		13.2	
Intersection Capacity Utilization	76.1%	ICU Level of Service		D	
Analysis Period (min)	15				

c Critical Lane Group

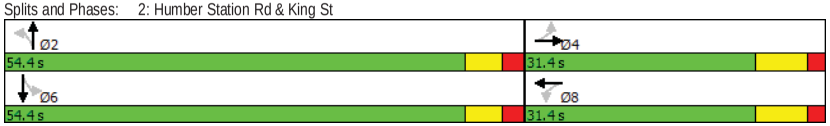
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	10.0		0.0	10.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	15.0			15.0			0.0			0.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.996			0.990			0.965			0.968	
Flt Protected		0.999			0.999			0.979			0.979	
Satd. Flow (prot)	0	1807	0	0	1791	0	0	1756	0	0	1821	0
Flt Permitted		0.992			0.982			0.850			0.851	
Satd. Flow (perm)	0	1794	0	0	1761	0	0	1525	0	0	1583	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			5			33			5	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		342.4			840.4			348.4			739.7	
Travel Time (s)		24.7			60.5			25.1			53.3	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	7	463	11	373	84	59	9	7
Future Volume (vph)	7	463	11	373	84	59	9	7
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	14.4	14.4	14.4	14.4
Minimum Split (s)	22.4	22.4	22.4	22.4	21.4	21.4	21.4	21.4
Total Split (s)	31.4	31.4	31.4	31.4	54.4	54.4	54.4	54.4
Total Split (%)	36.6%	36.6%	36.6%	36.6%	63.4%	63.4%	63.4%	63.4%
Yellow Time (s)	5.4	5.4	5.4	5.4	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.4	2.4	2.4	2.4
Lost Time Adjust (s)		0.0		0.0		0.0		0.0
Total Lost Time (s)		7.4		7.4		6.4		6.4
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Max	Max	Max	Max	Min	Min	Min	Min
Act Effct Green (s)		24.0		24.0		14.4		14.4
Actuated g/C Ratio		0.46		0.46		0.28		0.28
v/c Ratio		0.59		0.51		0.43		0.05
Control Delay		14.0		12.6		16.5		12.6
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		14.0		12.6		16.5		12.6
LOS		B		B		B		B
Approach Delay		14.0		12.6		16.5		12.6
Approach LOS		B		B		B		B

Intersection Summary		
Cycle Length: 85.8		
Actuated Cycle Length: 52.2		
Natural Cycle: 50		
Control Type: Semi Act-Uncoord		
Maximum v/c Ratio: 0.59		
Intersection Signal Delay: 13.9	Intersection LOS: B	
Intersection Capacity Utilization 53.8%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 2: Humber Station Rd & King St



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	485	416	193	21
v/c Ratio	0.59	0.51	0.43	0.05
Control Delay	14.0	12.6	16.5	12.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	14.0	12.6	16.5	12.6
Queue Length 50th (m)	32.7	26.5	12.7	1.2
Queue Length 95th (m)	57.5	47.5	28.0	5.2
Internal Link Dist (m)	318.4	816.4	324.4	715.7
Turn Bay Length (m)				
Base Capacity (vph)	825	812	1404	1456
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.59	0.51	0.14	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	463	15	11	373	32	84	59	50	9	7	5
Future Volume (vph)	7	463	15	11	373	32	84	59	50	9	7	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.4			7.4			6.4			6.4	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		1.00			0.99			0.97			0.97	
Flt Protected		1.00			1.00			0.98			0.98	
Satd. Flow (prot)		1807			1790			1756			1820	
Flt Permitted		0.99			0.98			0.85			0.85	
Satd. Flow (perm)		1794			1761			1524			1582	
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)	7	463	15	11	373	32	84	59	50	9	7	5
RTOR Reduction (vph)	0	1	0	0	3	0	0	24	0	0	4	0
Lane Group Flow (vph)	0	484	0	0	413	0	0	169	0	0	17	0
Heavy Vehicles (%)	14%	5%	26%	63%	2%	34%	3%	5%	2%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		24.0			24.0			14.4			14.4	
Effective Green, g (s)		24.0			24.0			14.4			14.4	
Actuated g/C Ratio		0.46			0.46			0.28			0.28	
Clearance Time (s)		7.4			7.4			6.4			6.4	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		824			809			420			436	
v/s Ratio Prot												
v/s Ratio Perm		c0.27			0.23			c0.11			0.01	
v/c Ratio		0.59			0.51			0.40			0.04	
Uniform Delay, d1		10.4			10.0			15.4			13.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		3.1			2.3			0.6			0.0	
Delay (s)		13.5			12.3			16.0			13.9	
Level of Service		B			B			B			B	
Approach Delay (s)		13.5			12.3			16.0			13.9	
Approach LOS		B			B			B			B	

Intersection Summary					
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.52				
Actuated Cycle Length (s)	52.2	Sum of lost time (s)	13.8		
Intersection Capacity Utilization	53.8%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

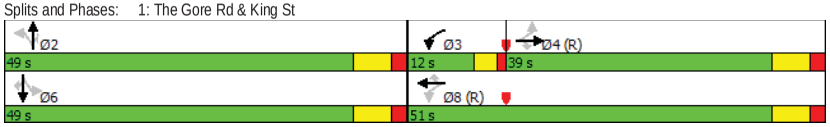
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	135.0		25.0	140.0		25.0	200.0		50.0	175.0		50.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1580	1746	1585	1700	1779	1633	1275	1921	1432	1700	1921	1633
Flt Permitted	0.253			0.215			0.095			0.671		
Satd. Flow (perm)	421	1746	1585	385	1779	1633	127	1921	1432	1201	1921	1633
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			83			39			98			135
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		363.2			192.2			628.5			387.0	
Travel Time (s)		26.2			13.8			45.3			27.9	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	451	71	245	659	26	11	135	98	103	764	227
Future Volume (vph)	71	451	71	245	659	26	11	135	98	103	764	227
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	18.6	18.6	18.6	18.6	18.6	18.6
Minimum Split (s)	30.6	30.6	30.6	9.0	30.6	30.6	30.6	30.6	30.6	30.6	30.6	30.6
Total Split (s)	39.0	39.0	39.0	12.0	51.0	51.0	49.0	49.0	49.0	49.0	49.0	49.0
Total Split (%)	39.0%	39.0%	39.0%	12.0%	51.0%	51.0%	49.0%	49.0%	49.0%	49.0%	49.0%	49.0%
Yellow Time (s)	4.6	4.6	4.6	3.0	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	4.0	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Recall Mode	C-Min	C-Min	C-Min	None	C-Min	C-Min	Min	Min	Min	Min	Min	Min
Act Effct Green (s)	31.5	31.5	31.5	47.2	44.6	44.6	42.2	42.2	42.2	42.2	42.2	42.2
Actuated g/C Ratio	0.32	0.32	0.32	0.47	0.45	0.45	0.42	0.42	0.42	0.42	0.42	0.42
v/c Ratio	0.54	0.82	0.13	0.81	0.83	0.03	0.21	0.17	0.15	0.20	0.94	0.30
Control Delay	45.5	45.6	5.0	41.5	35.6	3.3	29.9	18.5	4.3	19.4	49.3	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	45.6	5.0	41.5	35.6	3.3	29.9	18.5	4.3	19.4	49.3	8.8
LOS	D	D	A	D	D	A	C	B	A	B	D	A
Approach Delay		40.7			36.2			13.3			38.1	
Approach LOS		D			D			B			D	

Intersection Summary		
Cycle Length: 100		
Actuated Cycle Length: 100		
Offset: 61 (61%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.94		
Intersection Signal Delay: 35.9	Intersection LOS: D	
Intersection Capacity Utilization 116.6%	ICU Level of Service H	
Analysis Period (min) 15		

Splits and Phases: 1: The Gore Rd & King St



Queues
1: The Gore Rd & King St

Future Total Conditions
Morning Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	71	451	71	245	659	26	11	135	98	103	764	227
v/c Ratio	0.54	0.82	0.13	0.81	0.83	0.03	0.21	0.17	0.15	0.20	0.94	0.30
Control Delay	45.5	45.6	5.0	41.5	35.6	3.3	29.9	18.5	4.3	19.4	49.3	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	45.6	5.0	41.5	35.6	3.3	29.9	18.5	4.3	19.4	49.3	8.8
Queue Length 50th (m)	11.9	84.5	0.0	30.6	117.8	0.0	1.4	16.4	0.0	12.7	142.5	11.0
Queue Length 95th (m)	#29.3	#133.3	7.9	#65.8	#181.9	3.3	6.7	29.2	9.5	24.8	#224.4	27.1
Internal Link Dist (m)		339.2			168.2			604.5			363.0	
Turn Bay Length (m)	135.0		25.0	140.0		25.0	200.0		50.0	175.0		50.0
Base Capacity (vph)	137	568	572	302	803	758	54	824	670	515	824	778
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.79	0.12	0.81	0.82	0.03	0.20	0.16	0.15	0.20	0.93	0.29

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: The Gore Rd & King St

Future Total Conditions
Morning Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	451	71	245	659	26	11	135	98	103	764	227
Future Volume (vph)	71	451	71	245	659	26	11	135	98	103	764	227
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Total Lost time (s)	6.6	6.6	6.6	4.0	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1580	1746	1585	1700	1779	1633	1275	1921	1432	1700	1921	1633
Flt Permitted	0.25	1.00	1.00	0.22	1.00	1.00	0.09	1.00	1.00	0.67	1.00	1.00
Satd. Flow (perm)	420	1746	1585	385	1779	1633	127	1921	1432	1200	1921	1633
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	71	451	71	245	659	26	11	135	98	103	764	227
RTOR Reduction (vph)	0	0	49	0	0	14	0	0	57	0	0	78
Lane Group Flow (vph)	71	451	22	245	659	12	11	135	41	103	764	149
Heavy Vehicles (%)	13%	10%	3%	5%	8%	0%	40%	0%	14%	5%	0%	0%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	31.5	31.5	31.5	44.6	44.6	44.6	42.2	42.2	42.2	42.2	42.2	42.2
Effective Green, g (s)	31.5	31.5	31.5	44.6	44.6	44.6	42.2	42.2	42.2	42.2	42.2	42.2
Actuated g/C Ratio	0.32	0.32	0.32	0.45	0.45	0.45	0.42	0.42	0.42	0.42	0.42	0.42
Clearance Time (s)	6.6	6.6	6.6	4.0	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6
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)	132	549	499	291	793	728	53	810	604	506	810	689
v/s Ratio Prot		0.26		0.08	c0.37			0.07			c0.40	
v/s Ratio Perm	0.17		0.01	c0.30		0.01	0.09		0.03	0.09		0.09
v/c Ratio	0.54	0.82	0.04	0.84	0.83	0.02	0.21	0.17	0.07	0.20	0.94	0.22
Uniform Delay, d1	28.2	31.7	23.8	21.1	24.4	15.5	18.3	18.0	17.2	18.3	27.7	18.4
Progression 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
Incremental Delay, d2	14.8	13.0	0.2	19.3	9.9	0.0	1.9	0.1	0.0	0.2	19.1	0.2
Delay (s)	43.1	44.6	24.0	40.4	34.3	15.5	20.3	18.1	17.2	18.5	46.8	18.5
Level of Service	D	D	C	D	C	B	C	B	B	B	D	B
Approach Delay (s)		42.0			35.4			17.8			38.3	
Approach LOS		D			D			B			D	

Intersection Summary

HCM 2000 Control Delay	36.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.2
Intersection Capacity Utilization	116.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

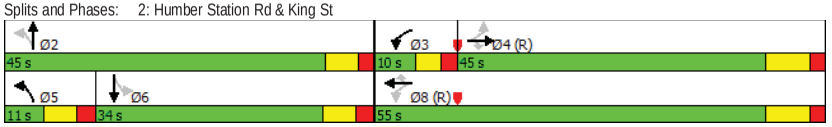
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	50.0		25.0	50.0		25.0	0.0		0.0	50.0		0.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			0.0			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850		0.988			0.998	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	1762	1555	1716	1830	1633	1102	1808	0	1240	1805	0
Flt Permitted	0.304			0.181			0.181			0.653		
Satd. Flow (perm)	571	1762	1555	327	1830	1633	210	1808	0	852	1805	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			177			103		5			1	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		342.4			840.4			348.4			649.8	
Travel Time (s)		24.7			60.5			25.1			46.8	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	3	577	429	84	637	133	107	151	170	387
Future Volume (vph)	3	577	429	84	637	133	107	151	170	387
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	NA
Protected Phases		4		3	8		5	2		6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	4	4	4	3	8	8	5	2	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	14.4	14.4	14.4
Minimum Split (s)	31.4	31.4	31.4	10.0	31.4	31.4	11.2	30.0	30.2	30.2
Total Split (s)	45.0	45.0	45.0	10.0	55.0	55.0	11.0	45.0	34.0	34.0
Total Split (%)	45.0%	45.0%	45.0%	10.0%	55.0%	55.0%	11.0%	45.0%	34.0%	34.0%
Yellow Time (s)	5.4	5.4	5.4	3.0	5.4	5.4	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.0	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.4	7.4	7.4	5.0	7.4	7.4	6.2	6.0	6.2	6.2
Lead/Lag	Lag	Lag	Lag	Lead			Lead		Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes		Yes	Yes
Recall Mode	C-Min	C-Min	C-Min	None	C-Min	C-Min	None	Min	Min	Min
Act Effct Green (s)	40.3	40.3	40.3	51.2	48.8	48.8	37.6	37.8	25.1	25.1
Actuated g/C Ratio	0.40	0.40	0.40	0.51	0.49	0.49	0.38	0.38	0.25	0.25
v/c Ratio	0.01	0.81	0.59	0.34	0.71	0.16	0.80	0.24	0.80	0.86
Control Delay	20.0	38.8	17.8	16.9	26.0	5.1	66.0	21.4	61.6	54.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	38.8	17.8	16.9	26.0	5.1	66.0	21.4	61.6	54.8
LOS	B	D	B	B	C	A	E	C	E	D
Approach Delay		29.9			21.9			39.0		56.9
Approach LOS		C			C			D		E

Intersection Summary		
Cycle Length: 100		
Actuated Cycle Length: 100		
Offset: 56.4 (56%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green		
Natural Cycle: 85		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.86		
Intersection Signal Delay: 33.9	Intersection LOS: C	
Intersection Capacity Utilization 86.9%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 2: Humber Station Rd & King St



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	3	577	429	84	637	133	107	164	170	391
v/c Ratio	0.01	0.81	0.59	0.34	0.71	0.16	0.80	0.24	0.80	0.86
Control Delay	20.0	38.8	17.8	16.9	26.0	5.1	66.0	21.4	61.6	54.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	38.8	17.8	16.9	26.0	5.1	66.0	21.4	61.6	54.8
Queue Length 50th (m)	0.4	107.5	40.4	8.5	99.3	3.1	14.7	21.6	31.6	74.1
Queue Length 95th (m)	2.3	#171.5	74.1	16.9	145.7	13.2	#43.2	36.5	#64.3	#117.8
Internal Link Dist (m)		318.4			816.4			324.4		625.8
Turn Bay Length (m)	50.0		25.0	50.0		25.0			50.0	
Base Capacity (vph)	231	713	735	246	893	850	134	708	236	502
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.81	0.58	0.34	0.71	0.16	0.80	0.23	0.72	0.78

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	577	429	84	637	133	107	151	13	170	387	4
Future Volume (vph)	3	577	429	84	637	133	107	151	13	170	387	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Total Lost time (s)	7.4	7.4	7.4	5.0	7.4	7.4	6.2	6.0		6.2	6.2	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1785	1762	1555	1716	1830	1633	1102	1808		1240	1806	
Flt Permitted	0.30	1.00	1.00	0.18	1.00	1.00	0.18	1.00		0.65	1.00	
Satd. Flow (perm)	571	1762	1555	327	1830	1633	209	1808		852	1806	
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)	3	577	429	84	637	133	107	151	13	170	387	4
RTOR Reduction (vph)	0	0	108	0	0	53	0	3	0	0	1	0
Lane Group Flow (vph)	3	577	321	84	637	80	107	161	0	170	390	0
Heavy Vehicles (%)	0%	9%	5%	4%	5%	0%	62%	0%	63%	44%	6%	25%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	39.2	39.2	39.2	48.8	48.8	48.8	37.8	37.8		25.1	25.1	
Effective Green, g (s)	39.2	39.2	39.2	48.8	48.8	48.8	37.8	37.8		25.1	25.1	
Actuated g/C Ratio	0.39	0.39	0.39	0.49	0.49	0.49	0.38	0.38		0.25	0.25	
Clearance Time (s)	7.4	7.4	7.4	5.0	7.4	7.4	6.2	6.0		6.2	6.2	
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)	223	690	609	223	893	796	135	683		213	453	
v/s Ratio Prot		c0.33		0.02	c0.35		c0.05	0.09			0.22	
v/s Ratio Perm	0.01		0.21	0.17		0.05	c0.25			0.20		
v/c Ratio	0.01	0.84	0.53	0.38	0.71	0.10	0.79	0.24		0.80	0.86	
Uniform Delay, d1	18.6	27.5	23.3	17.6	20.1	13.8	25.0	21.2		35.1	35.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	11.5	3.3	1.1	4.8	0.3	26.4	0.2		18.5	15.4	
Delay (s)	18.7	39.0	26.6	18.7	24.9	14.0	51.4	21.4		53.6	51.2	
Level of Service	B	D	C	B	C	B	D	C		D	D	
Approach Delay (s)		33.7			22.6			33.3			51.9	
Approach LOS		C			C			C			D	

Intersection Summary

HCM 2000 Control Delay	33.9	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.87				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		24.8	
Intersection Capacity Utilization	86.9%	ICU Level of Service		E	
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%	0%		0%	
Storage Length (m)	50.0			25.0	0.0	0.0
Storage Lanes	1			1	1	0
Taper Length (m)	7.5				0.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850	0.945	
Flt Protected	0.950				0.971	
Satd. Flow (prot)	1750	1883	1883	1601	1728	0
Flt Permitted	0.950				0.971	
Satd. Flow (perm)	1750	1883	1883	1601	1728	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		192.2	368.5		90.0	
Travel Time (s)		13.8	26.5		6.5	

Intersection Summary	
Area Type:	Other

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	42	622	822	45	159	109
Future Volume (Veh/h)	42	622	822	45	159	109
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)	42	622	822	45	159	109
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (m)		192	369			
pX, platoon unblocked	0.75				0.86	0.75
vC, conflicting volume	867				1528	822
vC1, stage 1 conf vol					822	
vC2, stage 2 conf vol					706	
vCu, unblocked vol	656				935	596
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	94				56	71
cM capacity (veh/h)	698				358	378

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	42	622	822	45	268
Volume Left	42	0	0	0	159
Volume Right	0	0	0	45	109
cSH	698	1700	1700	1700	366
Volume to Capacity	0.06	0.37	0.48	0.03	0.73
Queue Length 95th (m)	1.5	0.0	0.0	0.0	45.0
Control Delay (s)	10.5	0.0	0.0	0.0	37.5
Lane LOS	B				E
Approach Delay (s)	0.7		0.0		37.5
Approach LOS					E

Intersection Summary			
Average Delay		5.8	
Intersection Capacity Utilization		65.4%	ICU Level of Service C
Analysis Period (min)		15	

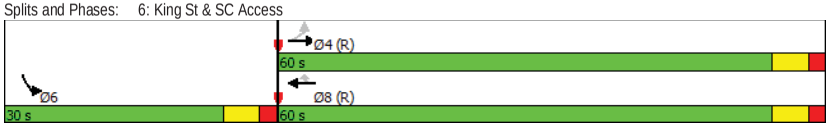
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%	0%		0%	
Storage Length (m)	50.0			25.0	0.0	0.0
Storage Lanes	1			1	1	0
Taper Length (m)	7.5				0.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850	0.944	
Flt Protected	0.950				0.971	
Satd. Flow (prot)	1750	1883	1883	1601	1726	0
Flt Permitted	0.283				0.971	
Satd. Flow (perm)	521	1883	1883	1601	1726	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				23	38	
Link Speed (k/h)		50	50		50	
Link Distance (m)		368.5	458.8		105.2	
Travel Time (s)		26.5	33.0		7.6	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBT	WBT	WBR	SBL
Lane Configurations					
Traffic Volume (vph)	42	739	758	43	155
Future Volume (vph)	42	739	758	43	155
Turn Type	Perm	NA	NA	Perm	Prot
Protected Phases		4	8		6
Permitted Phases	4			8	
Detector Phase	4	4	8	8	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.0	23.0	23.0	23.0	30.0
Total Split (s)	60.0	60.0	60.0	60.0	30.0
Total Split (%)	66.7%	66.7%	66.7%	66.7%	33.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min
Act Effct Green (s)	60.8	60.8	60.8	60.8	17.2
Actuated g/C Ratio	0.68	0.68	0.68	0.68	0.19
v/c Ratio	0.12	0.58	0.60	0.04	0.73
Control Delay	7.7	11.1	8.3	1.2	40.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.7	11.1	8.3	1.2	40.8
LOS	A	B	A	A	D
Approach Delay		11.0	7.9		40.8
Approach LOS		B	A		D

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 90		
Offset: 36 (40%), Referenced to phase 4:EBTL and 8:WBT, Start of Green		
Natural Cycle: 65		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.73		
Intersection Signal Delay: 13.9	Intersection LOS: B	
Intersection Capacity Utilization 65.2%	ICU Level of Service C	
Analysis Period (min) 15		

Splits and Phases: 6: King St & SC Access



Lane Group	EBL	EBT	WBT	WBR	SBL
Lane Group Flow (vph)	42	739	758	43	264
v/c Ratio	0.12	0.58	0.60	0.04	0.73
Control Delay	7.7	11.1	8.3	1.2	40.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.7	11.1	8.3	1.2	40.8
Queue Length 50th (m)	2.4	63.2	88.6	0.2	38.9
Queue Length 95th (m)	8.0	119.7	138.5	m0.7	60.2
Internal Link Dist (m)		344.5	434.8		81.2
Turn Bay Length (m)	50.0			25.0	
Base Capacity (vph)	352	1272	1272	1089	488
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.12	0.58	0.60	0.04	0.54

Intersection Summary

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	42	739	758	43	155	109
Future Volume (vph)	42	739	758	43	155	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.7	3.7	3.7
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	1.00	0.85	0.94	
Flt Protected	0.95	1.00	1.00	1.00	0.97	
Satd. Flow (prot)	1750	1883	1883	1601	1728	
Flt Permitted	0.28	1.00	1.00	1.00	0.97	
Satd. Flow (perm)	522	1883	1883	1601	1728	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	42	739	758	43	155	109
RTOR Reduction (vph)	0	0	0	7	31	0
Lane Group Flow (vph)	42	739	758	36	233	0
Turn Type	Perm	NA	NA	Perm	Prot	
Protected Phases		4	8		6	
Permitted Phases	4			8		
Actuated Green, G (s)	60.8	60.8	60.8	60.8	17.2	
Effective Green, g (s)	60.8	60.8	60.8	60.8	17.2	
Actuated g/C Ratio	0.68	0.68	0.68	0.68	0.19	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	352	1272	1272	1081	330	
v/s Ratio Prot		0.39	c0.40		c0.14	
v/s Ratio Perm	0.08			0.02		
v/c Ratio	0.12	0.58	0.60	0.03	0.71	
Uniform Delay, d1	5.2	7.8	7.9	4.8	34.0	
Progression Factor	1.00	1.00	0.70	0.29	1.00	
Incremental Delay, d2	0.7	1.9	1.7	0.0	6.8	
Delay (s)	5.8	9.7	7.3	1.4	40.8	
Level of Service	A	A	A	A	D	
Approach Delay (s)		9.5	7.0		40.8	
Approach LOS		A	A		D	

Intersection Summary

HCM 2000 Control Delay	12.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

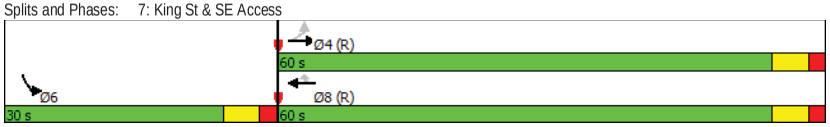
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%	0%		0%	
Storage Length (m)	50.0			25.0	0.0	0.0
Storage Lanes	1			1	1	0
Taper Length (m)	7.5				0.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850	0.946	
Flt Protected	0.950				0.971	
Satd. Flow (prot)	1750	1883	1883	1601	1730	0
Flt Permitted	0.319				0.971	
Satd. Flow (perm)	588	1883	1883	1601	1730	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				40	37	
Link Speed (k/h)		50	50		50	
Link Distance (m)		458.8	342.4		146.4	
Travel Time (s)		33.0	24.7		10.5	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBT	WBT	WBR	SBL
Lane Configurations					
Traffic Volume (vph)	43	851	689	66	166
Future Volume (vph)	43	851	689	66	166
Turn Type	Perm	NA	NA	Perm	Prot
Protected Phases		4	8		6
Permitted Phases	4			8	
Detector Phase	4	4	8	8	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.0	23.0	23.0	23.0	30.0
Total Split (s)	60.0	60.0	60.0	60.0	30.0
Total Split (%)	66.7%	66.7%	66.7%	66.7%	33.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min
Act Effct Green (s)	60.2	60.2	60.2	60.2	17.8
Actuated g/C Ratio	0.67	0.67	0.67	0.67	0.20
v/c Ratio	0.11	0.68	0.55	0.06	0.75
Control Delay	7.3	16.8	10.8	3.6	41.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.3	16.8	10.8	3.6	41.6
LOS	A	B	B	A	D
Approach Delay		16.4	10.2		41.6
Approach LOS		B	B		D

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 90		
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green		
Natural Cycle: 70		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.75		
Intersection Signal Delay: 17.6		Intersection LOS: B
Intersection Capacity Utilization 70.8%		ICU Level of Service C
Analysis Period (min) 15		

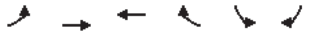
Splits and Phases: 7: King St & SE Access



Lane Group	EBL	EBT	WBT	WBR	SBL
Lane Group Flow (vph)	43	851	689	66	278
v/c Ratio	0.11	0.68	0.55	0.06	0.75
Control Delay	7.3	16.8	10.8	3.6	41.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.3	16.8	10.8	3.6	41.6
Queue Length 50th (m)	3.9	117.4	58.1	1.4	41.6
Queue Length 95th (m)	m5.9	181.7	107.1	6.8	63.7
Internal Link Dist (m)		434.8	318.4		122.4
Turn Bay Length (m)	50.0			25.0	
Base Capacity (vph)	393	1259	1259	1084	488
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.11	0.68	0.55	0.06	0.57

Intersection Summary

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



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	43	851	689	66	166	112
Future Volume (vph)	43	851	689	66	166	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.7	3.7	3.7
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	1.00	0.85	0.95	
Flt Protected	0.95	1.00	1.00	1.00	0.97	
Satd. Flow (prot)	1750	1883	1883	1601	1729	
Flt Permitted	0.32	1.00	1.00	1.00	0.97	
Satd. Flow (perm)	588	1883	1883	1601	1729	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	43	851	689	66	166	112
RTOR Reduction (vph)	0	0	0	13	30	0
Lane Group Flow (vph)	43	851	689	53	248	0
Turn Type	Perm	NA	NA	Perm	Prot	
Protected Phases		4	8		6	
Permitted Phases	4			8		
Actuated Green, G (s)	60.2	60.2	60.2	60.2	17.8	
Effective Green, g (s)	60.2	60.2	60.2	60.2	17.8	
Actuated g/C Ratio	0.67	0.67	0.67	0.67	0.20	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	393	1259	1259	1070	341	
v/s Ratio Prot		c0.45	0.37		c0.14	
v/s Ratio Perm	0.07			0.03		
v/c Ratio	0.11	0.68	0.55	0.05	0.73	
Uniform Delay, d1	5.3	9.0	7.8	5.1	33.8	
Progression Factor	0.97	1.35	1.00	1.00	1.00	
Incremental Delay, d2	0.5	2.4	1.7	0.1	7.6	
Delay (s)	5.6	14.5	9.5	5.2	41.4	
Level of Service	A	B	A	A	D	
Approach Delay (s)		14.1	9.1		41.4	
Approach LOS		B	A		D	

Intersection Summary

HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

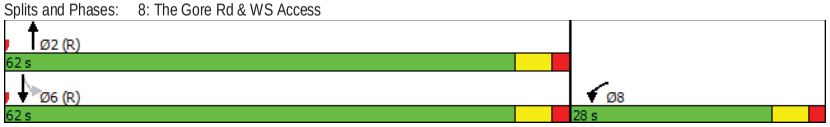
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.5	3.7
Grade (%)	0%		0%			0%
Storage Length (m)	0.0	0.0		0.0	50.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	0.0				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.986		0.975			
Flt Protected	0.957				0.950	
Satd. Flow (prot)	1777	0	1836	0	1750	1883
Flt Permitted	0.957				0.616	
Satd. Flow (perm)	1777	0	1836	0	1135	1883
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	6		24			
Link Speed (k/h)	50		50			50
Link Distance (m)	162.1		387.0			198.4
Travel Time (s)	11.7		27.9			14.3

Intersection Summary	
Area Type:	Other

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	150	186	6	944
Future Volume (vph)	150	186	6	944
Turn Type	Prot	NA	Perm	NA
Protected Phases	8	2		6
Permitted Phases			6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	28.0	25.0	25.0	25.0
Total Split (s)	28.0	62.0	62.0	62.0
Total Split (%)	31.1%	68.9%	68.9%	68.9%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Min	C-Min	C-Min
Act Effct Green (s)	13.5	64.5	64.5	64.5
Actuated g/C Ratio	0.15	0.72	0.72	0.72
v/c Ratio	0.62	0.17	0.01	0.70
Control Delay	44.0	4.5	3.0	8.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	44.0	4.5	3.0	8.2
LOS	D	A	A	A
Approach Delay	44.0	4.5		8.2
Approach LOS	D	A		A

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 12.0	Intersection LOS: B
Intersection Capacity Utilization 69.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 8: The Gore Rd & WS Access



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	168	228	6	944
v/c Ratio	0.62	0.17	0.01	0.70
Control Delay	44.0	4.5	3.0	8.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	44.0	4.5	3.0	8.2
Queue Length 50th (m)	28.0	10.0	0.2	36.3
Queue Length 95th (m)	45.7	21.5	m0.4	42.8
Internal Link Dist (m)	138.1	363.0		174.4
Turn Bay Length (m)			50.0	
Base Capacity (vph)	438	1322	813	1349
Starvation Cap Reductn	0	0	0	3
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.38	0.17	0.01	0.70

Intersection Summary

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

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	150	18	186	42	6	944
Future Volume (vph)	150	18	186	42	6	944
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.7	3.7	3.7	3.5	3.7
Total Lost time (s)	6.0		6.0		6.0	6.0
Lane Util. Factor	1.00		1.00		1.00	1.00
Frt	0.99		0.98		1.00	1.00
Flt Protected	0.96		1.00		0.95	1.00
Satd. Flow (prot)	1777		1837		1750	1883
Flt Permitted	0.96		1.00		0.62	1.00
Satd. Flow (perm)	1777		1837		1135	1883
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	150	18	186	42	6	944
RTOR Reduction (vph)	5	0	7	0	0	0
Lane Group Flow (vph)	163	0	221	0	6	944
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	13.5		64.5		64.5	64.5
Effective Green, g (s)	13.5		64.5		64.5	64.5
Actuated g/C Ratio	0.15		0.72		0.72	0.72
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	266		1316		813	1349
v/s Ratio Prot	c0.09		0.12			c0.50
v/s Ratio Perm					0.01	
v/c Ratio	0.61		0.17		0.01	0.70
Uniform Delay, d1	35.8		4.1		3.6	7.2
Progression Factor	1.00		1.00		0.61	0.65
Incremental Delay, d2	4.1		0.3		0.0	2.6
Delay (s)	39.9		4.4		2.2	7.3
Level of Service	D		A		A	A
Approach Delay (s)	39.9		4.4			7.2
Approach LOS	D		A			A

Intersection Summary

HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

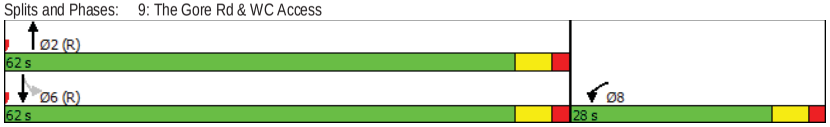
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.5	3.7
Grade (%)	0%		0%			0%
Storage Length (m)	0.0	0.0		0.0	50.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	0.0				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.985		0.972			
Flt Protected	0.957				0.950	
Satd. Flow (prot)	1775	0	1831	0	1750	1883
Flt Permitted	0.957				0.629	
Satd. Flow (perm)	1775	0	1831	0	1159	1883
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	7		27			
Link Speed (k/h)	50		50			50
Link Distance (m)	106.6		198.4			231.4
Travel Time (s)	7.7		14.3			16.7

Intersection Summary	
Area Type:	Other

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	145	163	6	804
Future Volume (vph)	145	163	6	804
Turn Type	Prot	NA	Perm	NA
Protected Phases	8	2		6
Permitted Phases			6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	28.0	25.0	25.0	25.0
Total Split (s)	28.0	62.0	62.0	62.0
Total Split (%)	31.1%	68.9%	68.9%	68.9%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Min	C-Min	C-Min
Act Effct Green (s)	13.2	64.8	64.8	64.8
Actuated g/C Ratio	0.15	0.72	0.72	0.72
v/c Ratio	0.61	0.15	0.01	0.59
Control Delay	43.7	3.6	3.5	6.8
Queue Delay	0.0	0.0	0.0	0.1
Total Delay	43.7	3.6	3.5	6.9
LOS	D	A	A	A
Approach Delay	43.7	3.6		6.9
Approach LOS	D	A		A

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 11.4	Intersection LOS: B
Intersection Capacity Utilization 61.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 9: The Gore Rd & WC Access



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	163	205	6	804
v/c Ratio	0.61	0.15	0.01	0.59
Control Delay	43.7	3.6	3.5	6.8
Queue Delay	0.0	0.0	0.0	0.1
Total Delay	43.7	3.6	3.5	6.9
Queue Length 50th (m)	26.9	6.7	0.2	43.2
Queue Length 95th (m)	44.3	12.3	m0.6	43.1
Internal Link Dist (m)	82.6	174.4		207.4
Turn Bay Length (m)			50.0	
Base Capacity (vph)	439	1325	834	1355
Starvation Cap Reductn	0	0	0	7
Spillback Cap Reductn	0	0	0	39
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.37	0.15	0.01	0.61

Intersection Summary

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

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	145	18	163	42	6	804
Future Volume (vph)	145	18	163	42	6	804
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.7	3.7	3.7	3.5	3.7
Total Lost time (s)	6.0		6.0		6.0	6.0
Lane Util. Factor	1.00		1.00		1.00	1.00
Frt	0.99		0.97		1.00	1.00
Flt Protected	0.96		1.00		0.95	1.00
Satd. Flow (prot)	1776		1831		1750	1883
Flt Permitted	0.96		1.00		0.63	1.00
Satd. Flow (perm)	1776		1831		1159	1883
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	145	18	163	42	6	804
RTOR Reduction (vph)	6	0	8	0	0	0
Lane Group Flow (vph)	157	0	197	0	6	804
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	13.2		64.8		64.8	64.8
Effective Green, g (s)	13.2		64.8		64.8	64.8
Actuated g/C Ratio	0.15		0.72		0.72	0.72
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	260		1318		834	1355
v/s Ratio Prot	c0.09		0.11			c0.43
v/s Ratio Perm					0.01	
v/c Ratio	0.60		0.15		0.01	0.59
Uniform Delay, d1	36.0		4.0		3.5	6.2
Progression Factor	1.00		0.85		0.73	0.71
Incremental Delay, d2	3.9		0.2		0.0	1.7
Delay (s)	39.9		3.6		2.6	6.1
Level of Service	D		A		A	A
Approach Delay (s)	39.9		3.6			6.1
Approach LOS	D		A			A

Intersection Summary

HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

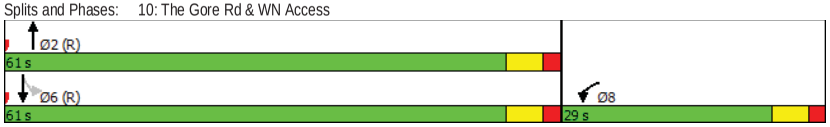
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.5	3.7
Grade (%)	0%		0%			0%
Storage Length (m)	0.0	0.0		0.0	50.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	0.0				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.985		0.968			
Flt Protected	0.957				0.950	
Satd. Flow (prot)	1775	0	1823	0	1750	1883
Flt Permitted	0.957				0.643	
Satd. Flow (perm)	1775	0	1823	0	1184	1883
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	7		32			
Link Speed (k/h)	50		50			50
Link Distance (m)	119.9		231.4			136.3
Travel Time (s)	8.6		16.7			9.8

Intersection Summary	
Area Type:	Other

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	145	138	6	664
Future Volume (vph)	145	138	6	664
Turn Type	Prot	NA	Perm	NA
Protected Phases	8	2		6
Permitted Phases			6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	28.0	25.0	25.0	25.0
Total Split (s)	29.0	61.0	61.0	61.0
Total Split (%)	32.2%	67.8%	67.8%	67.8%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Min	C-Min	C-Min
Act Effct Green (s)	13.2	64.8	64.8	64.8
Actuated g/C Ratio	0.15	0.72	0.72	0.72
v/c Ratio	0.61	0.14	0.01	0.49
Control Delay	43.7	3.3	4.7	7.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	43.7	3.3	4.7	7.6
LOS	D	A	A	A
Approach Delay	43.7	3.3		7.5
Approach LOS	D	A		A

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 90		
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green		
Natural Cycle: 60		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.61		
Intersection Signal Delay: 12.6	Intersection LOS: B	
Intersection Capacity Utilization 54.1%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 10: The Gore Rd & WN Access



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	163	181	6	664
v/c Ratio	0.61	0.14	0.01	0.49
Control Delay	43.7	3.3	4.7	7.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	43.7	3.3	4.7	7.6
Queue Length 50th (m)	26.9	4.9	0.3	43.9
Queue Length 95th (m)	44.3	13.2	1.6	82.1
Internal Link Dist (m)	95.9	207.4		112.3
Turn Bay Length (m)			50.0	
Base Capacity (vph)	458	1321	852	1355
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.36	0.14	0.01	0.49

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	145	18	138	43	6	664
Future Volume (vph)	145	18	138	43	6	664
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.7	3.7	3.7	3.5	3.7
Total Lost time (s)	6.0		6.0		6.0	6.0
Lane Util. Factor	1.00		1.00		1.00	1.00
Frt	0.99		0.97		1.00	1.00
Flt Protected	0.96		1.00		0.95	1.00
Satd. Flow (prot)	1776		1823		1750	1883
Flt Permitted	0.96		1.00		0.64	1.00
Satd. Flow (perm)	1776		1823		1185	1883
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	145	18	138	43	6	664
RTOR Reduction (vph)	6	0	9	0	0	0
Lane Group Flow (vph)	157	0	172	0	6	664
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	13.2		64.8		64.8	64.8
Effective Green, g (s)	13.2		64.8		64.8	64.8
Actuated g/C Ratio	0.15		0.72		0.72	0.72
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	260		1312		853	1355
v/s Ratio Prot	c0.09		0.09			c0.35
v/s Ratio Perm					0.01	
v/c Ratio	0.60		0.13		0.01	0.49
Uniform Delay, d1	36.0		3.9		3.5	5.5
Progression Factor	1.00		0.81		1.00	1.00
Incremental Delay, d2	3.9		0.2		0.0	1.3
Delay (s)	39.9		3.4		3.6	6.7
Level of Service	D		A		A	A
Approach Delay (s)	39.9		3.4			6.7
Approach LOS	D		A			A

Intersection Summary

HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

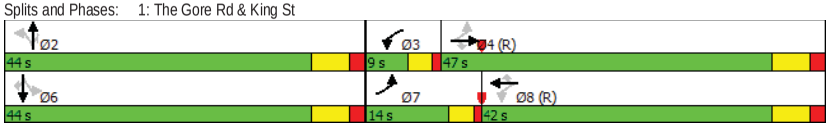
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	135.0		25.0	140.0		25.0	200.0		50.0	175.0		50.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	1847	1633	1539	1865	1585	1785	1921	1555	1684	1865	1541
Flt Permitted	0.155			0.205			0.483			0.112		
Satd. Flow (perm)	291	1847	1633	332	1865	1585	908	1921	1555	199	1865	1541
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			83			127			201			127
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		363.2			192.2			628.5			387.0	
Travel Time (s)		26.2			13.8			45.3			27.9	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	266	609	14	146	559	101	87	634	306	35	294	104
Future Volume (vph)	266	609	14	146	559	101	87	634	306	35	294	104
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	18.6	18.6	18.6	18.6	18.6	18.6
Minimum Split (s)	9.0	30.6	30.6	9.0	30.6	30.6	30.6	30.6	30.6	30.6	30.6	30.6
Total Split (s)	14.0	47.0	47.0	9.0	42.0	42.0	44.0	44.0	44.0	44.0	44.0	44.0
Total Split (%)	14.0%	47.0%	47.0%	9.0%	42.0%	42.0%	44.0%	44.0%	44.0%	44.0%	44.0%	44.0%
Yellow Time (s)	3.0	4.6	4.6	3.0	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.6	6.6	4.0	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	Min	Min	Min	Min	Min	Min
Act Effct Green (s)	53.7	40.7	40.7	44.9	35.8	35.8	35.7	35.7	35.7	35.7	35.7	35.7
Actuated g/C Ratio	0.54	0.41	0.41	0.45	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36
v/c Ratio	0.82	0.81	0.02	0.65	0.84	0.16	0.27	0.92	0.45	0.49	0.44	0.16
Control Delay	37.8	36.8	0.1	31.2	42.7	2.9	24.8	51.6	10.3	51.5	26.6	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.8	36.8	0.1	31.2	42.7	2.9	24.8	51.6	10.3	51.5	26.6	3.1
LOS	D	D	A	C	D	A	C	D	B	D	C	A
Approach Delay		36.5			35.6			37.0			22.9	
Approach LOS		D			D			D			C	

Intersection Summary		
Cycle Length: 100		
Actuated Cycle Length: 100		
Offset: 58 (58%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.92		
Intersection Signal Delay: 34.6	Intersection LOS: C	
Intersection Capacity Utilization 112.9%	ICU Level of Service H	
Analysis Period (min) 15		

Splits and Phases: 1: The Gore Rd & King St



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	266	609	14	146	559	101	87	634	306	35	294	104
v/c Ratio	0.82	0.81	0.02	0.65	0.84	0.16	0.27	0.92	0.45	0.49	0.44	0.16
Control Delay	37.8	36.8	0.1	31.2	42.7	2.9	24.8	51.6	10.3	51.5	26.6	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.8	36.8	0.1	31.2	42.7	2.9	24.8	51.6	10.3	51.5	26.6	3.1
Queue Length 50th (m)	29.2	108.4	0.0	15.1	104.0	0.0	12.1	119.1	14.2	5.3	43.9	0.0
Queue Length 95th (m)	#73.3	#168.6	0.0	#34.7	#163.5	7.1	24.6	#186.0	36.4	#20.0	67.6	7.6
Internal Link Dist (m)		339.2			168.2			604.5			363.0	
Turn Bay Length (m)	135.0		25.0	140.0		25.0	200.0		50.0	175.0		50.0
Base Capacity (vph)	323	763	724	226	681	659	339	718	707	74	697	655
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.80	0.02	0.65	0.82	0.15	0.26	0.88	0.43	0.47	0.42	0.16

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	266	609	14	146	559	101	87	634	306	35	294	104
Future Volume (vph)	266	609	14	146	559	101	87	634	306	35	294	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Total Lost time (s)	4.0	6.6	6.6	4.0	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1785	1847	1633	1539	1865	1585	1785	1921	1555	1684	1865	1541
Flt Permitted	0.16	1.00	1.00	0.21	1.00	1.00	0.48	1.00	1.00	0.11	1.00	1.00
Satd. Flow (perm)	292	1847	1633	333	1865	1585	908	1921	1555	199	1865	1541
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)	266	609	14	146	559	101	87	634	306	35	294	104
RTOR Reduction (vph)	0	0	8	0	0	65	0	0	129	0	0	67
Lane Group Flow (vph)	266	609	6	146	559	36	87	634	177	35	294	37
Heavy Vehicles (%)	0%	4%	0%	16%	3%	3%	0%	0%	5%	6%	3%	6%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	51.1	40.7	40.7	42.3	35.9	35.9	35.7	35.7	35.7	35.7	35.7	35.7
Effective Green, g (s)	51.1	40.7	40.7	42.3	35.9	35.9	35.7	35.7	35.7	35.7	35.7	35.7
Actuated g/C Ratio	0.51	0.41	0.41	0.42	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36
Clearance Time (s)	4.0	6.6	6.6	4.0	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6
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)	316	751	664	218	669	569	324	685	555	71	665	550
v/s Ratio Prot	c0.09	0.33		0.04	0.30			c0.33			0.16	
v/s Ratio Perm	c0.34		0.00	0.24		0.02	0.10		0.11	0.18		0.02
v/c Ratio	0.84	0.81	0.01	0.67	0.84	0.06	0.27	0.93	0.32	0.49	0.44	0.07
Uniform Delay, d1	19.1	26.2	17.6	20.7	29.3	21.0	22.9	30.9	23.3	25.1	24.5	21.2
Progression 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
Incremental Delay, d2	18.0	9.3	0.0	7.6	11.8	0.2	0.4	18.4	0.3	5.3	0.5	0.1
Delay (s)	37.1	35.5	17.7	28.2	41.1	21.2	23.3	49.3	23.7	30.4	25.0	21.2
Level of Service	D	D	B	C	D	C	C	D	C	C	C	C
Approach Delay (s)		35.7			36.3			39.4			24.5	
Approach LOS		D			D			D			C	

Intersection Summary

HCM 2000 Control Delay	35.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.2
Intersection Capacity Utilization	112.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

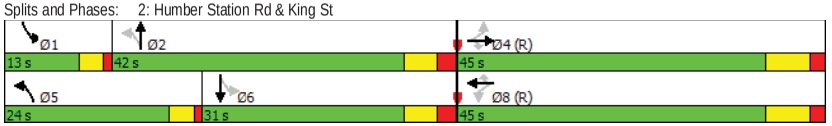
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	50.0		25.0	50.0		25.0	0.0		0.0	50.0		0.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			0.0			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850		0.983			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1566	1830	1296	1095	1883	1219	1733	1804	0	1785	1898	0
Flt Permitted	0.174			0.122			0.388			0.194		
Satd. Flow (perm)	287	1830	1296	141	1883	1219	708	1804	0	365	1898	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			124			124		7			4	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		342.4			840.4			348.4			649.8	
Travel Time (s)		24.7			60.5			25.1			46.8	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	22	669	229	13	617	231	380	489	199	233
Future Volume (vph)	22	669	229	13	617	231	380	489	199	233
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases		4			8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	4	4	4	8	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	14.4	5.0	14.4
Minimum Split (s)	31.4	31.4	31.4	31.4	31.4	31.4	9.0	30.4	9.0	30.4
Total Split (s)	45.0	45.0	45.0	45.0	45.0	45.0	24.0	42.0	13.0	31.0
Total Split (%)	45.0%	45.0%	45.0%	45.0%	45.0%	45.0%	24.0%	42.0%	13.0%	31.0%
Yellow Time (s)	5.4	5.4	5.4	5.4	5.4	5.4	3.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.4	1.0	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.4	7.4	7.4	7.4	7.4	7.4	4.0	6.4	4.0	6.4
Lead/Lag							Lead	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	None	Min	None	Min
Act Effct Green (s)	40.0	40.0	40.0	40.0	40.0	40.0	48.6	33.2	35.4	24.0
Actuated g/C Ratio	0.40	0.40	0.40	0.40	0.40	0.40	0.49	0.33	0.35	0.24
v/c Ratio	0.19	0.91	0.39	0.23	0.82	0.41	0.72	0.91	0.78	0.55
Control Delay	28.9	49.2	15.4	34.4	38.3	12.9	25.0	52.4	40.3	37.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.9	49.2	15.4	34.4	38.3	12.9	25.0	52.4	40.3	37.7
LOS	C	D	B	C	D	B	C	D	D	D
Approach Delay		40.3			31.4			41.2		38.9
Approach LOS		D			C			D		D

Intersection Summary		
Cycle Length: 100		
Actuated Cycle Length: 100		
Offset: 55 (55%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.91		
Intersection Signal Delay: 37.9	Intersection LOS: D	
Intersection Capacity Utilization 90.5%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 2: Humber Station Rd & King St



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	22	669	229	13	617	231	380	550	199	253
v/c Ratio	0.19	0.91	0.39	0.23	0.82	0.41	0.72	0.91	0.78	0.55
Control Delay	28.9	49.2	15.4	34.4	38.3	12.9	25.0	52.4	40.3	37.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.9	49.2	15.4	34.4	38.3	12.9	25.0	52.4	40.3	37.7
Queue Length 50th (m)	3.3	131.2	19.4	1.8	115.1	14.7	46.5	101.2	21.4	43.7
Queue Length 95th (m)	m7.1	#210.0	43.7	8.0	#180.2	35.9	70.1	#161.6	#51.8	69.8
Internal Link Dist (m)		318.4			816.4			324.4		625.8
Turn Bay Length (m)	50.0		25.0	50.0		25.0			50.0	
Base Capacity (vph)	114	732	593	56	754	562	549	646	257	472
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.91	0.39	0.23	0.82	0.41	0.69	0.85	0.77	0.54

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	669	229	13	617	231	380	489	61	199	233	20
Future Volume (vph)	22	669	229	13	617	231	380	489	61	199	233	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Total Lost time (s)	7.4	7.4	7.4	7.4	7.4	7.4	4.0	6.4		4.0	6.4	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1566	1830	1296	1095	1883	1219	1733	1805		1785	1898	
Flt Permitted	0.17	1.00	1.00	0.12	1.00	1.00	0.39	1.00		0.19	1.00	
Satd. Flow (perm)	286	1830	1296	141	1883	1219	707	1805		365	1898	
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)	22	669	229	13	617	231	380	489	61	199	233	20
RTOR Reduction (vph)	0	0	74	0	0	74	0	5	0	0	3	0
Lane Group Flow (vph)	22	669	155	13	617	157	380	545	0	199	250	0
Heavy Vehicles (%)	14%	5%	26%	63%	2%	34%	3%	5%	2%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	40.0	40.0	40.0	40.0	40.0	40.0	46.2	33.2		33.1	24.1	
Effective Green, g (s)	40.0	40.0	40.0	40.0	40.0	40.0	46.2	33.2		33.1	24.1	
Actuated g/C Ratio	0.40	0.40	0.40	0.40	0.40	0.40	0.46	0.33		0.33	0.24	
Clearance Time (s)	7.4	7.4	7.4	7.4	7.4	7.4	4.0	6.4		4.0	6.4	
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)	114	732	518	56	753	487	512	599		248	457	
v/s Ratio Prot		c0.37			0.33		c0.13	c0.30		0.07	0.13	
v/s Ratio Perm	0.08		0.12	0.09		0.13	0.21			0.19		
v/c Ratio	0.19	0.91	0.30	0.23	0.82	0.32	0.74	0.91		0.80	0.55	
Uniform Delay, d1	19.5	28.4	20.4	19.8	26.8	20.7	19.3	32.0		26.4	33.2	
Progression Factor	1.12	1.10	1.31	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.2	16.0	1.3	9.5	9.7	1.7	5.7	18.1		16.9	1.3	
Delay (s)	25.2	47.3	28.1	29.3	36.5	22.4	25.1	50.0		43.3	34.5	
Level of Service	C	D	C	C	D	C	C	D		D	C	
Approach Delay (s)		42.0			32.6			39.8			38.4	
Approach LOS		D			C			D			D	

Intersection Summary

HCM 2000 Control Delay	38.3	HCM 2000 Level of Service		D	
HCM 2000 Volume to Capacity ratio	0.91				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		17.8	
Intersection Capacity Utilization	90.5%	ICU Level of Service		E	
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%	0%		0%	
Storage Length (m)	50.0			25.0	0.0	0.0
Storage Lanes	1			1	1	0
Taper Length (m)	7.5				0.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850	0.927	
Flt Protected	0.950				0.977	
Satd. Flow (prot)	1785	1921	1921	1633	1740	0
Flt Permitted	0.950				0.977	
Satd. Flow (perm)	1785	1921	1921	1633	1740	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		192.2	368.5		90.0	
Travel Time (s)		13.8	26.5		6.5	

Intersection Summary	
Area Type:	Other

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	133	824	738	142	59	69
Future Volume (Veh/h)	133	824	738	142	59	69
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)	133	824	738	142	59	69
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (m)		192	369			
pX, platoon unblocked	0.80				0.82	0.80
vC, conflicting volume	880				1828	738
vC1, stage 1 conf vol					738	
vC2, stage 2 conf vol					1090	
vCu, unblocked vol	728				1358	551
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	81				72	84
cM capacity (veh/h)	711				212	432

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	133	824	738	142	128
Volume Left	133	0	0	0	59
Volume Right	0	0	0	142	69
cSH	711	1700	1700	1700	292
Volume to Capacity	0.19	0.48	0.43	0.08	0.44
Queue Length 95th (m)	5.5	0.0	0.0	0.0	16.9
Control Delay (s)	11.2	0.0	0.0	0.0	26.6
Lane LOS	B				D
Approach Delay (s)	1.6		0.0		26.6
Approach LOS					D

Intersection Summary				
Average Delay		2.5		
Intersection Capacity Utilization		63.7%	ICU Level of Service	B
Analysis Period (min)		15		

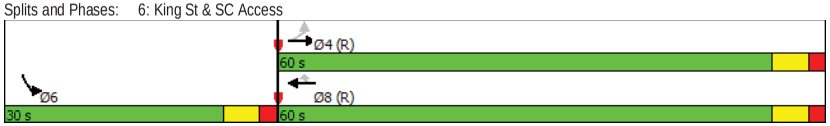
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%	0%		0%	
Storage Length (m)	50.0			25.0	0.0	0.0
Storage Lanes	1			1	1	0
Taper Length (m)	7.5				0.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850	0.950	
Flt Protected	0.950				0.969	
Satd. Flow (prot)	1785	1921	1921	1633	1768	0
Flt Permitted	0.278				0.969	
Satd. Flow (perm)	522	1921	1921	1633	1768	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				70	32	
Link Speed (k/h)		50	50		50	
Link Distance (m)		368.5	458.8		105.2	
Travel Time (s)		26.5	33.0		7.6	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBT	WBT	WBR	SBL
Lane Configurations					
Traffic Volume (vph)	133	750	811	138	118
Future Volume (vph)	133	750	811	138	118
Turn Type	Perm	NA	NA	Perm	Prot
Protected Phases		4	8		6
Permitted Phases	4			8	
Detector Phase	4	4	8	8	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.0	23.0	23.0	23.0	30.0
Total Split (s)	60.0	60.0	60.0	60.0	30.0
Total Split (%)	66.7%	66.7%	66.7%	66.7%	33.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min
Act Effct Green (s)	64.7	64.7	64.7	64.7	13.3
Actuated g/C Ratio	0.72	0.72	0.72	0.72	0.15
v/c Ratio	0.35	0.54	0.59	0.12	0.65
Control Delay	9.1	8.4	9.1	2.8	39.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.1	8.4	9.1	2.8	39.7
LOS	A	A	A	A	D
Approach Delay		8.5	8.2		39.7
Approach LOS		A	A		D

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 90		
Offset: 36 (40%), Referenced to phase 4:EBTL and 8:WBT, Start of Green		
Natural Cycle: 80		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.65		
Intersection Signal Delay: 11.2		Intersection LOS: B
Intersection Capacity Utilization 75.8%		ICU Level of Service D
Analysis Period (min) 15		

Splits and Phases: 6: King St & SC Access



Lane Group	EBL	EBT	WBT	WBR	SBL
Lane Group Flow (vph)	133	750	811	138	187
v/c Ratio	0.35	0.54	0.59	0.12	0.65
Control Delay	9.1	8.4	9.1	2.8	39.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.1	8.4	9.1	2.8	39.7
Queue Length 50th (m)	7.7	52.9	60.3	3.0	26.8
Queue Length 95th (m)	22.5	100.8	115.0	10.2	45.3
Internal Link Dist (m)		344.5	434.8		81.2
Turn Bay Length (m)	50.0			25.0	
Base Capacity (vph)	375	1380	1380	1193	494
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.35	0.54	0.59	0.12	0.38

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	133	750	811	138	118	69
Future Volume (vph)	133	750	811	138	118	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.7	3.7	3.7
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	1.00	0.85	0.95	
Flt Protected	0.95	1.00	1.00	1.00	0.97	
Satd. Flow (prot)	1785	1921	1921	1633	1770	
Flt Permitted	0.28	1.00	1.00	1.00	0.97	
Satd. Flow (perm)	522	1921	1921	1633	1770	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	133	750	811	138	118	69
RTOR Reduction (vph)	0	0	0	20	27	0
Lane Group Flow (vph)	133	750	811	118	160	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	NA	Perm	Prot	
Protected Phases		4	8		6	
Permitted Phases	4			8		
Actuated Green, G (s)	64.7	64.7	64.7	64.7	13.3	
Effective Green, g (s)	64.7	64.7	64.7	64.7	13.3	
Actuated g/C Ratio	0.72	0.72	0.72	0.72	0.15	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	375	1380	1380	1173	261	
v/s Ratio Prot		0.39	c0.42		c0.09	
v/s Ratio Perm	0.25			0.07		
v/c Ratio	0.35	0.54	0.59	0.10	0.61	
Uniform Delay, d1	4.8	5.8	6.2	3.8	35.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.6	1.5	1.8	0.2	4.2	
Delay (s)	7.4	7.4	8.0	4.0	40.1	
Level of Service	A	A	A	A	D	
Approach Delay (s)		7.4	7.4		40.1	
Approach LOS		A	A		D	

Intersection Summary

HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

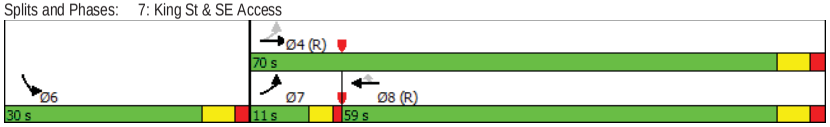
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%	0%		0%	
Storage Length (m)	50.0			25.0	0.0	0.0
Storage Lanes	1			1	1	0
Taper Length (m)	7.5				0.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850	0.954	
Flt Protected	0.950				0.968	
Satd. Flow (prot)	1785	1921	1921	1633	1774	0
Flt Permitted	0.142				0.968	
Satd. Flow (perm)	267	1921	1921	1633	1774	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				69	25	
Link Speed (k/h)		50	50		50	
Link Distance (m)		458.8	342.4		146.4	
Travel Time (s)		33.0	24.7		10.5	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBT	WBT	WBR	SBL
Lane Configurations					
Traffic Volume (vph)	150	718	864	188	165
Future Volume (vph)	150	718	864	188	165
Turn Type	pm+pt	NA	NA	Perm	Prot
Protected Phases	7	4	8		6
Permitted Phases	4			8	
Detector Phase	7	4	8	8	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	23.0	23.0	23.0	30.0
Total Split (s)	11.0	70.0	59.0	59.0	30.0
Total Split (%)	11.0%	70.0%	59.0%	59.0%	30.0%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes		Yes	Yes	
Recall Mode	None	C-Max	C-Max	C-Max	Min
Act Effct Green (s)	72.1	70.1	58.3	58.3	17.9
Actuated g/C Ratio	0.72	0.70	0.58	0.58	0.18
v/c Ratio	0.48	0.53	0.77	0.19	0.74
Control Delay	10.4	9.8	20.1	4.5	47.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.4	9.8	20.1	4.5	47.9
LOS	B	A	C	A	D
Approach Delay		9.9	17.3		47.9
Approach LOS		A	B		D

Intersection Summary		
Cycle Length: 100		
Actuated Cycle Length: 100		
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green		
Natural Cycle: 80		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.77		
Intersection Signal Delay: 17.9		Intersection LOS: B
Intersection Capacity Utilization 81.5%		ICU Level of Service D
Analysis Period (min) 15		

Splits and Phases: 7: King St & SE Access



Lane Group	EBL	EBT	WBT	WBR	SBL
Lane Group Flow (vph)	150	718	864	188	251
v/c Ratio	0.48	0.53	0.77	0.19	0.74
Control Delay	10.4	9.8	20.1	4.5	47.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.4	9.8	20.1	4.5	47.9
Queue Length 50th (m)	8.1	61.5	135.2	7.3	44.0
Queue Length 95th (m)	17.6	109.3	#230.6	m15.3	66.5
Internal Link Dist (m)		434.8	318.4		122.4
Turn Bay Length (m)	50.0			25.0	
Base Capacity (vph)	312	1346	1119	980	444
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.48	0.53	0.77	0.19	0.57

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	150	718	864	188	165	86
Future Volume (vph)	150	718	864	188	165	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.7	3.7	3.7
Total Lost time (s)	4.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	1.00	0.85	0.95	
Flt Protected	0.95	1.00	1.00	1.00	0.97	
Satd. Flow (prot)	1785	1921	1921	1633	1774	
Flt Permitted	0.14	1.00	1.00	1.00	0.97	
Satd. Flow (perm)	266	1921	1921	1633	1774	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	150	718	864	188	165	86
RTOR Reduction (vph)	0	0	0	29	21	0
Lane Group Flow (vph)	150	718	864	159	230	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA	NA	Perm	Prot	
Protected Phases	7	4	8		6	
Permitted Phases	4			8		
Actuated Green, G (s)	70.1	70.1	58.3	58.3	17.9	
Effective Green, g (s)	70.1	70.1	58.3	58.3	17.9	
Actuated g/C Ratio	0.70	0.70	0.58	0.58	0.18	
Clearance Time (s)	4.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	304	1346	1119	952	317	
v/s Ratio Prot	0.04	c0.37	c0.45		c0.13	
v/s Ratio Perm	0.31			0.10		
v/c Ratio	0.49	0.53	0.77	0.17	0.73	
Uniform Delay, d1	13.6	7.1	15.8	9.6	38.7	
Progression Factor	1.00	1.00	0.92	0.59	1.00	
Incremental Delay, d2	1.3	1.5	3.4	0.2	8.1	
Delay (s)	14.8	8.7	17.9	5.9	46.8	
Level of Service	B	A	B	A	D	
Approach Delay (s)		9.7	15.8		46.8	
Approach LOS		A	B		D	

Intersection Summary

HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

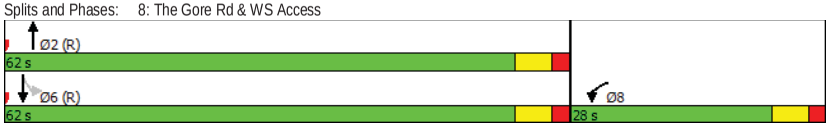
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.5	3.7
Grade (%)	0%		0%			0%
Storage Length (m)	0.0	0.0		0.0	50.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	0.0				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.986		0.982			
Flt Protected	0.957				0.950	
Satd. Flow (prot)	1813	0	1887	0	1785	1921
Flt Permitted	0.957				0.222	
Satd. Flow (perm)	1813	0	1887	0	417	1921
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	6		17			
Link Speed (k/h)	50		50			50
Link Distance (m)	162.1		387.0			198.4
Travel Time (s)	11.7		27.9			14.3

Intersection Summary	
Area Type:	Other

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	94	846	19	339
Future Volume (vph)	94	846	19	339
Turn Type	Prot	NA	Perm	NA
Protected Phases	8	2		6
Permitted Phases			6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	28.0	25.0	25.0	25.0
Total Split (s)	28.0	62.0	62.0	62.0
Total Split (%)	31.1%	68.9%	68.9%	68.9%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Min	C-Min	C-Min
Act Effct Green (s)	10.3	71.4	71.4	71.4
Actuated g/C Ratio	0.11	0.79	0.79	0.79
v/c Ratio	0.50	0.65	0.06	0.22
Control Delay	42.6	8.4	3.8	3.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	42.6	8.4	3.8	3.8
LOS	D	A	A	A
Approach Delay	42.6	8.4		3.8
Approach LOS	D	A		A

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 90		
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green		
Natural Cycle: 75		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.65		
Intersection Signal Delay: 9.8		Intersection LOS: A
Intersection Capacity Utilization 68.5%		ICU Level of Service C
Analysis Period (min) 15		

Splits and Phases: 8: The Gore Rd & WS Access



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	105	979	19	339
v/c Ratio	0.50	0.65	0.06	0.22
Control Delay	42.6	8.4	3.8	3.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	42.6	8.4	3.8	3.8
Queue Length 50th (m)	17.2	72.1	1.0	18.8
Queue Length 95th (m)	32.0	138.3	3.1	26.0
Internal Link Dist (m)	138.1	363.0		174.4
Turn Bay Length (m)			50.0	
Base Capacity (vph)	447	1500	330	1523
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.23	0.65	0.06	0.22

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	94	11	846	133	19	339
Future Volume (vph)	94	11	846	133	19	339
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.7	3.7	3.7	3.5	3.7
Total Lost time (s)	6.0		6.0		6.0	6.0
Lane Util. Factor	1.00		1.00		1.00	1.00
Frt	0.99		0.98		1.00	1.00
Flt Protected	0.96		1.00		0.95	1.00
Satd. Flow (prot)	1813		1886		1785	1921
Flt Permitted	0.96		1.00		0.22	1.00
Satd. Flow (perm)	1813		1886		418	1921
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	94	11	846	133	19	339
RTOR Reduction (vph)	5	0	4	0	0	0
Lane Group Flow (vph)	100	0	975	0	19	339
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	9.0		69.0		69.0	69.0
Effective Green, g (s)	9.0		69.0		69.0	69.0
Actuated g/C Ratio	0.10		0.77		0.77	0.77
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	181		1445		320	1472
v/s Ratio Prot	c0.05		c0.52			0.18
v/s Ratio Perm					0.05	
v/c Ratio	0.55		0.67		0.06	0.23
Uniform Delay, d1	38.6		5.1		2.6	3.0
Progression Factor	1.00		1.00		0.94	0.98
Incremental Delay, d2	3.6		2.5		0.4	0.4
Delay (s)	42.2		7.6		2.8	3.3
Level of Service	D		A		A	A
Approach Delay (s)	42.2		7.6			3.3
Approach LOS	D		A			A

Intersection Summary			
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

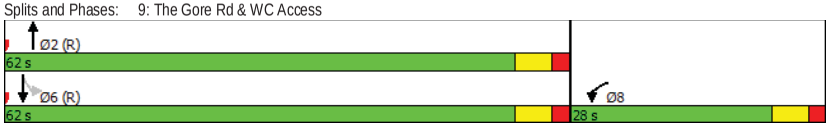
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.5	3.7
Grade (%)	0%		0%			0%
Storage Length (m)	0.0	0.0		0.0	50.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	0.0				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.986		0.979			
Flt Protected	0.957				0.950	
Satd. Flow (prot)	1813	0	1881	0	1785	1921
Flt Permitted	0.957				0.279	
Satd. Flow (perm)	1813	0	1881	0	524	1921
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	6		19			
Link Speed (k/h)	50		50			50
Link Distance (m)	106.6		198.4			231.4
Travel Time (s)	7.7		14.3			16.7

Intersection Summary	
Area Type:	Other

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	92	725	19	267
Future Volume (vph)	92	725	19	267
Turn Type	Prot	NA	Perm	NA
Protected Phases	8	2		6
Permitted Phases			6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	28.0	25.0	25.0	25.0
Total Split (s)	28.0	62.0	62.0	62.0
Total Split (%)	31.1%	68.9%	68.9%	68.9%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Min	C-Min	C-Min
Act Effct Green (s)	10.2	71.5	71.5	71.5
Actuated g/C Ratio	0.11	0.79	0.79	0.79
v/c Ratio	0.49	0.57	0.05	0.18
Control Delay	42.5	5.6	3.9	3.8
Queue Delay	0.0	0.1	0.0	0.0
Total Delay	42.5	5.7	3.9	3.8
LOS	D	A	A	A
Approach Delay	42.5	5.7		3.8
Approach LOS	D	A		A

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 90		
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green		
Natural Cycle: 65		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.57		
Intersection Signal Delay: 8.3		Intersection LOS: A
Intersection Capacity Utilization 62.0%		ICU Level of Service B
Analysis Period (min) 15		

Splits and Phases: 9: The Gore Rd & WC Access



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	103	858	19	267
v/c Ratio	0.49	0.57	0.05	0.18
Control Delay	42.5	5.6	3.9	3.8
Queue Delay	0.0	0.1	0.0	0.0
Total Delay	42.5	5.7	3.9	3.8
Queue Length 50th (m)	16.8	41.5	0.4	5.1
Queue Length 95th (m)	31.4	70.2	4.1	28.8
Internal Link Dist (m)	82.6	174.4		207.4
Turn Bay Length (m)			50.0	
Base Capacity (vph)	447	1497	416	1525
Starvation Cap Reductn	0	70	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.23	0.60	0.05	0.18

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	92	11	725	133	19	267
Future Volume (vph)	92	11	725	133	19	267
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.7	3.7	3.7	3.5	3.7
Total Lost time (s)	6.0		6.0		6.0	6.0
Lane Util. Factor	1.00		1.00		1.00	1.00
Frt	0.99		0.98		1.00	1.00
Flt Protected	0.96		1.00		0.95	1.00
Satd. Flow (prot)	1812		1881		1785	1921
Flt Permitted	0.96		1.00		0.28	1.00
Satd. Flow (perm)	1812		1881		525	1921
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	92	11	725	133	19	267
RTOR Reduction (vph)	5	0	4	0	0	0
Lane Group Flow (vph)	98	0	854	0	19	267
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	8.9		69.1		69.1	69.1
Effective Green, g (s)	8.9		69.1		69.1	69.1
Actuated g/C Ratio	0.10		0.77		0.77	0.77
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	179		1444		403	1474
v/s Ratio Prot	c0.05		c0.45			0.14
v/s Ratio Perm					0.04	
v/c Ratio	0.55		0.59		0.05	0.18
Uniform Delay, d1	38.6		4.4		2.5	2.8
Progression Factor	1.00		0.82		1.03	1.03
Incremental Delay, d2	3.4		1.4		0.2	0.3
Delay (s)	42.0		5.0		2.8	3.2
Level of Service	D		A		A	A
Approach Delay (s)	42.0		5.0			3.2
Approach LOS	D		A			A

Intersection Summary			
HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

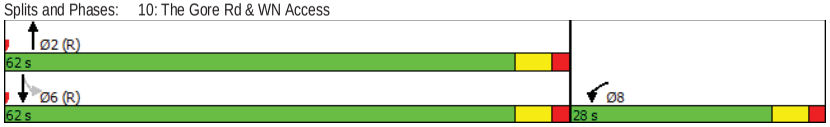
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.5	3.7
Grade (%)	0%		0%			0%
Storage Length (m)	0.0	0.0		0.0	50.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	0.0				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.986		0.975			
Flt Protected	0.957				0.950	
Satd. Flow (prot)	1813	0	1873	0	1785	1921
Flt Permitted	0.957				0.339	
Satd. Flow (perm)	1813	0	1873	0	637	1921
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	6		24			
Link Speed (k/h)	50		50			50
Link Distance (m)	119.9		231.4			136.3
Travel Time (s)	8.6		16.7			9.8

Intersection Summary	
Area Type:	Other

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	92	599	19	193
Future Volume (vph)	92	599	19	193
Turn Type	Prot	NA	Perm	NA
Protected Phases	8	2		6
Permitted Phases			6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	28.0	25.0	25.0	25.0
Total Split (s)	28.0	62.0	62.0	62.0
Total Split (%)	31.1%	68.9%	68.9%	68.9%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Min	C-Min	C-Min
Act Effct Green (s)	10.2	71.5	71.5	71.5
Actuated g/C Ratio	0.11	0.79	0.79	0.79
v/c Ratio	0.49	0.49	0.04	0.13
Control Delay	42.5	6.5	3.7	3.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	42.5	6.5	3.7	3.5
LOS	D	A	A	A
Approach Delay	42.5	6.5		3.5
Approach LOS	D	A		A

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 90		
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green		
Natural Cycle: 60		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.49		
Intersection Signal Delay: 9.4		Intersection LOS: A
Intersection Capacity Utilization 55.6%		ICU Level of Service B
Analysis Period (min) 15		

Splits and Phases: 10: The Gore Rd & WN Access



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	103	736	19	193
v/c Ratio	0.49	0.49	0.04	0.13
Control Delay	42.5	6.5	3.7	3.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	42.5	6.5	3.7	3.5
Queue Length 50th (m)	16.8	33.1	0.7	7.7
Queue Length 95th (m)	31.4	81.6	2.9	16.3
Internal Link Dist (m)	95.9	207.4		112.3
Turn Bay Length (m)			50.0	
Base Capacity (vph)	447	1492	505	1525
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.23	0.49	0.04	0.13

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	92	11	599	137	19	193
Future Volume (vph)	92	11	599	137	19	193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.7	3.7	3.7	3.5	3.7
Total Lost time (s)	6.0		6.0		6.0	6.0
Lane Util. Factor	1.00		1.00		1.00	1.00
Frt	0.99		0.97		1.00	1.00
Flt Protected	0.96		1.00		0.95	1.00
Satd. Flow (prot)	1812		1873		1785	1921
Flt Permitted	0.96		1.00		0.34	1.00
Satd. Flow (perm)	1812		1873		636	1921
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	92	11	599	137	19	193
RTOR Reduction (vph)	5	0	6	0	0	0
Lane Group Flow (vph)	98	0	730	0	19	193
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	8.9		69.1		69.1	69.1
Effective Green, g (s)	8.9		69.1		69.1	69.1
Actuated g/C Ratio	0.10		0.77		0.77	0.77
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	179		1438		488	1474
v/s Ratio Prot	c0.05		c0.39			0.10
v/s Ratio Perm					0.03	
v/c Ratio	0.55		0.51		0.04	0.13
Uniform Delay, d1	38.6		4.0		2.5	2.7
Progression Factor	1.00		1.19		1.00	1.00
Incremental Delay, d2	3.4		1.1		0.1	0.2
Delay (s)	42.0		5.8		2.7	2.9
Level of Service	D		A		A	A
Approach Delay (s)	42.0		5.8			2.9
Approach LOS	D		A			A

Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	55.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Bolton GO Access - 1h.j9
Path: G:\0 DEMASIMULATIONS\01 BA Group\7694-01 Bolton\ARCADY Analysis
Report generation date: 01/02/2021 16:55:54

»2031, AM
»2031, PM

Summary of junction performance

	AM								PM							
	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
	[Lane Simulation] - 2031															
Arm 1	0.7	2.2	6.07		A	4.98	A	% [ ]	0.6	1.8	4.84		A	4.99	A	% [ ]
Arm 2	0.9	2.9	4.90		A				1.9	5.6	5.46		A			
Arm 3	1.0	3.3	4.56		A				0.5	1.6	3.98		A			

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Arm and junction delays are averages for all movements, including movements with zero delay. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

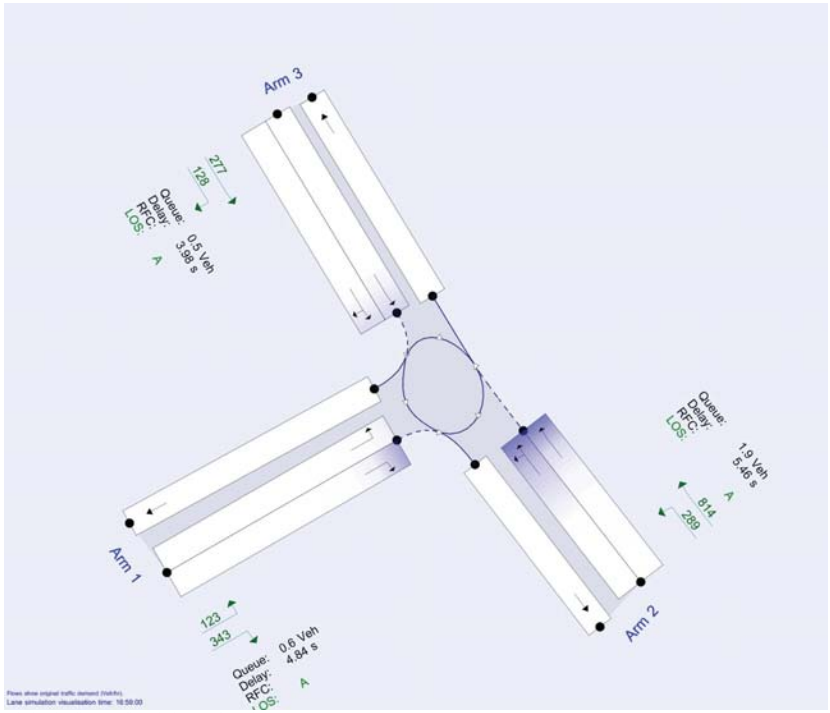
File Description

Title	(untitled)
Location	Emil Kolb & GOAccess
Site number	
Date	30/10/2020
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	BACTOR\DMA
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	s	-Min	perMin

Generated on 01/02/2021 16:57:04 using Junctions 9 (9.0.1.4646)



The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75	✓		✓	Delay	0.85	36.00	20.00

Lane Simulation options

Stop criteria (%)	Stop criteria time (s)	Stop criteria number of trials	Random seed	Results refresh speed (s)	Individual vehicle animation number of trials	Use crossings quick response	Last run random seed	Last run number of trials	Last run time taken (s)
1.00	100000	100000	-1	3	1	✓	1261611353	101	2.59

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Single time segment only	Run automatically
D3	2031	AM	FLAT	08:00	09:00	60	✓	✓
D4	2031	PM	FLAT	16:00	17:00	60	✓	✓

Analysis Set Details

ID	Use Lane Simulation	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	✓	100.000	100.000

Generated on 01/02/2021 16:57:04 using Junctions 9 (9.0.1.4646)

2031, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Warning	Flow Arm 1	Analysis Options	Queue Variations cannot be calculated for the selected traffic profile type.
Warning	Flow Arm 2	Analysis Options	Queue Variations cannot be calculated for the selected traffic profile type.
Warning	Flow Arm 3	Analysis Options	Queue Variations cannot be calculated for the selected traffic profile type.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	1,2,3	4.98	A

Junction Network Options

Driving side	Lighting
Right	Normal/unknown

Arms

Arms

Am	Name	Description
1	untitled	
2	untitled	
3	untitled	

Roundabout Geometry

Am	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	6.17	8.29	30.0	22.0	55.0	20.0	
2	6.87	7.55	30.0	21.6	55.0	20.0	
3	7.09	8.65	30.0	21.5	55.0	20.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Am	Final slope	Final intercept (PCU/hr)
1	0.738	2487
2	0.715	2361
3	0.768	2651

The slope and intercept shown above include any corrections and adjustments.

Lane Simulation: Arm options

Am	Lane capacity source	Traffic Considering Secondary Lanes (%)
1	Evenly split	10.00
2	Evenly split	10.00
3	Evenly split	10.00

Lanes

Arm	Lane level	Lane	Destination arms	Has limited storage	Storage (PCU)	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)
1	1 [Give-way line]	1	2		Infinity	0	99999
		2	3		Infinity	0	99999
2	1 [Give-way line]	1	3		Infinity	0	99999
		2	1,3		Infinity	0	99999
3	1 [Give-way line]	1	1,2		Infinity	0	99999
		2	2		Infinity	0	99999

Entry Lane slope and intercept

Arm	Lane level	Lane	Final slope	Final intercept (PCU/hr)
1	1 [Give-way line]	1	0.369	1244
		2	0.369	1244
2	1 [Give-way line]	1	0.358	1180
		2	0.358	1180
3	1 [Give-way line]	1	0.384	1325
		2	0.384	1325

Lane Movements

Arm	Lane Level	Lane	Destination arm		
			1	2	3
1	1 [Give-way line]	1		✓	
		2			✓
2	1 [Give-way line]	1			✓
		2	✓		✓
3	1 [Give-way line]	1	✓	✓	
		2		✓	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Single time segment only	Run automatically
D3	2031	AM	FLAT	08:00	09:00	60	✓	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		FLAT	✓	393	100.000
2		FLAT	✓	566	100.000
3		FLAT	✓	809	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1	2	3
From	1	0	278	115
	2	259	0	307
	3	87	722	0

Vehicle Mix

Generated on 01/02/2021 16:57:04 using Junctions 9 (9.0.1.4646)

Heavy Vehicle Percentages

	To			
		1	2	3
From	1	0	12	6
	2	8	0	25
	3	4	22	9

Results

Results Summary for whole modelled period

Arm	Max delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	6.07	0.7	2.2	A	395	395
2	4.90	0.9	2.9	A	562	562
3	4.56	1.0	3.3	A	841	841

Main Results for each time segment

08:00 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
1	395	395	754	395	354	0.0	0.6	6.070	A
2	564	564	121	562	1028	0.0	1.0	4.901	A
3	842	842	263	844	419	0.0	0.9	4.562	A

Queue Variation Results for each time segment

08:00 - 09:00

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)
1	0.65	0.00	0.00	1.62	2.25
2	0.93	0.00	0.10	2.23	2.90
3	1.00	0.00	0.11	2.46	3.28

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

08:00 - 09:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
1	Entry	1	1	2	275	799	0.344	275	0.0	0.5	6.651	A
			2	3	120	854	0.140	121	0.0	0.1	4.671	A
	Exit	1	1		354			354	0.0	0.0	0.000	A
2	Entry	1	1	3	178	904	0.197	178	0.0	0.2	4.321	A
			2	1,3	385	1003	0.383	384	0.0	0.7	5.178	A
	Exit	1	1		1028			1028	0.0	0.0	0.000	A
3	Entry	1	1	1,2	443	1018	0.435	445	0.0	0.5	4.622	A
			2	2	399	990	0.402	399	0.0	0.4	4.493	A
	Exit	1	1		419			419	0.0	0.0	0.000	A

Lanes: Queue Variation Results for each time segment

08:00 - 09:00

Arm	Side	Lane level	Lane	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)
1	Entry	1	1	0.54	0.00	0.00	1.47	1.98
			2	0.11	0.00	0.00	0.09	0.56
	Exit	1	1	0.00	0.00	0.00	0.00	0.00
2	Entry	1	1	0.24	0.00	0.00	0.73	1.59
			2	0.70	0.00	0.00	1.69	2.27
	Exit	1	1	0.00	0.00	0.00	0.00	0.00
3	Entry	1	1	0.52	0.00	0.00	1.35	1.66
			2	0.48	0.00	0.00	1.18	1.55
	Exit	1	1	0.00	0.00	0.00	0.00	0.00

Generated on 01/02/2021 16:57:04 using Junctions 9 (9.0.1.4646)

2031, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Warning	Flow Arm 1	Analysis Options	Queue Variations cannot be calculated for the selected traffic profile type.
Warning	Flow Arm 2	Analysis Options	Queue Variations cannot be calculated for the selected traffic profile type.
Warning	Flow Arm 3	Analysis Options	Queue Variations cannot be calculated for the selected traffic profile type.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	1,2,3	4.99	A

Junction Network Options

Driving side	Lighting
Right	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Single time segment only	Run automatically
D4	2031	PM	FLAT	16:00	17:00	60	✓	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		FLAT	✓	466	100.000
2		FLAT	✓	1103	100.000
3		FLAT	✓	405	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1	2	3
From	1	0	343	123
	2	289	0	814
	3	128	277	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		1	2	3
From	1	0	6	7
	2	8	0	6
	3	9	22	0

Results

Results Summary for whole modelled period

Arm	Max delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	4.84	0.6	1.8	A	460	460
2	5.46	1.9	5.6	A	1109	1109
3	3.98	0.5	1.6	A	404	404

Main Results for each time segment

16:00 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
1	460	460	278	460	414	0.0	0.6	4.836	A
2	1108	1108	122	1108	616	0.0	1.7	5.458	A
3	405	405	286	406	944	0.0	0.5	3.980	A

Queue Variation Results for each time segment

16:00 - 17:00

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)
1	0.59	0.00	0.00	1.52	1.82
2	1.85	0.00	0.92	3.55	5.62
3	0.49	0.00	0.00	1.30	1.63

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

16:00 - 17:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
1	Entry	1	1	2	338	1055	0.320	338	0.0	0.4	5.184	A
			2	3	122	1035	0.118	122	0.0	0.1	3.854	A
	Exit	1	1		414			414	0.0	0.0	0.000	A
2	Entry	1	1	3	494	1071	0.462	494	0.0	0.7	4.930	A
			2	1,3	613	1061	0.579	614	0.0	1.0	5.874	A
	Exit	1	1		616			616	0.0	0.0	0.000	A
3	Entry	1	1	1,2	254	1050	0.241	254	0.0	0.3	4.071	A
			2	2	151	989	0.152	152	0.0	0.2	3.827	A
	Exit	1	1		944			944	0.0	0.0	0.000	A

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Lanes: Queue Variation Results for each time segment

16:00 - 17:00

Arm	Side	Lane level	Lane	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)
1	Entry	1	1	0.44	0.00	0.00	1.12	1.60
			2	0.16	0.00	0.00	0.30	0.69
	Exit	1	1	0.00	0.00	0.00	0.00	0.00
2	Entry	1	1	0.76	0.00	0.00	1.65	2.50
			2	1.08	0.00	0.32	2.20	2.63
	Exit	1	1	0.00	0.00	0.00	0.00	0.00
3	Entry	1	1	0.33	0.00	0.00	0.86	1.41
			2	0.16	0.00	0.00	0.40	0.75
	Exit	1	1	0.00	0.00	0.00	0.00	0.00

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Bolton King&Emil - Dec - 1h.j9
Path: G:\0 DEMASIMULATIONS\01 BA Group\7694-01 Bolton\ARCADY Analysis
Report generation date: 01/02/2021 16:53:45

Summary of junction performance

	AM								PM							
	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
[Lane Simulation] - 2020																
Arm 1	0.6	2.7	4.04		A	4.25	A	% [ ]	0.8	2.8	4.12		A	4.69	A	% [ ]
Arm 2	0.5	1.7	4.80		A				1.0	2.6	5.40		A			
Arm 3	0.7	2.4	4.02		A				0.2	0.8	3.96		A			
[Lane Simulation] - 2031																
Arm 1	1.6	4.5	6.21		A	6.56	A	% [ ]	2.0	5.4	6.29		A	11.77	B	% [ ]
Arm 2	1.9	4.3	7.13		A				7.3	20.6	18.28		C			
Arm 3	1.8	5.0	6.30		A				1.1	3.1	5.59		A			

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Arm and junction delays are averages for all movements, including movements with zero delay. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	(untitled)
Location	
Site number	
Date	30/10/2020
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	BACTOR\DMA
Description	

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Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75	✓		✓	Delay	0.85	36.00	20.00

Lane Simulation options

Stop criteria (%)	Stop criteria time (s)	Stop criteria number of trials	Random seed	Results refresh speed (s)	Individual vehicle animation number of trials	Use crossings quick response	Last run random seed	Last run number of trials	Last run time taken (s)
1.00	100000	100000	-1	3	1	✓	1796443527	101	2.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Single time segment only	Run automatically
D1	2020	AM	DIRECT	08:00	09:00	60	60		✓
D2	2020	PM	FLAT	16:00	17:00		60	✓	✓
D3	2031	AM	FLAT	08:00	09:00		60	✓	✓
D4	2031	PM	FLAT	16:00	17:00		60	✓	✓

Analysis Set Details

ID	Use Lane Simulation	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	✓	100.000	100.000

2020, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Warning	Flow Arm 1	Analysis Options	Queue Variations cannot be calculated for the selected traffic profile type.
Warning	Flow Arm 2	Analysis Options	Queue Variations cannot be calculated for the selected traffic profile type.
Warning	Flow Arm 3	Analysis Options	Queue Variations cannot be calculated for the selected traffic profile type.
Warning	Profile Type	D1 - 2020, AM	The DIRECT profile type is being used with the 'O-D data varies over time' option, but O-D data does not vary over time. Are you sure this is correct?
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	1,2,3	4.25	A

Junction Network Options

Driving side	Lighting
Right	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	6.17	8.29	30.0	22.0	55.0	20.0	
2	6.87	7.55	30.0	21.6	55.0	20.0	
3	7.09	8.65	30.0	21.5	55.0	20.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.738	2487
2	0.715	2361
3	0.768	2651

The slope and intercept shown above include any corrections and adjustments.

Lane Simulation: Arm options

Arm	Lane capacity source	Traffic Considering Secondary Lanes (%)
1	Evenly split	10.00
2	Evenly split	10.00
3	Evenly split	10.00

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Lanes

Arm	Lane level	Lane	Destination arms	Has limited storage	Storage (PCU)	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)
1	1 [Give-way line]	1	2		Infinity	0	99999
		2	2,3		Infinity	0	99999
2	1 [Give-way line]	1	3		Infinity	0	99999
		2	1,3		Infinity	0	99999
3	1 [Give-way line]	1	1,2		Infinity	0	99999
		2	2		Infinity	0	99999

Entry Lane slope and intercept

Arm	Lane level	Lane	Final slope	Final intercept (PCU/hr)
1	1 [Give-way line]	1	0.369	1244
		2	0.369	1244
2	1 [Give-way line]	1	0.358	1180
		2	0.358	1180
3	1 [Give-way line]	1	0.384	1325
		2	0.384	1325

Lane Movements

Arm	Lane Level	Lane	Destination arm		
			1	2	3
1	1 [Give-way line]	1		✓	
		2		✓	✓
2	1 [Give-way line]	1			✓
		2	✓		✓
3	1 [Give-way line]	1	✓	✓	
		2		✓	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D1	2020	AM	DIRECT	08:00	09:00	60	60	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Scaling Factor (%)
1		DIRECT	✓	100.000
2		DIRECT	✓	100.000
3		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1	2	3
From	1	0	323	129
	2	279	0	123
	3	277	315	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		1	2	3
From	1	0	12	6
	2	8	0	25
	3	4	9	0

Results

Results Summary for whole modelled period

Arm	Max delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	4.04	0.6	2.7	A	448	448
2	4.80	0.5	1.7	A	402	402
3	4.02	0.7	2.4	A	592	592

Main Results for each time segment

08:00 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
1	449	449	316	449	555	0.0	0.6	4.042	A
2	402	402	125	403	639	0.0	0.5	4.802	A
3	593	593	278	593	251	0.0	0.6	4.017	A

Queue Variation Results for each time segment

08:00 - 09:00

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)
1	0.58	0.00	0.00	1.54	2.71
2	0.48	0.00	0.00	1.27	1.68
3	0.65	0.00	0.00	1.66	2.43

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

08:00 - 09:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
1	Entry	1	1	2	175	981	0.179	175	0.0	0.2	3.875	A
			2	2,3	275	1029	0.267	274	0.0	0.4	4.149	A
	Exit	1	1		555			555	0.0	0.0	0.000	A
2	Entry	1	1	3	77	901	0.085	77	0.0	0.1	4.129	A
			2	1,3	325	1025	0.317	326	0.0	0.4	4.961	A
	Exit	1	1		639			639	0.0	0.0	0.000	A
3	Entry	1	1	1,2	403	1152	0.350	403	0.0	0.5	4.258	A
			2	2	190	1105	0.171	190	0.0	0.2	3.496	A
	Exit	1	1		251			251	0.0	0.0	0.000	A

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Lanes: Queue Variation Results for each time segment

08:00 - 09:00

Arm	Side	Lane level	Lane	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)
1	Entry	1	1	0.19	0.00	0.00	0.50	0.81
			2	0.39	0.00	0.00	0.91	1.49
	Exit	1	1	0.00	0.00	0.00	0.00	0.00
2	Entry	1	1	0.06	0.00	0.00	0.00	0.26
			2	0.42	0.00	0.00	1.10	1.60
	Exit	1	1	0.00	0.00	0.00	0.00	0.00
3	Entry	1	1	0.48	0.00	0.00	0.94	1.62
			2	0.17	0.00	0.00	0.41	0.83
	Exit	1	1	0.00	0.00	0.00	0.00	0.00

2020, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Warning	Flow Arm 1	Analysis Options	Queue Variations cannot be calculated for the selected traffic profile type.
Warning	Flow Arm 2	Analysis Options	Queue Variations cannot be calculated for the selected traffic profile type.
Warning	Flow Arm 3	Analysis Options	Queue Variations cannot be calculated for the selected traffic profile type.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	1,2,3	4.69	A

Junction Network Options

Driving side	Lighting
Right	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Single time segment only	Run automatically
D2	2020	PM	FLAT	16:00	17:00	60	✓	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		FLAT	✓	626	100.000
2		FLAT	✓	765	100.000
3		FLAT	✓	227	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1	2	3
From	1	0	356	270
	2	368	0	397
	3	127	100	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	6	7
	2	8	0	6
	3	9	22	0

Results

Results Summary for whole modelled period

Arm	Max delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	4.12	0.8	2.8	A	630	630
2	5.40	1.0	2.6	A	763	763
3	3.96	0.2	0.8	A	227	227

Main Results for each time segment

16:00 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
1	630	630	101	629	494	0.0	0.7	4.123	A
2	763	763	262	767	468	0.0	1.0	5.397	A
3	227	227	369	227	660	0.0	0.3	3.960	A

Queue Variation Results for each time segment

16:00 - 17:00

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)
1	0.75	0.00	0.00	1.70	2.83
2	1.04	0.00	0.31	2.25	2.65
3	0.24	0.00	0.00	0.59	0.82

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

16:00 - 17:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
1	Entry	1	1	2	223	1144	0.195	222	0.0	0.3	3.464	A
			2	2,3	407	1132	0.360	407	0.0	0.4	4.467	A
	Exit	1	1		494			494	0.0	0.0	0.000	A
2	Entry	1	1	3	265	1026	0.258	266	0.0	0.3	4.183	A
			2	1,3	497	1005	0.496	501	0.0	0.7	6.017	A
	Exit	1	1		468			468	0.0	0.0	0.000	A
3	Entry	1	1	1,2	169	1040	0.163	169	0.0	0.2	4.044	A
			2	2	58	951	0.061	58	0.0	0.0	3.698	A
	Exit	1	1		660			660	0.0	0.0	0.000	A

Lanes: Queue Variation Results for each time segment

16:00 - 17:00

Arm	Side	Lane level	Lane	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)
1	Entry	1	1	0.30	0.00	0.00	0.70	0.91
			2	0.45	0.00	0.00	1.07	1.75
	Exit	1	1	0.00	0.00	0.00	0.00	0.00
2	Entry	1	1	0.28	0.00	0.00	0.72	1.13
			2	0.75	0.00	0.00	1.69	2.16
	Exit	1	1	0.00	0.00	0.00	0.00	0.00
3	Entry	1	1	0.21	0.00	0.00	0.52	0.78
			2	0.03	0.00	0.00	0.00	0.00
	Exit	1	1	0.00	0.00	0.00	0.00	0.00

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2031, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Warning	Flow Arm 1	Analysis Options	Queue Variations cannot be calculated for the selected traffic profile type.
Warning	Flow Arm 2	Analysis Options	Queue Variations cannot be calculated for the selected traffic profile type.
Warning	Flow Arm 3	Analysis Options	Queue Variations cannot be calculated for the selected traffic profile type.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	1,2,3	6.56	A

Junction Network Options

Driving side	Lighting
Right	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Single time segment only	Run automatically
D3	2031	AM	FLAT	08:00	09:00	60	✓	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		FLAT	✓	849	100.000
2		FLAT	✓	940	100.000
3		FLAT	✓	1001	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1	2	3
From	1	0	692	157
	2	531	0	409
	3	338	663	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	12	6
	2	8	0	25
	3	4	22	9

Results

Results Summary for whole modelled period

Arm	Max delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	6.21	1.6	4.5	A	841	841
2	7.13	1.9	4.3	A	937	937
3	6.30	1.8	5.0	A	999	999

Main Results for each time segment

08:00 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
1	840	840	663	839	871	0.0	1.5	6.213	A
2	936	936	160	938	1342	0.0	1.8	7.134	A
3	999	999	535	1000	564	0.0	1.7	6.298	A

Queue Variation Results for each time segment

08:00 - 09:00

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)
1	1.57	0.00	0.57	3.74	4.47
2	1.86	0.00	1.30	3.38	4.33
3	1.77	0.00	0.73	4.28	5.01

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

08:00 - 09:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
1	Entry	1	1	2	380	843	0.451	379	0.0	0.6	5.939	A
			2	2,3	460	860	0.536	460	0.0	0.9	6.440	A
	Exit	1	1		871			871	0.0	0.0	0.000	A
2	Entry	1	1	3	282	892	0.317	282	0.0	0.4	5.177	A
			2	1,3	655	1014	0.646	657	0.0	1.4	7.984	A
	Exit	1	1		1342			1342	0.0	0.0	0.000	A
3	Entry	1	1	1,2	604	984	0.614	605	0.0	1.0	6.724	A
			2	2	395	902	0.438	395	0.0	0.6	5.656	A
	Exit	1	1		564			564	0.0	0.0	0.000	A

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Lanes: Queue Variation Results for each time segment

08:00 - 09:00

Arm	Side	Lane level	Lane	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)
1	Entry	1	1	0.67	0.00	0.00	1.66	2.49
			2	0.90	0.00	0.07	2.04	2.61
	Exit	1	1	0.00	0.00	0.00	0.00	0.00
2	Entry	1	1	0.48	0.00	0.00	1.32	1.58
			2	1.39	0.00	0.75	2.70	3.36
	Exit	1	1	0.00	0.00	0.00	0.00	0.00
3	Entry	1	1	1.09	0.00	0.29	2.49	3.02
			2	0.68	0.00	0.00	1.58	2.28
	Exit	1	1	0.00	0.00	0.00	0.00	0.00

2031, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Warning	Flow Arm 1	Analysis Options	Queue Variations cannot be calculated for the selected traffic profile type.
Warning	Flow Arm 2	Analysis Options	Queue Variations cannot be calculated for the selected traffic profile type.
Warning	Flow Arm 3	Analysis Options	Queue Variations cannot be calculated for the selected traffic profile type.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	1,2,3	11.77	B

Junction Network Options

Driving side	Lighting
Right	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Single time segment only	Run automatically
D4	2031	PM	FLAT	16:00	17:00	60	✓	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		FLAT	✓	1056	100.000
2		FLAT	✓	1578	100.000
3		FLAT	✓	620	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1	2	3
From	1	0	727	329
	2	804	0	774
	3	155	465	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	6	7
	2	8	0	6
	3	9	22	0

Results

Results Summary for whole modelled period

Arm	Max delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	6.29	2.0	5.4	A	1066	1066
2	18.28	7.3	20.6	C	1544	1544
3	5.59	1.1	3.1	A	618	618

Main Results for each time segment

16:00 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
1	1065	1065	463	1063	942	0.0	1.9	6.289	A
2	1547	1547	331	1557	1195	0.0	7.3	18.278	C
3	619	619	786	619	1102	0.0	1.1	5.586	A

Queue Variation Results for each time segment

16:00 - 17:00

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)
1	2.01	0.00	0.97	4.13	5.44
2	7.33	-0.01	5.66	16.54	20.62
3	1.15	0.00	0.34	2.51	3.12

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

16:00 - 17:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
1	Entry	1	1	2	454	973	0.467	454	0.0	0.6	5.477	A
			2	2,3	611	970	0.631	609	0.0	1.3	6.899	A
	Exit	1	1		942			942	0.0	0.0	0.000	A
2	Entry	1	1	3	661	995	0.664	663	0.0	1.6	10.008	B
			2	1,3	886	976	0.905	895	0.0	5.6	24.273	C
	Exit	1	1		1195			1195	0.0	0.0	0.000	A
3	Entry	1	1	1,2	358	860	0.415	357	0.0	0.7	5.792	A
			2	2	261	817	0.319	262	0.0	0.4	5.299	A
	Exit	1	1		1102			1102	0.0	0.0	0.000	A

Lanes: Queue Variation Results for each time segment

16:00 - 17:00

Arm	Side	Lane level	Lane	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)
1	Entry	1	1	0.67	0.00	0.00	1.54	2.31
			2	1.34	0.00	0.46	3.19	4.25
	Exit	1	1	0.00	0.00	0.00	0.00	0.00
2	Entry	1	1	1.64	0.00	0.67	3.68	4.75
			2	5.66	0.00	3.55	12.70	17.06
	Exit	1	1	0.00	0.00	0.00	0.00	0.00
3	Entry	1	1	0.72	0.00	0.00	1.70	2.29
			2	0.43	0.00	0.00	1.14	1.56
	Exit	1	1	0.00	0.00	0.00	0.00	0.00