CITY OF BARRIE

ALLANDALE MOBILITY HUB STUDY

FINAL REPORT

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WSP CANADA
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CONTRIBUTORS

CITY OF BARRIE

Barrie Transit (Project Lead)

Brent Forsyth- Director, Transit and Parking Strategy
Jason Zimmerman – Supervisor, Transit Operations & Infrastructure
Michael McConnell – Transit Operations Planner

Technical Advisory

Jason de Vroom – Facilities
Lindsay Worton – Facilities
Jordan Lambie – Planning
Janet Foster – Planning
Tom Hanrahan – Traffic Services
Rebecca James-Reid – Access Barrie
Tyrell Turner – Transit and Parking Strategy

WSP PROJECT TEAM

Daniel Haufschild – Project Manager
Marcus Bowman – Deputy Project Manager
Andrew Shea – Functional Design Lead
Annie Boulanger – Design Technician
Keyur Shah – Traffic Impact Study
Qinjie Zeng – Project Engineer
Gera Taubkin – Transit Planner
Shannon Cole – Transit Planner
Allison Luoma – Land-Use Planner
Blair Underhill – Transportation Planner
Kevin Rodger – Senior Engineer

TABLE OF CONTENTS

1 INTRODUCTION

1.1 PURPOSE

The City of Barrie retained WSP to study the feasibility of shifting the main Barrie Transit Terminal from its current location on Maple Avenue in Downtown to an expanded facility immediately adjacent to the Allandale Waterfront GO Station. This study examined several factors to assess the potential impacts of relocating the bus terminal and established a functional design to demonstrate how the site can meet the program requirements safely, efficiently and in line with City policies. A comprehensive review of relevant transportation and land use planning policies was compiled to understand the policy context of the site and the long-term vision for the area. To inform decisions around the design a best practice report was compiled based on a literature review and study of comparable transit facilities recently constructed around the world. A traffic impact study was also completed to understand the potential impacts of the proposed site reconfigurations on the area's road network. Each piece provided an individual input to the overall functional site plan which can serve as the basis for further consultation and design work.

Throughout the project, WSP worked closely with staff from the City of Barrie to coordinate assumptions and requirements. This report provides an overview of the overall study, including the key findings of each piece of analysis, major recommendations and assumptions developed to conduct each part of the study. The report documents the decision-making process used to evaluate different potential options. Individual components of the study such as the policy review, best practice report and traffic impact study are all included as appendices.

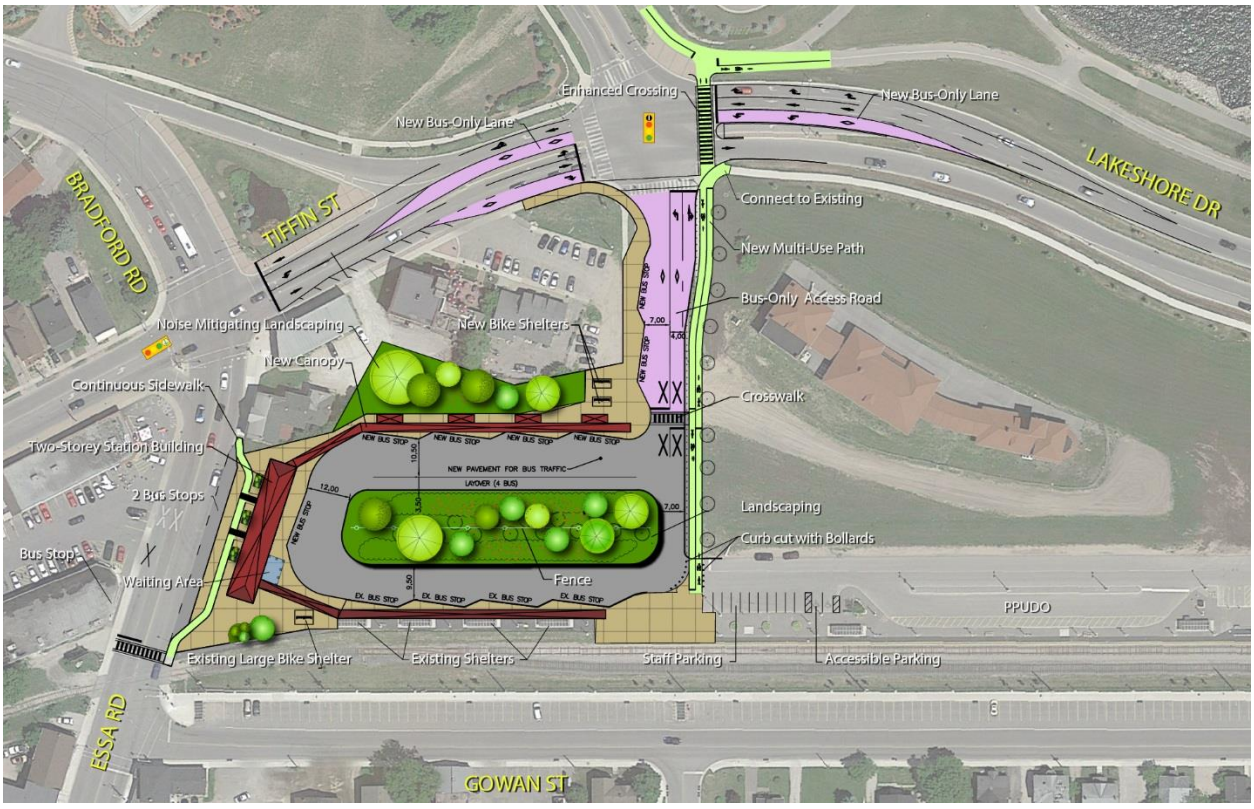
1.2 BACKGROUND

Situated on a natural crossroads at the head of Kempenfelt Bay, Allandale has been an important transportation hub for over 160 years. The return of rail service to Allandale Station in 2012 represented the beginning of the rejuvenation of area's historic role in Ontario's transportation network. The start of electrified two-way, all-day service in 2024 will continue this progress by providing a fast, frequent and reliable rapid transit connection to the rest of the Greater Golden Horseshoe. The site is ideally situated to host travel connections between the GTA, Simcoe County, Muskoka and cities along the Georgian Bay coast. With it's proximity to Barrie's rapidly growing south and designation by the Province as an Urban Growth Centre, Allandale is also well suited to serve as a central transportation hub for the city of Barrie. An expanded central bus terminal at Allandale Station builds on previous and planned strategic investments to advance the community's evolution into a modern intermodal and inter-regional mobility hub.

The relocation of the transit facility creates space in the downtown for a new farmers market and event space while consolidating the transit hub function at the GO Rail station to coincide with the arrival of all-day rail service. Reducing the footprint of the transit facility in the downtown while maintaining high service levels furthers the City's objectives for downtown revitalization. Investing in transportation and public realm amenities in the Allandale area advances the City's preparation for intensification and development in the area in the future. The new terminal further advances transportation plans to coordinate local and regional transit services with seamless connections.

1.3 FUNCTIONAL DESIGN SUMMARY

The image below shows an overview rendering of the proposed functional design for the site. The bus terminal has been reconfigured into a loop with a central landscaped island, converting the existing western station access road into a transit-only driveway. A new, two-storey station services building is situated in an expanded public plaza located on the Essa Road frontage of the site. Continuous pedestrian canopies and additional shelters are extended from the station building to ensure comfortable waiting areas for transit passengers. Pedestrian crossing of the bus driveway is focused to one location at the top of the loop allowing for improved operational efficiency and safety. A multi-use path has been extended from the existing Lakeshore trail facility directly to the bus terminal and rail platforms. Linear bus stops are included on Essa Road, preserving Barrie Transit's ability to run express service along the corridor without routing into the terminal. Many of the existing features of the current terminal are preserved to save construction costs and minimize the removal of any valuable infrastructure. Ample landscaping is provided to ensure that the site is attractive to users and minimize any potential impacts on surrounding properties.



Overview of the Functional Design

A more detailed explanation of the proposed functional design can be found in section 4.3. Larger versions of the functional design drawings can be found in Appendix C.

2 PLANNING CONTEXT

2.1 POLICY REVIEW

To inform the mobility hub study, WSP prepared a comprehensive review of policies and plans relevant to the site. This included both provincial and municipal planning policies speaking to transportation infrastructure generally and the Allandale community specifically. The review included relevant guidance from the 2017 review of the Province's Growth Plan for the Greater Golden Horseshoe which includes new policies for Major Transit Station Areas. It also studied relevant sections of the City's Official Plan and Zoning By-law as well as the City's specific design guidelines for transit station areas. A key finding of this review was the planned potential for significant redevelopment and intensification in the Allandale area which will likely see the district transform significantly during the service life of the new transit facility. Another key finding was the limited potential for increased parking supply at the station site, necessitating that increased ridership be accommodated through alternative access means.

Key Findings of the Policy Review:

- While the Allandale area is currently relatively low density, the City of Barrie, in accordance with provincial planning policies, has established a planning framework allowing for significant intensification of the area in the future
- It is likely the community will grow significantly over the lifespan of any new transit facility
- Parking is highly constrained at the station meaning that ridership growth will have to come from other alternative means of station access
- Increasing GO Station access mode share by Barrie Transit is an efficient way of addressing the station's parking constraints as expanding commuter parking at the station is difficult and disruptive
- The long-term role of the station as the terminus of the GO Rail line means that regional services may use the hub as a connection to destinations beyond the City of Barrie

A comprehensive review of municipal and provincial planning policies relevant to the site can be found in the full Policy Review contained in Appendix A.

2.2 CURRENT AND FUTURE TRANSIT SERVICES

CURRENT BARRIE TRANSIT SERVICES

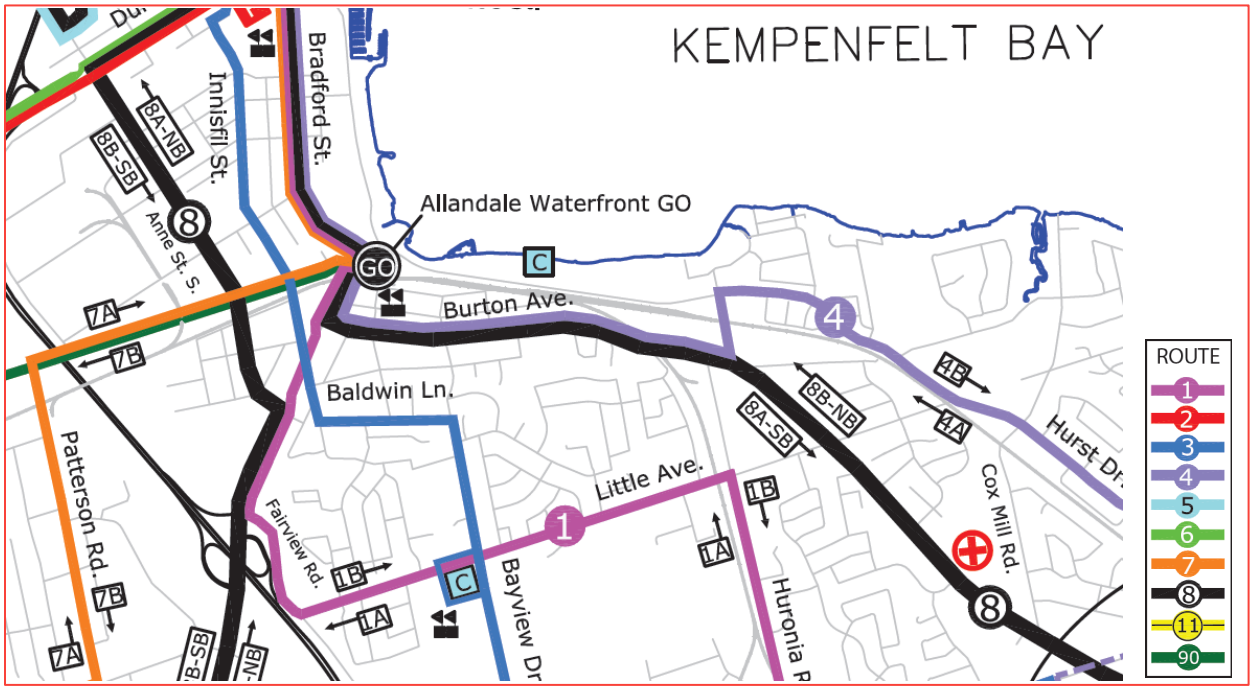
Barrie Transit currently serves Allandale with five routes connecting from Essa Rd, Tiffin St and Bradford Street. The terminal does not have a station services building and is not staffed. There are four heated, fully enclosed shelters at the site to provide full weather protection for transit patrons. Bus services to the site may be used to access GO Rail during the morning and evening peak periods. Few transfers are timed to take place at the terminal and buses typically do not layover for long periods of times.

The current Barrie Transit routes serving Allandale terminal include:

- Route 1A (Georgian Mall-northbound) and Route 1B (Welham-southbound) operate along Bradford Street/Essa Road with a 30-min headway during Monday to Saturday daytime, and a 45-min headway during Monday to Saturday evening and on Sunday.
- Route 4A (East Bayfield-northbound) and Route 4B (South GO-southbound) operate along Bradford Street/Essa Road with a 35-min headway during Monday to Saturday daytime, and a 65-min headway

during Monday to Saturday evening and on Sunday. During Monday to Friday morning hour (5:45 to 6:45), service headways is reduced to 30-min for both routes.

- Route 7A (Bell Farm-northbound) and Route 7B (Bear Creek-southbound) operate along Bradford Street/Tiffin Street with a 30-min headway during Monday to Saturday daytime, and a 60-min headway during Monday to Saturday evening and on Sunday.
- Route 8A (Yonge-southbound) and Route 8B (Crosstown-northbound) operate along Bradford Street/Essa Road with a 30-min headway during Monday to Saturday daytime, and a 60-min headway during Monday to Saturday evening and on Sunday.
- Route 90A (Angus Borden-clockwise) and Route 90B (Peacekeepers Way-counter-clockwise) operate along Tiffin Street with five departures daily from Monday to Friday.



Current Barrie Transit Map Surrounding Allandale Station

Intercity coach services operated by Greyhound, Ontario Northland and Hammond Transportation currently serve the existing downtown terminal. Greyhound operates four trips daily between Toronto and Barrie. Ontario Northland offers seven daily trips in each direction with Barrie as a stopover between Toronto, North Bay and Sudbury. Hammond Transportation offers one trip daily between Barrie and Midland and 3-4 trips between Barrie and Orillia.

CURRENT GO TRANSIT SERVICES

Allandale Waterfront GO rail station is currently served on weekdays by seven southbound departures in the morning and seven northbound arrivals in the evening and on weekends by three morning departures and evening arrivals on weekends. Trains on the Barrie corridor serve several stations in York Region and connect directly to Line 1 of the TTC Subway at Downsview Park Station. Additional connections to new rapid transit lines are planned. GO buses currently service the terminal with the route 68 which operates approximately hourly throughout the day. The route terminates at the current Barrie Transit terminal just north of the Allandale site. Due to the variable nature of GO bus travel times, buses typically layover for longer periods in Barrie. Route 68 is a local-stop service, using Yonge Street to provide an

intercity connection between Barrie, Innisfil, Bradford, Newmarket and Aurora. Two variants of the route serve either East Gwillimbury GO Station or Aurora GO Station where mid-day train connections are available. GO bus service is replaced by rail service during the peak period in the peak direction.

EXISTING TRANSIT FACILITIES

The existing Barrie Transit terminal is located on Maple Street in the city's downtown. Opened in 1991, the facility includes 12 bus platforms that serve both Barrie Transit and intercity coach operators. GO Transit, Ontario Northland, Greyhound and Hammond Transportation operate regularly scheduled services from the terminal to Toronto, Sudbury, North Bay and Midland making the station a regional hub for intercity travel. Intercity coach services are segregated to platforms 9-12 allowing for longer layovers without compromising Barrie Transit operations. The station also includes passenger amenities such as ticket counters, washrooms, heated waiting areas, retail and concessions as a well a Barrie Police kiosk. The area around the facility includes public plaza space, landscaping and bike parking.

The current facilities at Allandale Waterfront station were opened in 2012 when GO Rail service was extended north from the previous terminus at Barrie South Station. The bus facility includes eight signed bus stops with six saw-tooth bays along the north side of the rail corridor served by a one-way transit-only access road accessed from Essa Road and egressing onto the main station access road. A transit-only lane is also provided on the station access road to accommodate north bound left turn movements by transit vehicles. Four of the saw-tooth bays are reserved for Barrie Transit with two reserved for GO buses. Barrie Transit also uses two on-street stops on the east and west sides of Essa Road.

PLANNED TRANSIT EXPANSION

As part of the GO Regional Express Rail (RER) program two-way, all-day rail service is currently in-delivery between Union Station and Allandale Waterfront GO and is expected to be operational by 2024. The full length of the Barrie Corridor will be fully electrified and double tracked. Several new stations are planned with two new intermodal connections to the Eglinton LRT and the Line 2 of the TTC subway. An environmental assessment (EA) for double tracking the entire length of the Barrie Corridor was completed in October 2017. The EA design calls for the addition of a second platform at Allandale Waterfront Station but does not indicate any property impacts.

The current RER service plan calls for hourly service between Union Station and Allandale Waterfront, with 15-minute service between Union Station and Aurora GO. In the peak period this service would be increased to every 30-minutes or better between Allandale Waterfront and Union Station. Service levels are planned to increase incrementally as double tracking and a new rail-rail grade separation is completed at the Davenport Junction in Toronto. The details of the RER service plan are still subject to change as the implementation of the project continues. Recent reports from Metrolinx have suggested that all services from Allandale Waterfront may run express between Aurora and Union Station with stops only at Downsview Park and Spadina Stations. The 2041 Regional Transportation Plan calls for 15-minute electrified RER service to eventually be extended to East Gwillimbury GO. There are no mentions in the 2041 plan about extending GO service north of Allandale Waterfront.

Simcoe County has completed detailed planning for a new inter-municipal regional transit service. The first phase of this service, between Barrie and Midland is scheduled to begin full operation in September 2018. The full network is planned to include five new routes, four of which will connect directly to Barrie

Transit. Current plans for the project envision most of the new routes connecting to Barrie Transit at Georgian College and the Royal Victoria Hospital rather than Allandale or Downtown. This service will likely replace the existing transit provisions between municipalities operated by Barrie Transit such as route 90 to Angus.

A full review of applicable transportation plans, committed expansions and surrounding services can be found in section four of the Policy Report contained in Appendix A.

2.3 BEST PRACTICE REVIEW

To inform the design of the new terminal, WSP undertook a detailed best practices report. The aim of this work was to ensure that a new facility in Barrie will incorporate state of the art of planning and design practices. This work also focused on ensuring that the design is future ready for the potentially disruptive changes currently facing the transportation sector. The review included an overview of basic terminal design typologies and their relative benefits for various design objectives. It also included a review of many new station designs both in Ontario and internationally to draw trends and observations from comparative projects.

To help understand flexibility for the future, the review also studied several emerging technologies which may impact the operation of the facility within its current lifecycle including dynamic bus bay assignment and charging for battery-electric vehicles. Various best practices and design guidelines were highlighted for specific station elements such as active transportation and urban integration. Finally, the review analysed several local peer networks with similar configurations of transit hubs at rail stations slightly outside of their downtown core.

A comprehensive review of terminal design typologies, peer networks in Ontario, emerging technologies and a global scan of design practices for bus terminals at commuter rail stations can be found in the Best Practices Report contained in Appendix B.

3 DESIGN CONSIDERATIONS

3.1 PROGRAM REQUIREMENTS

The development of functional design alternatives for the proposed bus terminal at the Allandale GO Station was driven by the range of issues identified by Barrie Transit and the estimated future functional requirements identified as part of the transit servicing and scheduling review. As part of this study WSP worked with Barrie Transit to develop an assumed future transit network reflecting the modifications to serve the new terminal. This analysis informed the recommendations for the sizing and future capacity of the terminal.

The following facility program requirements were established:

- Passenger safety features are paramount in the design of the facility and features to minimize pedestrian circulation conflicts with vehicle traffic will be incorporated;
- Emphasis will be placed on connecting the terminal to the planned active transportation network as the provision of a safe, comfortable and convenient pedestrian environment is a key factor in increasing the use of public transportation;
- Full accessibility, in accordance with the Accessibility for Ontarians with Disabilities Act (AODA) will be provided as necessary, including accessibility features for physically, visually and hearing-impaired customers;
- A passenger services building and plaza is to be incorporated in the terminal design concepts to accommodate ticket sales, a concession area, washrooms, service information, bicycle storage and lockers, etc. In addition, the terminal design concepts will accommodate features and amenities to enhance the passenger environment including canopies along platforms, a heated/air-conditioned waiting area, benches, litter containers, newspaper boxes, public telephones, electronic information displays and a public-address system;
- A total of at least 12 bus platforms, sized for standard 12m city buses (B-12), are desired for the new transit terminal. In addition, a small but undefined bus layover area is anticipated to be required and will be incorporated into the design where feasible;
- Support facilities for operations personnel (washrooms, driver and staff lunchroom, supervisor's office, janitorial closet, electrical/mechanical room, fire detection and alarm, emergency lighting supply, parking) will be required for each of the terminal design concepts; and
- Access for service vehicles to perform routine service and maintenance without interrupting normal terminal operations.

3.2 FUTURE TRANSIT NETWORK ANALYSIS

To understand the design requirements of the new terminal and the transit network implications of moving the facility to Allandale from Downtown Barrie a study of transit network impacts was undertaken. Two scenarios were developed for the future bus network based on different approaches to network design. The development of the scenarios included analysis of current ridership and boarding patterns as well as a strategic focus on providing access to the GO Rail station in anticipation of increased demand coming from all-day service. Data from the GO Rail Passenger Survey and Transportation Tomorrow Survey were used to identify clusters of trip origins that may be served by GO Transit and may access the system from the northern and central parts of Barrie. Small modifications were proposed in both scenarios to provide enhanced service between these demand clusters and Allandale Waterfront GO Station. As

Downtown Barrie is a significant destination for travellers and will remain so in the future, the network configurations placed an emphasis on continuing to maintain high service to the downtown.

DESCRIPTION OF SCENARIOS

Scenario 1 involves diverting all the existing Barrie Transit routes to the Allandale Mobility Hub. This scenario creates the benefit of having a central hub location where travellers can easily transfer to any other route in the system. However, it brings the disadvantage of increased operating costs as some routes become longer and may require additional vehicles to maintain current headways. Because this scenario focuses on serving Allandale it provides the most direct coverage to the GO Rail station but reduces direct coverage to Downtown.

Scenario 2 involves strategically diverting some routes to service the hub while maintaining other routes with a focus on Downtown. This scenario includes strategic improvements to provide more direct service to the GO Station for areas where there are likely clusters of trip origins. Importantly, this scenario was designed to be cost neutral, meaning that operating costs are relatively close to the existing network and no additional buses are anticipated to be required. This conceptual transit network would have the benefit of increasing service to the GO station and providing more transfer options at Allandale station than currently exist today. It would also preserve good direct coverage to Downtown Barrie meaning that passengers who can currently access the downtown without transferring would likely still be able to do so. This is particularly important for routes in the north part of Barrie for which a diversion to Allandale station may be a longer trip. The routes which do not directly service the Allandale terminal have alternative places to layover for their recovery time and driver breaks so that will not need an off-street facility in the downtown.

SCENARIO ANALYSIS

Both scenarios were analysed using GIS software to understand their operating requirements and coverage impacts. Barrie Transit Staff provided detailed consultation on existing network characteristics and feasibility. The total operating distance of each scenario was compared against average operating costs provided by Barrie Transit. The potential changes to operating speed were also estimated and compared to the current average Barrie Transit vehicle operating cost per hour. From this speed analysis the number of additional vehicles was determined to maintain the current system-wide service level of 30-minute headways. Finally, the spatial software was used to understand the coverage provided by each network of a single-seat ride to four different key destinations around Barrie. These destinations included Downtown, Allandale Station, Georgian College and Park Place. The analysis captures the percentage of total residents who live within a 400m walk to a bus route that will take them directly to the specified location.

SCENARIO ANALYSIS RESULTS

The analysis showed that while scenario 1 provided significantly higher coverage to Allandale station, it did so at the expense of providing coverage to the downtown. Scenario 1 also incurred an increased annual operating cost and the purchase of two new buses to accommodate the longer total route lengths with longer roundtrip travel times. In scenario 1 direct coverage to the downtown dropped from 79% today to around 72%. Some of this coverage would also be impacted by longer and more circuitous trips to reach downtown, particularly from the Letitia Heights community as existing routes would only service the downtown in one direction. Because Downtown is Barrie's most significant travel destination, reduced coverage to the downtown has a disproportionately large impact on the attractiveness of the network. The first scenario also reduces coverage from the southwest of the city to the Dunlop Street corridor.

Scenario two was able to preserve only a small decrease in direct coverage to the Downtown while substantially increasing coverage to Allandale. As described, the new coverage areas were strategically developed to target areas likely to connect to GO Transit rail services at Allandale. The Allandale Waterfront GO station does not itself require complete transit coverage from the entire city as many residents may find it more convenient to access these services at Barrie South GO station where Barrie Transit connections are also available. Because this scenario still involves increasing the length of some routes to divert into the new terminal a small incremental operating cost increase is required. This is somewhat offset by improvements to operating speed. The speed improvements also allow for this conceptual network to be operated with the existing vehicle fleet.

TRANSIT NETWORK SCENARIO FINDINGS

SCENARIO	DESCRIPTION	COST INCREMENT	% OF RESIDENTS WITH DIRECT SERVICE COVERAGE
Transit Network Scenario 1	All routes diverted to serve Allandale Hub Additional Operating Cost	12.1% Annual Operating Cost Increase 2 Additional Buses	**To Downtown: 72%** To Allandale: 78% To Georgian College: 63% To Park Place: 62%
Transit Network Scenario 2	Select routes diverted to Allandale, service levels maintained to Downtown Barrie Cost Neutral	3.2% Annual Operating Cost Increase No Additional Buses	**To Downtown: 78%** To Allandale: 68% To Georgian College: 62% To Park Place: 64%
Existing Network	Current Barrie Transit Network	n/a	**To Downtown: 79%** To Allandale: 63% To Georgian College: 63% To Park Place: 63%

Summary of Transit Network Scenario Analysis

Based on the outcomes of the coverage and operational analysis, scenario two was found to offer several clear benefits. Downtown, as the commercial and cultural heart of the city, is likely to remain the busiest destination for transit riders from across Barrie. By maintaining direct service coverage to the downtown, Scenario Two provides more beneficial service to riders. The robust structure of the Barrie Transit network provides additional transfer points between routes and locations for vehicles to layover with a hub at Allandale and an on-street transit stop in the downtown. Scenario two also avoids a significant increase in annual operating costs and the requirement to purchase additional vehicles. While not all routes serve the Allandale Hub, riders wishing to access GO Rail services from the southern part of the city may also use Barrie South GO Station.

3.3 TRAFFIC COUNT ANALYSIS

To provide a basic understanding of the surrounding traffic conditions and a basis for the traffic impact study, turning movement counts were collected for all of the study area intersections. The counts were conducted in February 2018, for an eight-hour period for the typical weekday and four-hour for weekend conditions. The counts were reviewed and compiled to reflect the weekday morning and afternoon peak hour conditions, and weekend peak hour condition. Traffic volumes for these three peak hours (morning, afternoon, and weekend) were further balanced to ensure consistency between two adjacent intersections. Truck percentages and peak hour factors were also calculated and applied in intersection capacity analysis.

The local road network consists of five municipal roads in additional to the station access roadway:

- ***Lakeshore Drive*** is a City Parkway traveling in the north-south direction north of Tiffin Street and in the east-west direction east of GO Station West Access. This corridor includes two-lane cross-section within the study area, and operates with signalized intersections at Tiffin Street/GO Station West Access and at GO Station East Access. Lakeshore Drive widens and accommodates an additional through lane on the east approach to Tiffin Street/GO Station West Access. The speed limit is 50 km/h on Lakeshore Drive within the study area.
- ***Bradford Street*** is an Arterial corridor in the north-south direction parallel to Lakeshore Drive, with a four-lane cross-section within the study area, and operates with a signalized intersection at Tiffin Street. The speed limit is 50 km/h on Bradford Street within the study area.
- ***Tiffin Street*** is also an Arterial corridor, providing access in the east-west direction and connect to Lakeshore Drive at the Allandale GO Station West Access. The segment in the study area includes two-lane cross-section and operates with signalized intersections at Bradford Street and at Lakeshore Drive/GO Station West Access. The channelized westbound right turn lane from Tiffin Street to Bradford Street forms a triangle landscaping island. The speed limit is 50 km/h on Tiffin Street within the study area.
- ***Essa Road*** is an Arterial corridor, traveling in the north-south direction and connects to Bradford Street at Tiffin Street intersection. It includes four-lane cross-section within the study area, and operates with traffic signals at Tiffin Street and at Gowan Street intersections. The signalized intersection at Gowan Street also accommodates an at-grade railway crossing. A 'bus-only' access to the GO Station is located 20 m north of the Essa Road and Gowan Street intersection. Within the study area, the speed limit is 50 km/h on Essa Road.
- ***Gowan Street*** is a Minor Collector traveling in the east-west direction and providing access to the GO Station (on the north side of the road) and local residential areas (on the south side of the road). It has a two-lane cross-section and operates with a signalized intersection at Essa Road. The speed limit is 50 km/h on Gowan Street.

The results of these counts were assessed using the 'Level of Service' (LOS) measure for signalized intersections. LOS provides an indication of the experience of using the intersection based on a mixture of measures and expressed as the average delay in seconds per vehicle. The measure takes into account factors such as signal timings and coordination, traffic volumes, fuel consumption and queueing.

The intersection capacity analysis results indicated that all the study area intersections and individual movements are operating at LOS 'C' or better for three peak hour conditions, except for the southbound left movement at the Lakeshore Drive and Tiffin Street intersection. This movement is operating with an unacceptable level of delay (at LOS 'F') during all the three peak hours with volume to capacity (v/c) ratio over 1.0. The higher delay for this movement is mainly caused by heavy traffic demands (400, 620, and 460 vehicles per hour during morning, afternoon, and weekend peak hour, respectively). This results in overall intersection LOS at 'E/F' for Lakeshore Drive and Tiffin Street intersection during afternoon and weekend peak hours.

LEVEL OF SERVICE	CONTROL DELAY (s/vehicle)	DESCRIPTION
A	< 10	Free flow of traffic
B	10 – 20	Slight delay, good traffic flow
C	20 – 35	Acceptable delay, acceptable traffic flow
D	35 – 55	Potential unstable traffic flow,
E	55 – 80	Unstable traffic flow, queues may fail to clear
F	>80	Congested operations, queues fail to clear

Source: *Highway Capacity Manual*, Transportation Research Board, 2010

4 DESIGN RECOMMENDATIONS

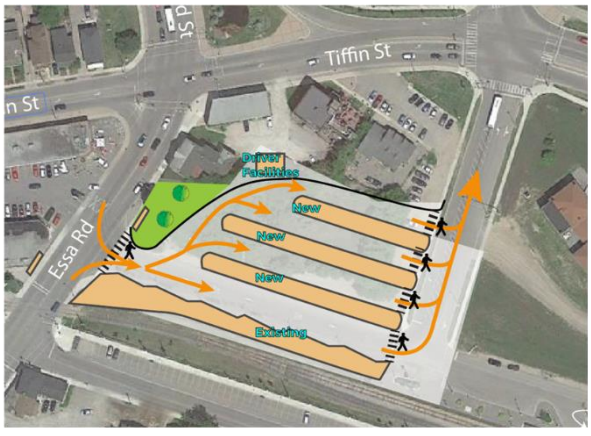
4.1 HIGH-LEVEL DESIGN OPTIONS

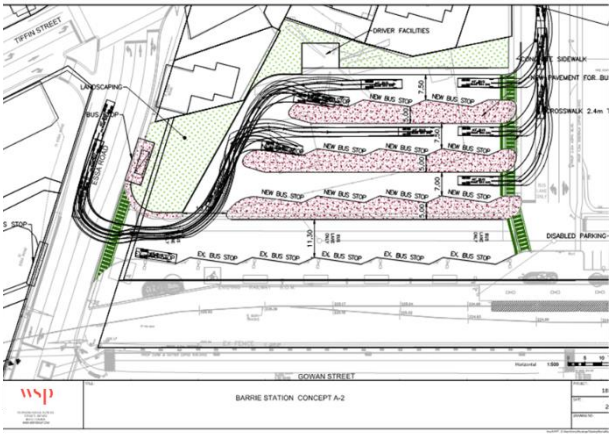
Three conceptual alternative bus terminal design configurations were considered in the early phase of the study to present high-level potential design directions to the project team. These alternative bus terminal configurations were developed based on the results of the Best Practice and Policy Reviews. The high-level alternative bus terminal design concepts shared through this process are presented below. Following consultation with Barrie Staff, two of the alternative configurations were evaluated through a preliminary screening. Based on this preliminary screening, one design concept was carried forward for further development with the full station program, local geometric standards and property requirements to produce the final proposed functional design. Concept A and concept C were advance the preliminary screening while concept C was advanced to the functional design.

CONCEPT A:

Concept A provides a total of 11 additional bus bays distributed among three separate passenger platforms, and maintains the existing six bus bays adjacent to the rail corridor. This concept was predicated on the notion of maintaining the existing bus access and circulation operation, but expanding on the capacity of the bus terminal. This configuration allows buses serving the new stops to recirculate back through the terminal to access layover facilities as required. While it is a relatively space-efficient layout, the concept introduces several new potential vehicle/pedestrian conflict points; pedestrians would have to cross the paths of buses (potentially multiple times) to transfer between the proposed new bus platforms. Further, by distributing the new bus bays among multiple passenger platforms, duplicate passenger amenities (benches, shelters, lighting, etc.) would have to be installed.

Concept A



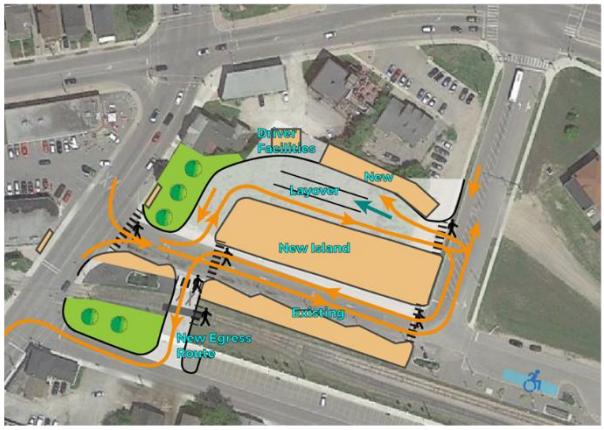


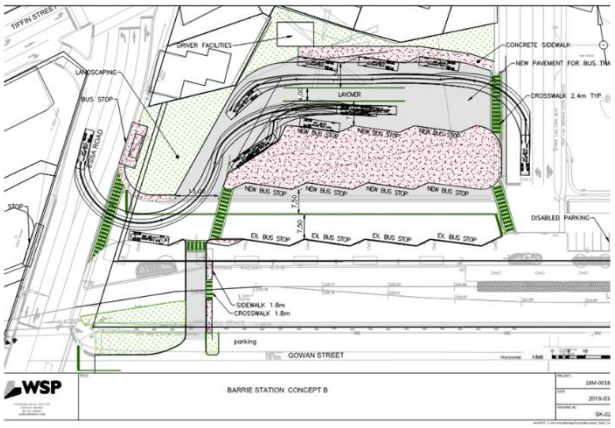
CONCEPT B:

Concept B provides a total of 11 additional bus bays, with eight bays consolidated around a central passenger island-platform, and three additional bays adjacent to the northern curb of the proposed terminal. This concept again maintains five of the existing six bus bays currently in operation along the south side of the site. This concept, by consolidating more passenger platforms around a single island, addresses some of the pedestrian crossing challenges present under Concept A, but at the expense of a

particularly-wide (15m) pedestrian crossing of the bus terminal circulation laneway. Further, the vehicular operations are somewhat more complicated and space-consumptive given the two-way bus circulation required around the proposed passenger island. The access configuration to the terminal would remain as exists today.

Concept B

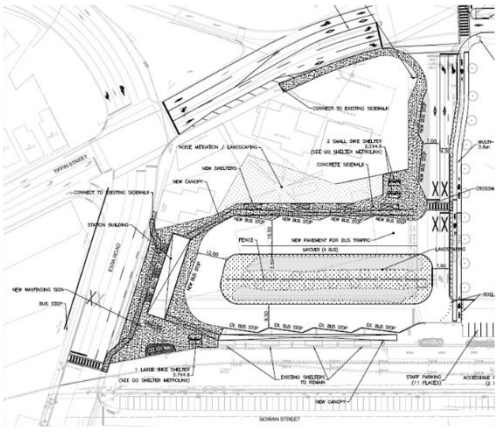




CONCEPT C:

This concept was developed to focus on addressing the drawback of Concepts A and B, by minimizing the need for pedestrians to cross vehicular circulation pathways, and simplifying the vehicular circulation requirements. The concept results in a total of nine bus bays in an outer-loop configuration terminal, with two more bays along the station access road and two additional passenger platforms on Essa Road for a total of 13 bays. This would allow passengers to transfer between bus services without crossing vehicular roadways, and access the rail platform by crossing one relatively narrow bus-only driveway. A central landscaped island would be provided to discourage pedestrian crossing of the bus terminal. In this concept, the Allandale GO Station access at Lakeshore Drive/Tiffin Street would be converted to bus-only operation, which would act as the sole point of access for the terminal; the existing Essa Road access would be closed to simplify vehicle circulation and pedestrian access. New transit-priority measures may be included on Tiffin Street to assist with bus circulation from the new singular access/egress point. Platforms would likely be allocated so that inter-city services were concentrated at the north of the site, allowing for shorter transfers between Barrie Transit services.

Concept C



PRELIMINARY SCREENING

The range of design concepts were presented to the City of Barrie for review and discussion. Concept B was subsequently eliminated from consideration based on concerns regarding the proposed access operation on Essa Road, and the presence of obviously better performing alternatives; Concepts A and C. Stakeholder review raised potential challenges of relying on a new rail corridor crossing to access the terminal as this could create complications with potential rail expansion plans. As such, Concepts A and C were carried forward for a more detailed comparative assessment.

ASSESSMENT CRITERIA

The following evaluation criteria were used to determine a preferred conceptual design:

Transportation / Transit

Ease of Bus Access – This criterion considers two elements of bus access: travel distances, and turning movements. Further consideration is given to the potential for conflicts with other vehicles. Travel distances were measured from various points along the perimeter of the study area to compare the vehicular attractiveness of the transit terminal location to GO Transit, Barrie Transit, pedestrians, and cyclists. The comparison of turning movements includes the number of turning movements required (particularly left-turns) and their anticipated delays. For comparison purposes, the following anticipated bus approaches were assumed:

- For buses accessing from/to the north, their path was measured from Bradford Street at the southern access to the Wastewater Treatment Facility;
- For buses accessing from/to the south, their path was measured from Essa Road at Gowan Street;
- For buses accessing from/to the east (via Burton Avenue), their path was measured from Essa Road at Gowan Street; and
- For buses accessing from/to the west, their path was measured from Tiffin Street at Short Street.

Ease and Safety of Pedestrian Linkages – Each facility was designed primarily with transit operations in mind. However, with the station being integrated into a commercial district where pedestrian activity could be heavy, consideration must be taken to provide a facility that will allow for safe pedestrian access. Terminal configurations that would result in the need for pedestrians to cross wide accesses or encourage unsafe crossing were rated lower than those that provided easy, safe access to the platforms.

Impact on Area Traffic Operations – This criterion was measured according to the number and location of accesses to the terminal facility. Alternative designs that require multiple accesses/egresses could result in a greater disruption to traffic by increasing the possible points of conflict. In addition, locations that would access/egress from high volume streets will pose a greater risk of conflict than those using minor streets.

Land Use

Relationship to Municipal and Provincial Policies – Describes the proposal's general adherence to the vision for the area as articulated by official planning documents.

Impact on Existing Properties – This criterion considers qualitatively the impact of the proposed design on adjacent properties, including their access operations, visual impacts, and potential for noise impacts.

Engineering Considerations

Efficiency of Site Use – This criterion forms a quantitative measure of how efficient the design concept makes use of the available space, by calculating the area required per bus bay, for each of the design concepts.

Potential for Future Expansion – Building on the evaluation of alternative sites for the Construction Cost criteria, this criterion will compare physical constraints such as major utilities and existing infrastructure beyond the construction limits of the current program requirements. Concepts that provide greater potential to accommodate future expansion of the transit facilities will be rated higher than those that are constrained.

Construction Cost – This criterion will be based on a qualitative comparison of construction costs for the alternative sites. The evaluation will draw on the conceptual facility layouts to be developed and available base mapping and utility information. Options that can be implemented at reduced cost and with minimal impact to existing infrastructure and major utilities will be rated higher than those that require additional new infrastructure, or significant modifications to existing infrastructure and utilities.

4.2 EVALUATION OF DESIGN CONCEPTS

CRITERIA	CONCEPT A	CONCEPT C
Transportation/ Transit Considerations		
Ease of Bus Access	The option of accessing the site via either Tiffin Street or Essa Road provides for flexibility and redundancy for bus operations. The Essa Road access, as existing, can be problematic in times of heavy traffic volumes. Further, egress operations could potentially be impacted by traffic congestion and conflicts associated with operating in mixed traffic with other station users.	This option requires all buses to access the terminal via the controlled Tiffin/Lakeshore intersection, resulting in marginally-longer travel distances for some bus services. The conversion of the access roadway to bus-only use is, however, expected to improve access and egress operations by eliminating potential for conflicts and congestion associated with general traffic.
Access from the North (Bradford St)	150, 1 left-turn 43s intersection delay	240m, 1 left-turn, 1 right-turn 44s intersection delay
Access from the South (Essa Rd)	50m, 1 right-turn 3s intersection delay	310m, 2 right-turns 37s intersection delay

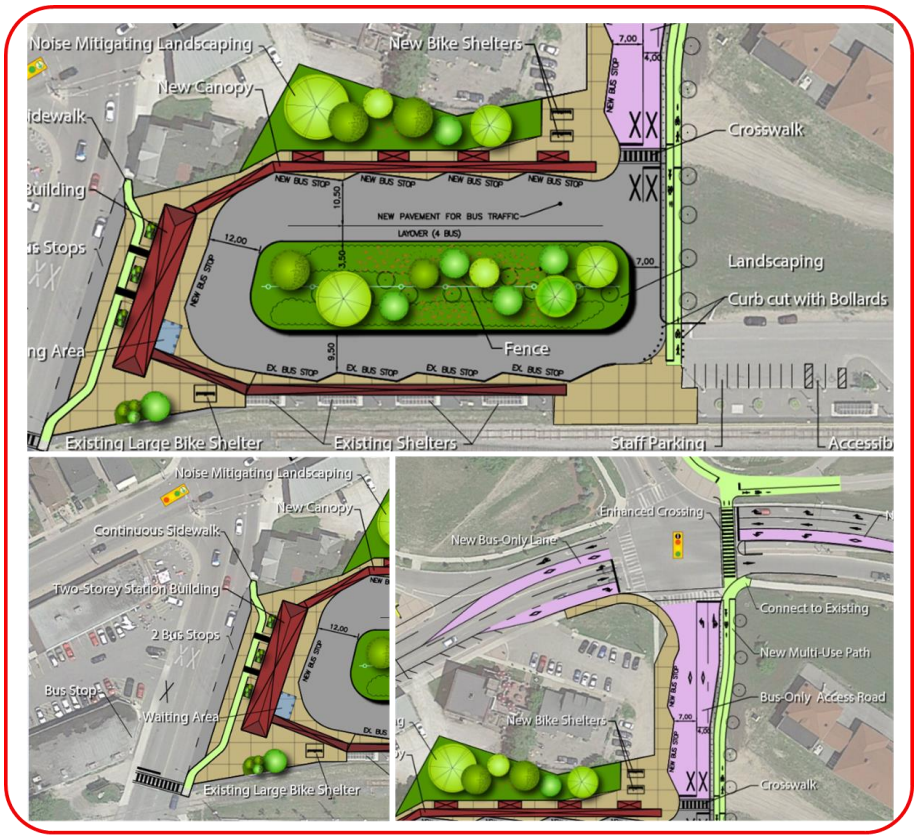
Access from the West (Tiffin St)	120m, 1 right-turn 59s intersection delay	250m, 1 right-turn 60s intersection delay
Ease and Safety of Pedestrian Linkages	 This option requires bus passengers to cross at least one, or up to three, vehicle pathways to transfer between buses and/or the rail platforms. While designated pedestrian crossing points are provided and signed accordingly, this introduces several potential pedestrian/vehicle conflict points.	 This option, by situating all bus platforms along the outer perimeter of the terminal, allows for passengers to transfer between bus platforms and the rail station without having to cross a vehicular path. Recognizing that this may not be convenient for all movements, the provision of a pedestrian crossing of the main station access roadway provides a single point at which pedestrians would have to cross a vehicular path. The closure of the access to general traffic also allows for the introduction of an active transportation pathway directly to the station platforms, further improving pedestrian and cycling access to the station.
Impact on Area Traffic Operations	 This option requires all the southbound buses to occupy the median lane on Essa Road while entering the station. This condition will affect the southbound traffic flow on Essa Road, which could result in vehicles changing lane to overtake these buses. With high southbound traffic volumes on Essa Road, this option can potentially create long queues up to the upstream intersection at Tiffin Street/Bradford Street.	 This option closes the station access on Essa Road, and provides a transit-only station access at Lakeshore Drive/Tiffin Street. The dedicated transit-only turning lanes and applicable transit signal priority/coordination can facilitate bus movements around the station and minimize traffic impact to other general-purpose traffic. This option may increase slight delays for the eastbound right turn movement at the Lakeshore Drive and Tiffin Street intersection, compared to Concept A. However, this could be reduced by providing a dedicated eastbound right turn lane.
Land Use Considerations		
Relationship to Municipal and Provincial Policies	 The Allandale Station area falls within the ‘city centre’ designation in the City’s Official plan and is identified as both an Urban Growth Centre and a Major Transit Station Area by the Province. Investments to create an integrated transit hub at the site are supportive of land use policies	
	Prevents a continuous street frontage on Essa Rd Corridor by requiring the main access station access road.	Allows for a continuous building and park frontage along Essa Rd by closing the existing station access road. Generally improves the pedestrian experience in the area.

Impact on Existing Properties	None of the options explored were found to have a significant impact on surrounding properties. The identified parcel of vacant city-owned land is sufficient to accommodate all the program elements	
Engineering Considerations		
Efficiency of Site Use	550m2/bus bay	760m2/bus bay
Potential for Future Expansion	This option allows for incremental expansion of bus bays using new islands, eventually facilitating expansion to 17 bays, five more than at the current Barrie Transit Terminal. Site operations are constrained by the unsignalized access point on Essa Rd.	This option provides only one additional bus bay more than the current facility but improves the likely operational capacity of the site. Bus bays may be expanded to the east of the bus loop in the future with minor site work and relocation of the employee parking.
Construction Cost	The largest cost item of the proposal is the station building which is not affected by either option. This option does not present any significant cost increments.	This option creates a slightly larger footprint but is not anticipated to represent a significant cost premium over Option A.
Conclusions		
Recommendation	Do Not Carry Forward	**Carry Forward for Further Study**

Considering all the above, Concept C was determined to be the simplest, safest, and most efficient of the alternatives considered. Concept C does result in minor increases in bus travel distances over Concept A. However, Concept A has other notable drawbacks in pedestrian/cyclist access, and complexity without commensurate improvements in bus operations. Ultimately, Concept A creates several compromises for the sake of a minor improvement in bus travel distances, and is therefore not recommended. Concept C was carried forward to a full functional concept design.

4.3 RECOMMENDED DESIGN

The recommended functional design for the terminal is a loop configuration with a transit-only access from the intersection of Lakeshore Drive and Tiffin Street. The design includes 11 bus bays within the loop and an additional two bays on Essa Road for a total of 13 bus bays. Passenger movements are focused to avoid interaction with transit vehicles except at one crossing on the north side of the loop which will be well marked. A station services building is situated in a plaza along the site's Essa Road frontage. Private vehicle access to the site is moved exclusively to the existing eastern station access road from Lakeshore Drive which is located closer to the rail tunnel and with good proximity to the rail passenger pick-up and drop-off area.



BUS SERVICE CONFIGURATION

Nine bus bays are configured around the central island, four of these are existing bus bays along the south which are being preserved from the existing site. By concentrating Barrie Transit services in the bays along the south and central portions of the site, most transfers to GO rail and between buses may be accommodated without pedestrians having to cross the bus driveway. The two linear bus stops on Essa Road allow Barrie Transit the flexibility to operate express services that may not enter the rest of the terminal facility. There is potential to add additional on-street bus bays on the west side of Essa Road if the adjacent plaza site redevelops at some point in the future. Two new bus bays are proposed for the western side of the access road. These bays may be allocated to intercity coach services where passengers are less likely to transfer between vehicles. The new bays are accommodated within the existing road right-of-way and should not require additional property acquisition.

SITE ACCESS

The current mixed-traffic station access road is re-purposed as a transit-only access to the site. This will preserve the reliability and speed of transit vehicles accessing the terminal, in line with the City of Barrie's objectives to increase transit mode share and the Metrolinx objectives of encouraging alternate modes of station access to driving and parking at the station. The intersection maintains a transit priority phase which preserves any future need for enhanced transit-priority at the site. The ability for buses to move in any direction at the intersection is also preserved, allowing for future operational flexibility. New bus-only turn lanes are provided to the facility from Tiffin Street and Lakeshore Drive. The eastbound righthand turn lane from Tiffin Street to allows transit vehicles to bypass a potential que from the eastbound through movement. A new transit-only left lane westbound on Tiffin Street provides buses with reliable access to the left turn movement onto Essa Road. Bollards and a curb cut are proposed at the southeast corner of the loop to preserve an emergency secondary site access.

PASSENGER AMENITIES

A glass-enclosed vestibule area is shown adjacent to the station building which can allow for a heated waiting area to remain open when the rest of the station building may be closed. Canopies are extended from the station building across the main bus platforms providing weather protected access to the station building. New heated shelters are shown at the north side of the bus loop along with two additional new covered bike shelters in addition to the current heated shelters and sheltered bike parking which will be preserved. The new bike shelters are in an area of high visibility to discourage theft and will fulfill the Metrolinx objective of increasing overall bike parking at the station.

LANDSCAPING & PUBLIC REALM

At the western side of the bus loop emphasis is placed on maintaining a continuous sidewalk along Essa Road and improved public realm experience. New plantings and gardens are possible in this plaza space. The two-storey station building is positioned to frame Essa Road while preserving sightlines from the street into the bus terminal for safety. The main bus loop is configured around a landscaped island. This island will prevent pedestrian crossing of the bus loop with a special raised central curb and offers opportunities for enhanced visual amenities in detailed design. A landscaped area north of the bus loop is maintained to provide a buffer to the existing businesses and an opportunity to potentially preserve some of the site's existing mature vegetation.

ACTIVE TRANSPORTATION

A multi-use path is extended from the existing facility along the waterfront into the heart of the station. This will ensure that the waterfront trail asset is leveraged to encourage access to the station by active transportation. An enhanced pedestrian and cyclist crossing is shown at the east side of the intersection to increase pedestrian safety as the intersection experiences a very high volume of southbound left turns from Lakeshore Drive. An additional crosswalk is shown across Essa Road immediately north of the rail corridor crossing.

4.4 PROPOSED ROAD NETWORK MODIFICATIONS

The functioning of the surrounding road network is fundamentally linked to the operations of the terminal itself. Congestion accessing the terminal creates a negative experience for transit riders and can significantly hurt on-time performance around a central hub. Because the preferred functional design involves altering the existing transit access point to the site, attention was given to potential modifications to the surrounding the road network which can ensure the speed and reliability of buses accessing the site. These proposed road network modifications were limited to minor alterations based on the current traffic counts and condition and age of the infrastructure. The proposed alterations were included in the scenarios assessed in the traffic impact study. Further study and design is required to refine the proposed road network changes.

SUMMARY OF PROPOSED TERMINAL ACCESS MODIFICATIONS:

1. Closure of the current station access on Essa Rd.
2. Severing the station access road so that public access to the Passenger Pick-up and Drop-off is exclusively through the signalized intersection east of the historic station building
3. Conversion of the western station access road to a bus-only facility
4. Introduction of transit priority measures on Tiffin Street

Overview of Terminal Access Modifications

SUMMARY OF PROPOSED TRANSIT ACCESS MODIFICATIONS:

1. Introduction of a bus-only lane on Tiffin Street that merges into a general left-hand turn lane before the intersection of Tiffin Street and Essa Road/Bradford Street – with potential for this turn lane to be extended to the intersection in the future
2. Introduction of a bus-only right turn lane at Tiffin Street and Lakeshore Drive to allow buses to bypass any queued traffic for the eastbound through (two bus lengths or 20m)
3. Reduction of Tiffin Street and Lakeshore Drive eastbound through to one lane from existing two and conversion of far-left lane to a transit-only left turn lane
4. Continuation of transit priority measures at Tiffin Street and Lakeshore and new Transit Priority measures incorporating the dedicated left turn phase at Tiffin Street and Essa Road/Bradford Street

Overview of Surrounding Road Network Modifications

LAKESHORE DRIVE AND TIFFIN STREET INTERSECTION

This intersection represents the most challenging point in the study area. The conversion of the station access road to transit only traffic may help to improve the intersection by providing additional space for left hand turns however a transit-only phase may still be needed to allow buses to make the westbound left onto Bradford Street. Tiffin Street has been modified to have one westbound receiving lane with the slip right turn to Bradford shortened to extend from the single lane. The Traffic Impact Study included a scenario including provision for two northbound left lanes to help buses bound for the westbound right onto the Bradford Street make the lane transition. Alternatively, a right on red prohibition may be implemented at the Lakeshore southbound right to reduce conflicts with buses changing lanes on Tiffin Street to make the westbound right onto Bradford Street.

Lakeshore Dr – Tiffin St – Station Access Road Modifications

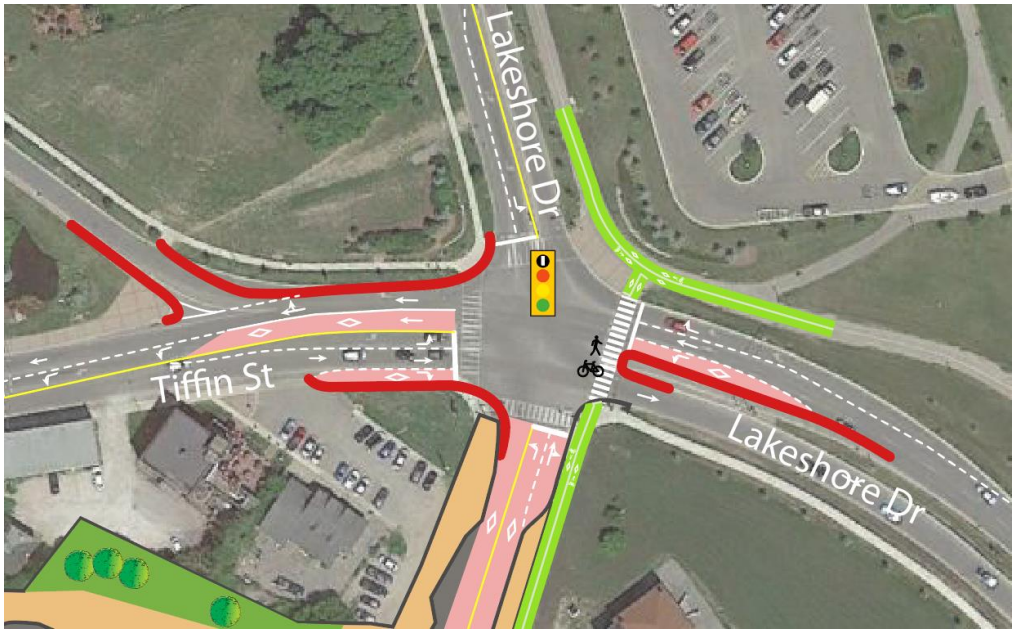
TRANSIT PRIORITY MEASURES

A dedicated transit lane is provided starting at Lakeshore east of the station access road and extending along Tiffin Street to the left-hand turn lane for Essa Road. This lane will allow for buses to avoid any congestion delays with through traffic, conflicts with vehicles turning right from Lakeshore or vehicles slowing to turn right onto Bradford. Special signage and design consideration will be needed to ensure the legibility of this transit-only lane and reduce the chance of private vehicles entering it.

A transit-only eastbound right from Tiffin has also been included to ensure reliable transit access to the station access road and avoid any potential queuing of the eastbound through movements. A right turn channelized lane for buses is not recommended as it may conflict with pedestrians and cyclists. Special consideration is anticipated to mitigate the conflicts with pedestrian traffic at this intersection as it is intended to provide a primary access point between the station and the multi-use trail along the waterfront.

INFRASTRUCTURE MODIFICATIONS

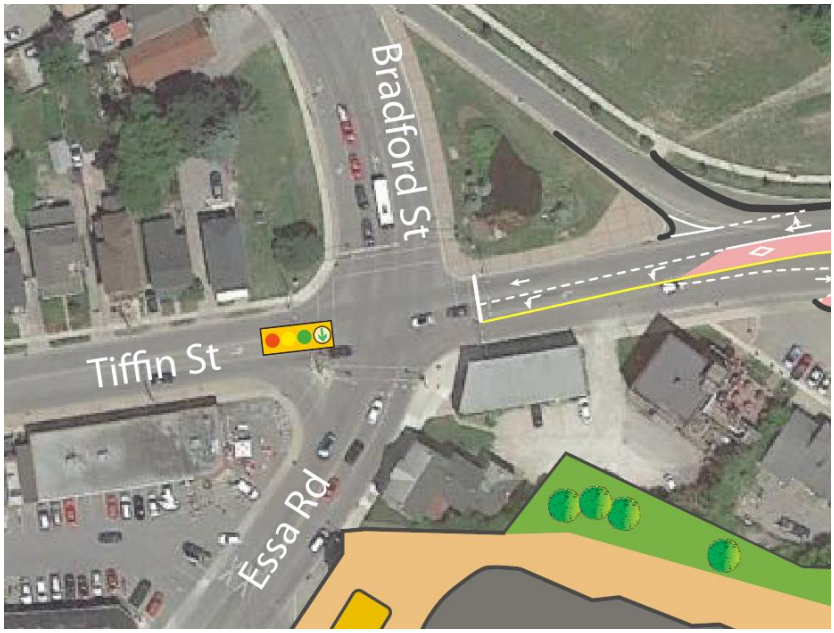
The proposed road network changes require some minor modifications to the existing hard infrastructure. As the intersection is in good condition, the changes were designed to preserve as much of the existing infrastructure as possible. Curb modifications would be required on the west side of Lakeshore Drive north of Tiffin St, the center median of Lakeshore Drive south of Tiffin Street and on south side of Tiffin Street. This work would likely take the form of minor works. A general line item for intersection modifications was included in the overall cost estimate.



Potential Curb Modifications

TIFFIN STREET AND ESSA RD/BRADFORD STREET INTERSECTION:

The transit-only lane on Tiffin Street will merge with the general vehicle EBL at this intersection. This is because a separate WBL lane was determined to be impractical for the opening day time horizon because of property impacts. The dedicated left phase will be maintained with provision for transit signal priority coordination with station access road intersection. This configuration has been identified for the opening day of the station.



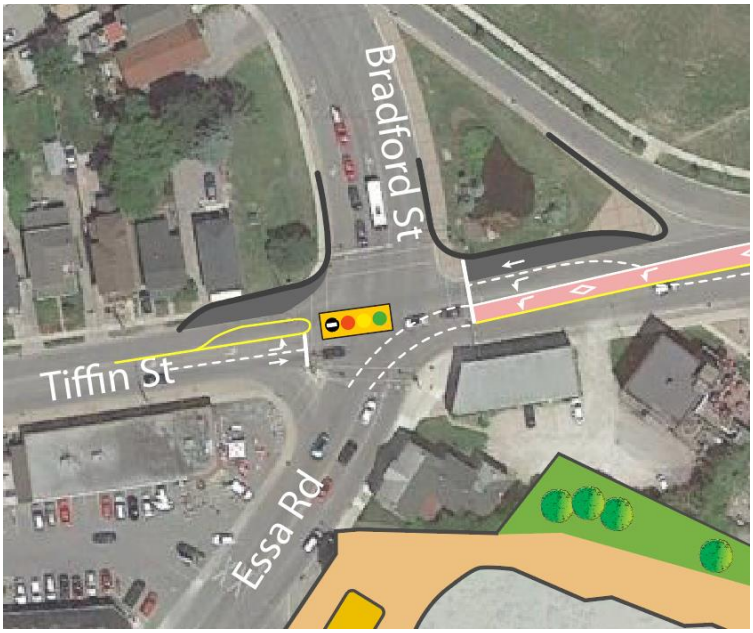
Opening Day Configuration at Tiffin Street and Bradford Street / Essa Road

POTENTIAL TRANSIT SIGNAL PRIORITY MEASURES:

The City has indicated that transit priority measures should be included in this area to save travel time and operational costs. The existing transit priority timing measures may be included at the station access road but will have to be coordinated with pedestrian phase timings. There is potential that signal priorities may be coordinated between the Lakeshore and Tiffin intersection and the Tiffin and Essa intersection with a radio frequency transit signal priority system. This could potentially allow for coordinated movements allowing buses to have priority for both left turn movements to access Essa Rd southbound from the new bus terminal. This type of analysis is not included in the current scope of this study as more detailed intersection movements may require a micro-simulation model.

FUTURE ROAD NETWORK CONSIDERATIONS

In the future, the City has identified the potential expand this intersection to accommodate a complete transit-only lane with a dedicated transit-only phase. This would likely require a separate transit-only phase to provide a safe WBL that avoids conflicts with buses and private vehicles. A separate phase would also allow buses to more easily access the curb lane to serve stops on Essa Rd. It is likely that some property acquisition would be required on northwest side of the intersection to facilitate the geometry of the WBTH to Tiffin Street. This would need to be further studied if this long-term design solution is pursued and may be coordinated with any future redevelopment on the subject properties.



Potential Future Condition at Tiffin Street and Bradford Street/Essa Road

4.5 TRAFFIC IMPACT STUDY FINDINGS

The existing intersection capacity analysis results indicate that all of the study area intersections and individual movements are operating at Level of Service (LOS) 'C' or better during morning, afternoon, and weekend peak hours, except for the southbound left turn movement at the Lakeshore Drive and Tiffin Street intersection. This movement is currently operating at LOS 'F' during all the three peak hours with volume to capacity (v/c) ratio over 1.0.

TRAFFIC STUDY METHODOLOGY

Future total traffic volumes were estimated for the opening year (2024) to incorporate future background traffic growth and future site traffic demands. A compound annual growth rate of 2% was applied to the existing (2018) balanced traffic volumes based on Barrie Traffic Staff recommendation, to estimate future background traffic volumes for three peak hour conditions. Future site traffic volumes were estimated considering the future bus routes serving the new mobility hub, and additional pick-up and drop-off vehicle trips that may generate from the growth of GO Transit ridership. All the bus trips will be using GO Station West Access and all new pick-up and drop-off vehicle trips will be using GO Station East Access.

For the future (2024) opening day analysis, two different signal timing priorities were established to provide a range of the likely traffic impacts. In the first set of analysis the signal timings were optimized to prioritize bus movements and to coordinate transit left hand turns from the station access road onto Tiffin Street and from Tiffin Street onto Essa Road. In the second set of analysis, the signal timings were optimized to reduce overall intersection delay, potential resulting in less priority for transit vehicles but reducing delay for other movements. These two sets of analysis provide a bracket to understand the potential range of delay at this level of study detail. The performance of the intersections is likely to fall within this bracket based on the final prioritization decisions that made in detailed design. The analysis for this work was completed using Synchro software that provides formula based results. A full microsimulation may be undertaken to fully optimize signal timings as part of the detailed design.

Additionally, two intersection lane configuration scenarios were assessed for the northbound approach at the Lakeshore Drive/Tiffin Street and Station West Access intersection. Scenario 1 included a single lane for northbound left movement at GO Station West Access, while Scenario 2 included dual lanes for northbound left movement at GO Station West Access. The analysis results for Scenario 2 show higher traffic delays for the Tiffin Street intersections, as compared to Scenario 1.

TRANSIT SIGNAL PRIORITY

Additionally, Transit Signal Priority (TSP) and signal coordination could be considered to reduce the vehicular delays and transit delays in the study area. Dedicated bus-only turn lanes are recommended for eastbound right and westbound left movements at Lakeshore Drive and Tiffin Street. Additional through lane in the east-west direction may be considered beyond 2024 to provide additional vehicular capacity on Tiffin Street.

SUMMER TRAFFIC CONDITIONS

The study area is uniquely situated to experience heavy traffic volume peaks on summer weekends as visitors from the GTA access surrounding recreational opportunities. Congestion on Highway 400 can create traffic infiltration onto city streets including within the Allandale area. Because the traffic counts for this study were completed in the winter months, comparative counts from the summer were provided by the City of Barrie in order to understand the likely impact of summer weekend traffic. Data provided for the intersection of Essa Road and Gowan Street from a Friday in June 2015, demonstrated an increase of 49% in approaching volume during the PM peak compared to the traffic counts in February. Analysis of the intersection performance with these increased traffic volumes revealed a reduced, but acceptable Level of Service.

Summer weekend traffic volumes are likely to further increase delays at the Tiffin Street and Lakeshore Drive intersection which operates near capacity at peak periods throughout the year. However, the volume increase at this intersection may not be as great as at Essa Road and Gowan Street because traffic diverting from Highway 400 is likely to somewhat disperse using Bradford Street. The increased delays likely on summer weekends further underscore the need to provide transit priority lanes in the area to ensure that reliable transit service is maintained during these periods of peak demand on the local road network. Additional study of the impact of summer weekends volumes on the Tiffin Street and Lakeshore Drive intersection may be considered for a future phase of this work.

FINDINGS & RECOMMENDATIONS

When signal timings plans were optimized to facilitate bus movements the overall intersection LOS dropped from ‘A/B’ in the future background traffic condition to ‘B/C’ in the future total traffic condition during the morning peak hour, from ‘A/C/D’ to ‘B/D/E’ during the afternoon peak hour, and from ‘A/B’ to ‘A/C’ during the weekend peak hour (Table 5). Especially for the intersection at Lakeshore Drive and Tiffin Street, the eastbound through and southbound left movements are expected to experience higher delays and longer queues during the afternoon peak hour. These impacts are mainly resulting from higher traffic demands and optimized signal timing settings to improve bus movements egressing from the station (the northbound left movement at Lakeshore Drive and Tiffin Street intersection).

When signal timing plans were optimized for general traffic operation at Lakeshore Drive and Tiffin Street intersection and at Essa Road and Tiffin Street intersection, both the intersections are expected to operate at an overall LOS ‘D’ or better during the three peak hours. Furthermore, the overall intersection delays are expected to be reduced by 2 to 12 seconds during the three peak hours (as compared to the future total traffic condition with optimized signal timing plans for bus movements).

Intersection LOS (Delay) for	Condition	Intersection		
		Lakeshore Drive and Tiffin Street	Essa Road and Tiffin Street	Lakeshore Drive and GO Station East Access
AM Peak Hour	Background Traffic	B (18 s)	B (18 s)	A (8 s)
	Total Traffic (optimized for bus)	C (21 s)	C (30 s)	B (11 s)
	Total Traffic (optimized for traffic)	B (19 s)	C (22 s)	B (11 s)
PM Peak Hour	Background Traffic	D (37 s)	C (24 s)	A (8 s)
	Total Traffic (optimized for bus)	E (59 s)	D (45 s)	B (16 s)
	Total Traffic (optimized for traffic)	D (47 s)	D (36 s)	B (16 s)
Weekend Peak Hour	Background Traffic	B (20 s)	B (19 s)	A (6 s)
	Total Traffic (optimized for bus)	C (24 s)	C (30 s)	A (9 s)
	Total Traffic (optimized for traffic)	C (21 s)	C (22 s)	A (9 s)

Overall Intersection LOS Review

The complete traffic impact study can be found in Appendix D.

4.6 COST ESTIMATE

The estimate has been prepared to a 'Level D' basis of accuracy with figures provided conservatively to protect for future design progress. WSP developed unit price estimates based on comparable recent projects in the region. These examples ranged from 50% to 75% design completion and were selected to reflect the most current design standards and requirements from Metrolinx. Barrie Staff reviewed all cost estimates and unit costs based on recent local examples to more accurately reflect the local market and design precedents. Percentages were included for minor items, utilities and professional services and a reasonable contingency was added to account for the design items which will be addressed in future phases of planning and design. Archeological work is not included in the estimate and is assumed to be accounted for separately.

The functional design for the site is structured to strategically preserve as much existing infrastructure as possible. This includes maintaining four of the existing bays along the south side of the bus loop as well as the existing asphalt on the station access road and transit access driveway from Essa Road. Existing concrete sidewalk and curb infrastructure not impacted directly by the proposed work is assumed to

remain in place and is not included in the cost estimate. New asphalt work is assumed at a higher unit rate to account for excavation laying of granular. Existing asphalt areas are assumed to require a cosmetic repaving following construction to create a uniform appearance, repair any wear and tear from construction and allow for any minor grading work.

The project as depicted in the functional design drawings is estimated to cost approximately $7.2 million to achieve full design and implementation.

4.7 ADDITIONAL DESIGN CONSIDERATIONS

SIGNAGE AND WAYFINDING

The closure of the western station access road to private vehicles may create initial confusion and requires specific direction from around the area to the station's Passenger Pick-Up and Drop-Off area. The introduction of significant new transit-only infrastructure will also require deliberate design approaches as such facilities are not common in Simcoe County. Many similar bus terminals in the region struggle with frequent instances of drivers accidently or intentionally entering the bus-only area. Special signage and pavement treatment should be considered to avoid these problems. Furthermore, the site has been planned to minimize pedestrian and vehicle conflicts however there are inevitably places where pedestrian crossings are necessary. Special features such as lighting, signage and pavement should be considered that these crossings are visible both to pedestrians and vehicle operators.

STATION SERVICES BUILDING

The station services building has been designed with sufficient room with accommodate the suggested program. The building may also include an enclosed vestibule which can continue to serve as a weather shelter for passengers even while the rest of the station building is closed. The exact layout and detailed program within the station building remains to be determined a future phase of design. Given the historic surrounding buildings and established character of the Allandale area it is likely that specific consideration will need to be given to these features. For the purposes of the functional design drawing, the station building is shown suggestive of the adjacent historic Allandale Station.

5 CONCLUSION

5.1 FINDINGS

The Allandale site represents a feasible location for the relocation of the main Barrie Transit Terminal and offers several benefits to the City. The site can accommodate the program requirements of Barrie Transit service as well as GO Transit and inter-city coach operators while preserving significant existing infrastructure and encouraging investment in the surrounding area. This study has demonstrated a functional design that includes 13 bus bays on the existing property and which can operate safely and efficiently. The study has also demonstrated that Barrie Transit operations can be redirected to utilize the site with minimal incremental cost and disruption to the existing bus network. Finally, the traffic impact study has demonstrated that the site reconfigurations are unlikely to have a significant traffic impact on the surrounding road network.

By reconfiguring the existing station access road to a transit-only facility, operations at the site can be improved by removing the existing unsignalized intersection at Essa Road. The recommended system of bus-only lanes facilitates reliable and fast transit access to the central hub and GO Rail station, advancing the goals of Barrie Multimodal Transportation Master Plan, the Metrolinx Regional Transportation Plan and the GO Rail Station Access Strategy. Closing the bus access at Essa Road also improves the pedestrian experience along an emerging intensification corridor by creating space for an attractive public plaza and station services building. The location of the proposed bus facility also provides substantial buffers from the surrounding businesses and residential areas including the potential to retain existing mature vegetation along the north side of the property. The configuration of the bus bays around a landscaped island allows for focused pedestrian crossings, rational separation of bays amongst operators and preserves for long-term transit expansion.

5.2 NEXT STEPS

This work has advanced a functional design for the mobility hub site. Its intention has been to assess the feasibility of relocating the City's central bus terminal to Allandale station and to confirm that the site can satisfactorily meet the program requirements and high-level cost of developing the site. Further work is required to develop the functional design presented here into a detailed design with a refined cost estimate that can be taken to procurement and construction. Future work will include a more detailed investigation of considerations such as site utilities, geology and topography as well as architectural elements such as the design and materiality of the new station building, landscaping and shelters. Further work is also required to fully refine the traffic analysis at the site to optimize any potential transit signal priority measures through micro-simulation.

The functional design presented here provides the basis for further consultation with stakeholders, partner agencies and the local community within the City's broader planning framework of Allandale and the Essa Road intensification corridor.

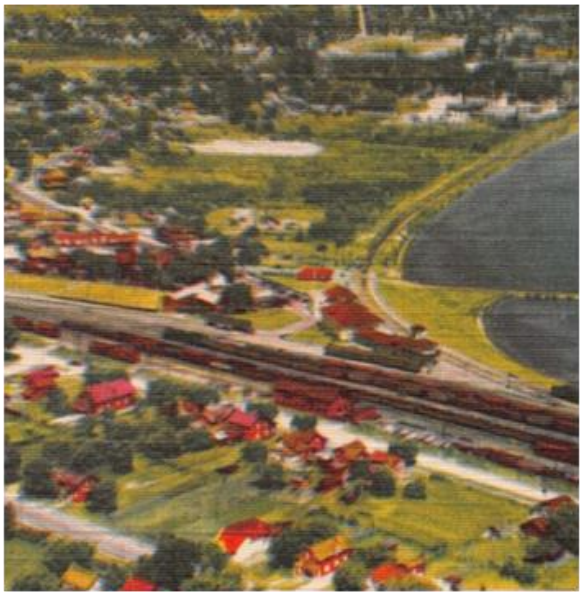
Allandale Mobility Hub Study Final Report

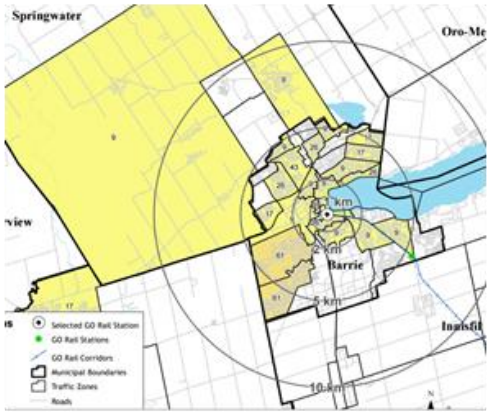
APPENDIX

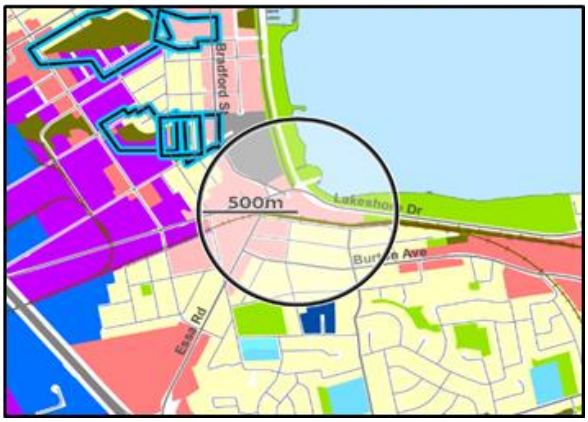
A Policy Review Report

Allandale Mobility Hub Study

Policy Review Report







March 2018

Contents

1. Background

The City of Barrie has retained WSP to study the costs and feasibility of shifting the Barrie Transit Terminal from its current location on Maple Avenue in downtown to a new site immediately adjacent to the Allandale GO Station. The relocation of the transit facility creates space in the downtown for a new farmers market and event space while consolidating the transit hub function at the GO Rail station to coincide with the arrival of all-day rail service.

The Allandale neighbourhood is a historic community with a wealth of civic amenities and natural heritage. Included within the Downtown Barrie Urban Growth Centre, the neighbourhood has also been a significant focus of planning and strategic investment by the City of Barrie for several years. This planning and investment framework, combined with the transportation and public realm amenities of the area are likely to lead to significant intensification in the future.

Situated at a natural crossroads at the head of Kempenfelt Bay, the station site has been a transportation hub for over 160 years. The station will serve as the northern terminus of two-way, all-day rail service from Toronto by 2024 given it an important role both within the City of Barrie, Simcoe County and to other points north. An active freight short-line railway owned by the City of Barrie skirts the site and crosses Essa Road just north of the station property.

It is important that the functional design work include a policy review to fully contextualize the policy framework for the site in terms of land use planning, urban design and transportation.

2. Key Findings

- While the Allandale area is currently relatively low density, the City of Barrie, in accordance with provincial planning policies, has established planning policies allowing for significant intensification of the area
- It is likely the community will grow significantly over the lifespan of any new transit facility
- Parking is highly constrained at the station meaning that ridership growth will have to come from other alternative means of station access
- Parking constraints at Allandale GO make the station attractive for public transit users
- The role of the station at the terminus of the GO Rail line means that other services may use the hub as a connection to destinations beyond the City of Barrie

3. Land Use Planning Policies

3.1 Growth Plan for the Greater Golden Horseshoe (2017)

In general terms, the Provincial Growth Plan for the Greater Golden Horseshoe (herein referred to as the 'Growth Plan') strives to support complete communities through the efficient use of land and resources. The Growth Plan defines a complete community as:

> *"Places such as mixed-use neighbourhoods or other areas within cities, towns, and settlement areas that offer and support opportunities for people of all ages and abilities*

to conveniently access most of the necessities for daily living, including an appropriate mix of jobs, local stores, and services, a full range of housing, transportation options and public service facilities. Complete communities are age-friendly and may take different shapes and forms appropriate to their contexts."

The Growth Plan further expands upon the elements of a complete community:

"Applying the policies of this Plan will support the achievement of complete communities that:

a) feature a diverse mix of land uses, including residential and employment uses, and convenient access to local stores, services, and public service facilities;

b) improve social equity and overall quality of life, including human health, for people of all ages, abilities, and incomes;

c) provide a diverse range and mix of housing options, including second units and affordable housing, to accommodate people at all stages of life, and to accommodate the needs of all household sizes and incomes;

d) expand convenient access to:

i. a range of transportation options, including options for the safe, comfortable and convenient use of active transportation;

ii. public service facilities, co-located and integrated in community hubs;

iii. an appropriate supply of safe, publicly-accessible open spaces, parks, trails, and other recreational facilities; and

iv. healthy, local, and affordable food options, including through urban agriculture;

e) ensure the development of high quality compact built form, an attractive and vibrant public realm, including public open spaces, through site design and urban design standards;

f) mitigate and adapt to climate change impacts, build resilience, reduce greenhouse gas emissions, and contribute towards the achievement of low-carbon communities; and,

g) integrate green infrastructure and low impact development." (Growth Plan, Section 2.2.1(4))

The proposed Allandale Station Mobility Hub is characterized as a 'Major Transit Station Area' within the terminology and constructs of Provincial policy. The Growth Plan (2017) defines a 'Major Transit Station Area' as:

"The area including and around any existing or planned higher order transit station or stop within a settlement area; or the area including and around a major bus depot in an urban core. Major transit station areas generally are defined as the area within an approximate

500 metre radius of a transit station, representing about a 10-minute walk." (Growth Plan (2017), Glossary)

To place this in context, 'higher order transit' is defined by the Growth Plan (2017) as:

> *"Transit that generally operates in partially or completely dedicated rights-of-way, outside of mixed traffic, and therefore can achieve levels of speed and reliability greater than mixed-traffic transit. Higher order transit can include heavy rail (such as subways and inter-city rail), light rail, and buses in dedicated rights-of-way."* (Growth Plan (2017), Glossary)

Any future land use or development in proximity of the proposed Allandale Station Mobility Hub must occur in accordance with the Provincial principles for growth articulated above. However, development within proximity of the Allandale Station Mobility Hub must also occur at greater densities given that downtown Barrie and the lands contemplated for the new Allandale Transit Mobility Hub in particular, are identified as an 'Urban Growth Centre' by the Growth Plan.

Urban Growth Centres are the regional focal points designed to accommodate population and employment growth. These areas are intended to be the priority strategic areas along with transit corridors and station areas, to provide for intensification. Such areas are also the focus for municipal investment in transit, infrastructure and public service facilities. The Growth Plan provides that:

> *"Urban growth centres will be planned:*
>
> *a) as focal areas for investment in regional public service facilities, as well as commercial, recreational, cultural, and entertainment uses;*
>
> *b) to accommodate and support the transit network at the regional scale and provide connection points for inter- and intra-regional transit;*
>
> *c) to serve as high-density major employment centres that will attract provincially, nationally, or internationally significant employment uses; and*
>
> *d) to accommodate significant population and employment growth*." (Growth Plan, Section 2.2.3(1))

The capacity for growth within the Urban Growth Centre to a large degree depends on the base population projections for the City as a whole. The Province has been very prescriptive in assigning population and growth projections to municipalities within the Growth Plan area. The Growth Plan requires that:

> *"Population and employment forecasts contained in Schedule 3 will be used for planning and managing growth in the GGH to the horizon of this Plan in accordance with the policies in subsection 5.2.4."* (Growth Plan, Section 2.2.1(1))

Section 5.2.4 of the Growth Plan compels municipalities to apply the population and employment forecasts for managing growth to the Growth Plan horizon of 2041. The population and employment forecasts applied to the City of Barrie are provided in Table 1 below.

Table 1: Growth Plan Population and Growth Projections for the City of Barrie

	Population	Employment
2031	210,000	101,000
2036	231,000	114,000
2041	253,000	129,000

The City of Barrie has recently completed an Intensification Study (February 2018) in which the City's population projections for the 2041 planning horizon were allocated to various locations and forms of development within the City including: the urban growth centre, nodes and corridors, 'other' built boundary, greenfield and the new secondary plan areas. In reference to the lands surrounding the proposed Allandale Station Mobility Hub, relevant population allocations include those projections that the City has undertaken for the City's Urban Growth Centre and to the Nodes and Corridors.

The Essa Road corridor extends west from the proposed Allandale Station Mobility Hub and is a connecting link between Highway 400 and the City's lakefront. It is one of a number of nodes and corridors within the City and one of the City's priority corridors. The City has also recently initiated a study of the Essa Road corridor to identify redevelopment and intensification opportunities. Population projections that will influence development in proximity of the Allandale Station Mobility Hub are provided in Table 2 below.

TABLE 2: BREAKDOWN OF POPULATION ALLOCATIONS

Area	2016 Census		2031 Growth Plan		2041 Growth Plan	
	Population	%	Population	%	Population	%
Urban Centre	4,500	3%	13,400	6%	17,600	7%
Nodes & Corridors*	6,500	4%	12,00	6%	24,500	10%

Source: *"Population and Employment Trends: Changing the Conversation About Intensification"*, City staff presentation to Council February 5, 2018

% = Percentage of overall City population

* = These figures are a cumulative total for all nodes and corridors of which the Essa Road corridor is only one such corridor.

Generally, municipalities cannot designate a supply of land beyond the 2041 time horizon contained within the Growth Plan. However, the Growth Plan does provide for planning beyond this time horizon in 'strategic growth areas' such as the Urban Centre, transit station areas and nodes and corridors (including the Essa Road corridor) as follows:

> *"Within delineated built-up areas, municipalities may plan for development beyond the horizon of this Plan for strategic growth areas that are delineated in official plans and subject to minimum density targets, provided that:*
>
> *a) integrated planning for infrastructure and public service facilities would ensure that the development does not exceed existing or planned capacity;*

b) the type and scale of built form for the development would be contextually appropriate; and

c) the development would support the achievement of complete communities, including a diverse mix of land uses and sufficient open space." (Growth Plan, Section 5.2.4(5))

There is significant development potential for lands in proximity of the Allandale Mobility Station Hub. Generally, this will take the form of redevelopment or infill development as there are very few vacant lots in this area.

The Provincial Growth Plan establishes minimum intensification targets for residential development within the Growth Plan Area municipalities. These are as follows:

- From 2022 to 2031 – 50% of all residential development occurring annually within the City must occur through intensification within the City's built boundary (Growth Plan, Section 2.2.2(2))
- From 2031 to 2041 - 60% of all residential development occurring annually within the City must occur through intensification within the City's built boundary (Growth Plan, Section 2.2.2(1))

Currently the City's Official Plan requires that at least 40% of all residential development must occur within the built boundary. (City of Barrie Official Plan, Section 3.1.2.3(b)) This requirement will be updated to reflect the 2017 Growth Plan through as part of the City's upcoming Municipal Comprehensive Review targeted to occur in 2018/2019.

The City has noted an underutilization of lands within the Urban Growth Centre and along its Nodes and Corridors. In order to meet both the 2031 and the 2041 Growth Plan density and intensification targets, a significant amount of additional high density growth will need to occur within the Urban Growth Centre and along the City's nodes and corridors. The Essa Road Study is one ongoing study that will address this issue. It is also anticipated that the City will be initiating an Official Plan Review project this year with an anticipated completion date of Q4 2019.

In order to promote compact development forms within the Urban Centres and along Transit Corridors and Station Areas, the Province has identified a minimum density target that municipalities must plan to achieve by 2031 or sooner. In the case of the City of Barrie, the Growth Plan prescribes a minimum target density of **150 residents and jobs combined per hectare** for lands within the delineated Urban Centre and within 500 metres of the proposed Allandale Mobility Hub which is characterized as a 'Major Transit Station Area' within the Growth Plan. (Growth Plan, Section 2.2.3(2)(c) and 2.2.4(3)(c))

In delineating the boundaries of a Major Transit Station Area, the Growth Plan requires that municipalities:

"…will delineate the boundaries of major transit station areas in a transit-supportive manner that maximizes the size of the area and the number of potential transit users that are within walking distance of the station." (Growth Plan, Section 2.2.4(2)

The Growth Plan defines 'transit supportive' as meaning:

"Relating to development that makes transit viable and improves the quality of the experience of using transit. It often refers to compact, mixed-use development that has a high level of employment and residential densities. Transit-supportive development will

be consistent with Ontario's Transit Supportive Guidelines. (Based on PPS, 2014 and modified for this Plan)"

At present, the City of Barrie Official Plan does not delineate the boundaries of any Major Transit Station Area around the proposed Allandale Mobility Hub lands. This will need to be done as part of the municipality's conformity exercise to bring the current Official Plan into conformity with the 2017 Growth Plan.

The Growth Plan requires that such Major Transit Station Areas be planned and designed to provide multi-modal access to the stations and that lands in proximity of the stations be protected for possible future expansion. In this regard, the Growth Plan provides that:

"All major transit station areas will be planned and designed to be transit-supportive and to achieve multimodal access to stations and connections to nearby major trip generators by providing, where appropriate:

a) connections to local and regional transit services to support transit service integration;

b) infrastructure to support active transportation, including sidewalks, bicycle lanes, and secure bicycle parking; and

c) commuter pick-up/drop-off areas." (Growth Plan, Section 2.2.4(8))

"In planning lands adjacent to or near higher order transit corridors and facilities, municipalities will identify and protect lands that may be needed for future enhancement or expansion of transit infrastructure, in consultation with Metrolinx, as appropriate." (Growth Plan, Section 2.2.4(11))

The Growth Plan further requires that lands within the Major Transit Station Area must be planned to support a diverse mix of uses and compact built forms at densities sufficient to support existing and planned transit service levels. In particular, the Growth Plan provides that:

"Within all major transit station areas, development will be supported, where appropriate, by:

a) planning for a diverse mix of uses, including second units and affordable housing, to support existing and planned transit service levels;

b) fostering collaboration between public and private sectors, such as joint development projects;

c) providing alternative development standards, such as reduced parking standards; and

d) prohibiting land uses and built form that would adversely affect the achievement of transit-supportive densities." (Growth Plan, Section 2.2.4(9))

"Lands adjacent to or near to existing and planned frequent transit should be planned to be transit-supportive and supportive of active transportation and a range and mix of uses and activities." (Growth Plan, Section 2.2.4(10))

"Within major transit station areas on priority transit corridors or subway lines, land uses and built form that would adversely affect the achievement of the minimum density targets in this Plan will be prohibited." (Growth Plan, Section 2.2.4(6))

Collectively, the policies of the Provincial Growth Plan provide strong policy support for a significant amount of population and employment growth within proximity of the Allandale Station Mobility Hub.

3.2 Bill 139 Planning Act Reform

Bill 139, Building Better Communities and Conserving Watersheds Act, 2017, proposes changes to a number of pieces of legislation including enactment of the *Local Planning Appeal Tribunal Act, 2017*; *Local Planning Appeal Support Centre Act, 2017*; amendments to the *Planning Act, City of Toronto Act, 2006* and the *Ontario Planning and Development Act, 1994*; as well as amendments to the Conservation Authorities Act and various acts consequential to the enactment of the *Local Planning Appeal Tribunal Act, 2017.* This piece of legislation received Royal Assent in the Ontario legislature on December 12, 2017 and has a scheduled Proclamation date of April 3, 2018. As of April 3, 2018 the legislative changes and associated regulations introduced through Bill 139 will fully take effect.

While Bill 139 makes a number of changes to the Planning Act, there are a few amendments that will directly impact development in proximity of the Allandale Station Mobility Hub. Bill 139 provides that:

- Municipalities may now designate lands in proximity of an existing or planned higher order transit station such as the proposed Allandale Station Mobility Hub as a protected Major Transit Station Area. Such areas will need to be delineated in the City's Official Plan.
- Official Plan policies applicable to a Major Transit Station Area must at a minimum identify the minimum number of residents and jobs per hectare, permitted uses and minimum densities for buildings and structures for such areas
- The legislation provides that where lands have been designated as a 'Protected Transit Station Area' within an Official Plan, the boundaries of such designation and any associated policies can only be appealed by the Minister (except with very limited exceptions)
- Zoning By-laws establishing densities and height regulations for Major Transit Station Areas equally, cannot be appealed except where such an appeal is permitted by resolution of Council

These legislative changes afford an added level of certainty in establishing the planning policies that will regulate land uses in proximity of the Allandale Station Mobility Hub.

3.3 City of Barrie Official Plan

The Province has identified downtown Barrie as a focal point to accommodate growth and development by identifying this area as one of the Provincial Urban Growth Centres within the Greater Toronto Area. Barrie's Urban Growth Centre encompasses the historic downtown and surrounding lands as well as the proposed Allandale Station Mobility Hub site.

The Province established the specific limits of Barrie's Urban Growth Centre in 2008. These boundaries along with the density target of 150 residents and jobs combined per hectare have been incorporated within the Official Plan along with a number of additional policies to direct the amount and form of

growth in this area. Existing capacity for intensification in the Urban Growth Centre is articulated in Section 3.1.2.3(d) of the Official Plan:

> *"The City's Growth Management Strategy identifies that the built up area, as identified on Schedule I, can accommodate an additional 13,500 housing units, of which 39% are in the Urban Growth Centre and 61% are outside the Urban Growth Centre."*

The **'City Centre' designation** that has been applied to the Urban Growth Centre lands is one of 5 commercial designations within the City's Official Plan. The City Centre designation permits a variety of residential, commercial and institutional uses at higher densities and compact form as follows:

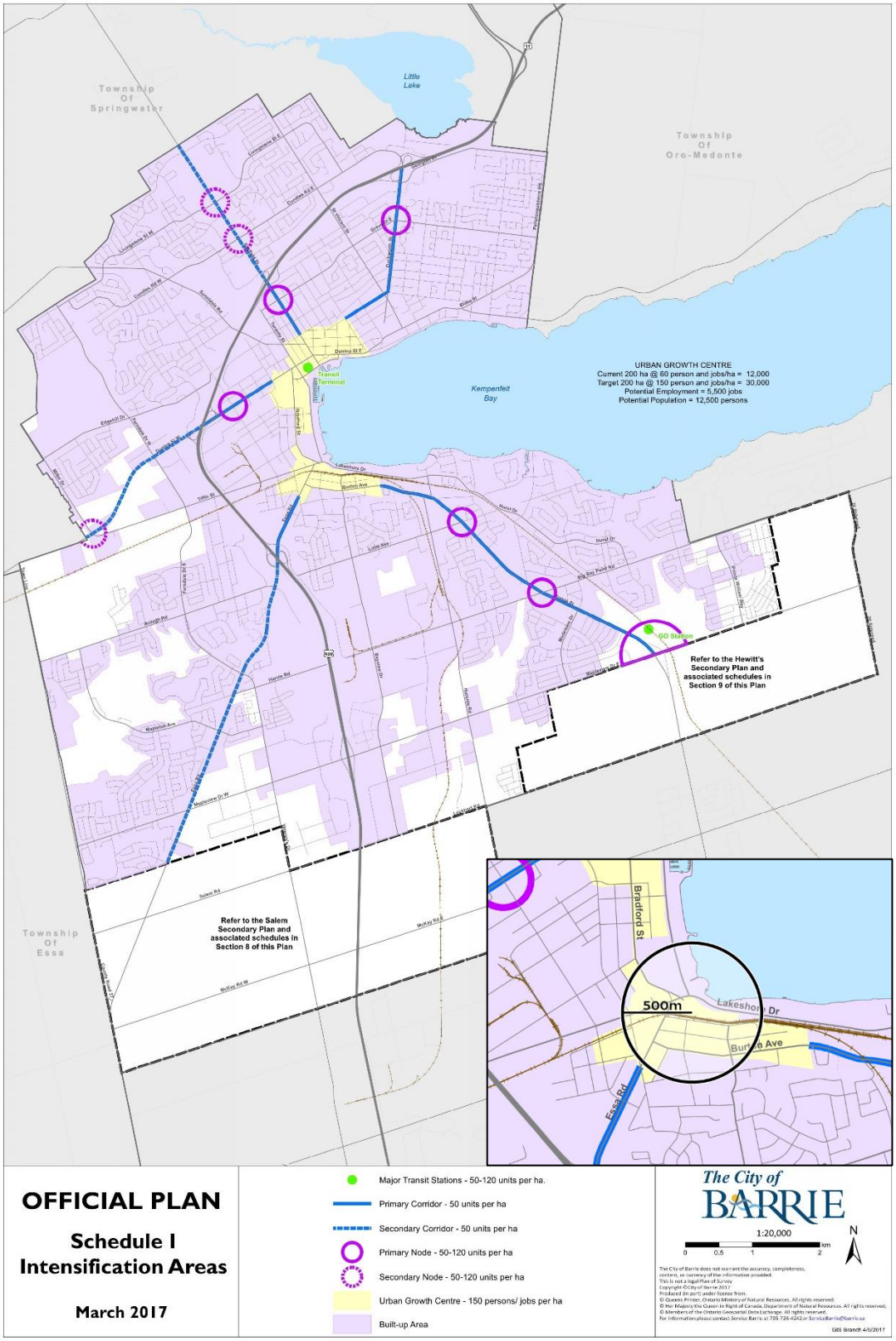
> *"Lands designated City Centre are intended to provide a broad range of retail, service, office, institutional, public and residential uses to serve the general needs of Downtown residents as well as specialized functions for the entire community and market area. Retail stores, offices, hotels, institutional, and entertainment uses shall be integrated, where possible, with residential uses, community facilities, and open space. The City Centre includes the Downtown Barrie UGC which is planned to achieve a minimum gross density target of 150 residents and jobs combined per hectare as identified on Schedule I – Intensification Area. (Mod E (cc))"* (City of Barrie Official Plan, Section 4.3.2.2(a))

> *"The following uses may be permitted within the City Centre designation: commercial activities ranging from local service and retail use to business and administration uses; residential development, including the residential use of upper floor of commercial buildings; cultural and institutional uses; leisure and recreational uses; major office uses, and all levels of government and special purpose public agencies. (Mod E (dd)) Commercial uses shall be located so as to avoid an undue concentration of uses that reduce the quality of the pedestrian environment or have the potential to negatively impact the City's downtown revitalization efforts. (OPA 007, By-law 2011-084))"* (City of Barrie Official Plan, Section 4.3.2.2(b)

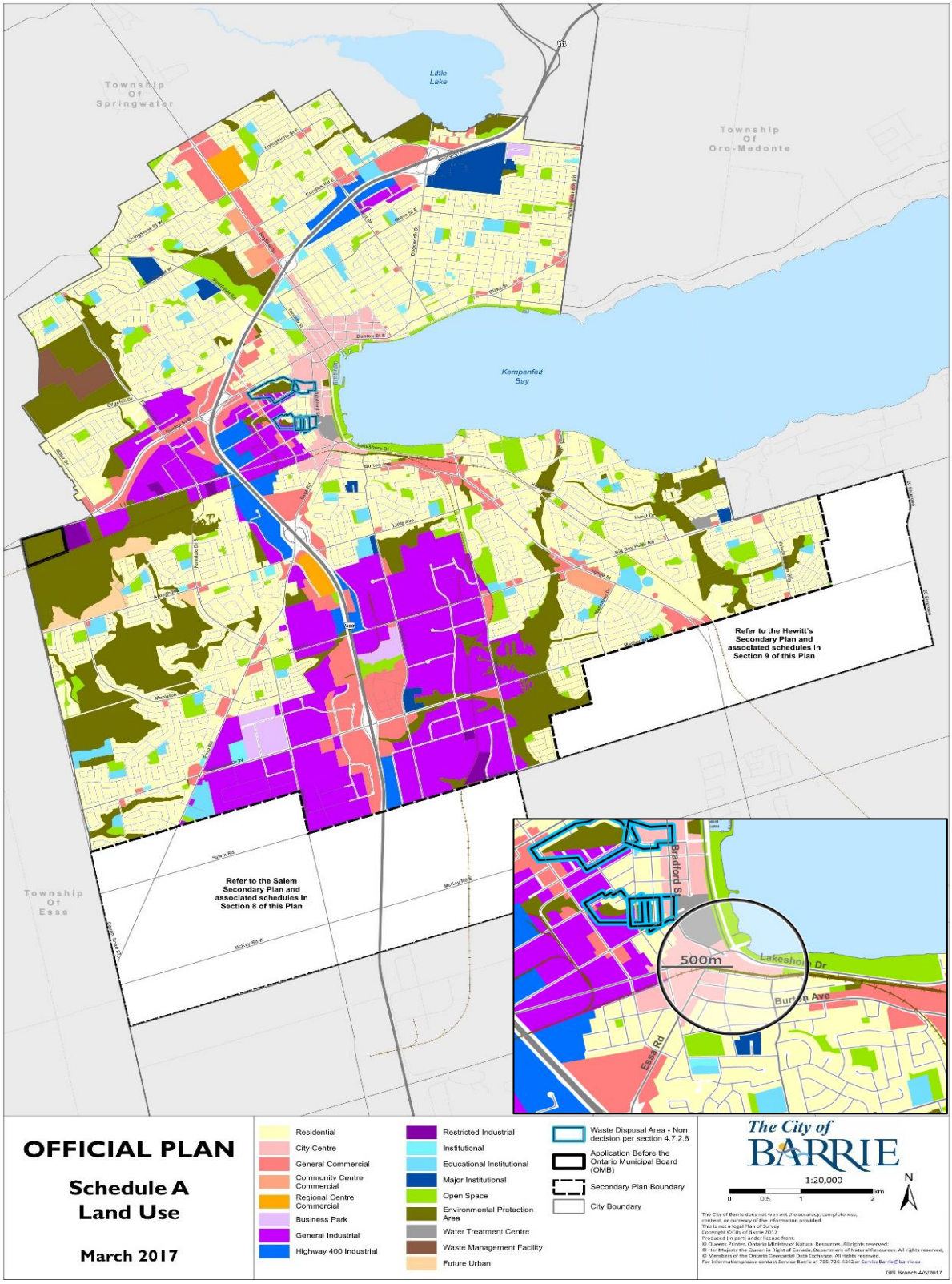
The Official Plan policies encourage a concentration of medium and higher density residential uses within the Urban Growth Centre and in proximity of a Major Transit Station Area in particular, in order to provide for live/work opportunities and to ensure an active downtown after business hours.

> *"Residential intensification is encouraged in a number of general locations in the City and shall be focused in the Urban Growth Centre, Intensification Nodes, Intensification Corridors, and the Major Transit Station Areas identified on Schedule I of this Plan*
>
> *Development proposals for higher densities in other locations will be considered subject to the policies of Sections 3.3 and 4.2 of this Plan. (Mod E (s))"* (City of Barrie Official Plan, Section 4.2.2.6(b))
>
> *"Intensification will contribute to development that is more compact and will efficiently use land and resources, optimize the use of existing and new infrastructure and services, support public transit and active transportation, contribute to improving air quality and promoting energy efficiency. (Mod E (t))"* (City of Barrie Official Plan, Section 4.2.2.6(c))

City of Barrie Official Plan Intensification Schedule



City of Barrie Official Plan Land Use Schedule



Currently, the Official Plan provides for a target density of 50-120 units per hectare within a Major Transit Node.

> *"To achieve the goals of this section of the Plan, the following target densities shall be applied to the Urban Growth Centre, Intensification Nodes and Corridors and Major Transit Node identified on Schedule I of this Plan;*
>
> *iv) Major Transit Node – 50 - 120 units per hectare (Mod E (x))"* (City of Barrie Official Plan, Section 4.2.2.6(g))

Lands in proximity of the proposed Allandale Station Mobility Hub but outside of the Urban Growth Centre boundary are designated for residential, general industrial and open space uses along the waterfront as shown on Schedule A of the Official Plan. Residential uses beyond the Urban Growth Centre are generally of a medium density form with some low density residential uses to the south beyond Burton Avenue.

The Official Plan further includes a number of policies to direct urban design both across the City and within the Urban Growth Centre in particular. These policies emphasize high quality design, pedestrian scale, views to Lake Simcoe, siting of tall buildings, compatibility and transition to lower density land uses beyond the Urban Growth Centre boundary.

The urban design policies of the Official Plan are complemented by a set of urban design guidelines for intensification areas in a document developed for the City in 2012 *"Urban Design Guidelines for Barrie's Intensification Areas"*. In particular, this document provides a number of urban design guidelines to shape development within the City's Major Transit Station Areas. This area would extend 500 metres (approximately a 10 minute walk) around the proposed Allandale Station Mobility Hub.

The goals of the guidelines for the Major Transit Station Area is to promote development that is transit supportive, promotes active streetscapes and that encourages active transportation alternatives. Excerpts from this document providing specific recommendations for the site design, streets and open spaces, built form and station design have been provided in Appendix A.

3.4 City of Barrie Zoning By-law

An Official Plan is the guiding policy document that establishes the vision, overarching goals, objectives, general land use principles and supporting policies to guide the City's evolution and development over the short and long term planning horizons. It is one of the municipality's primary tools to direct the actions of local government, shape development decisions and manage growth.

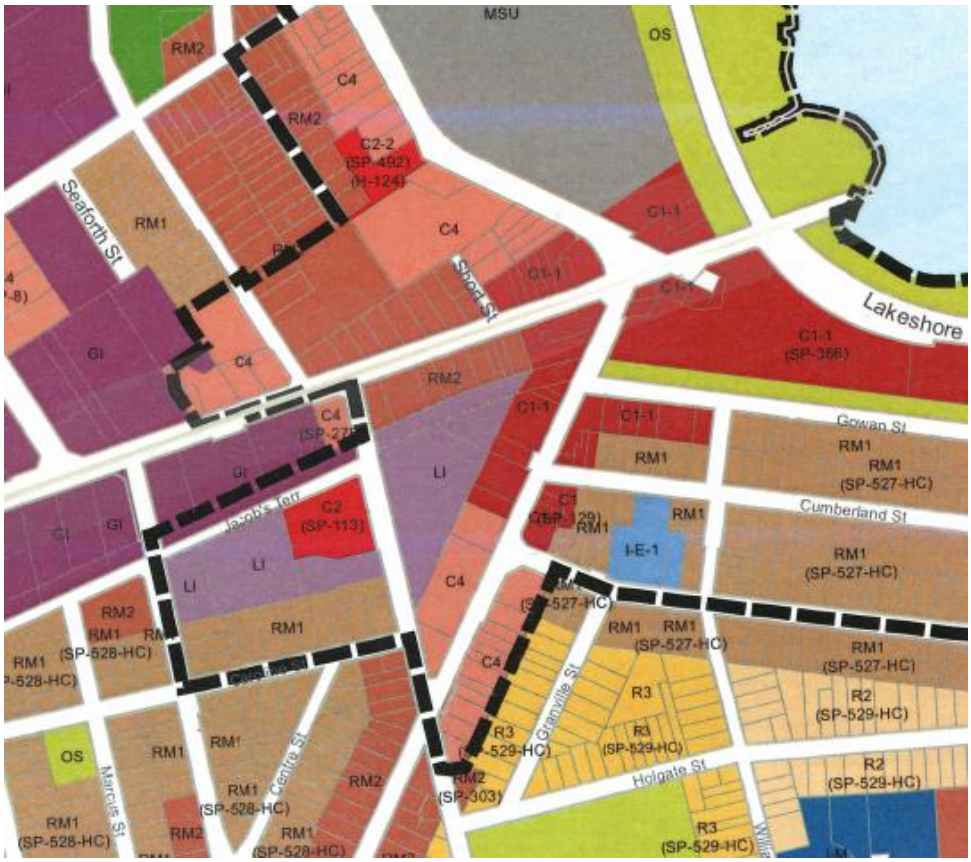
A Zoning By-law establishes and regulates the use of land by implementing the policies of the City's Official Plan. It provides the municipality with a legally enforceable means of regulating the use of land and applies performance standards that regulate the scale and intensity of development including:

- The types of buildings that are permitted and how they may be used;
- Where buildings and other structures can be located; and

- Lot sizes and dimensions, building heights, setbacks from the street, parking requirements associated with a permitted use and some aspects of building design.

Comprehensive Zoning By-law 2009-141 is the primary zoning by-law that regulates the use of land within the City of Barrie and the Allandale Station Mobility Hub Study Area in particular. Existing zoning within the study area is a mixture of zone categories.

City of Barrie Zoning Map in the Vicinity of Allandale Station



Study Area

- Central Area One (C1-1) Commercial Zone (applicable to the proposed Allandale Station)
- Open Space (OS) Zone (along the Lake Simcoe shoreline)

The C1-1 Zone applying to the station lands and adjacent commercial uses permits a variety of commercial retail and service uses, office, accessory residential uses, institutional uses and uses permitted within the Residential Apartment Two (RA-2) Zone.

The C1-1 Zone has limited zone regulations as shown below:

Side Yard Setback Where C1-1 Zone Abuts a Residential Zone: 6 metres (does not apply to station lands)

Rear Yard Setback Where C1-1 Zone Abuts a Residential Zone: 7 metres (does not apply to station lands)

Maximum Gross Floor Area - 600%
Minimum Coverage for Commercial Uses - 50%
Maximum Building Height – 10 metres within 5 metres of the front lot line and the lot flankage, 30 metres beyond 5 metres of the front lot line and the lot flankage

Proximity of the Study Area and Within the Urban Growth Centre

- General Commercial (C-4) Zone along Essa Road and Bradford Street
- Light Industrial (LI) Zone (west of station)
- Municipal Services and Utilities (MSU) Zone (water treatment plant)
- Residential Multiple One (RM-1) Zone (opposite station lands)
- Residential Multiple Two (RM-2) Zone (opposite station lands and along Tiffin Street).

Lands within the Urban Growth Centre boundary that are in proximity of the Allandale Mobility Hub are varied although the dominant zones are the General Commercial (C-4) Zone along Essa Road and Bradford Street which permits an assortment of commercial uses and the Residential Multiple One and Two (RM-1 and RM-2) Zones which provides for a range of low and medium density housing.

The existing zoning is fairly reflective of traditional zoning standards for such zones. Maximum heights being 14 metres (9 metres if adjacent to residential uses) for the C4 Zone and 10 metres for the residential zones. The current zoning has not yet been updated to reflect the policy direction of the Official Plan. Significant growth is anticipated in this area as the policy framework directs that significant growth be directed to areas within a Major Transit Station Area. The City has recently initiated the Essa Road Corridor Study to provide the context and necessary regulatory changes to promote increased density and development within this area.

3.5 Future Development Potential

The Allandale area is a historic development node along the Lake Simcoe shoreline. As a result, lands surrounding the proposed Allandale Station Mobility Hub are already built out. There is very little vacant land in this area. However, many of the existing parcels are under developed. While there are currently no active applications in proximity of the Allandale station lands, there is a significant opportunity for infill development, redevelopment and lot consolidation. Such future development is anticipated in this area.

While the existing zoning in proximity of the Allandale Station lands does not facilitate the anticipated future growth potential of the area, the policy frameworks are in place at the Provincial level and to a lesser degree at the Official Plan level. The City has targeted to update the Official Plan through a Municipal Comprehensive Review that is scheduled for completion by Q4 2019. This will be the City's conformity exercise to update the Official Plan in accordance with the requirements of the 2017 Growth Plan. At the same time, the Essa Road Corridor Study will provide more specific direction as to the density, form and intensification of land uses along Essa Road.

All of these planning and legislative initiatives that have target completion for the short term will provide the necessary framework for development to occur in this area.

4. Transportation Plans

4.1 Metrolinx Regional Transportation Plan & GO Regional Express Rail

Allandale Waterfront GO Station is currently served by seven southbound departures in the morning and seven northbound arrivals in the evening on weekdays and three morning departures and evening arrivals on weekends. Trains on the Barrie corridor serve several stations in York Region and connect directly to Line 1 of the TTC Subway at Downsview Park Station. Bus service is currently available throughout the day when trains are not running, connecting to all-day rail service at Aurora GO.

As part of the GO Regional Express Rail (RER) program two-way, all-day rail service is currently in-delivery between Union Station and Allandale Waterfront GO. The RER program is fully funded and is currently in design and procurement with completion anticipated by 2024. The full length of the Barrie Corridor is owned by Metrolinx and will be fully electrified and double tracked. New stations are planned to be added at 6th Line in Innisfil, Mulock Dr in Newmarket, Kirby Rd in Vaughan, Eglinton Ave in Toronto (Caledonia Station), Bloor St in Toronto (Bloor-Lansdowne Station) and Spadina Ave in Toronto. The two new stations in Toronto will include direct connections to the Eglinton LRT and the Line 2 of the TTC subway respectively. An EA for double tracking the entire length of the Barrie Corridor was completed in October 2017. The EA design calls for the addition of a second platform at Allandale Waterfront Station but does not indicate any property impacts. Separate EA's are underway for several of the new stations and the Rail to Rail grade separate at the Davenport Diamond.

Allandale Station Conceptual Design from Barrie Rail Corridor Expansion EA

Source: Metrolinx, Barrie Rail Corridor Expansion Project Environmental Project Report (2017)

The current RER service plan calls for hourly service between Union Station and Allandale Waterfront, with 15-minute service between Union Station and Aurora GO. In the peak period this service would be increased to every 30-minutes or better between Allandale Waterfront and Union Station. Service levels are planned to increase incrementally as double tracking and a new rail-rail grade separation is completed at the Davenport Junction in Toronto. The details of the RER service plan are still subject to

change as the implementation of the project continues. In March 2018 the Metrolinx Board received updated Initial Business Cases on the proposed new stations in which a new service model was proposed that would see all services from Allandale Waterfront run express between Aurora and Union Station with stops only at Downsview Park and Spadina Stations. In December 2017, rail service on the Barrie Corridor was increased to provide all-day service between Union Station and Aurora GO as well as weekend service throughout the year.

The 2041 Regional Transportation Plan (RTP) further outlines the visions and goals of the regional transportation network as well as planned rapid transit projects for over the 30-year planning horizon. The RTP calls for 15-minute electrified RER service to eventually be extended to East Gwillimbury GO. There are no mentions in the 2041 RTP about extending GO service north of Barrie including the .

4.2 GO Rail Station Access Plan

In response to the significant service expansions being delivered by the RER program, Metrolinx completed a revised GO Rail Station Access Plan in December 2016. The plan outlines high level strategies and objectives for how passengers will access different kinds of GO Rail Station and lays out specific plans and targets for each station. The plan envisions dramatically increasing the share of GO passengers who arrive at rail stations by local public transit.

The Allandale Waterfront GO station is identified as a Historic Suburban Town Center type station. This typology is characterized in the plan as having limited expansion opportunities because of surrounding established medium density development and a walkable environment with smaller block sizes. The station is seen as having significant potential to increase walking and cycling access and well as integration with local transit because of a central location within the local municipality.

There are currently 160 surface parking spaces at the station with an estimated utilization of over 90%. The plan calls for adding an additional 200 spaces at the station via alternative parking solutions. Alternative solutions may include things such as satellite lots connected by shuttles, shared parking with sites that have a different parking demand profile or peer-to-peer parking sharing which could allow local property owners to market available parking spaces to GO customers. The plan also calls for exploring opportunities for Metrolinx to lease additional lands in the area for parking including the open space area at the northwest corner of Lakeshore Drive and Tiffin Street.

The plan does not call for any expansion of the bus terminal at the site, but also does not expressly note the possibility of relocating the bus terminal from Downtown Barrie. The transit mode share target of 28-30% is slightly higher than the overall targets for the GO system indicating that Allandale has above average potential for access by local transit. Using data from the GO Rail passenger survey the plan identifies the areas of Letitia Heights, Sunnidale, Edgehill, Ardagh and Holly as concentrations of GO Rail passengers that could be served by local transit.

Furthermore, the plan calls for some specific interventions on the station property related to passenger pick-up and drop-off. This includes and on-street vehicle waiting area along Bayview Drive as well as unspecified medium-term measures to resolve conflicts between drop-off traffic and transit vehicles on the north side of the station.

Current and Target Mode Split for Access to Allandale Waterfront GO Station (2016 GO Rail Access Plan)

Mode	Current Share (2015)	Target Share 2031
Walking	9%	14-16%
Local Transit	7%	28-30%
Micro-Transit	n/a	*tbc*
Cycling	0%	3-5%
Pick Up/Drop Off	20%	26-28%
Drive and Park	64%	26-28%
Carpool	0%	3-5%

Barrie South Station is identified as a Gateway Suburban Transit Node in the station access plan. This type of station is characterized by large catchment areas and a location on the periphery of the urban built area. As such, Barrie South station is planned to accommodate a larger mode share of pick-up and drop-off as well as drive and park passengers. The current parking utilization is around 80% and the plan identifies an expansion of 160 additional parking spaces at the station for a total of 779 parking spaces. By 2031 public transit is expected to accommodate 14-16% of the mode share to the station, up from around 1% today. An incremental expansion of the bus network in South Barrie, timed to meet train departures is suggested, along with long term expansion of the bus terminal at the station to potentially include a dedicated bus access or other transit priority measures. The Barrie South Station is seen as accommodating the overflow parking demand from Allandale Station.

Infrastructure Recommendations in the GO Rail Station Access Plan

Mode	Parking Expansion	New Transit Facilities	Other Facilities
Allandale GO	200 new spaces through alternative solutions (360 total)	None	- 64 new covered and 24 secured bike parking spaces - Modifications to PPUDO - Add 12 on-street waiting areas (potentially on Bayview Drive)
Barrie South GO	160 new spaces (779 total)	Potential improvements in medium term	- 32 new covered and 16 secure bike parking spaces - Reconfigure PPUDO to reduce vehicular conflicts

4.3 2011 Multi-Modal Active Transportation Master Plan Parking Study

The existing transportation master plan in Barrie was completed by Genivar (now WSP) in 2011. This study included a technical memorandum on parking in the downtown core and waterfront area. The study assumed a conservatively high auto access mode share of 73% for GO rail customers and found that parking deficiency of 389 parking spaces at Allandale Waterfront was offset by a similar surplus at Barrie South. Combined with an assumed increase in non-auto access mode share, the study concluded that there was no parking deficiency for GO Station access up to 2021. Furthermore, the study recommended increased transit access to Allandale GO station, parking restrictions in the surrounding community and a fare differential to encourage more customers to use Barrie South station and relieve the limited parking availability at Allandale.

4.4 Multi-Modal Active Transportation Master Plan Update:

The City of Barrie is currently undertaking an update to its Multi-Modal Active Transportation Master Plan (MMATMP) to address needs to 2041. This study will include a review of existing conditions, identify transportation improvements needed to support growth, assess alternatives based on different mode split scenarios and development a long-range implementation plan. WSP has also been retained to work on this study and the results of the Allandale Mobility Hub study will be shared with the MMATMP work in order to coordinate efforts.

4.5 Simcoe County Transit Study

The County of Simcoe is currently studying establishing an inter-municipal service at the country level which would operate in addition the existing services which currently operate between urban areas. This may include services such as the existing Route 90 to Angus and CFB Borden operated by Barrie Transit and GO Transit's route 68 which currently provides local service between Barrie and East Gwillimbury. Both of these routes currently use Allandale Station although the GO Bus only makes a brief stopover and currently lays over at the downtown terminal. In addition to the existing routes, Simcoe County is also proposing three additional routes which would operate from Barrie to Orillia, Midland and Wasaga Beach. Each route is assumed to operate on a 60 minute headway. The interim reporting completed up until August 2016 does not specify where this service would terminate in Barrie. It is reasonable to assume that such a service would require a recovery period at a terminal facility with facilities for drivers.

4.6 Barrie-Collingwood Railway

The Barrie-Collingwood Railway operates immediately adjacent to the Allandale Station on the south side of the Metrolinx tracks with a junction east of Essa Road. The railway then proceeds to cross Essa Road at grade with an un-signalized crossing. The railway is owned by the City of Barrie and operated under contract by Cando Rail Services as a short-line freight operation. It is currently used by a very limited number of industrial customers in the city and provides a connection to the MacTier subdivision of the CP mainline near its mile marker #58 at Utopia. The railway was once part of a continuous route to Collingwood however the portion of the tracks west of Utopia were abandoned in 2011 as maintenance was no longer financially viable. The Town of Collingwood subsequently transferred its ownership share of the rail corridor to Simcoe County. The Collingwood portion of the rail corridor is currently being considered for conversion to a rail trail. Some portions of the track west of the CP mainline have recently been upgraded for rail car storage.

The financial viability of the line in Barrie remains uncertain as it does not typically cover its annual operating costs. Cando Rail Services is currently studying the potential of building a fuel transfer facility near the main rail junction at Utopia which could improve the long term viability of the railway. If additional sources of revenue are not found it is possible that the railway may face difficulty financing major state of good repair upgrades.

The rail right of way is being preserved to protect for the potential of rail passenger service to Collingwood in the long term. There are currently no plans to extend passenger rail service beyond Allandale Waterfront GO as there is limited demand and rebuilding the tracks would represent a significant expense. Metrolinx currently has no plans to extend service beyond Allandale Waterfront in the 2041 Regional Transportation Plan and the project is not included in the lists of potential project to take place beyond 2041.

For the purposes of the Allandale Mobility Hub Study, the corridor will be treated as an active freight siding with a protected right of way. The limited amount of traffic on the line, currently estimated to be under 5 trains per month, however means that the line will not be assumed to represent a significant operating obstacle to Barrie Transit operations.

Barrie Collingwood Railway Route Map

Source: Railway Association of Canada, Google Maps

5 Additional Information

5.1 GO Rail Passenger Survey and Cordon Counts

Station Ridership:

The 2014 Rail cordon count found that there were 478 boardings at the Allandale Waterfront GO Rail Station, the 2016 station access plans cited a slightly lower number of 325 home station passengers. The station access plan also assumed that the station would continue to fall within the lower end of GO Rail stations potentially attracting between 1000-2000 daily passengers by 2031.

Passenger Origins:

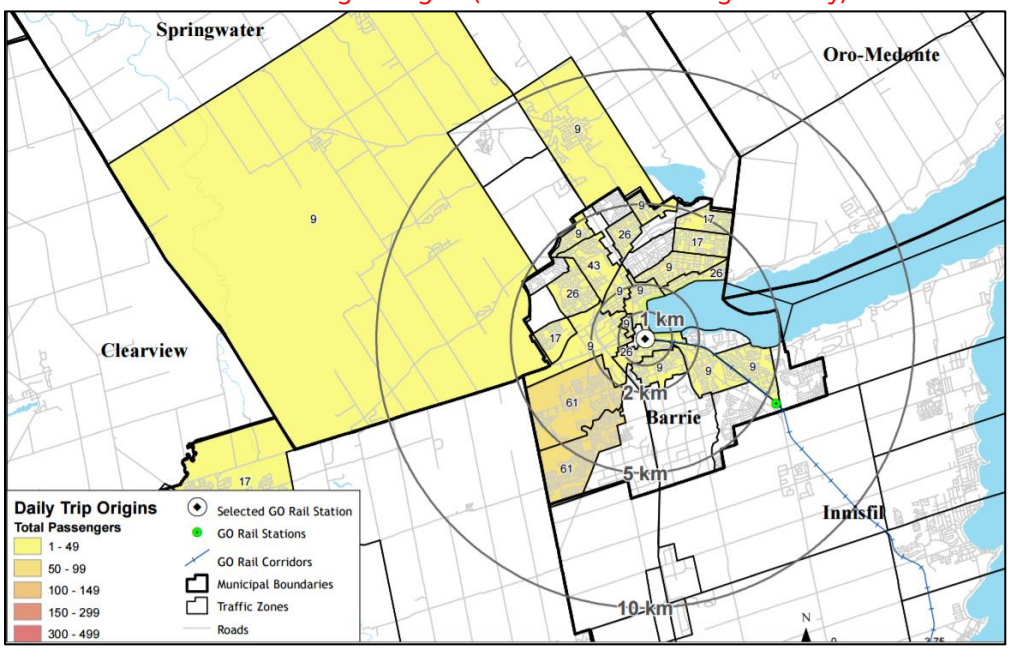
The 2015 GO Rail Passenger Survey estimated passenger origins for the Allandale GO Station by extrapolating from a relatively small sample of responders who use Allandale as their home station. As such, the report cautions that the accuracy of the extrapolations are less certain than other GO Stations. Key findings from the survey include that over 81% of passengers come from within 5km of the station, making the site ideal for walking and cycling access. Very few people come from between 5-15km from the station and almost 11% of passengers come from more than 15kms, likely reflecting the terminus function of the station site.

Trip Origins by Distance from Allandale Waterfront GO Station (2015 GO Rail Passenger Survey)

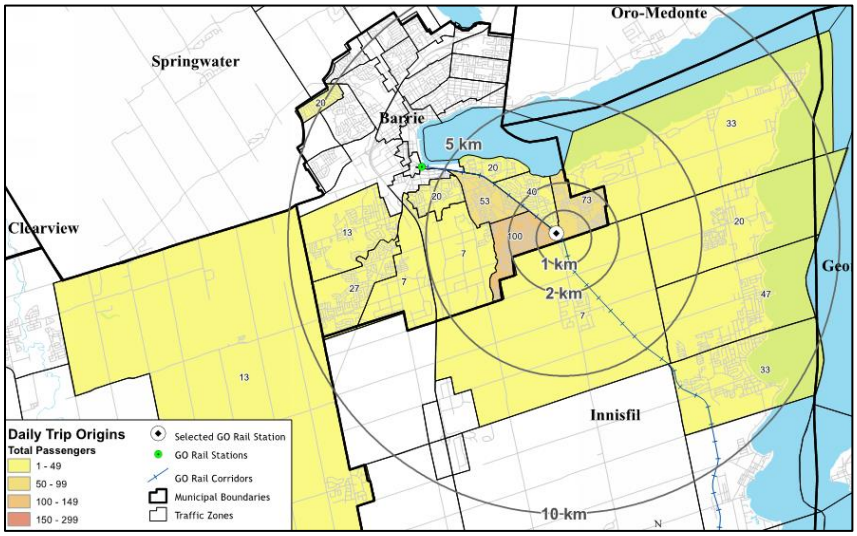
<500m	500m-1km	1-2km	2-3km	3-4km	4-5km	5-10km	10-15km	15+
1.9%	5.4%	7.3%	12.7%	34.4%	20.0%	5.4%	1.9%	10.9%

The distribution of origins identified particular clusters of GO customers in the Holly and Ardagh neighbourhoods of the city. Other secondary concentrations are found in the Letitia Heights and Cundles neighbourhoods. The neighbourhoods in the southwest of Barrie overlap with the catchment area for Barrie South GO station and may be inclined to access that station following parking expansion or the completion of a proposed new bridge over Highway 400 connecting Big Bay Point Road and Harvey Road. The catchment area for Barrie South station draws heavily from the immediately surrounding new subdivisions and generally from the southern portion of Barrie and the shoreline communities of Lake Simcoe. Almost no passengers were surveyed accessing Barrie South station from the northern portion of Barrie.

Allandale GO Station Passenger Origins (2015 GO Rail Passenger Survey)



Barrie South GO Station Passenger Origins (2015 GO Rail Passenger Survey)



5.2 GO Fare Policy

It is possible that GO fare policy is responsible for creating a disincentive to use the Allandale Waterfront GO Station. The GO Transit fare zones in Barrie are configured such that Allandale and Barrie South stations fall in different zones, making trips from Allandale Waterfront GO more expensive than from Barrie South. The following table summarizes the fare differences for a trip to Union Station.

Current Fare Difference between Allandale Waterfront and Barrie South GO Stations

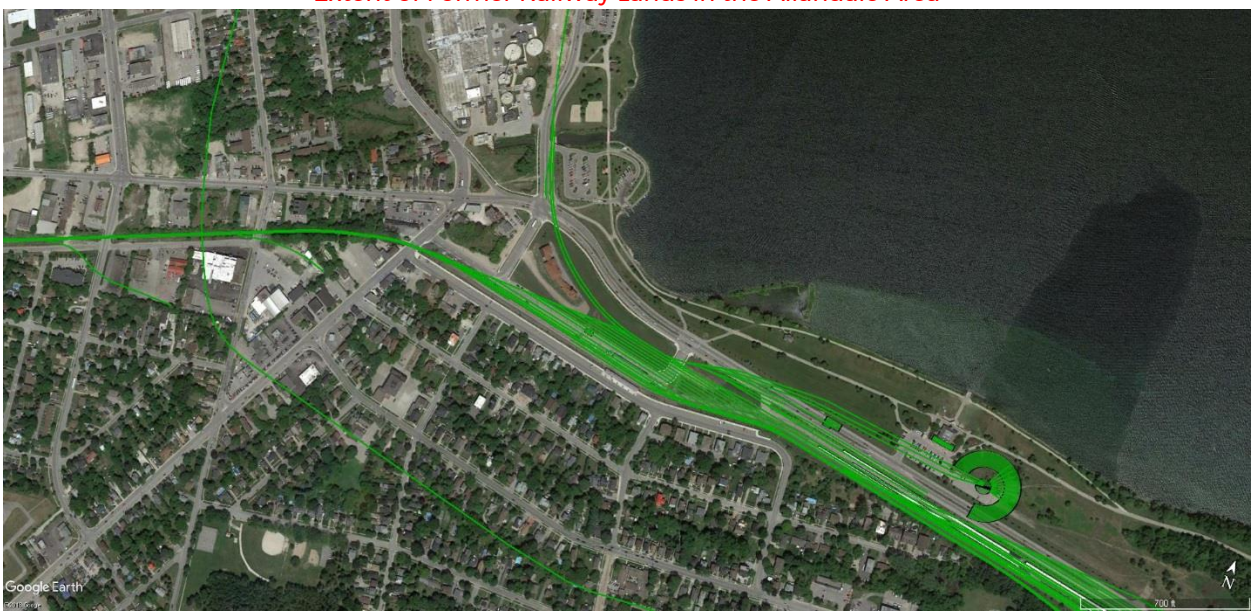
	Allandale Waterfront GO	Barrie South GO
Adult Single Ride	$14.45	$13.95
Adult with PRESTO	$12.83	$12.39
Typical Month	$282.26	$272.58

For a regular commuter, using the Barrie South Station would save slightly less than $10/month. This price point may be a significant enough factor to influence station access choice for sensitive commuters who use the service regularly or those who live close between stations.

5.3 Site History

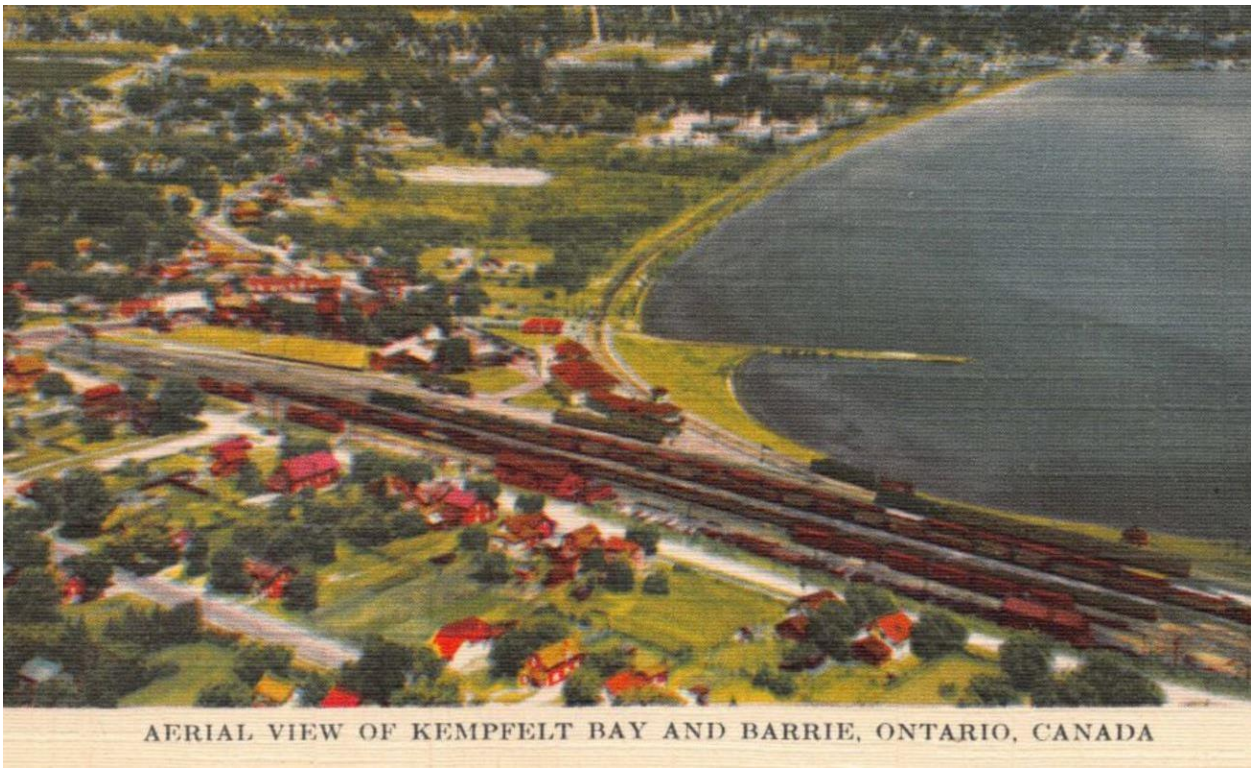
For much of its history, the Allandale Station area was developed as a rail yard and served as a junction between railways destined for Muskoka and Collingwood. The lands which are currently being considered for a new transit terminal appear to have been occupied for over 50 years by a lawn bowling club which was moved to a new site by the City during the redevelopment of the Allandale Station lands. The station was first served by rail in 1853 as the temporary terminus of the Ontario, Simcoe and Huron Union Railway before its eventual extension to Collingwood in 1855.

Extent of Former Railway Lands in the Allandale Area



Source: Ontario Railway Map Connection http://ontariomap.webs.com/

Allandale Station Area circa 1950



Source: Barrie Historical Archive

Allandale Station Area Circa 2000

Source: Barrie Historical Archive

Appendix

City of Barrie Urban Design Guidelines for Major Transit Station Areas

General

a) Ensure a high concentration of density and people working and/or living within a 10 minute walk (500 metre) walking distance of the station. High densities may be achieved through a variety of building forms.

b) Plans should encourage a mix of uses near the station rather than dispersed, segregated uses. These uses should encourage activity in the area at all times of day, and should include convenience retail uses that support transit passengers, including cafés, dry cleaners, etc.

Site Design

c) New local roads should be provided, where necessary, to ensure efficient pedestrian, cycling, transit and vehicle circulation through the Major Transit Station Area.

d) Clear, weather protected outdoor paths should be provided to ensure comfortable connections for those transferring between different modes of transportation. As development occurs in Major Transit Station Areas, these connections can be integrated into new buildings.

e) Local trails and bicycle routes should provide direct links to transit facilities.

f) Auto dependent uses should be discouraged within Major Transit Station Areas, such as drive through retail and car wash facilities.

g) Limiting surface parking should be a key objective at Major Transit Station Areas. A variety of opportunities should be explored, including bicycle parking and storage adjacent to building entrances, preferential parking for auto-share and hybrid vehicles, shuttles to/from key locations within the City, etc.

h) Transit facilities should be located at public places in Major Transit Station Areas, such as community centres, parks and public open spaces, schools, and community facilities such as a library or gallery.

Streets and Open Spaces

i) Streetscape improvements should provide a clearly defined pedestrian route to/from the Major Transit Station Area. This route should be distinguished from vehicular traffic areas by easily navigated, barrier free sidewalks, open spaces, walkways and/or well-marked crosswalks.

j) At Major Transit Station Areas, social activities should be fostered through the inclusion of streetscape elements such as high quality street furniture.

k) Major Transit Station Areas should include public open spaces, including parks and plazas, that serve as gathering/recreational spaces for the local and wider community.

l) Wayfinding signage should be located throughout Major Transit Station Areas, ensuring easy navigation for those arriving to the City by transit.

m) Public art, enhanced landscaping, and other landmark features should be provided at Major Transit Station Areas to reinforce the significance of these sites.

Built Form

n) The station building within a Major Transit Station Area should be designed and massed as a landmark building to reinforce the importance of the site, and assist with wayfnding throughout the City.

o) Buildings within Major Transit Station Areas should include canopies (and other weather protection at the building edge), and internal passages where feasible, to ensure a continuous, weather-protected connection to the station.

p) It is particularly important that buildings within the Major Transit Station Areas have a pedestrian scaled building base (up to 4-storeys), in order to ensure an environment where pedestrians can comfortably walk or cycle to and from the station area

Station Design

q) The main entrances at transit stations should include transit-related amenities (i.e. signage, ticket machines, etc.), as well as amenities for those who may be waiting for a connection (i.e. public art, seating, food, etc.).

r) Transit stations should include an abundance of bicycle parking and storage facilities, in order to encourage users to connect to the station through active modes of transportation (i.e. cycling).

s) Station design should adhere to the principles of Crime Prevention Through Environmental Design (CPTED) to ensure the safe usage of the station at all times of day.

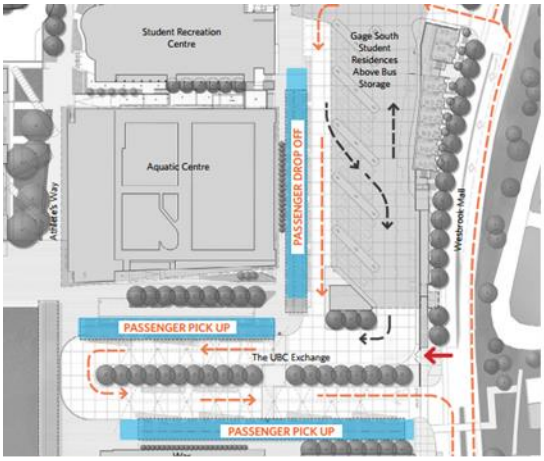
Allandale Mobility Hub Study Final Report

APPENDIX

B Best Practice Review Report

Allandale Mobility Hub Study

Best Practices Report



March 2018

Contents

1. Background

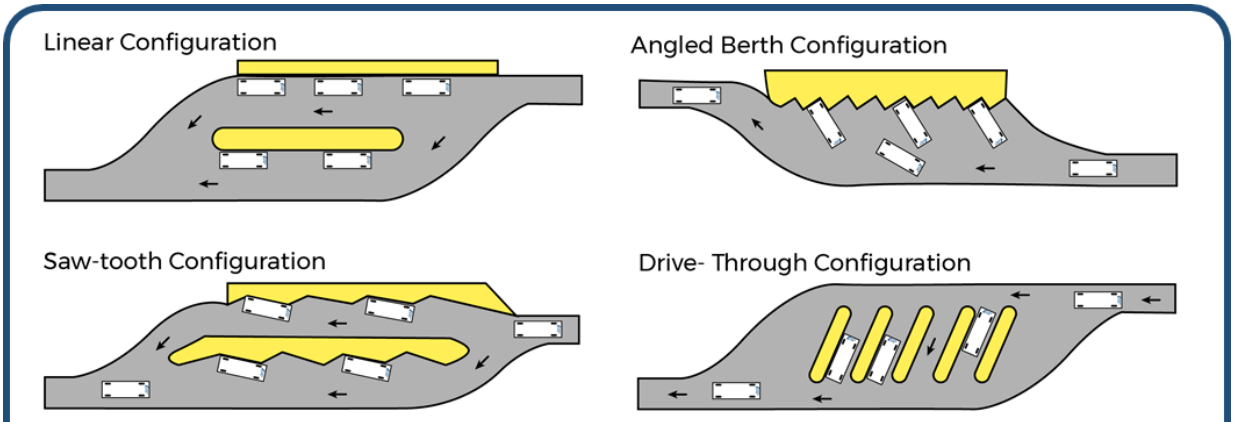
The City of Barrie has retained WSP to study the costs and feasibility of shifting the Barrie Transit Terminal from its current location on Maple Avenue in downtown to a new site immediately adjacent to the Allandale GO Station. The relocation of the transit facility creates space in the downtown for a new farmers market and event space while consolidating the transit hub function at the GO Rail station to coincide with the arrival of all-day rail service. The opportunity to create a new transit terminal at a landmark site within the City of Barrie presents an opportunity to adapt best practices from across the GO network and other transit terminals around the world. This review presents considerations of best practices from other sites which may be incorporated into the design of the new facilities at Allandale.

2. Terminal Design Typologies

2.1 General Types of Bus Terminal Configuration

The literature identifies a clear lack of common approach throughout the world in the optimal type of bus terminal configuration. Many different approaches are used based on different operating cultures. In the UK and New Zealand for example it is much more common to find reverse out facilities which are not favoured in Canada because of perceived operational complexity. In The Netherlands, most facilities use a drive-through configuration which increases spatial efficiency and is thought to improve legibility by positioning the front of the bus directly at the passenger waiting area. Other jurisdictions seek to limit pedestrian conflicts with buses as much as possible to ensure operating efficiency. Determining the optimal design for a facility is a reflection of the design values and operating priorities of the key stakeholders and facility managers.

The literature identifies four key configurations of bus terminal typologies: linear, angled berth, saw-tooth and drive-through. Linear configurations allow buses to pull up flush with a straight curb and may include side platforms or islands. This configuration has the advantage of being space efficient and requiring little alteration from existing roadways. Its primary disadvantage is that it is able to accommodate fewer vehicles because of the space required for turnouts. Linear bays work best in locations where buses are not frequently passing each other such as places where buses stop only briefly or where service is infrequent. Saw-tooth configurations adapt linear terminals by angling each bus bay to reduce the amount of space needed to park and maneuver. They are most commonly found at bus terminals as they provide a mix of operational and spatial efficiency. Angled berths allow for greater efficiency relative to passenger boarding curb space. They work best in situations where buses tend to be parked for longer periods or time, where passengers are gathering in a centralized waiting areas and where there is a controlled access area for the buses to reverse into. Drive-through configurations allow for some of the spatial benefits of angled bays without requiring reversing. They also have the advantage of ensuring that the main route display information on the front of the bus is angled toward the passenger waiting area. Drive-through bays create the most pedestrian to vehicle conflicts and create difficulties for passengers with special accessibility needs.



Principal types of bus terminal configuration (TCRP Transit Capacity and Quality of Service Manual)

Research has found that drive-through island configurations are typically the most spatially efficient but can introduce conflicts with pedestrians and require dynamic signage to maximize their capacity potential. Angled configurations, at angles of up to 90 degrees, are spatially efficient but increase operating complexity and may require a strict pedestrian exclusion area. More linear facilities are attractive for passenger comfort and reduce conflicts but experience problems with walking distances and passenger legibility beyond a certain size.

2.2 Reduced Footprints

Reducing bus terminal footprints can provide opportunity to consolidate passenger amenities, reduce walking times and accessibility concerns and free up land for transit oriented development opportunities. There are several best practices for reducing terminal footprints. The most important consideration is the configuration of the surrounding bus network. Timed transfers and pulses at terminals provide increased passenger mobility but dramatically increase the site footprint. Recovery times at stations also increases facility size. This can be overcome by providing off-site layover facilities so that multiple routes can share a single pick-up and drop-off bay.

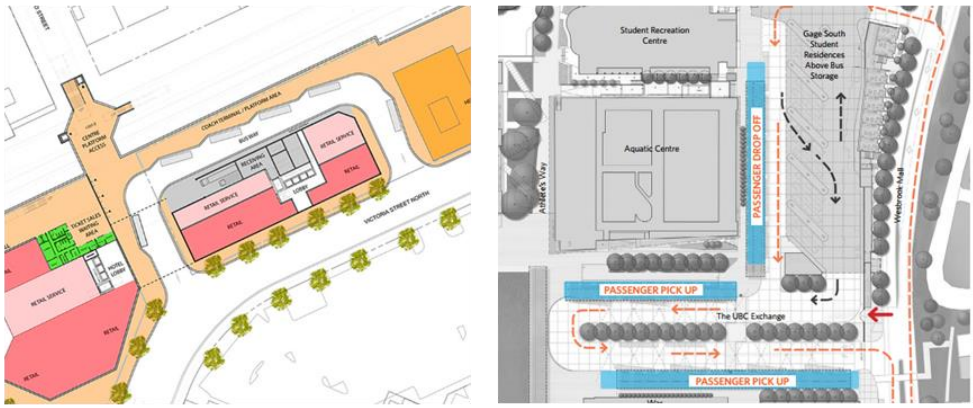
Bay assignments are often planned based around consistency and passenger legibility. Dynamic signage can help to overcome to this and provide flexibility to communicate changes and route assignments to passengers. Through-routing typically assigns two bays for each route, however in places where routes are frequent enough, routes may simply stop on-street allowing for faster operation and reduced delay for passenger travelling through the station. Bramalea GO station is an example of an existing facility where frequent services stop at enhanced on-street bays rather than entering the GO station property.

2.3 Urban Integration

A typical bus terminal is often segregated from the main public right of way in an enclosed facility. This allows for more seamless passenger transfers and a clean operating environment but may not optimize the potential for transit oriented development. Intensification and development of surrounding lands is often cited as an important objective of transit investment. The Allandale area has been clearly identified through provincial and municipal plans as a site for urban intensification. Throughout North America several best practices can be found in how to integrate transit terminals with land development. Reduced footprints are amongst the most common of such strategies as smaller bus terminals allow for more developable land and minimize disruption in the fabric of urban street

frontages. Examples such as the new Union Station Bus terminal in Toronto, Marine Drive in Vancouver and the dynamic terminals in Europe and Australia demonstrate how bus operations can be adjusted to open up land for redevelopment. The proceeds of land development may be directed back into further transit enhancements.

Aside from a reduced station footprint several other techniques are available. Urban areas generally require a fine grained street grid and bus terminals which allow new connections in the local street grid can create new development blocks as well as improve site circulation. Surrey City Center in British Columbia is an example of a location where the transit site is being broken up with new road connections to create new land parcels for development. Through an integrated planning process the operational needs of transit and the parcel needs of land-use planners were accommodated in a way that also utilized new roadways to shorten vehicle circulation travel times. The new UBC transit terminal in Vancouver is being planned with separate pick-up, drop-off and layover bays in order to reduce footprints and integrate a new student residence into the site.



Proposed integrated development the King-Victoria transit hub in Kitchener, ON (left) and integrated residence building at the new UBC terminal in Vancouver, BC (right)

Another common technique for accommodating intensification is to create a linear or square shaped parcel that preserves development blocks. Drive-through or multi-island configurations are often best suited for achieving this. Examples of this type of configuration include Christchurch, New Zealand and Central Park Station in Denver. This approach creates a square shaped transit terminal which avoids leaving wedges of land or irregularly shaped spaces that are less attractive for development. Linear terminal facilities can also be effective at preserving development blocks by wrapping around development sites. At the King-Victoria transit hub in Kitchener, plans call for coach and some local bus services to use such a facility with a one way transit-only access road surrounding a mixed-use development. This configuration likely requires the building's loading bay be accessed from the transit right of way meaning that some service vehicles such as delivery and garbage trucks must be granted access to the bus loop.

A final important best practice for urban integration is to preserve street frontages. Many of the best practice station examples include measures to either provide retail at the street frontage or protect for eventual redevelopment. Springfield station in Oregon and Ogden Central Station in Utah are both examples of facilities with a comparable scale and context to Allandale that include street fronting retail as well as preserve opportunities for further development. Large scale transit oriented development

projects typically require a lot depth of 40-50m to be viable but smaller retail frontages may take advantage of other station infrastructure such as share parking and servicing, to reduce land requirements. Street-facing retail benefits the broader neighbourhood while also providing increased activity at the site and services for local users. As the retail market at Allandale is likely somewhat limited, such facilities may be planned for future implementation by leaving appropriate space.

3. Bus Terminals at Commuter Rail Stations

3.1 Across the GO Rail System

Typical bus facilities at GO Rail stations use saw tooth bus bays configured in a tear drop or horseshoe. The Hamilton GO Centre uses reverse-out bays with static signage while the Union Station Bus Terminal employs dynamic signage to increase bus bay capacity. Most terminals at GO Rail stations are on Metrolinx property although select locations are owned and operated by the local municipality. Examples of municipal ownership include, Guelph GO and Brampton GO. Many GO stations include dedicated access and egress routes for public transit vehicles, something which is particularly important at stations with large park and ride facilities which generate significant traffic congestion.

Bus terminals at GO Rail stations typically do not include separate layover facilities or extensive on-site circulation with most layover occurring in the bay. Stations served by both GO and local buses typically segregate service areas by provider with GO buses often occupying the platforms closest to the rail facilities. At terminal stations, GO buses can layover for long periods of time due to infrequent schedules and long recovery times necessitated by travel on congested highways with variable travel times. Stations being planned for the Bowmanville extension are considering designing loops that include dedicated layover parking and the ability to circulate back through the site to allow for separate layovers.

Recently completed bus terminals at GO Rail Stations in Burlington and Gormley

GO Station bus terminals typically emphasize separating bus and pedestrian conflicts with most new facilities orienting bays around the perimeter of the bus loop and leaving a center island dedicated to landscaping or storm water management. Newly completed bus terminals at Burlington GO and Gormley GO stations are examples of this. At Burlington GO station an existing island platform terminal was replaced by a horseshoe design with a landscaped interior. Across the GO Rail network, island platforms are somewhat rare. The recently completed Guelph central terminal is an exception, here an island platform was used, likely because of space constraints, with two pedestrian crosswalks connecting to the rail platform. New subway stations such as those on the recently opened Spadina

Subway extension avoid pedestrian conflicts either through side platforms or pedestrian tunnels connecting to central islands.

3.2 North American and Global Rail Stations

There is a wide variety of terminal configurations applied throughout North American rail stations. Island and finger platforms are common at new stations being built in Salt Lake City and Denver. New commuter rail stations in Florida typically arrange bus platforms along the station frontage allowing for direct connection to rail platforms but require a dedicated cross-walk for park and ride and other station users. Many stations in Australia and California attempt to bring the local road network close to the station, allowing for short loops that minimize diversion from the local road network. Stations in California in particular integrate attractive public realm spaces immediately adjacent to the facility. Recently renovated stations on the Cal Train system in Silicon Valley also include distinct facilities for micro-shuttles such as those operated by local tech campuses.

New bus terminals at rail stations in Melbourne, Australia, Denver CO, and Silicon Valley, CA

While most new terminal facilities at Canadian rail stations do emphasize separating pedestrian conflicts, this is not necessarily the case with new transit terminal facilities in other jurisdictions. Island platforms are quite common in recently completed transit projects throughout the United States. Site plans for several new stations in Denver include a series of one-sided island platforms with several pedestrian conflict points. In Australia, new rail stations in Melbourne are serviced by linear terminals that require some pedestrian and bus conflicts. Bus terminals at newer stations in Montreal have adopted lollypop or horseshoe configurations similar to those found at many GO rail stations.

Further details of examples of transit terminals throughout North America be found in the appendix.

4. Dynamic Bus Bay Assignment

4.1 Background

Dynamic bus bay systems allow the operators of a bus terminal facility to assign bus routes, or each bus arriving at the facility, to a specific bus bay in real time. This is opposed to conventional operations where routes are scheduled to have a specific platform whenever they arrive. The primary benefit of dynamic bus bay systems is that they allow for bays to be used more intensively, which potentially (depending on the service frequency of the bus routes and other factors) could reduce the number of bus bays required to serve a given volume of service or number of bus routes. Several different systems exist throughout the world with some able to use the CAD/AVL technology currently installed on many vehicles in Ontario. Routes are typically assigned to a group of bays to improve customer legibility. Customers wait in a central area and are provided with audible and visual information about when their bus is arriving and what bay to proceed to.

Customer waiting areas in dynamic stations: Christchurch, NZ (left) and Perth Australia (right)

Aside from a potential reduction in the number of bays required, the technology also provides several other benefits. A commonly cited benefit of the technology is the perception and feel of a modern transit experience. Studies have shown that the user experience is not encumbered by the process and the added passenger communication systems help to improve the perception of bus transit. The technology also allows agencies to concentrate passenger amenities in a central waiting area, improving safety and the potential viability of station retail.

The system is currently widely used in The Netherlands where it has been employed at central rail stations since the 1990's. Several cities in Denmark have also used the technology to compress bus facility footprints in downtown areas as part of integrated development projects. More recently, the technology has been implemented in Australia, New Zealand and the UK. In Christchurch, New Zealand and Perth, Australia the system was incorporated into new central bus hubs to help facilitate surrounding redevelopment schemes as well as to create an 'airport like' waiting experience for bus passengers to improve the attractiveness of public transit.

4.2 Applicability at Allandale Waterfront

Because the site is not particularly space constrained at the present time, Allandale Waterfront is unlikely to be an immediate candidate for dynamic assignment. However the staggered arrival times of buses at the facility may allow for dynamic assignment to reduce the required number of bays if there is pressure to open up lands at the station for additional development. Dynamic assignment may also be provided as a means of expanding future capacity without having to increase the number of bays. The presence of third party operators such as Simcoe County Transit, Greyhound and Ontario Northland

increases the complexity of a dynamic assignment system as these vehicles must either be coordinated with the system, segregated into a separate area or specifically dealt with a site manager.

The design of the new terminal may however protect the eventual implementation of the technology through measures such as concentrating customer amenities in a central waiting and either providing digital signage at each bay or protecting for it in the future by including necessary duct and conduit space. This protection has been done at other facilities including the Marine Drive bus terminal in Vancouver. Metrolinx is currently working on digital signage strategy at its stations which may provide a coordination opportunity with the City of Barrie. Digital signage that communicates bus route and arrival information may be implemented as part of a future dynamic assignment system without requiring its full scale operation. Metrolinx is also working on the first implementation of Dynamic Assignment in North America at the new Union Station Bus Terminal, providing an opportunity for coordination of technological and design requirements.

5. Electric Vehicles

5.1 State of Practice

Over the past several years there have been significant advances in the technology behind battery-electric-buses (BEB) which has made their implementation increasingly practical for urban mass transit operators. Both internationally and within North America transit operators in a variety of different urban conditions are actively piloting electric bus operations. This includes large cities such as Los Angeles, which has committed to fully electrifying the second largest bus fleet in North America, to peer cities such as Brampton.

In Canada, several cities are currently in the process of procuring and testing battery electric vehicles. Vancouver, Edmonton and Toronto are all testing electric bus operations including special adaptations designed to improve the reliability of battery technology in extreme cold weather. Brampton Transit is currently involved in a collaborative pilot project with the Canadian Urban Transit Research & Innovation Consortium (CUTRIC) to test different electric bus systems from local manufacturers and equipment suppliers. Several large bus manufacturers including Nova Bus and New Flyer are actively bringing battery electric buses to market as are several start up corporations such as Proterra, based in California and the global leader BYD Auto based in China.

5.2 Benefits and Implementation

The primary benefits of electric buses are a dramatic reduction in local air pollutants. Electric buses eliminate the harmful emissions from diesel buses which may increase health risks in urban areas. Electric buses also operate more quietly than conventional diesel buses potentially dramatically improving the public perception of public transit buses. The vehicles are typically low-floor allowing for improved capacity and accessibility. Buses currently being brought to market may also offer reduced lifecycle costs because of reduced maintenance requirements, however initial capital costs remain significantly higher. Barrie may consider electric buses for implementation in areas where noise and perception is of particular concern such along the waterfront or within the downtown core.

5.3 Station Design Considerations

The potential implementation of battery electric buses may have design implications for bus terminals such as the Allandale Mobility Hub. Current technology requires approximately 7-10 minutes for vehicles to fully charge and provide sufficient distance to cover a generous route length. A common method for charging at terminals is assisted automatic overhead docking stations which allow buses to pull forward making a connection with a wired connection using a small guide track on the roof of the bus. Such systems are currently being piloted in Seattle, Washington and Helsinki Finland. Wireless charging technology, potentially embedded under the roadway surface are also currently being studied and piloted.

Example of overhead charging station Source: Winnipeg Transit

New bus terminals may consider including some form of protection for future overhead electric charging facilities as well as design for capacity to allow for charging at the terminal. This could include protecting space for necessary transformer equipment and overhead clearance for charging stations. Conducting charging at a central hub allows for increased efficiency of scale but requires that buses layover longer at a central facility where space may be at a premium. Barrie Transit may consider which routes are likely to adapt electric buses and protect for charging facilities only at bays that are planned to allocate to such routes. A dynamic assignment system may allow for different routes to use the bay with the charging facility so as to stagger charging times as necessary. As battery technology continues to improve, charging times and technologies will continue to evolve rapidly, making planning for a specific requirement difficult.

6. Integration with Active Transportation

Allandale station benefits from extensive connections to a surrounding active transportation network. The surrounding street network has a high intersection density allowing for good pedestrian movements as the area intensifies. To the south and west, surrounding uses are located close to the station and the Essa Road intensification corridor provides an attractive walking destination from the station. To the north, the site is adjacent to significant parkland and multi-use trail connections. As with many rail stations, transit infrastructure presents a connectivity challenge particularly to the south and east as there are few opportunities to cross the rail corridor and the GO rail layover facility located to the southeast of the station site along Lakeshore Dr.

6.1 Pedestrian Interaction

Pedestrian best practices can be found in the form of complete streets guidance. Many large Canadian cities, such as Toronto, Edmonton, Calgary and Vancouver have developed complete streets guidelines which may be utilized as resources for the Canadian context. Internationally, the National Association of City Transportation Officials (NACTO) has produced the Urban Street Design Guide (2012) which includes resources and guidance about designing for pedestrian safety. Traffic calming and pedestrian safety measures are particularly important around rail stations where pick-up and drop-off traffic is prone to rushing to make train connections. Design features such as narrows lanes, reduced curb radii, pedestrian bulb out outs and other refuge points can help improve station access for pedestrians.

The Metrolinx Mobility Hub Guidelines speak to the importance of clearly marking pedestrian routes to the station that follow the most direct and simple path. Pedestrians are likely to follow the most direct route between destinations and pedestrian infrastructure should reflect this as much as possible rather than attempting to divert pedestrian movements by removing sidewalks or placing barriers. Station facilities are also important opportunities to utilize transit infrastructure to provide new connections through the community. Several GO Rail stations currently serve as important links across the rail corridor within their community. Port Credit and Exhibition GO station both position their pedestrian rail underpasses to align with local streets and provide connections to communities and attractions on both sides of the tracks.

Rail station infrastructure connecting communities at Exhibition and Port Credit GO Stations

6.2 Cycling Facilities

The GO Rail Passenger survey indicates that the vast majority of passengers accessing Allandale Waterfront GO Station come from within 5km, making the site an ideal candidate for increased cycling mode share. Accommodating cycling at the station involves providing both for safe access routes and secure bike parking. Similar to pedestrian facilities, cycling routes should allow for a connection that is direct as possible and follows desire lines. Segregated cycling facilities provide a more comfortable and safe experience and have been found to improve perceptions of safety both by drivers and cyclist. Improving the quality and segregation of cycling facilities can help to attract a broader demographic to the cycling mode share. Raised curbs, bollards, or fully separate lanes are common approach to segregating cycling and vehicle traffic. In Quebec, provincial cycling policies prioritize infrastructure connections directly to the station building. At Mascouche Station, outside of Montreal, bike facilities at stations on a new rail extension were symbolically connected directly to the front door of the station, both facilitating good connections and providing a visual que to the safety and priority of cyclists.

GO rail commuters typically leave their bikes parked at the station for long periods of time at stations which experience fluctuating levels of passenger activity. This creates a situation where bike theft is a significant problem. Passengers who have their bike stolen from the station are less likely to continue seeking active transportation station access. Across the network, GO has added sheltered bike parking that keeps bike dry throughout the day. These facilities are usually placed in high-traffic areas and are built of glass in an attempt to keep the parked bikes as visible as possible. It is a best practice to keep bike parking in a well-lighted and highly trafficked area.

Secure bike parking (Toronto) and direct bike paths to the rail station (Montreal)

Metrolinx is currently moving towards providing secure bike parking at more rail stations. Secure facilities allow limited access to a bike parking facility for registered users. The station may be actively monitored by staff or simply controlled by fob entry key. The GO Rail Station Access Plan identifies Allandale as a potential site for secure parking, providing an opportunity for collaboration with Metrolinx. Some of the best bike parking stations in the world also include bike maintenance facilities to allow riders to perform common minor maintenance such as pumping tires or tightening bolts. Both Chicago and Washington DC have bike parking stations at their central transit hubs. Toronto Union Station includes a secure parking facility which is managed by the City and staffed during the day. In The Netherlands, bikes are a significant station access mode share and most large stations are supported by multi-level bike parking structures often accommodating thousands of bicycles.

7. Peer Network Examples

The following section looks at two similar examples of hubs in close proximity where one hub is located at a rail station and another is located in the downtown commercial area.

7.1 Burlington ON

Burlington is an example of a location where the local transit agency provides hubs at a GO Station and a downtown business area which are approximately two kilometers apart. Both areas are designated as mobility hubs creating an opportunity to provide a corridor between the two sites. With a more established culture of GO Rail ridership, Burlington concentrates more service at the GO Station but provides overlapping routes to the downtown terminal as well ensuring a low headway connection for transfers between the two hubs. The downtown hub is located one block off of the main commercial street and includes high quality weather shelters as well as a small station building.

Downtown Burlington Transit Terminal and Route Network

7.2 Guelph, ON

Guelph has a much less established culture of GO Rail ridership than Burlington having only received rail service in recent years. GO Rail service at Guelph is less than at Allandale Waterfront with only four trains daily in each direction between Kitchener and Toronto Union Station. The municipality completed at new transit terminal at a historic rail station adjacent to the GO platforms in 2017 replacing an on-street hub within the downtown core. The station is still in very close proximity to the downtown core and routes continue to serve a cluster of on-street stops located closer to the main attractions and retail areas. Stop clusters are concentrated around two sides of an intersection, a strategy which helps to disperse bus movement while also shortening walking distances between bus transfers outside of the transit hub. A similar configuration is used for the downtown transit stop cluster in Kingston, Ontario with stops clustered on the north east corner of an intersection. In Kingston, a one-way road configuration allows for routes to be stopped on the same side of the street.

Guelph downtown transit stops and bus waiting area

Appendix: Best Practice Station Examples

(See Attached)

Allandale Mobility Hub Study

Hamburg Poppenbüttel Station, image credit: Architizer

Best Practice Station Examples

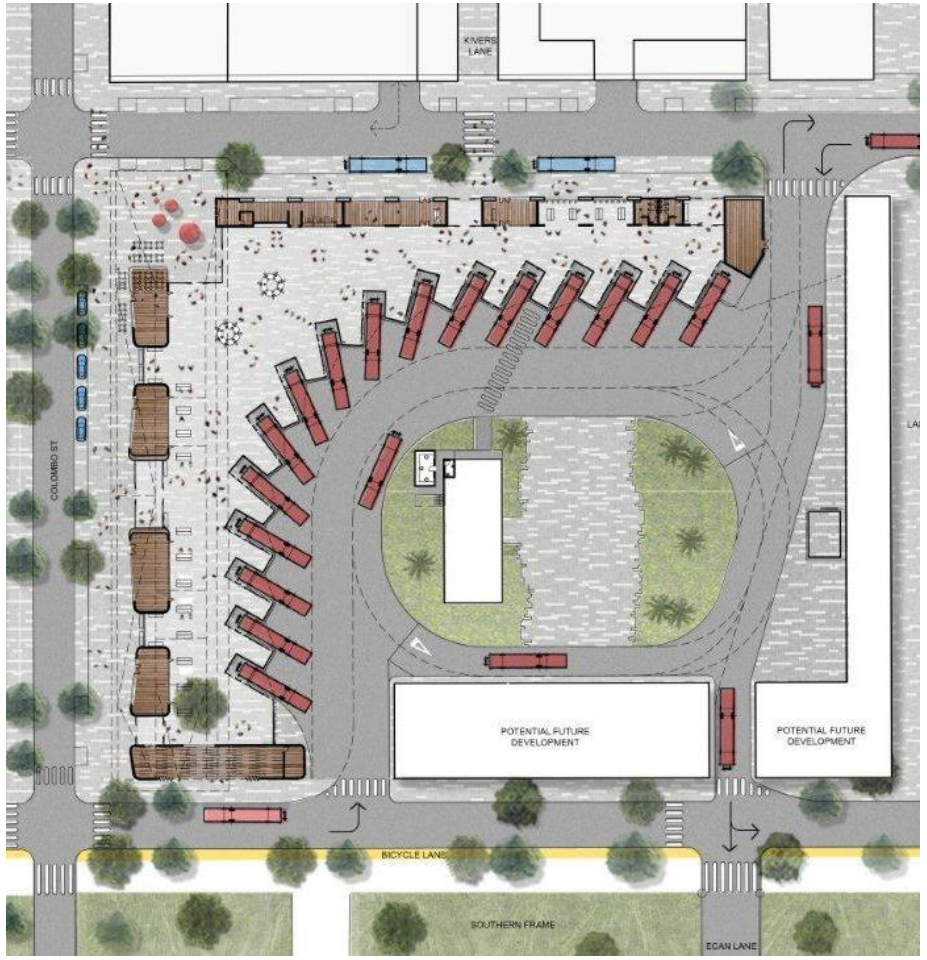
March 2018

Christchurch Bus Exchange

Christchurch, New Zealand

Key Features

- Fully dynamic assignment and reverse out bus operation
- High quality passenger environment with climate control and retail amenities integrated to street
- Structured to allow for future joint development on the site as market conditions evolve

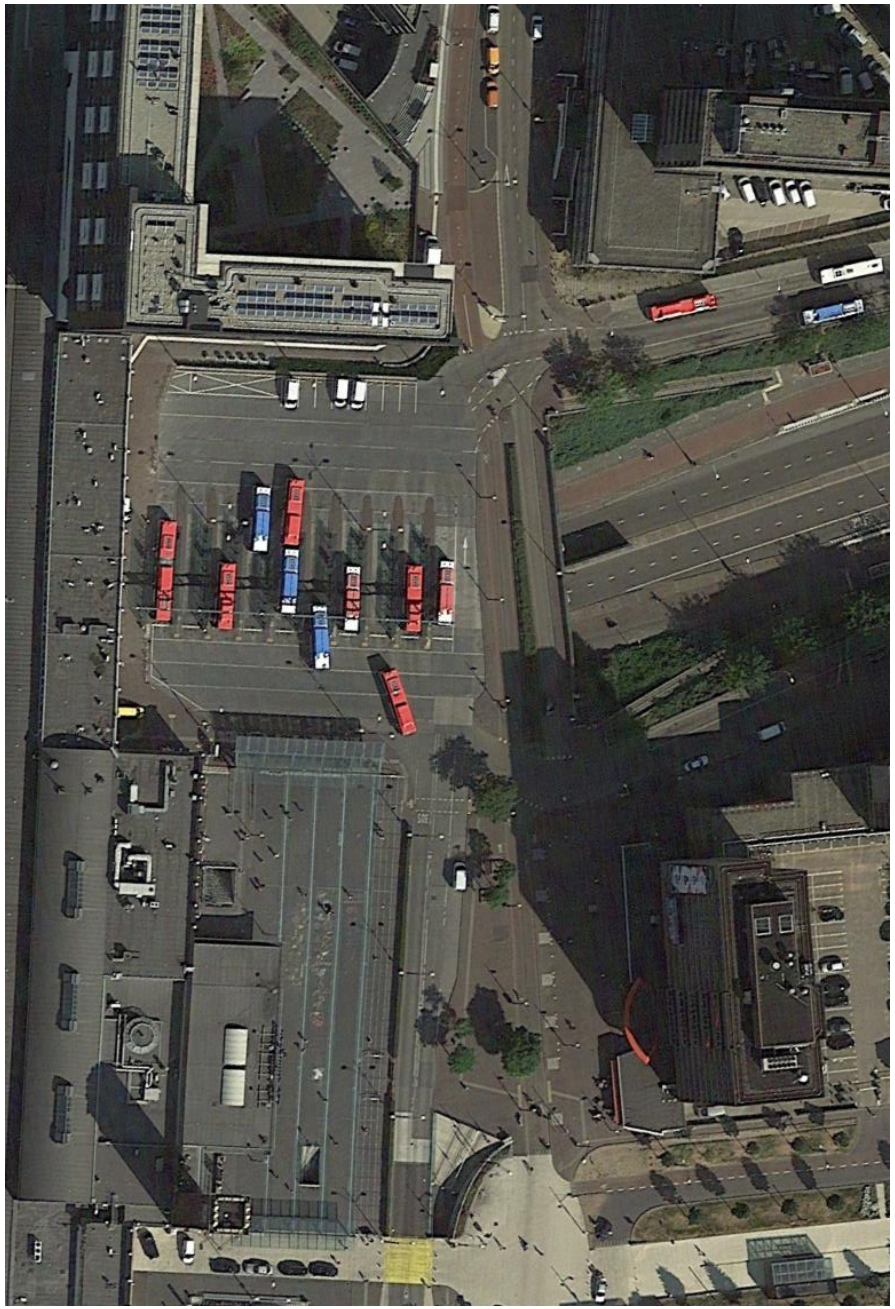


Nijmegen Central Station

Nijmegen, The Netherlands

Key Features

- Fully dynamic assignment claimed to reduce station footprint by 70%
- Drive-through configuration allows for small footprint and square site plan
- Concentrated passenger waiting area
- Layover on local side streets to maximize station capacity
- Drive through creates accessibility challenges

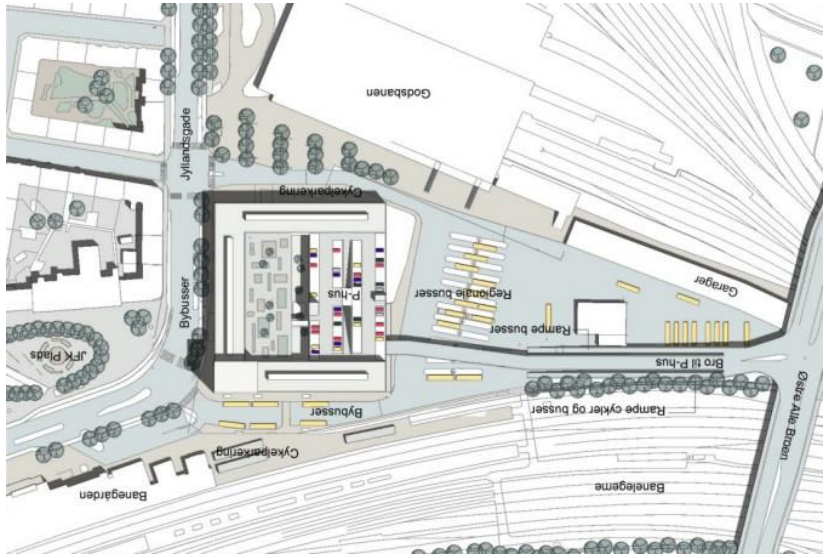


Aalborg Central Station

Aalborg, Denmark

Key Features

- A large 1960's era bus terminal was replaced by a smaller facility using dynamic terminal assignment
- Reduced footprint allowed for land sale to fund project and rejuvenate downtown area with new retail



Chatham Waterfront Station

Kent, UK

Key Features

- 12 bays communicated as four platforms with a dynamic information to allocate individual bays
- Moved to waterfront from central downtown location as part of development
- Has experienced issues with wind and weather conditions
- Incorporated within broader park setting of redeveloped waterfront area

Barrie

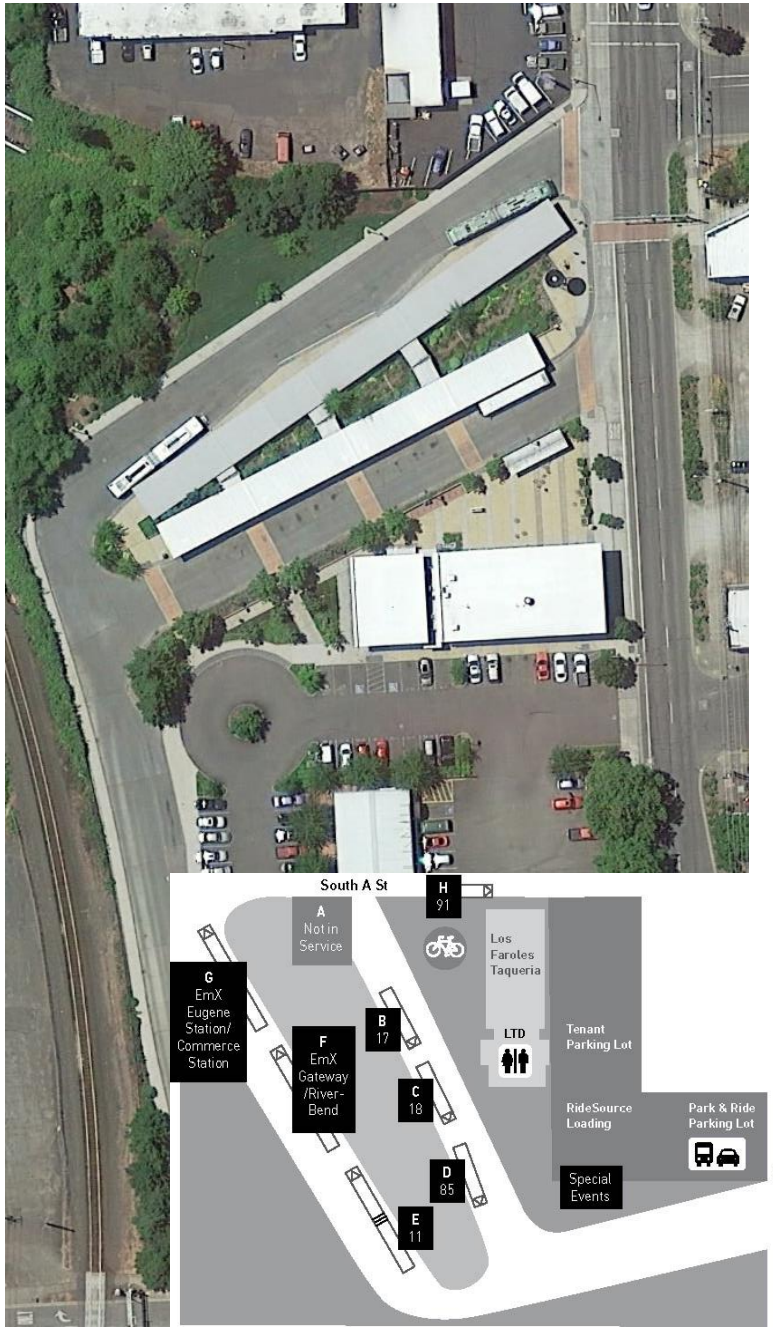
wsp

Springfield Station

Eugene, Oregon

Key Features

- Eight bays accommodating eight routes including frequent articulated service from a BRT corridor
- Incorporates street retail, washrooms, sheltered bike parking, small park and ride and ride hail meeting point
- Dedicated bus-only access roads on surrounding streets
- Swale with natural planting and public art to channelize pedestrian crossings



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Marine Drive Terminal

Vancouver, BC

Key Features

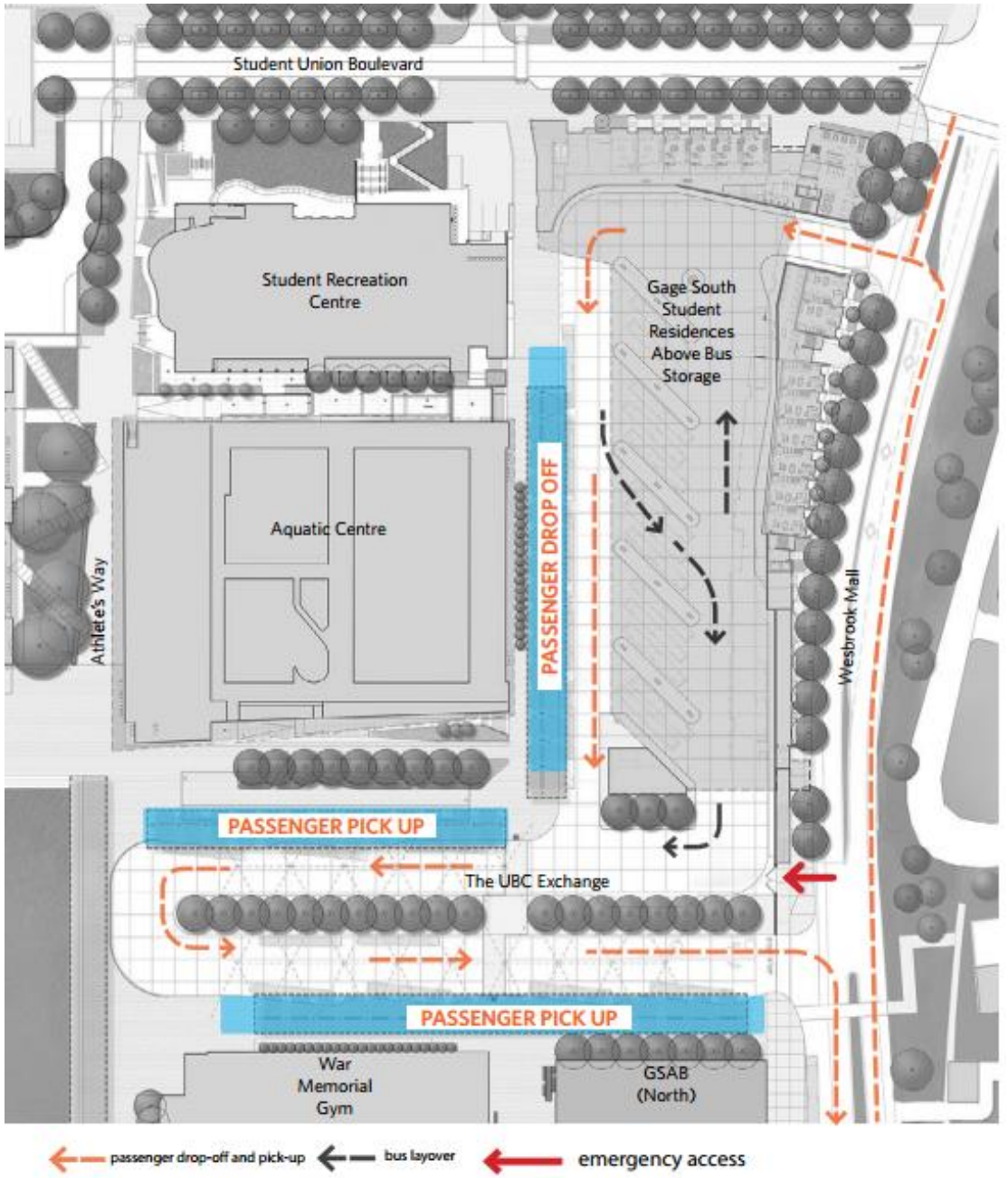
- Several high-frequency routes share one pick-up and one drop-off bay
- Dynamic assignment was protected for but was not implemented
- Separate layover with driver facilities
- Integrated with a joint development project following opening of transit line
- Small footprint for high passenger volumes

UBC Terminal

Vancouver, BC

Key Features

- Distinct areas for passenger pick-up and drop-off allowing for separate layover parking and reduced footprint
- Layover facility integrate within a new student residence development
- Surrounding route network largely terminates at the site

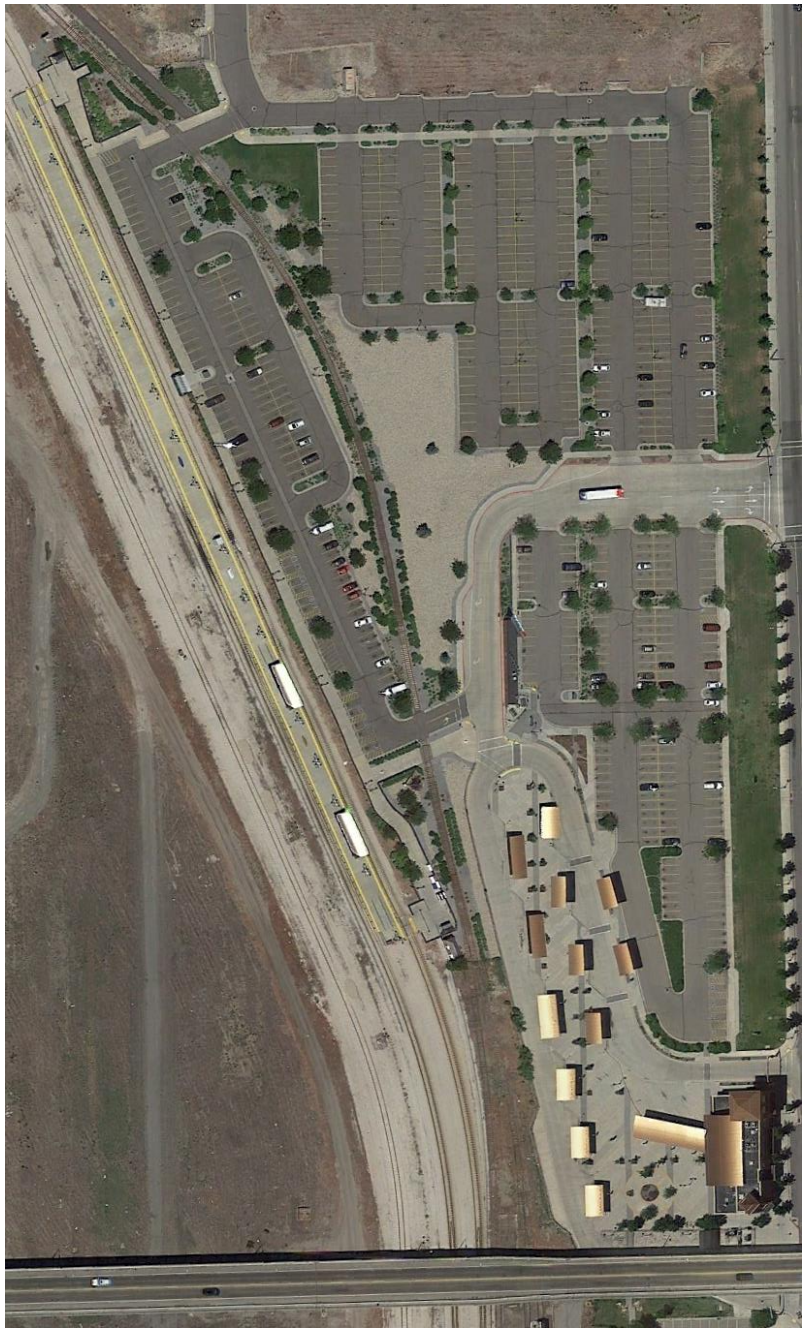


Ogden Transit Centre

Salt Lake City, UT

Key Features

- 11 Local Regional Bus Routes and Intercity Greyhound service
- 10 bays + 2 reverse out coach bays
- Protects street frontage for future retail and office developments using shared parking
- Opened in 2002 and expanded to accommodate new commuter rail service operating approximately hourly in 2008
- ‘Finger’ platform with three bus access points, six pedestrian crossing points

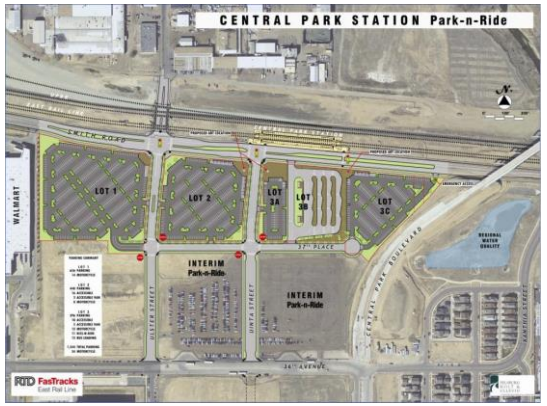


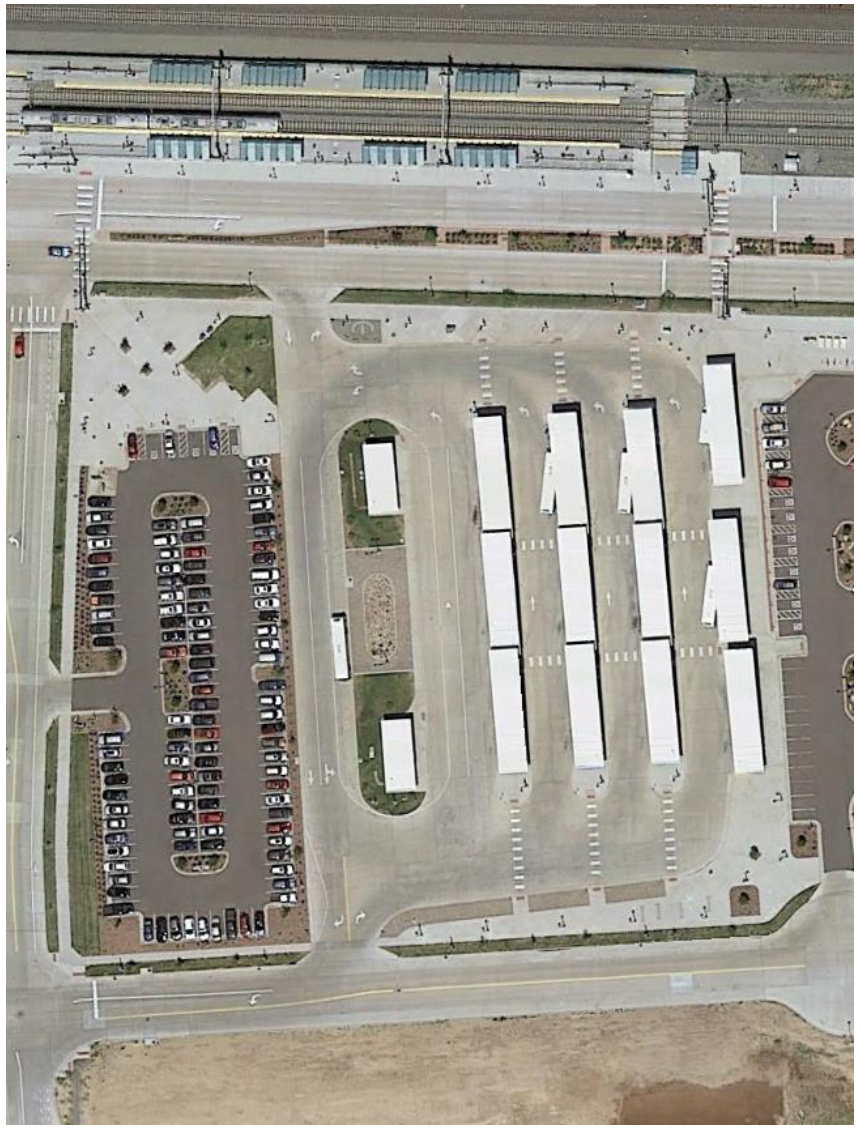
Central Park Station

Denver, CO

Key Features

- 12 bays serving 10 local transit routes
- Opened in 2016 as part of completely new commuter rail line
- Delivered as part of large P3 package
- Special drop-off points for micro-shuttles
- Two pedestrian crossing at mid point of islands as well as marked crossings at ends of each island
- Integrated within large surrounding area redevelopment plans





Barrie

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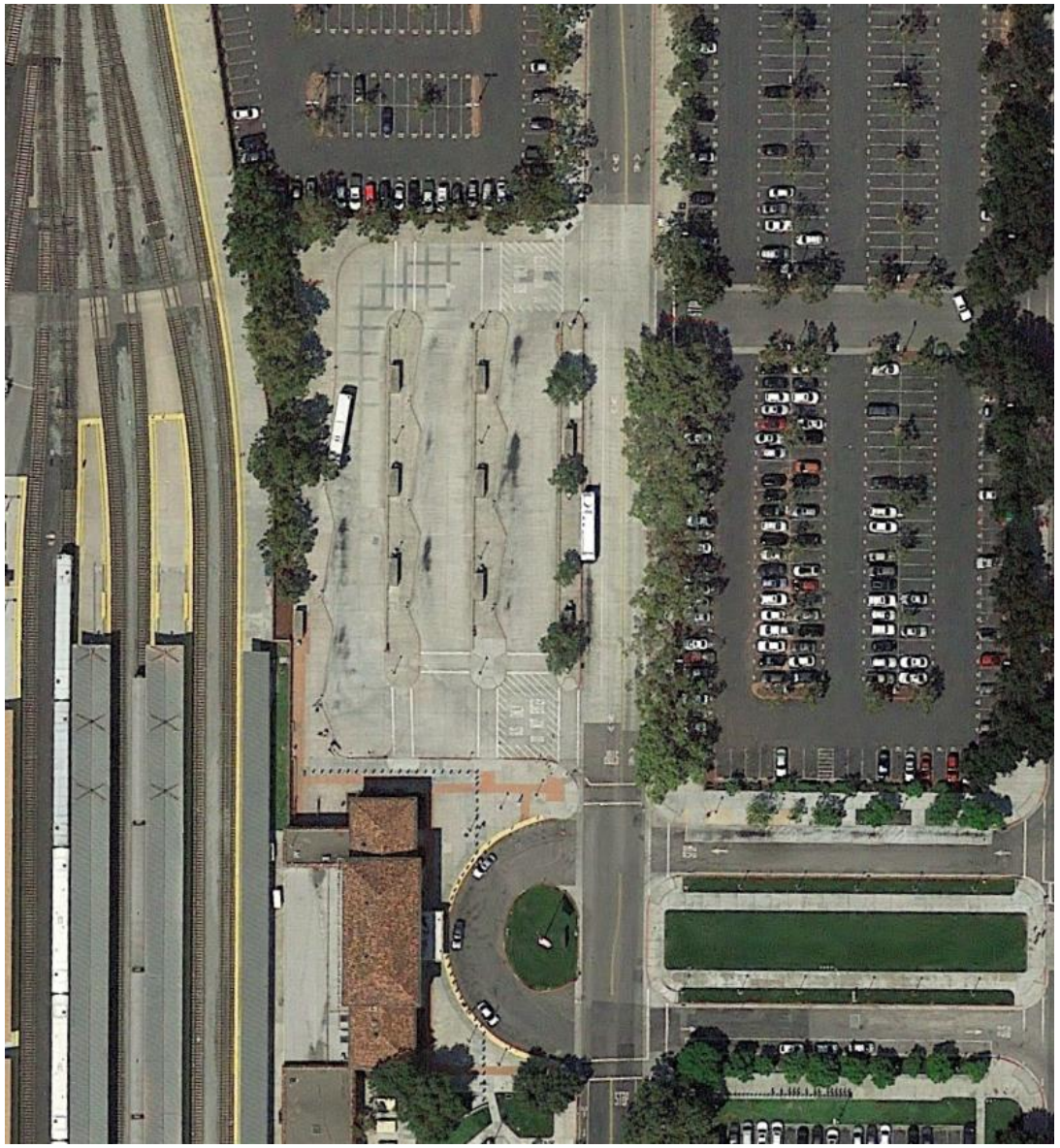
San Jose Diridon Station

San Jose, CA

Key Features

- Multi-modal Hub with LRT, Intercity Rail, Commuter Rail, Local Buses and Intercity Coaches
- 12 bays service 12 local bus routes, four intercity coach operators and several employer shuttle buses
- Drive through configuration with a combination of saw-tooth and linear bays



Gare Mascouche

Montreal, QC

Key Features

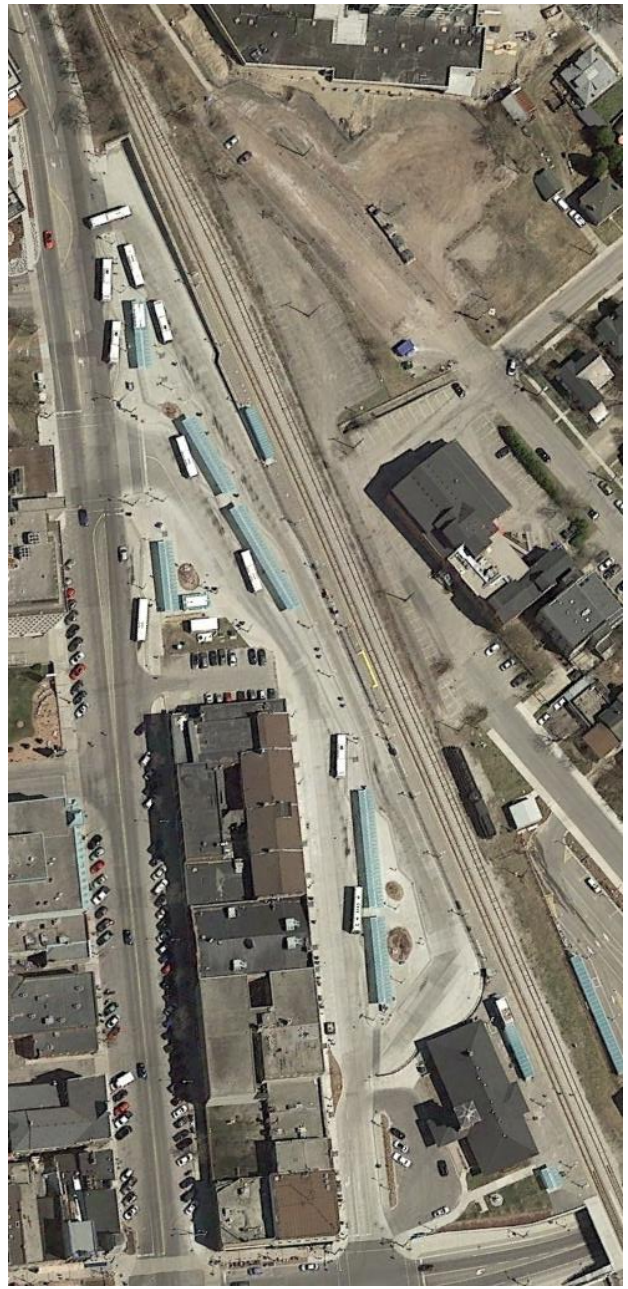
- Terminal station of a new commuter rail line opened in 2014
- 9 Bays serving 10 different route directions
- Landscaped center swale to prevent pedestrian conflicts
- Direct connection via off-road cycling path
- Compact bus terminal design, few pedestrian conflicts

Guelph Central Station

Guelph, ON

Key Features

- Includes Greyhound, Via Rail, GO Transit and Guelph Transit users
- Re-opened as an integrated facility in February 2017
- Ticket counters, washrooms, driver lunchroom and management facility located in historic station building
- 15 routes and 5,000 daily passengers
- Compact footprint in irregular station site

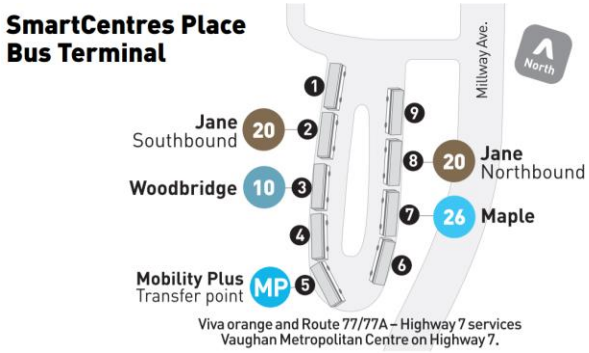


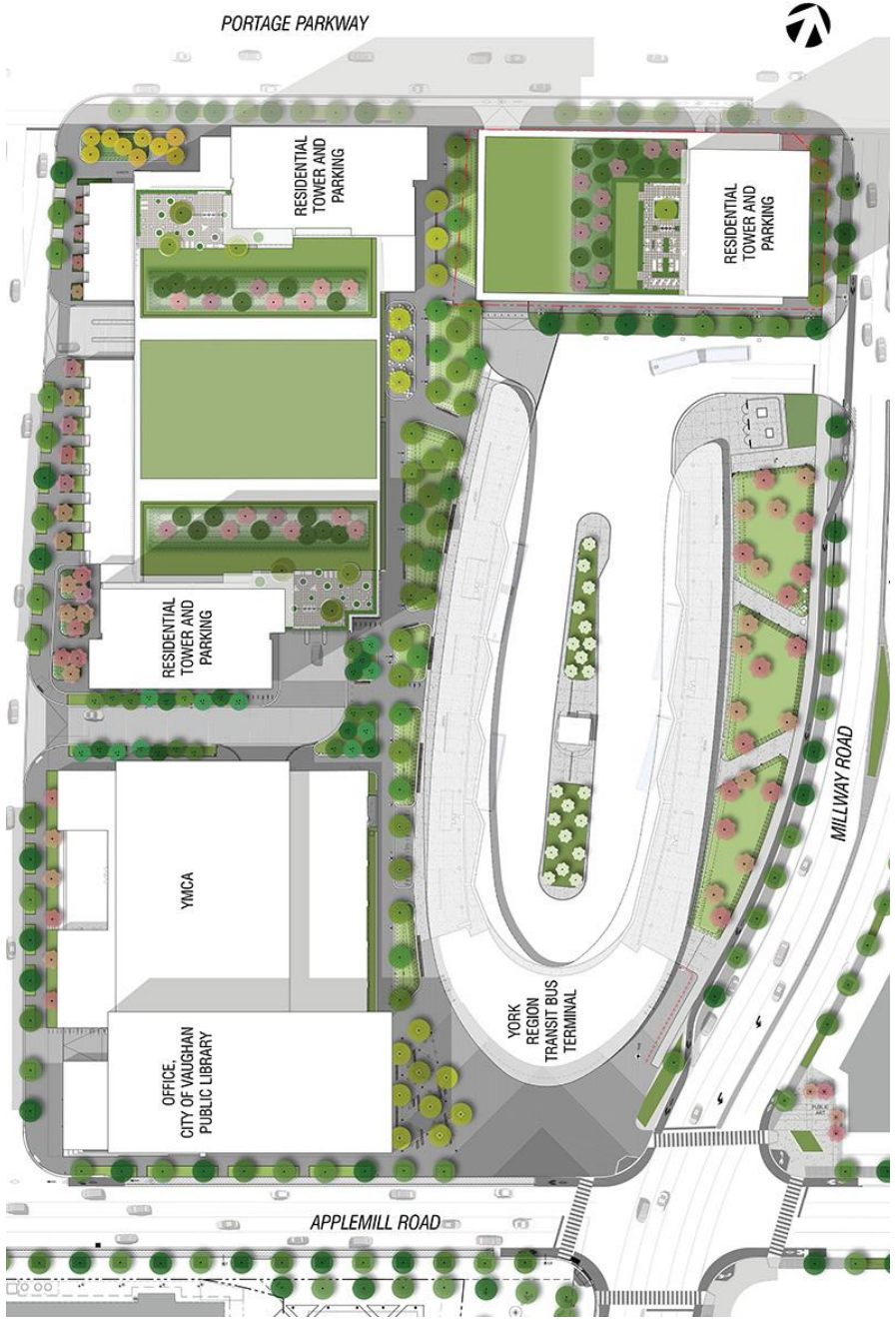
Smart Centers' Terminal

Vaughan, ON

Key Features

- Nine bays, including space for articulated vehicles
- Serving three routes and accessible transit
- High quality urban design and building materials
- Centre landscaped median with public art component covering vent shaft
- Connected by tunnel to subway station
- Budgeted cost of $32.1 million





MacNab Terminal

Hamilton, ON

Key Features

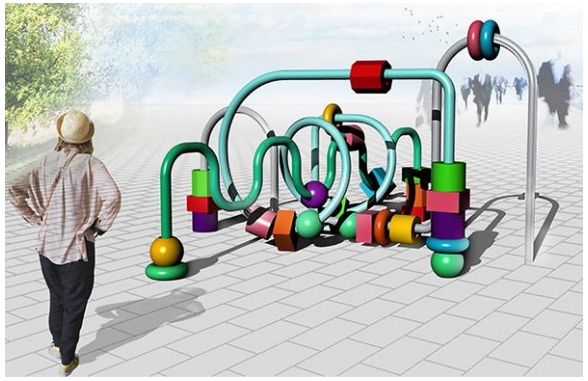
- 7 platforms with 10 routes
- Two level passenger services building with washrooms and real-time arrive display information
- New public realm space
- Glass barriers provide wind shelter and focus pedestrians at a single crossing
- Award winning design excellence

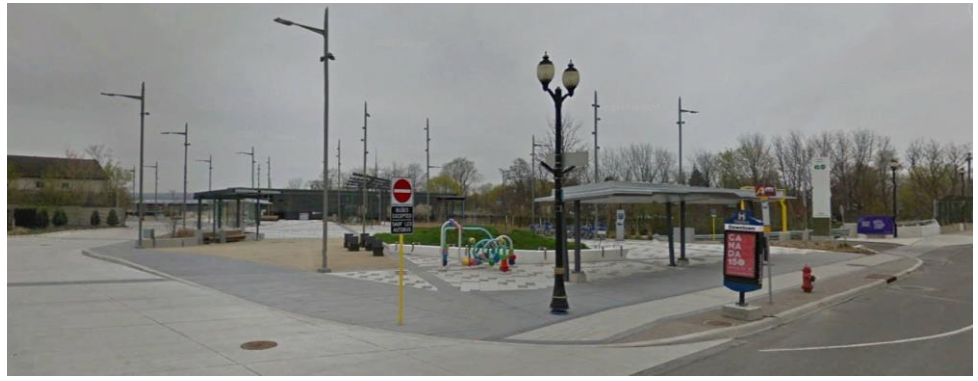
West Harbour Station

Hamilton, ON

Key Features

- 3 platforms including one on street
- Express routes pass the station on-street
- Sheltered bus waiting area
- Bus loop integrated within a new public realm plaza that includes public art and extensive landscaping
- Part of $50 million new GO Station development
- Limited rail service planned to expand in the future





Barrie

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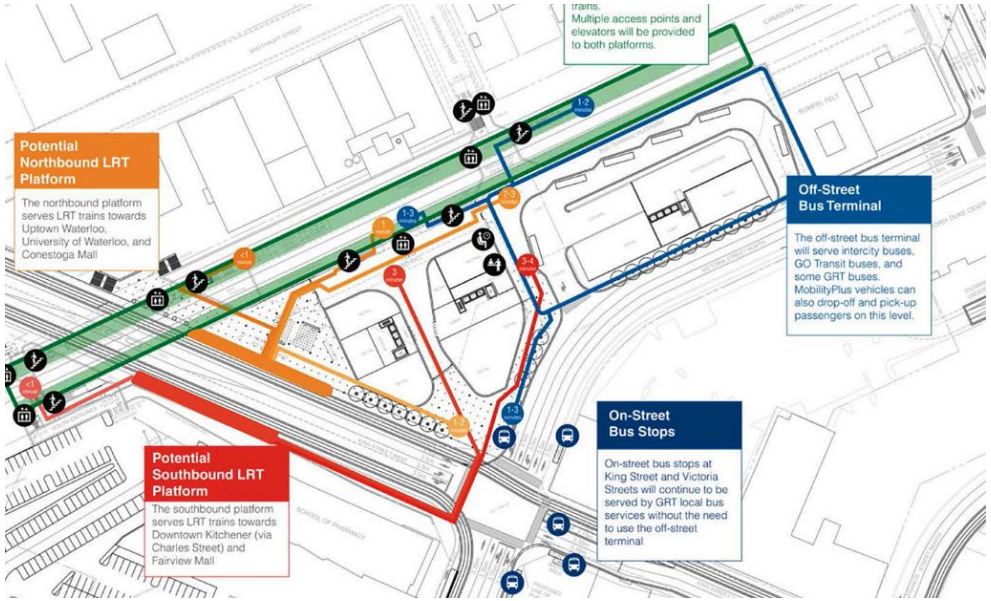
King-Victoria Transit Hub

Kitchener, ON

Key Features

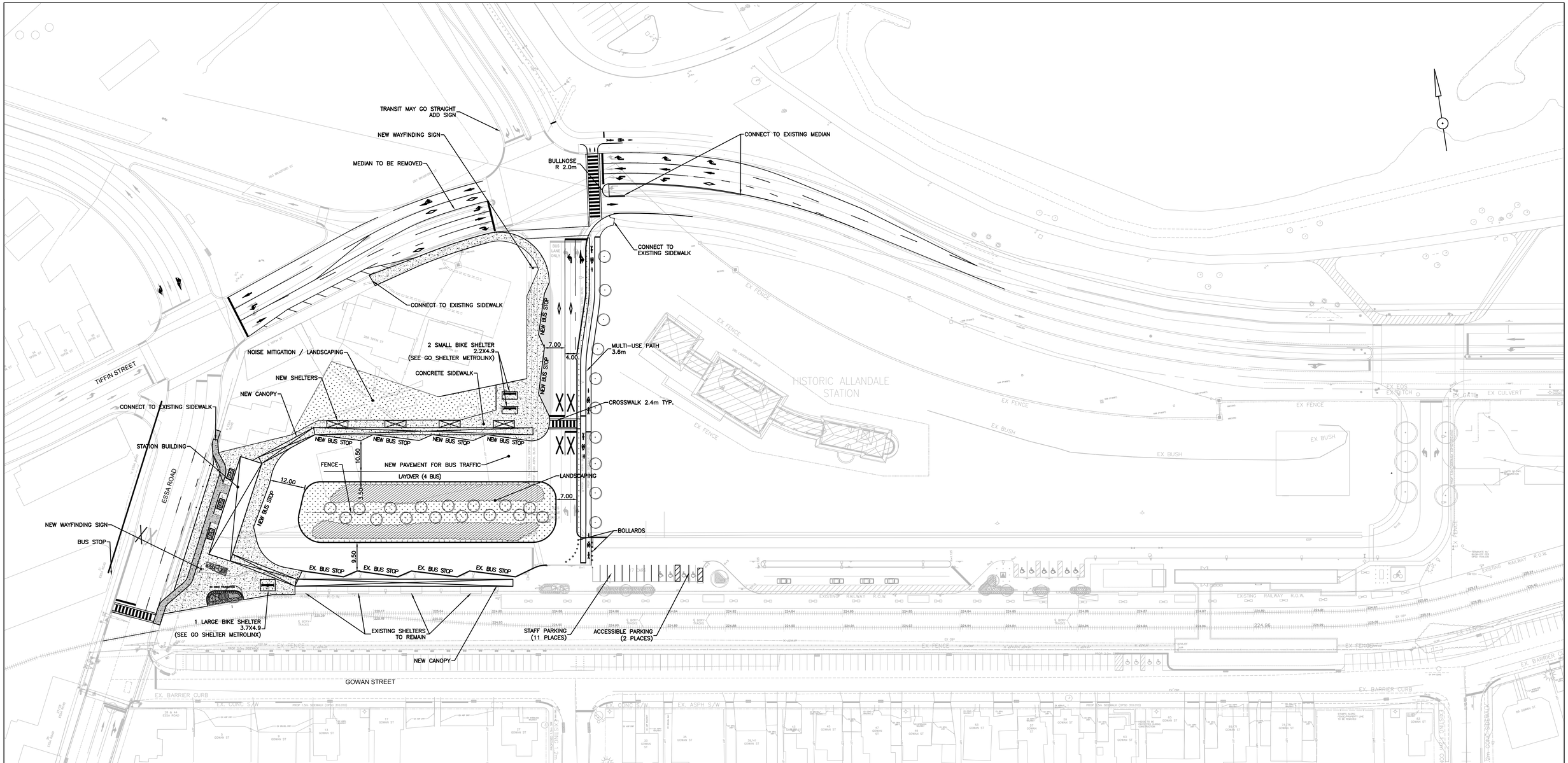
- Ambitious project to develop an integrated transit hub along with significant office, residential and retail development
- RFQ released in 2017 currently under review to find a master developer
- Includes $43 million in public funding
- Will eventually include Light Rail, GO Rail and intercity coach buses
- Bus terminal wraps around development block



Allandale Mobility Hub Study Final Report

APPENDIX

C Functional Design Drawings



HORIZONTAL SCALE: 0 5 10 25m

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110 SYCAMORE AVENUE, SUITE 500
TORONTO, ONTARIO
M5C 2L1 CANADA
www.wspgroup.com

TITLE :

BARRIE STATION CONCEPT C-1
Modified

PROJECT : 18M-00181-00

DATE : 2018-03-13

DRAWING NO : SK-02

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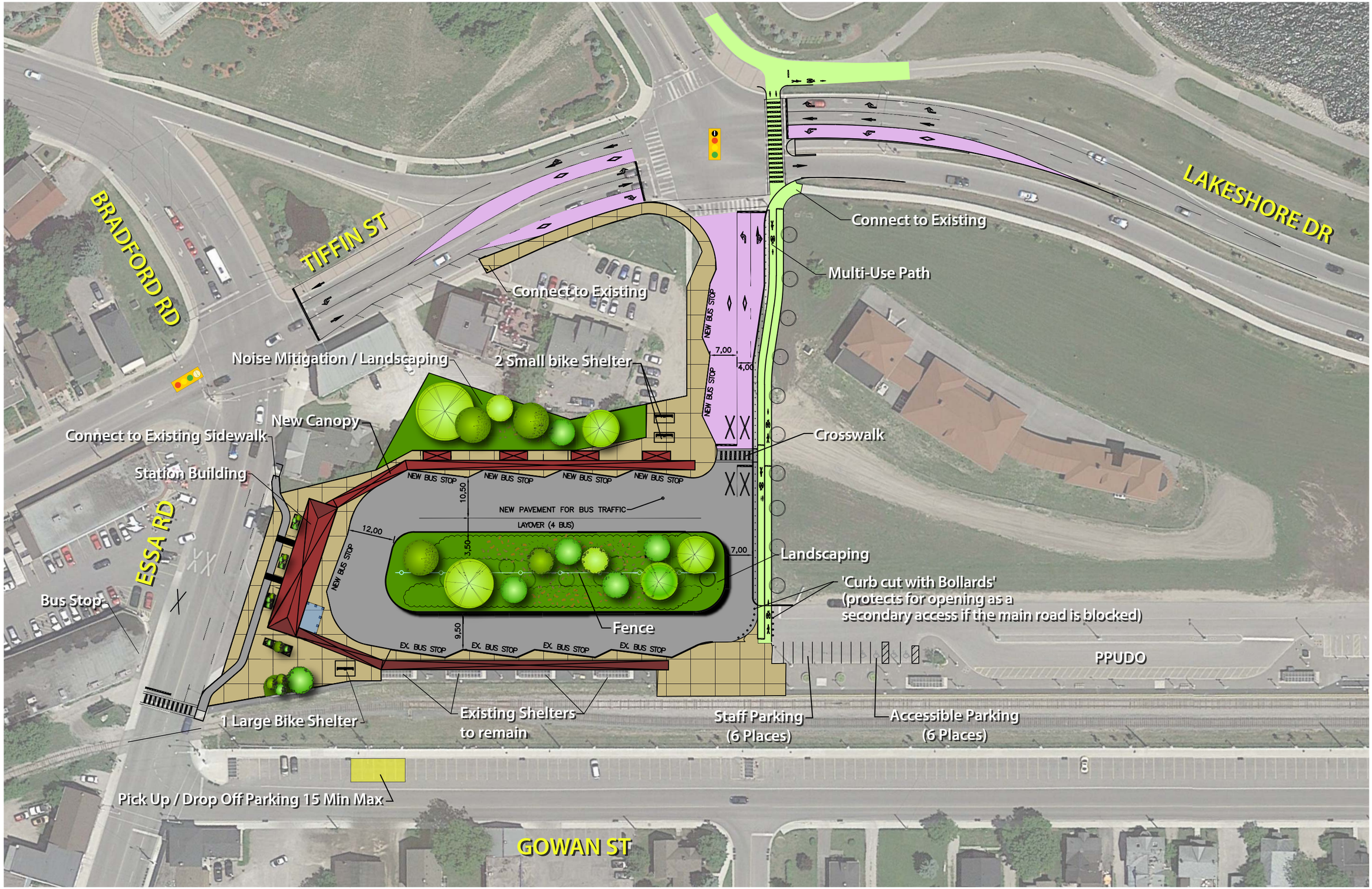
BRADFORD RD
TIFFIN ST
LAKESHORE DR
ESSA RD
GOWAN ST
Connect to Existing
Multi-Use Path
Connect to Existing
Noise Mitigation / Landscaping
2 Small bike Shelter
New Canopy
Connect to Existing Sidewalk
Station Building
Crosswalk
NEW BUS STOP
NEW BUS STOP
NEW BUS STOP
7,00
4,00
10,50
NEW PAVEMENT FOR BUS TRAFFIC
LAYOVER (4 BUS)
12,00
3,50
7,00
Landscaping
'Curb cut with Bollards'
(protects for opening as a
secondary access if the main road is blocked)
Bus Stop
Fence
9,50
EX. BUS STOP
EX. BUS STOP
EX. BUS STOP
EX. BUS STOP
PPUDO
1 Large Bike Shelter
Existing Shelters
to remain
Staff Parking
(6 Places)
Accessible Parking
(6 Places)
Pick Up / Drop Off Parking 15 Min Max

Allandale Mobility Hub Study Final Report

APPENDIX

D Traffic Impact Study

CITY OF BARRIE

BARRIE ALLANDALE MOBILITY HUB STUDY

Traffic Impact Study Report

MAY 31, 2018 FINAL

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BARRIE ALLANDALE MOBILITY HUB STUDY

TRAFFIC IMPACT STUDY REPORT

CITY OF BARRIE

FINAL

PROJECT NO.: 18M-00181
DATE: MAY 31, 2018

WSP
610 CHARTWELL ROAD
SUITE 300
OAKVILLE, ON, CANADA L6J 4A5

T: +1 905-823-8500
F: +1 905-823-8503
WSP.COM

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

1 INTRODUCTION

The City of Barrie is conducting a mobility hub study of the Allandale Waterfront Station to assess the feasibility of relocating Barrie Transit's central terminal to the site. This has the potential to benefit the city by improving transit connections to GO Rail in advance of the of start of all-day service and of freeing up space in the downtown for a new civic amenity. The existing bus terminal located on Maple Street in downtown Barrie serves Barrie Transit as well as other inter-city operators (GO Bus, Greyhound, and Ontario Northland). The proposed new transit terminal at Allandale would concentrate services to create an intermodal regional transportation hub at a prime redevelopment and intensification site. The City has long term growth plans to encourage intensification and investment in the historic Allandale community.

As part of the Allandale Station Mobility Hub Study, a Traffic Impact Study (TIS) was conducted for the existing (2018) and future (2024) planning horizons to assess the potential impacts of the proposed improvements on the transportation network. The report identifies the existing traffic operational issues, future capacity constraints, and recommended improvement measures to mitigate the future traffic impacts.

This TIS report summarizes the study area (in Section 2), Existing (2018) traffic conditions (in Section 3), Future (2024) background traffic conditions (in Section 4), Future (2024) total traffic conditions (in Section 5), Study Findings (in Section 6) and Recommendations (in Section 7).

2 STUDY AREA

The existing Allandale GO Station is located at the southeast corner of Essa Road/Bradford Street and Tiffin Street intersection, approximately 1.5 km south of Barrie downtown. Currently, the station can be accessed via three intersections – using two Lakeshore Drive intersections to the north platform, and using Essa Road and Gowan Street intersection to the south platform. An additional bus-only access is located north of the Essa Road and Gowan Street intersection.

The study area for the traffic analysis is presented in Figure 1. The following five intersections in the vicinity of existing Allandale GO Station were analyzed in this study:

- Essa Road/Bradford Street and Tiffin Street intersection (currently signalized),
- Lakeshore Drive and Tiffin Street intersection (currently signalized),
- Lakeshore Drive and GO Station East Access (currently signalized),
- Essa Road and Gowan Street intersection (currently signalized), and
- Essa Road and GO Station South Access (inbound bus-only and currently not signalized).

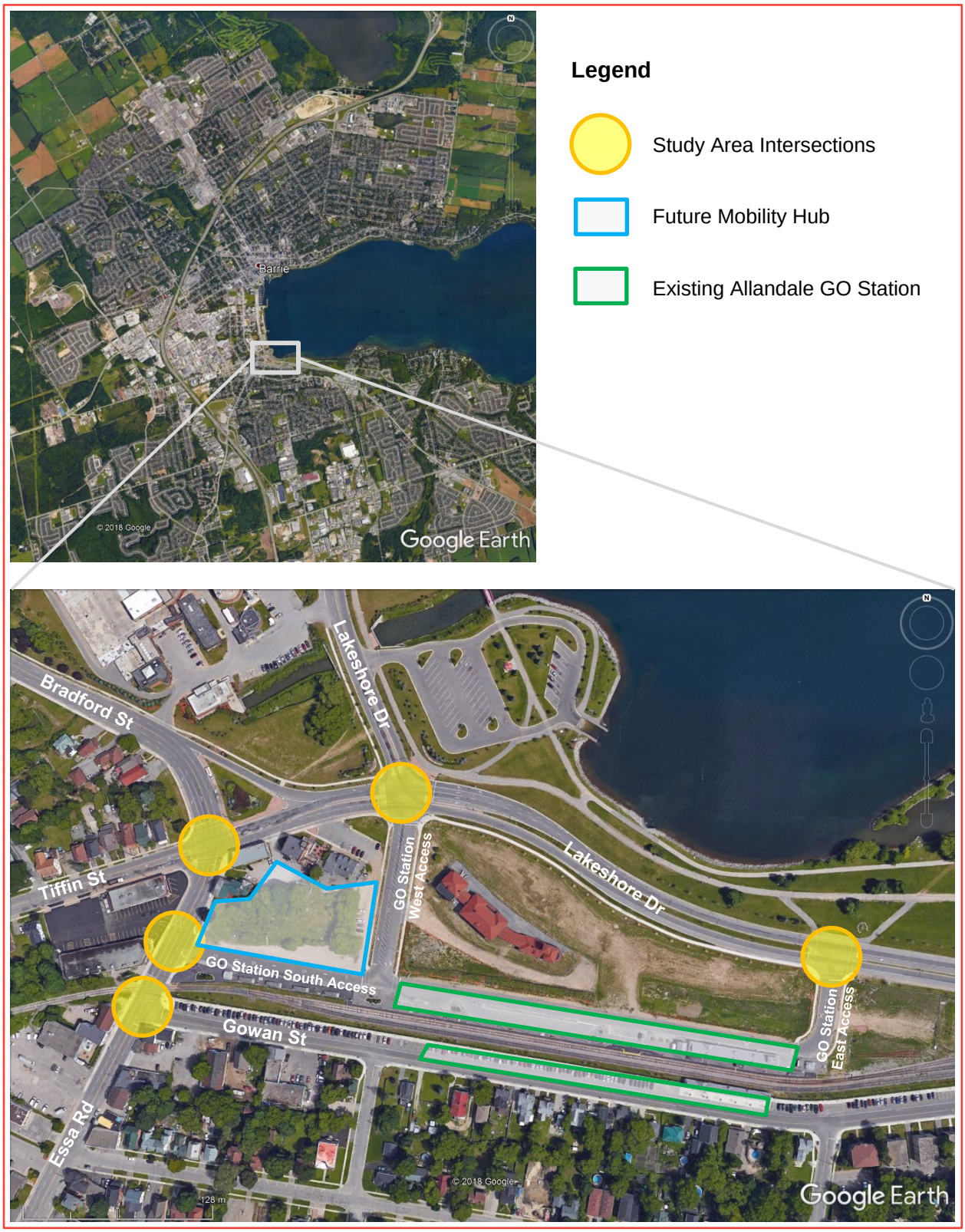


Figure 1: Study Area

3 EXISTING (2018) TRAFFIC CONDITIONS

3.1 EXISTING (2018) ROAD NETWORK

The study area includes following corridors:

- ***Lakeshore Drive*** is a City Parkway traveling in the north-south direction north of Tiffin Street and in the east-west direction east of GO Station West Access. This corridor includes two-lane cross-section within the study area, and operates with signalized intersections at Tiffin Street/GO Station West Access and at GO Station East Access. Lakeshore Drive widens and accommodates an additional through lane on the east approach to Tiffin Street/GO Station West Access. The posted speed limit is 50 km/h on Lakeshore Drive within the study area.
- ***Bradford Street*** is an Arterial corridor in the north-south direction parallel to Lakeshore Drive, with a four-lane cross-section within the study area, and operates with a signalized intersection at Tiffin Street. The posted speed limit is 50 km/h on Bradford Street within the study area.
- ***Tiffin Street*** is also an Arterial corridor, providing access in the east-west direction and connect to Lakeshore Drive at the Allendale GO Station West Access. The segment in the study area includes two-lane cross-section and operates with signalized intersections at Bradford Street and at Lakeshore Drive/GO Station West Access. The channelized westbound right turn lane from Tiffin Street to Bradford Street forms a triangle landscaping island. The posted speed limit is 50 km/h on Tiffin Street within the study area.
- ***Essa Road*** is an Arterial corridor, traveling in the north-south direction and connects to Bradford Street at Tiffin Street intersection. It includes four-lane cross-section within the study area, and operates with traffic signals at Tiffin Street and at Gowan Street intersections. The signalized intersection at Gowan Street also accommodates an at-grade railway crossing. A 'bus-only' access to the GO Station is located 20 m north of the Essa Road and Gowan Street intersection. Within the study area, the posted speed limit is 50 km/h on Essa Road.
- ***Gowan Street*** is a Minor Collector traveling in the east-west direction and providing access to the GO Station (on the north side of the road) and local residential areas (on the south side of the road). It has a two-lane cross-section and operates with a signalized intersection at Essa Road. The posted speed limit is 50 km/h on Gowan Street.

The existing intersection lane configurations for the study area intersections are presented in Figure 2.

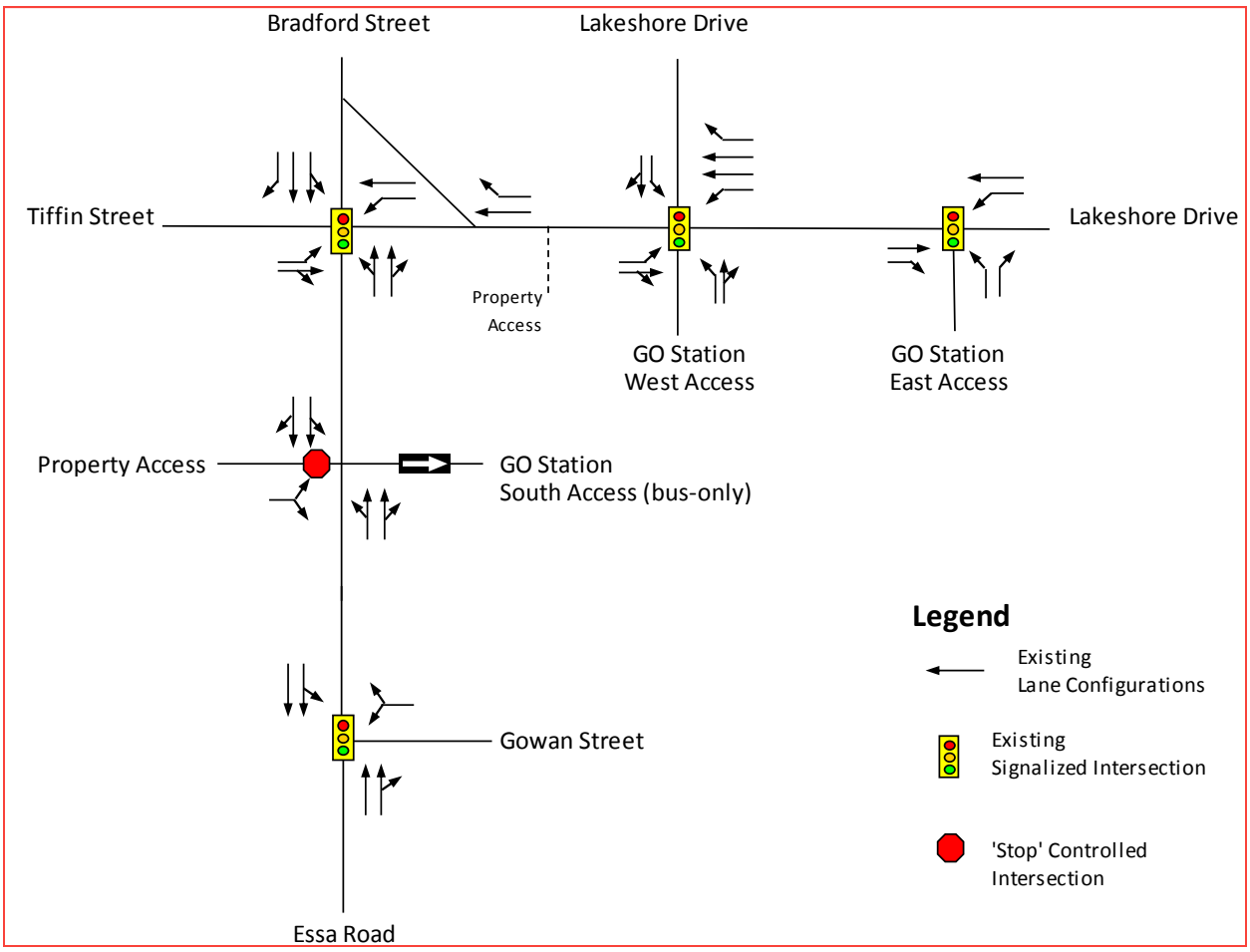


Figure 2: Existing Intersection Lane Configurations

3.2 EXISTING TRANSIT OPERATIONS

The Barrie Transit currently operates ten bus routes serving the study area, as described below and presented in Figure 3:

- Route 1A (Georgian Mall-northbound) and Route 1B (Welham-southbound) operate along Bradford Street/Essa Road with a 30-min headway during Monday to Saturday daytime, and a 45-min headway during Monday to Saturday evening and on Sunday.
- Route 4A (East Bayfield-northbound) and Route 4B (South GO-southbound) operate along Bradford Street/Essa Road with a 35-min headway during Monday to Saturday daytime, and a 65-min headway during Monday to Saturday evening and on Sunday. During Monday to Friday morning hour (5:45 to 6:45), service headways is reduced to 30-min for both routes.
- Route 7A (Bell Farm-northbound) and Route 7B (Bear Creek-southbound) operate along Bradford Street/Tiffin Street with a 30-min headway during Monday to Saturday daytime, and a 60-min headway during Monday to Saturday evening and on Sunday.
- Route 8A (Yonge-southbound) and Route 8B (Park Place-northbound) operate along Bradford Street/Essa Road with a 30-min headway during Monday to Saturday daytime, and a 60-min headway during Monday to Saturday evening and on Sunday.
- Route 90A (Angus Borden-eastbound) and Route 90B (Peacekeepers Way-westbound) operate along Tiffin Street with five departures daily from Monday to Friday.

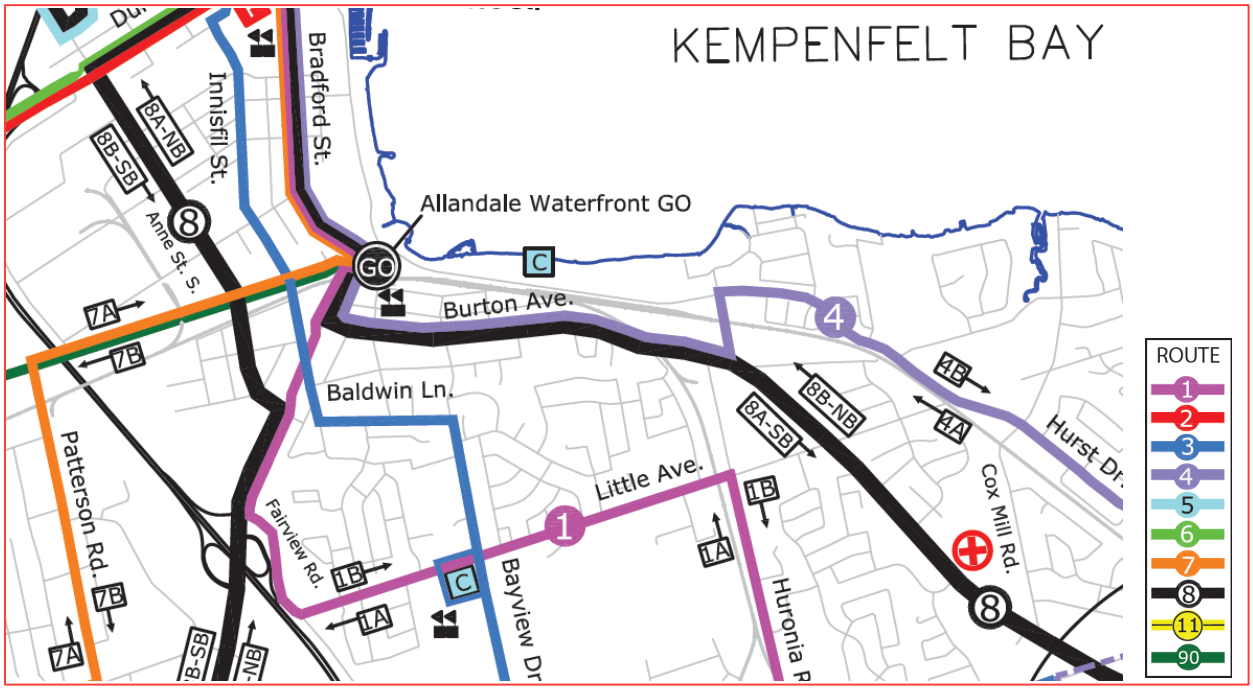


Figure 3: Barrie Transit Map (partial)

Source: Barrie Transit

In addition to the Barrie Transit, GO Train operates from Allandale GO to Union Station during the morning period and in the opposite way during the afternoon peak period. There are seven train departs from Allandale GO to Union Station during weekday mornings (between 5:18 and 7:18) and three train departs during weekend mornings (between 9:15 and 11:15), and vice versa during the afternoon periods. The GO Bus provides services between Allandale Waterfront GO and Brantford GO station daily with a headway of 45 min to 70 min.

3.3 EXISTING TRAFFIC VOLUMES

The turning movement counts (TMCs) were collected for the study area intersections in February 2018, for eight-hour period for the typical weekday and four-hour for weekend conditions. The TMCs were reviewed and compiled to reflect the weekday morning and afternoon peak hour conditions, and weekend peak hour condition. Traffic volumes for these three peak hours (morning, afternoon, and weekend) were further balanced to ensure consistency between two adjacent intersections. Truck percentages and peak hour factors (PHFs) were also calculated and applied in intersection capacity analysis.

The existing (2018) traffic volumes for the study area intersections are presented in Figure 4. The collected traffic counts are included in in Appendix A.

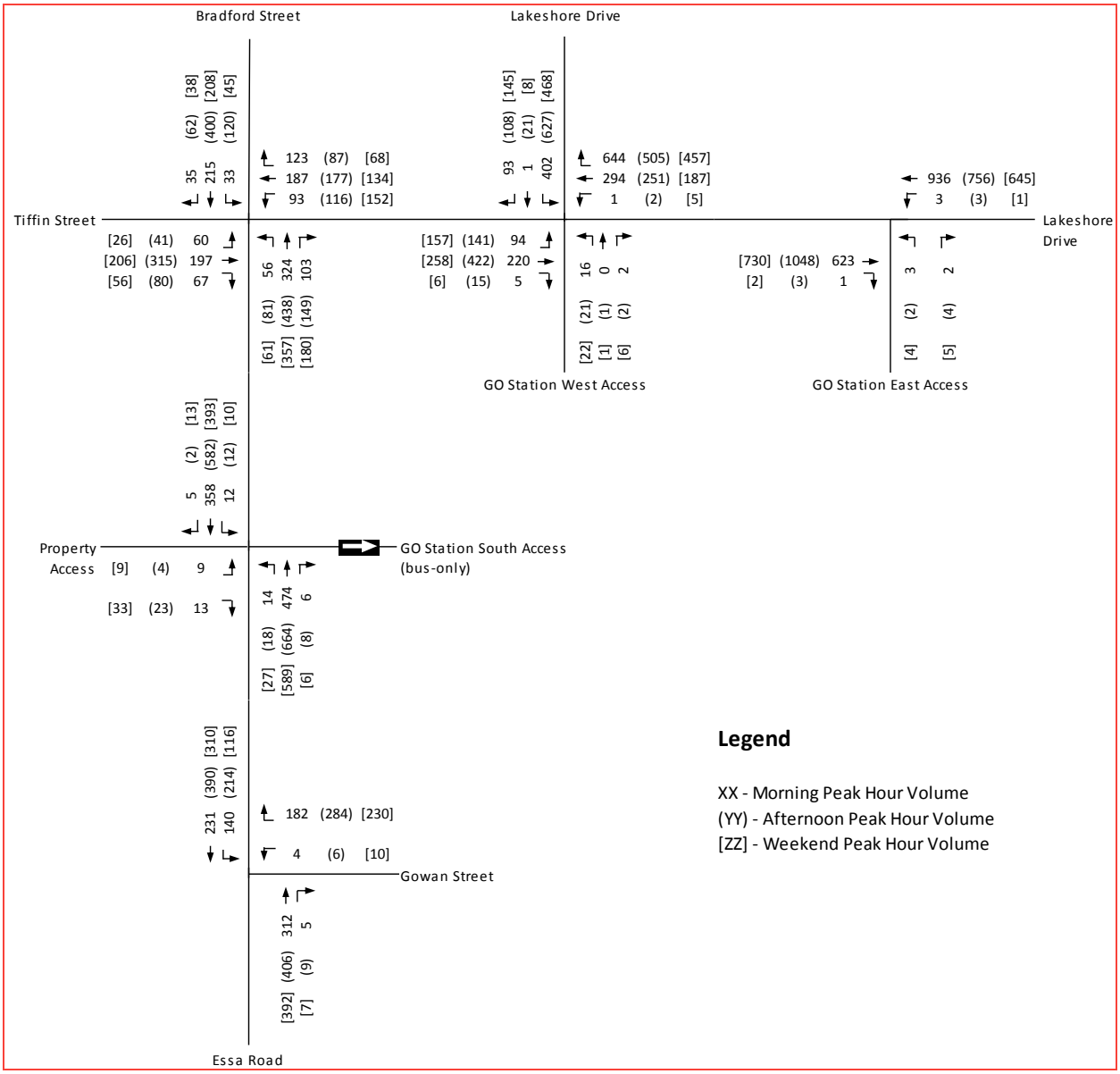


Figure 4: Existing (2018) Traffic Volumes

3.4 SIGNAL WARRANT ANALYSIS

Signal warrant analysis was conducted for Essa Road and GO Station South Access using existing (2018) eight-hour traffic counts as per the Ontario Traffic Manual (OTM) Book 12 guidelines. The result of signal warrant analysis indicates that traffic signal is not justified at Essa Road and GO Station South Access for the existing traffic conditions. The analysis summary is presented in Figure 5.

Detailed signal warrant analysis report is presented in Appendix B.

Summary Results

Justification			Compliance	Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A	Total Volume	90 %	☐	☑
	B	Crossing Volume	14 %		
2. Delay to Cross Traffic	A	Main Road	90 %	☐	☑
	B	Crossing Road	16 %		
3. Combination	A	Justificaton 1	14 %	☐	☑
	B	Justification 2	16 %		
4. 4-Hr Volume			18 %	☐	☑
5. Collision Experience			0 %	☐	☑
6. Pedestrians	A	Volume	Justification not met	☐	☑
	B	Delay	Justification not met		

Figure 5: Signal Warrant Analysis Results for Essa Road and GO Station Access Intersection

3.5 EXISTING INTERSECTION CAPACITY ANALYSIS

The intersection capacity analysis was conducted using *Synchro 9* software package using the level of service criteria defined under Highway Capacity Manual (HCM).

Capacity is defined as the maximum number of vehicles that can pass over a road segment or through a intersection within set time duration. Capacity is combined with Level of Service (LOS) to describe the operating characteristics of a road segment or intersection. LOS is a qualitative measure that describes operational conditions and motorist perceptions within a traffic stream. The HCM defines six levels of service, LOS 'A' through LOS 'F', with 'A' representing the shortest average delays and 'F' representing the longest average delays. LOS 'D' is the typically accepted standard in urbanized areas. In addition, any movement with volume to capacity (v/c) ratio over 0.85 was considered as critical movement with traffic operational concern, as per the City's Traffic Impact Study Guidelines.

For unsignalized intersections, only the movements that must yield right-of-way experience the delay. Accordingly, minor street approach delays are reported herein for unsignalized conditions. It is typical for 'stop' sign controlled side streets and driveways intersecting major streets to experience longer delays during peak hours, while the majority of the traffic moving through the intersection on the major street experiences little or no delay.

Table 1 presents the intersection delay criteria for signalized and 'stop-sign' controlled intersections.

Table 1: Intersection Level of Service Criteria

Level of Service	Intersection Delay Criteria (seconds per vehicle)		Traffic Operation
	Signalized	'Stop-Sign' Controlled/Roundabout	
A	≤ 10	≤ 10	Acceptable operation
B	> 10.0 and ≤ 20.0	> 10.0 and ≤ 15.0	
C	> 20.0 and ≤ 35.0	> 15.0 and ≤ 25.0	
D	> 35.0 and ≤ 55.0	> 25.0 and ≤ 35.0	
E	> 55.0 and ≤ 80.0	> 35.0 and ≤ 50.0	Marginally Acceptable – occasional queuing
F	> 80.0	> 50.0	Unacceptable – persistent queuing

The existing traffic operating performances for the signalized intersections were assessed based on average vehicular delay and resulting LOS using *Synchro* report. The traffic operational performance for the unsignalized intersection (at Essa Road and GO Station South Access) was assessed based on HCM 2000 report, as the *Synchro* report for the unsignalized intersection was showing unrealistic delays.

The intersection capacity analysis results for existing (2018) peak hour conditions are presented in Table 2. Detailed *Synchro* reports are presented in Appendix C.

Table 2: Existing (2018) Intersection Capacity Analysis Results

Morning Peak Hour

Intersection	Overall Intersection		Weekday AM Peak				
	Delay	LOS	Movement	Delay (s)	LOS	V/C	Queue[1] (m)
Lakeshore Dr. & Tiffin St. (Signalized)	34	C	EBL	7	A	0.14	14
			EBTR	8	A	0.21	32
			WBL	16	B	0.00	1
			WBT	14	B	0.18	27
			WBR	5	A	0.61	22
			NBL	32	C	0.15	7
			NBTR	30	C	0.01	2
			SBL	119	F	1.15	135
			SBTR	6	A	0.24	10
Essa Rd. & Tiffin St. (Signalized)	14	B	EBL	9	A	0.12	10
			EBTR	10	A	0.34	34
			WBL	11	B	0.21	15
			WBT	9	A	0.23	25
			NBLTR	19	B	0.67	34
			SBLT	17	B	0.41	18
			SBR	6	A	0.09	4
Lakeshore Dr. & GO Station East Access (Signalized)	4	A	EBT	4	A	0.39	94
			EBR	4	A	0	1
			WBL	1	A	0	1
			WBT	4	A	0.55	109
			NBL	27	C	0.04	1
			NBR	18	B	0.02	1
Essa Rd. & Gowan St. (Signalized)	6	A	WBLR	14	B	0.62	16
			NBTR	3	A	0.14	12
			SBLT	3	A	0.21	15
Essa Rd & GO Station South Access (Unsignalized)	1	A	EBLR	12	B	0.05	1
			NBL	1	A	0.01	1
			SBL	1	A	0.02	1

Note: 1. Queue length reflects the 95th percentile queue length

Afternoon Peak Hour

Intersection	Overall Intersection		Weekday PM Peak				
	Delay	LOS	Movement	Delay (s)	LOS	V/C	Queue[1] (m)
Lakeshore Dr. & Tiffin St. (Signalized)	116	F	EBL	8	A	0.20	19
			EBTR	11	B	0.38	65
			WBL	16	B	0.00	1
			WBT	15	B	0.17	24
			WBR	4	A	0.54	20
			NBL	33	C	0.20	9
			NBTR	29	C	0.02	2
			SBL	371	F	1.75	219
			SBTR	8	A	0.30	14
Essa Rd. & Tiffin St. (Signalized)	18	B	EBL	13	B	0.09	9
			EBTR	16	B	0.53	65
			WBL	18	B	0.39	26
			WBT	13	B	0.24	29
			NBLTR	18	B	0.69	48
			SBLT	22	C	0.73	43
			SBR	4	A	0.11	5
Lakeshore Dr. & GO Station East Access (Signalized)	5	A	EBT	7	A	0.61	242
			EBR	4	A	0	1
			WBL	1	A	0.01	1
			WBT	2	A	0.44	68
			NBL	28	C	0.01	2
			NBR	19	B	0.02	2
Essa Rd. & Gowan St. (Signalized)	7	A	WBLR	15	B	0.74	12
			NBTR	3	A	0.18	19
			SBLT	5	A	0.40	35
Essa Rd & GO Station South Access (Unsignalized)	1	A	EBLR	11	B	0.06	1
			NBL	1	A	0.02	1
			SBL	1	A	0.03	1

Note: 1. Queue length reflects the 95th percentile queue length

Weekend Peak Hour

Intersection	Overall Intersection		Weekend Peak				
	Delay	LOS	Movement	Delay (s)	LOS	V/C	Queue[1] (m)
Lakeshore Dr. & Tiffin St. (Signalized)	63	E	EBL	7	A	0.21	21
			EBTR	8	A	0.24	37
			WBL	16	B	0.01	2
			WBT	14	B	0.12	17
			WBR	4	A	0.49	18
			NBL	32	C	0.14	10
			NBTR	30	C	0.04	4
			SBL	205	F	1.36	158
			SBTR	7	A	0.35	14
Essa Rd. & Tiffin St. (Signalized)	15	B	EBL	9	A	0.05	5
			EBTR	11	B	0.34	36
			WBL	13	B	0.36	25
			WBT	10	A	0.18	19
			NBLTR	19	B	0.70	41
			SBLT	16	B	0.37	19
			SBR	5	A	0.08	5
Lakeshore Dr. & GO Station East Access (Signalized)	4	A	EBT	5	A	0.46	123
			EBR	4	A	0	1
			WBL	2	A	0	1
			WBT	2	A	0.38	54
			NBL	27	C	0.03	3
			NBR	16	B	0.04	2
Essa Rd. & Gowan St. (Signalized)	6	A	WBLR	14	B	0.67	17
			NBTR	3	A	0.17	16
			SBLT	4	A	0.25	19
Essa Rd & GO Station South Access (Unsignalized)	1	A	EBLR	12	B	0.09	2
			NBL	1	A	0.03	1
			SBL	1	A	0.02	1

Note: 1. Queue length reflects the 95th percentile queue length

The intersection capacity analysis results indicate that all the study area intersections and individual movements are operating at LOS 'C' or better for three peak hour conditions, except for the southbound left movement at the Lakeshore Drive and Tiffin Street intersection. This movement is operating with an unacceptable level of delay (at LOS 'F') during all the three peak hours with volume to capacity (v/c) ratio over 1.0. The higher delay for this movement is mainly caused by heavy traffic demands (400, 620, and 460 vehicles per hour during morning, afternoon, and weekend peak hour, respectively). This results in overall intersection LOS at 'E/F' for Lakeshore Drive and Tiffin Street intersection during afternoon and weekend peak hours.

4 FUTURE (2024) BACKGROUND TRAFFIC CONDITIONS

4.1 FUTURE (2024) BACKGROUND TRAFFIC VOLUMES

To assess the future background traffic conditions, the future background traffic volumes for the expected opening year (2024) were estimated based on the background traffic growth and additional pick-up and drop-off trips generated from the growth of GO Transit ridership.

4.1.1 BACKGROUND TRAFFIC GROWTH

The future (2024) background traffic volumes were estimated using a growth rate of 2% per annum, as suggested by the City based on the review of future travel demand. The projected future (2024) background traffic volumes for morning, afternoon, and weekend peak hour conditions are presented in Figure 6. It is noted that the existing bus volumes in the study area were excluded from the background traffic growth projection; the existing bus volumes were added back to the total background traffic volume estimate, after growth rate was applied to the existing non-bus volumes.

4.1.2 PICK-UP AND DROP-OFF TRIPS

Trips are expected to be generated by the proposed growth of GO Transit ridership and enhanced GO Transit service; additional pick-up and drop-off vehicle trips were included for the future background traffic estimate. A total of 25 vehicle trips and 7 vehicle trips were estimated for the weekday peak hours and for the weekend peak hour respectively. Details of the pick-up and drop-off trip estimates are presented in Appendix D.

The pick-up and drop-off vehicle trips were distributed to study area roadways based on the observed travel patterns of existing traffic. The future (2024) pick-up and drop-off vehicle trips are presented in Figure 7.

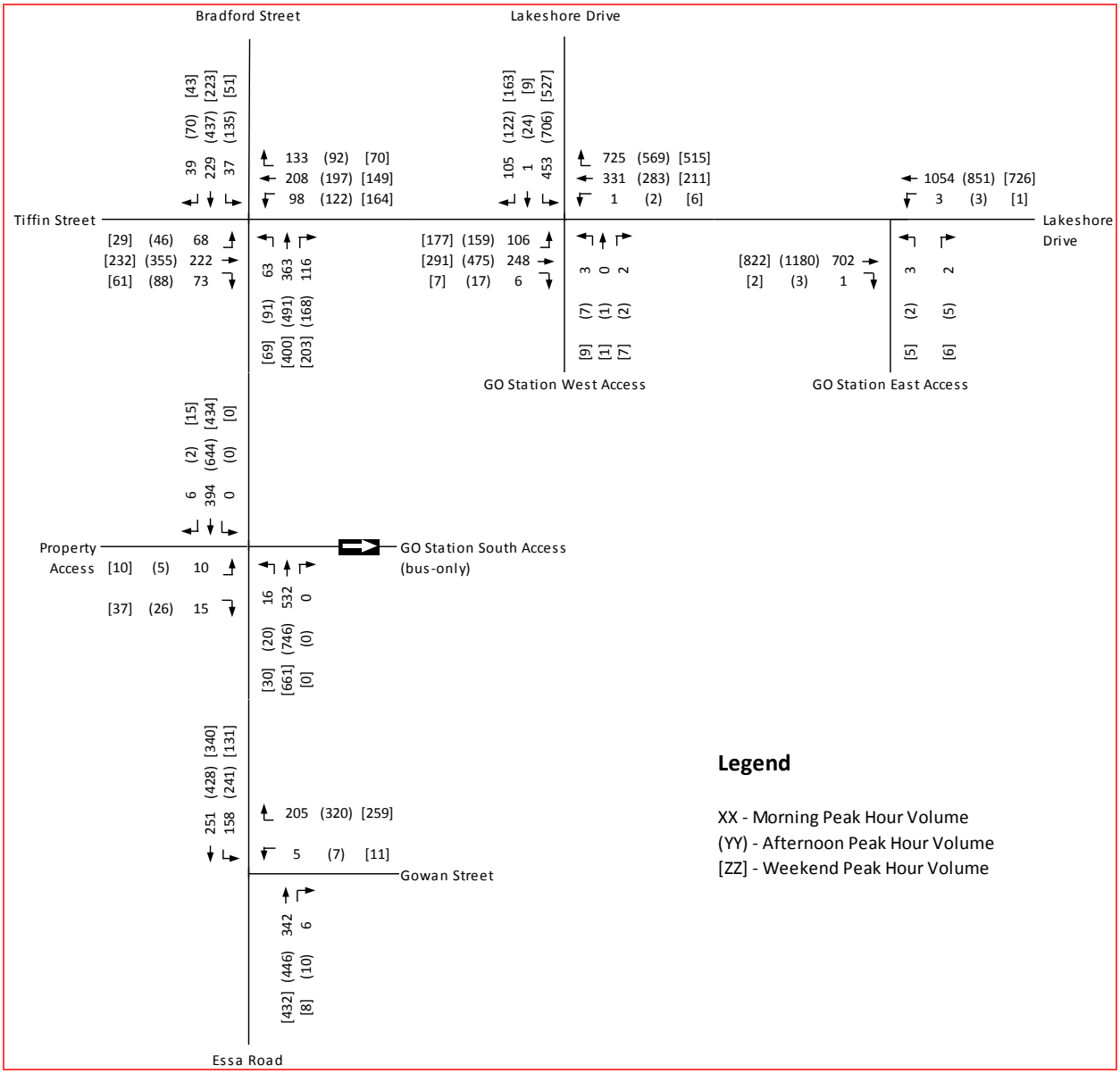


Figure 6: Future (2024) Background Traffic Growth

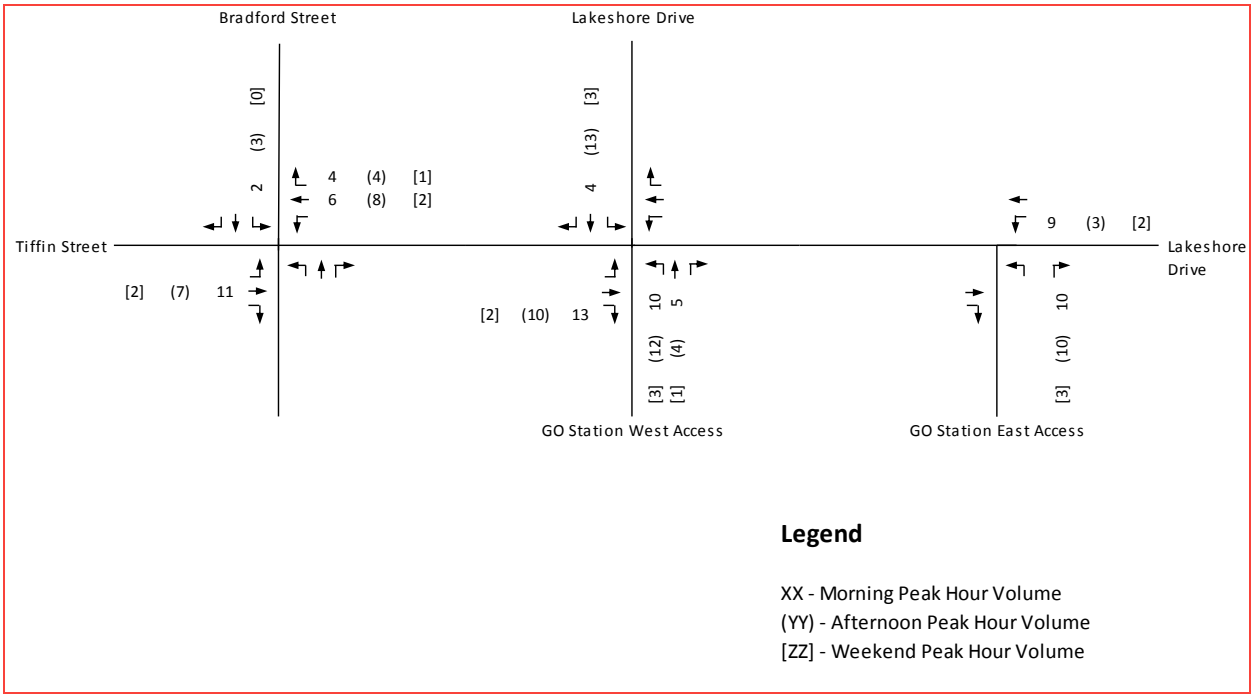


Figure 7: Future (2024) Pick-Up and Drop-Off Vehicle Trips

4.1.3 TOTAL BACKGROUND TRAFFIC VOLUMES

The total background traffic volumes include the existing bus volumes, future background traffic growth for the non-bus volumes, and additional pick-up and drop-off trips generated from the growth of GO Transit ridership, as presented in Figure 8.

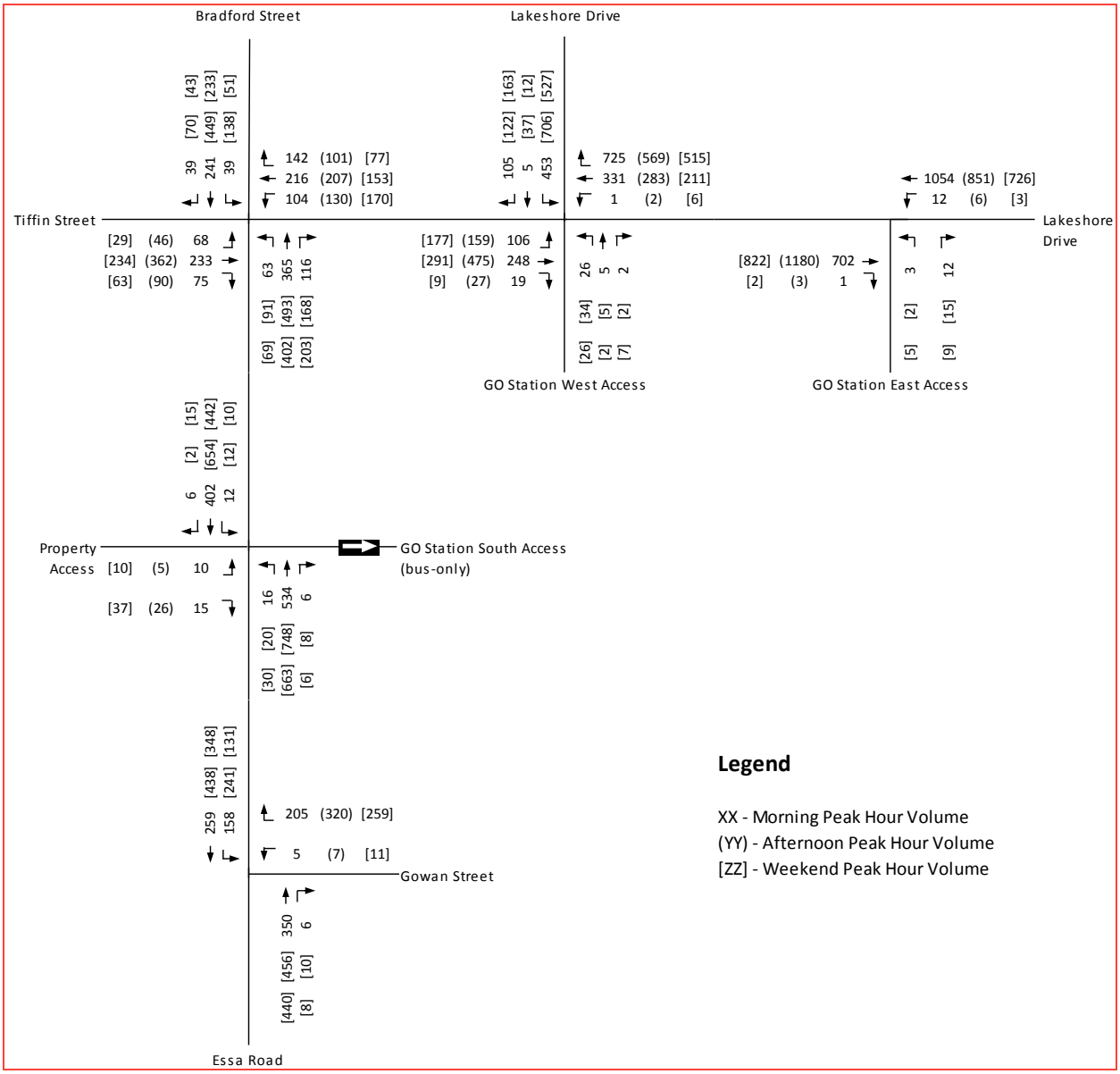


Figure 8: Future (2024) Total Background Traffic Volumes

4.2 FUTURE (2024) INTERSECTION CAPACITY ANALYSIS- BACKGROUND TRAFFIC CONDITION

Intersection capacity analysis for the future background traffic condition was conducted using *Synchro 9* software. Existing *Synchro* models were used for the analysis; existing signal timing plans were optimized to accommodate the future traffic demands. The evaluation elements for intersection capacity analysis include average delays, LOS, v/c ratio, and queue length. The analysis results for future (2024) background traffic condition are presented in Table 3, for all the three peak hour conditions.

Detailed *Synchro* reports are presented in Appendix E.

Table 3: Future (2024) Intersection Capacity Analysis Results – Background Traffic Condition

Morning Peak Hour

Intersection	Overall Intersection		Weekday AM Peak				
	Delay	LOS	Movement	Delay (s)	LOS	V/C	Queue[1] (m)
Lakeshore Dr. & Tiffin St. (Signalized)	18	B	EBL	19	B	0.26	24
			EBTR	22	C	0.36	59
			WBL	25	C	0.00	1
			WBT	28	C	0.32	40
			WBR	7	A	0.74	32
			NBL	27	C	0.11	10
			NBTR	26	C	0.02	4
			SBL	27	C	0.74	101
			SBTR	4	A	0.15	10
Essa Rd. & Tiffin St. (Signalized)	18	B	EBL	10	A	0.13	13
			EBTR	11	B	0.36	46
			WBL	11	B	0.24	20
			WBT	11	B	0.24	33
			NBLTR	26	C	0.74	49
			SBLT	22	C	0.49	26
			SBR	6	A	0.10	5
Lakeshore Dr. & GO Station East Access (Signalized)	8	A	EBT	7	A	0.50	114
			EBR	4	A	0	1
			WBL	2	A	0.02	1
			WBT	8	A	0.69	147
			NBL	31	C	0.04	2
			NBR	13	B	0.16	0

Intersection	Overall Intersection		Weekday AM Peak				
	Delay	LOS	Movement	Delay (s)	LOS	V/C	Queue[1] (m)
Essa Rd. & Gowan St. (Signalized)	6	A	WBLR	16	B	0.67	18
			NBTR	3	A	0.16	14
			SBLT	3	A	0.24	18
Essa Rd & GO Station South Access (Unsignalized)	1	A	EBLR	12	B	0.06	1
			NBL	1	A	0.02	1
			SBL	1	A	0.01	1

Note: 1. Queue length reflects the 95th percentile queue length

Afternoon Peak Hour

Intersection	Overall Intersection		Weekday PM Peak				
	Delay	LOS	Movement	Delay (s)	LOS	V/C	Queue[1] (m)
Lakeshore Dr. & Tiffin St. (Signalized)	37	D	EBL	21	C	0.35	34
			EBTR	36	D	0.66	117
			WBL	25	C	0.01	2
			WBT	28	C	0.28	35
			WBR	7	A	0.67	27
			NBL	31	C	0.25	13
			NBTR	26	C	0.02	4
			SBL	78	E	1.06	237
			SBTR	5	A	0.20	15
Essa Rd. & Tiffin St. (Signalized)	24	C	EBL	17	B	0.10	13
			EBTR	22	C	0.59	105
			WBL	27	C	0.51	43
			WBT	17	B	0.27	46
			NBLTR	24	C	0.78	72
			SBLT	29	C	0.81	64
			SBR	4	A	0.12	6
Lakeshore Dr. & GO Station East Access (Signalized)	8	A	EBT	11	B	0.73	288
			EBR	4	A	0	1
			WBL	2	A	0.02	1

Intersection	Overall Intersection		Weekday PM Peak				
	Delay	LOS	Movement	Delay (s)	LOS	V/C	Queue[1] (m)
			WBT	4	A	0.52	86
			NBL	32	C	0.01	2
			NBR	15	B	0.09	4
Essa Rd. & Gowan St. (Signalized)	8	A	WBLR	16	B	0.78	11
			NBTR	3	A	0.20	24
			SBLT	6	A	0.46	46
Essa Rd & GO Station South Access (Unsignalized)	1	A	EBLR	11	B	0.07	1
			NBL	1	A	0.02	1
			SBL	1	A	0.02	1

Note: 1. Queue length reflects the 95th percentile queue length

Weekend Peak Hour

Intersection	Overall Intersection		Weekend Peak				
	Delay	LOS	Movement	Delay (s)	LOS	V/C	Queue[1] (m)
Lakeshore Dr. & Tiffin St. (Signalized)	20	B	EBL	21	C	0.37	39
			EBTR	24	C	0.41	67
			WBL	25	C	0.02	3
			WBT	27	C	0.20	26
			WBR	6	A	0.62	24
			NBL	28	C	0.13	11
			NBTR	26	C	0.03	5
			SBL	33	C	0.83	133
			SBTR	4	A	0.22	13
Essa Rd. & Tiffin St. (Signalized)	19	B	EBL	11	B	0.05	7
			EBTR	12	B	0.35	50
			WBL	15	B	0.39	35
			WBT	11	B	0.19	26
			NBLTR	25	C	0.77	61
			SBLT	21	C	0.44	28
			SBR	6	A	0.09	6

Intersection	Overall Intersection		Weekend Peak				
	Delay	LOS	Movement	Delay (s)	LOS	V/C	Queue[1] (m)
Lakeshore Dr. & GO Station East Access (Signalized)	6	A	EBT	7	A	0.55	154
			EBR	5	A	0	1
			WBL	2	A	0.01	1
			WBT	3	A	0.45	64
			NBL	32	C	0.04	3
			NBR	17	B	0.07	2
Essa Rd. & Gowan St. (Signalized)	7	A	WBLR	17	B	0.73	20
			NBTR	3	A	0.19	20
			SBLT	4	A	0.29	25
Essa Rd & GO Station South Access (Unsignalized)	1	A	EBLR	12	B	0.10	2
			NBL	1	A	0.03	1
			SBL	1	A	0.01	1

Note: 1. Queue length reflects the 95th percentile queue length

The intersection capacity analysis results indicate that all the study area intersections and individual movements are expected to operate at LOS 'D' or better for all the three peak hour conditions, except for the southbound left movement at Lakeshore Drive and Tiffin Street intersection. This movement is operating at LOS 'E' during the afternoon peak hour with volume to capacity (v/c) ratio over 1.0. Signal timing plan was optimized to provide additional green time for this movement. The high delay for the southbound left movement is mainly caused by heavy traffic demands (over 700 vehicles per hour during the afternoon peak hour) allocated to single left turn lane.

5 FUTURE (2024) TOTAL TRAFFIC CONDITIONS

5.1 FUTURE (2024) TOTAL TRAFFIC VOLUMES

To assess the future total traffic conditions, the total traffic volumes for the expected opening year (2024) were estimated using the total background traffic volumes and assigned future bus trips.

5.1.1 ADJUSTMENT OF TOTAL BACKGROUND TRAFFIC VOLUMES

According to the proposed plan for the new mobility hub, the following network modifications will be implemented to existing station accesses:

- The existing bus-only access (GO Station South Access) at Essa Road will be permanently closed.
- The existing GO Station West Access at Lakeshore Drive will be converted into a bus-only access and used by all the future bus routes
- The existing general-traffic using GO Station West Access will need to divert to GO Station East Access.

Therefore, future total background traffic volumes (excluding existing bus volumes) were further adjusted to reflect these modified bus station accesses, as presented in Figure 9.

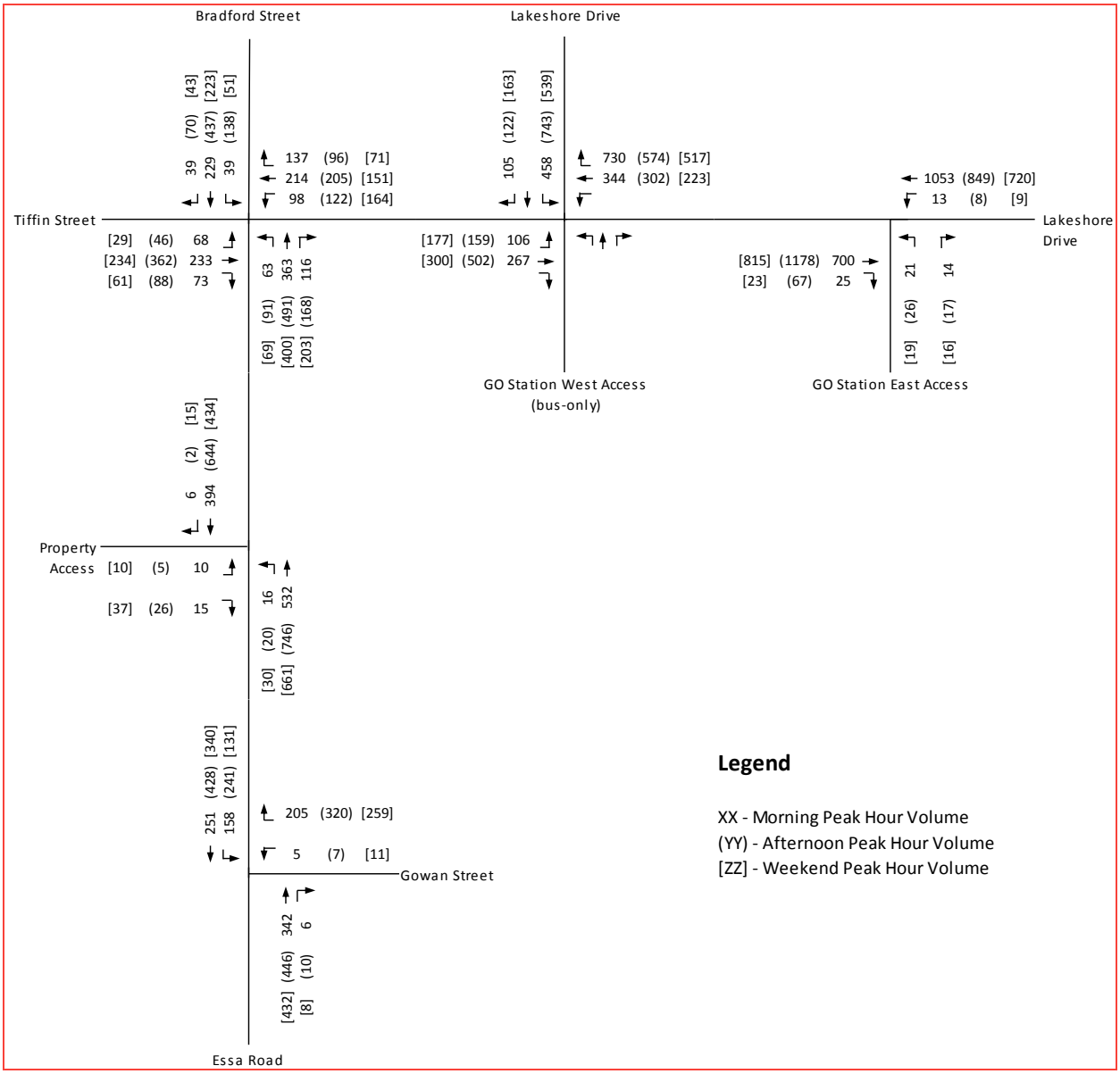


Figure 9: Future (2024) Adjusted Total Background Traffic Volumes

5.1.2 FUTURE BUS VOLUMES

Future bus volumes for the opening year (2024) condition were taken from Scenario 1 of the transit servicing work of this study. This option was developed in consultation with Barrie Transit to simulate a reasonable future transit network in which all routes were altered to serve the hub. This scenario was chosen because it created the higher of the volumes of the two potential scenarios. Scenario 2 of the future bus network was designed to balance routes to serve the new hub while maintaining direct access to downtown.

All the Barrie transit routes serving the future mobility hub were assumed to operate with a 30-min headway in both directions during peak hours. Some other bus operations (Greyhound and Ontario Northland) were assumed to access the hub from Highway 400 via Essa Road and operate with 1-2 buses during the three peak hours. The total

bus trips are presented in Figure 10, for the opening year (2024) conditions. Detailed bus trip estimates were presented in Appendix D.

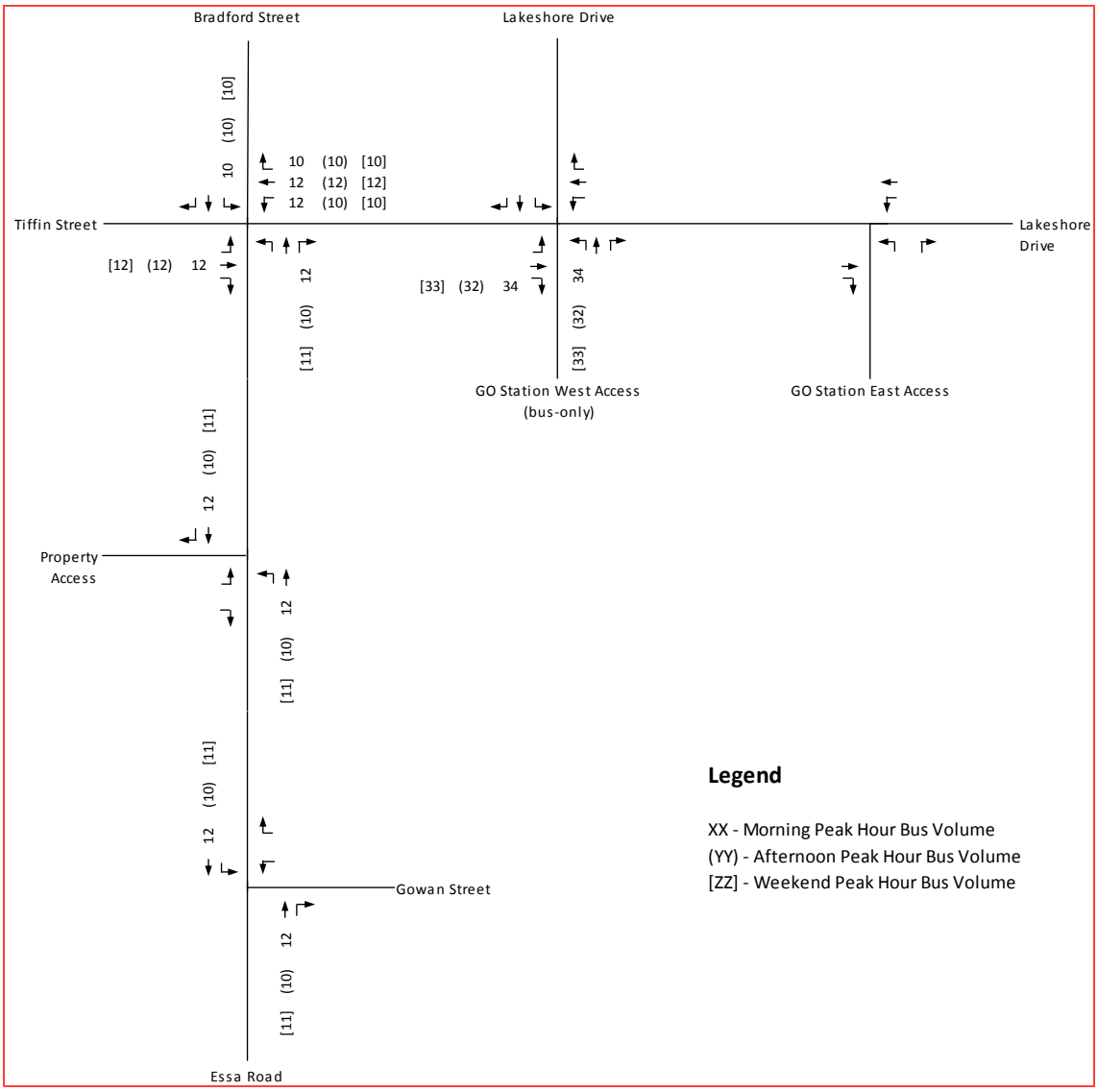


Figure 10: Future (2024) Bus Volumes

5.1.3 TOTAL TRAFFIC VOLUMES

The 'Total' traffic volumes for study area intersections include future adjusted total background traffic volumes and future bus volumes, as presented in Figure 11. It is noted that by 2024, no bus service is expected on Lakeshore Drive within the study area. Therefore, no traffic volume was shown for the westbound left, northbound through and right, and southbound through movements at Lakeshore Drive and Tiffin Street intersection.

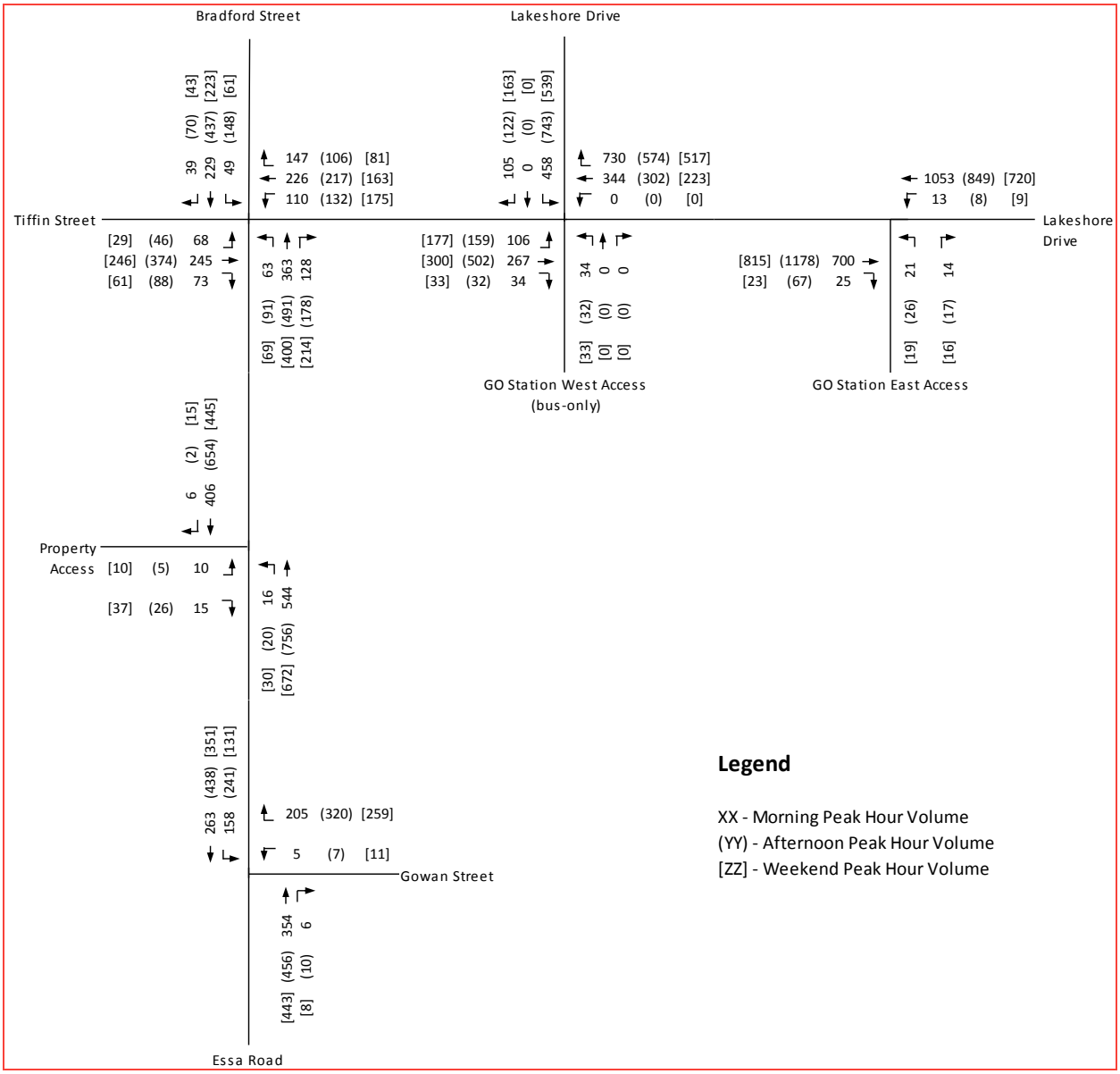


Figure 11: Future (2024) Total Traffic Volumes

5.2 FUTURE INTERSECTION LANE CONFIGURATIONS

For the future (2024) intersection capacity analysis, the following two intersection lane configuration scenarios were considered for the northbound approach at the Lakeshore Drive/Tiffin Street and Station West Access intersection, as presented in Figure 12:

- Scenario 1 with single lane for northbound left movement at GO Station West Access, and
- Scenario 2 with dual lanes for northbound left movement at GO Station West Access.

Scenario 1 with Single Left Turn Lane for Northbound Approach

Scenario 2 with Dual Left Turn Lanes for Northbound Approach

Figure 12: Future Opening Year (2024) Intersection Lane Configurations

Under both the scenarios, dedicated bus-only lane for eastbound right and westbound left movements are proposed at the Lakeshore Drive/Tiffin Street and Station West Access intersection. As presented in Figure 12, Scenario 1 assumes a single northbound left turn lane and a shared through/right lane for the northbound approach at GO Station West Access, and Scenario 2 assumes one dedicated left lane, and one shared left/through/right lane instead.

In this study, future total traffic analysis was conducted for Scenario 1 and presented in the next section; traffic analysis conducted for Scenario 2 was considered as a test scenario and documented in the appendix.

5.3 FUTURE (2024) INTERSECTION CAPACITY ANALYSIS-TOTAL TRAFFIC CONDITION

Intersection capacity analysis for the future opening year (2024) was conducted using *Synchro 9* software. Existing *Synchro* models were modified to reflect future intersection lane configurations; existing signal timing plans were optimized to accommodate future traffic demands. To improve bus movements and minimize the queue length for westbound movements at Essa Road/Bradford Street and Tiffin Street intersection, the following signal improvement measures were considered in the analysis:

- A protected plus permissive phase was proposed for the northbound left movement at Lakeshore Drive and Tiffin Street intersection (transit signal priority exists in the existing condition);
- A protected plus permissive phase was proposed for the westbound left movement at Essa Road/Bradford Street and Tiffin Street intersection (signal head with green arrow light exists in the existing condition); and,
- Actuated-coordinated phase setting was applied to Tiffin Street intersections at the Essa Road/Bradford Street and Lakeshore Drive intersection.

The evaluation elements for intersection capacity analysis include average delays, LOS, v/c ratio, and queue length. The analysis results for future (2024) total traffic condition (with lane configurations for Scenario 1) are presented in Table 4. Detailed *Synchro* reports are presented in Appendix F. The intersection capacity analysis for Scenario 2 (as a test scenario) was documented in Appendix G.

Table 4: Future (2024) Intersection Capacity Analysis Results – Total Traffic Condition

Morning Peak Hour

Intersection	Overall Intersection		Weekday AM Peak				
	Delay	LOS	Movement	Delay (s)	LOS	V/C	Queue[1] (m)
Lakeshore Dr. & Tiffin St. (Signalized)	21	C	EBL	31	C	0.34	34
			EBT	36	D	0.36	85
			EBR	2	A	0.09	0
			WBT	36	D	0.62	92
			WBR	8	A	0.74	33
			NBL	17	B	0.20	9
			SBL	27	C	0.74	103
			SBT	1	A	0.13	0
Essa Rd. & Tiffin St. (Signalized)	30	C	EBL	24	C	0.19	22
			EBTR	29	C	0.56	84
			WBL	4	A	0.20	6
			WBT	3	A	0.22	12
			NBLTR	43	D	0.85	71
			SBLT	37	D	0.63	38
			SBR	3	A	0.10	2
Lakeshore Dr. & GO Station East Access (Signalized)	11	B	EBT	8	A	0.53	118
			EBR	3	A	0.02	4
			WBL	3	A	0.03	2
			WBT	11	B	0.74	157
			NBL	35	C	0.29	7
			NBR	12	B	0.18	0
Essa Rd. & Gowan St. (Signalized)	6	A	WBLR	15	B	0.67	18
			NBTR	3	A	0.16	15
			SBLT	3	A	0.24	19
Essa Rd & Property Access (Unsignalized)	1	A	EBLR	11	B	0.05	1
			NBL	0	A	0.02	0

Note: 1. Queue length reflects the 95th percentile queue length

Afternoon Peak Hour

Intersection	Overall Intersection		Weekday PM Peak				
	Delay	LOS	Movement	Delay (s)	LOS	V/C	Queue[1] (m)
Lakeshore Dr. & Tiffin St. (Signalized)	59	E	EBL	28	C	0.45	29
			EBT	68	E	0.68	122
			EBR	1	A	0.08	0
			WBT	34	C	0.54	80
			WBR	6	A	0.66	27
			NBL	17	B	0.19	8
			SBL	118	F	1.17	273
			SBTR	1	A	0.15	0
Essa Rd. & Tiffin St. (Signalized)	45	D	EBL	27	C	0.15	17
			EBTR	59	E	0.93	165
			WBL	43	D	0.69	44
			WBT	11	B	0.31	21
			NBLTR	36	D	0.82	94
			SBLT	43	D	0.95	75
			SBR	4	A	0.11	6
Lakeshore Dr. & GO Station East Access (Signalized)	16	B	EBT	22	C	0.89	328
			EBR	4	A	0.06	8
			WBL	3	A	0.03	1
			WBT	7	A	0.59	98
			NBL	36	D	0.35	8
			NBR	12	B	0.21	0
Essa Rd. & Gowan St. (Signalized)	7	A	WBLR	16	B	0.77	19
			NBTR	3	A	0.20	23
			SBLT	6	A	0.41	42
Essa Rd & Property Access (Unsignalized)	1	A	EBLR	11	B	0.06	1
			NBL	1	A	0.02	1

Note: 1. Queue length reflects the 95th percentile queue length

Weekend Peak Hour

Intersection	Overall Intersection		Weekend Peak				
	Delay	LOS	Movement	Delay (s)	LOS	V/C	Queue[1] (m)
Lakeshore Dr. & Tiffin St. (Signalized)	24	C	EBL	32	C	0.42	53
			EBT	36	D	0.41	93
			EBR	1	A	0.09	0
			WBT	31	C	0.40	59
			WBR	6	A	0.62	25
			NBL	17	B	0.21	9
			SBL	36	D	0.86	150
			SBTR	1	A	0.19	0
Essa Rd. & Tiffin St. (Signalized)	30	C	EBL	26	C	0.09	12
			EBTR	35	C	0.62	88
			WBL	7	A	0.32	15
			WBT	6	A	0.17	15
			NBLTR	40	D	0.86	81
			SBLT	33	C	0.60	36
			SBR	3	A	0.10	3
Lakeshore Dr. & GO Station East Access (Signalized)	9	A	EBT	10	A	0.62	156
			EBR	4	A	0.02	4
			WBL	2	A	0.02	1
			WBT	6	A	0.51	67
			NBL	34	C	0.26	7
			NBR	12	B	0.21	0
Essa Rd. & Gowan St. (Signalized)	7	A	WBLR	17	B	0.73	20
			NBTR	3	A	0.19	21
			SBLT	4	A	0.26	24
Essa Rd & Property Access (Unsignalized)	1	A	EBLR	12	B	0.09	2
			NBL	1	A	0.03	1

Note: 1. Queue length reflects the 95th percentile queue length

With the optimized signal timing plans, all the intersection capacity analysis results indicate that all the study area intersections and individual movements are expected to operate at LOS 'D' or better for morning and weekend peak hour conditions. However, during the afternoon peak hour a few movements are expected to operate at LOS 'E/F' at Lakeshore Drive and Tiffin Street intersection. The southbound left movement at Lakeshore Drive and Tiffin Street intersection is expected to operate at LOS 'F' with v/c ratio over 1.0. The high delay for this movement is resulting due to projected heavy traffic demand (over 700 vehicles during afternoon peak hour) operating with a single left turn lane. As the dual left turn lanes are not being supported by the City staff for this southbound left turn movement, as the City intends to encourage vehicular traffic to use Bradford Street instead of Lakeshore Drive due to pedestrian safety issues at the crosswalks on Lakeshore Drive.

During afternoon peak hour, the eastbound through traffic on Tiffin Street at the Lakeshore Drive is expected to operate at LOS 'E' with 95th percentile queue length of 120 m, which could potentially back up to the upstream intersection at Essa Road/Bradford Street. The higher delay and longer queues for this movement are resulting due to less green time allocated to the east-west movements with the optimized signal timing plan to accommodate the higher traffic demand for the southbound left turn movement.

Similarly, the eastbound through traffic on Tiffin Street at Essa Road/Bradford Street is expected to operate at LOS 'E' during afternoon peak hour, due to the increased future traffic demands and advanced green phase (the protected phase) provided for the westbound left turn movement. To provide an acceptable level of service in afternoon peak hour, additional vehicular capacity may be required on Tiffin Street or Lakeshore Drive (for the southbound left movement).

5.4 REVIEW OF FUTURE BACKGROUND AND TOTAL TRAFFIC ANALYSES

With the planned mobility hub and network modifications (implemented to existing station accesses), traffic operational performances are expected to deteriorate in the future total traffic conditions for the adjacent intersections at Lakeshore Drive and Tiffin Street, at Essa Road and Tiffin Street, and at Lakeshore Drive and GO Station East Access.

When signal timings plans were optimized to facilitate bus movements (as described in Section 5.3), the overall intersection LOS dropped from 'A/B' in the future background traffic condition to 'B/C' in the future total traffic condition during the morning peak hour, from 'A/C/D' to 'B/D/E' during the afternoon peak hour, and from 'A/B' to 'A/C' during the weekend peak hour (Table 5). Especially for the intersection at Lakeshore Drive and Tiffin Street, the eastbound through and southbound left movements are expected to experience higher delays and longer queues during the afternoon peak hour. These impacts are mainly resulting from higher traffic demands and optimized signal timing settings to improve bus movements egressing from the station (the northbound left movement at Lakeshore Drive and Tiffin Street intersection).

A sensitivity scenario was conducted for the future total traffic condition, using optimized signal timing plans to reduce overall intersection delays and improve traffic operation. As presented in Table 5, when signal timing plans were optimized for general traffic operation at Lakeshore Drive and Tiffin Street intersection and at Essa Road and Tiffin Street intersection,

- both the intersections are expected to operate at an overall LOS 'D' or better during the three peak hours;
- the overall intersection delays are expected to reduce by 2 to 12 seconds during the three peak hours (as compared to the future total traffic condition with optimized signal timing plans for bus movements).

The complete intersection capacity analysis results and *Synchro* reports for this sensitivity scenario are presented in Appendix H.

Table 5: Overall Intersection LOS Review

Intersection LOS (Delay) for	Condition	Intersection		
		Lakeshore Drive and Tiffin Street	Essa Road and Tiffin Street	Lakeshore Drive and GO Station East Access
AM Peak Hour	Background Traffic	B (18 s)	B (18 s)	A (8 s)
	Total Traffic (optimized for bus)	C (21 s)	C (30 s)	B (11 s)
	Total Traffic (optimized for traffic)	B (19 s)	C (22 s)	B (11 s)
PM Peak Hour	Background Traffic	D (37 s)	C (24 s)	A (8 s)
	Total Traffic (optimized for bus)	E (59 s)	D (45 s)	B (16 s)
	Total Traffic (optimized for traffic)	D (47 s)	D (36 s)	B (16 s)
Weekend Peak Hour	Background Traffic	B (20 s)	B (19 s)	A (6 s)
	Total Traffic (optimized for bus)	C (24 s)	C (30 s)	A (9 s)
	Total Traffic (optimized for traffic)	C (21 s)	C (22 s)	A (9 s)

6 STUDY FINDINGS

The following key notes summarize the study findings:

- Five intersections near existing Allandale GO Station were analyzed in this study. Other than Essa Road and GO Station South Access intersection, all the study area intersections are signalized. The signal warrant analysis result confirms that traffic signals is not warranted for this intersection for the existing traffic demand.
- Existing intersection capacity analysis results indicate that all the study area intersections and individual movements are operating at LOS 'C' or better during morning, afternoon, and weekend peak hour, except for the southbound left turn movement at the Lakeshore Drive and Tiffin Street intersection. This movement is currently operating at LOS 'F' during all the three peak hours with v/c ratio over 1.0.
- Future total background traffic volumes were estimated for the opening year (2024) to incorporate existing bus volumes, background traffic growth (2% per annum) for non-bus volumes, and additional pick-up and drop-off trips generated from the growth of GO Transit ridership.
- The intersection capacity analysis results for future total background traffic conditions indicated that all the study area intersections and individual movements are operating at LOS 'D' or better for all the three peak hour conditions, except for the southbound left movement at the Lakeshore Drive and Tiffin Street intersection (at LOS 'E' during the afternoon peak hour).
- Future total traffic volumes were estimated for the opening year (2024) to incorporate future total background traffic volumes and future assigned bus volumes:
    - Future total background traffic volumes (excluding existing bus volumes) were adjusted to reflect network modifications implemented to bus station accesses (Figure 9).
    - Future bus volumes were estimated considering the future bus routes serving the new mobility hub. All the bus trips will be using GO Station West Access (Figure 10).
- The key findings of the future (2024) analysis results for the total traffic condition are noted below:
    - All the study area intersections and individual movements are expected to operate at LOS 'D' or better for morning and weekend peak hour conditions.
    - However, during the afternoon peak hour a few movements are expected to operate at LOS 'E/F' at Lakeshore Drive and Tiffin Street intersection.
- The review of the future background and total traffic analyses indicated that,
    - with the planned mobility hub and network modifications (implemented to existing station accesses), traffic operational performances for the adjacent intersections are expected to deteriorate in the future total traffic conditions, as compared to future background traffic conditions (presented in Table 5);
    - when signal timings plans were optimized to facilitate bus movements in future total traffic condition, the overall intersection LOS dropped from 'A/B' in future background condition to 'B/C' in future total traffic condition during the morning peak hour, from 'A/C/D' to 'B/D/E' during the afternoon peak hour, and from 'A/B' to 'A/C' during the weekend peak hour;
    - the traffic impacts are mainly resulting from higher traffic demands and optimized signal timing settings to improve bus movements egressing from the station;
    - when signal timings plans were optimized to reduce overall intersection delays and improve traffic operation, both the intersections on Tiffin Street are expected to operate at an overall LOS 'D' or better during three the peak hours; the overall intersection delays are expected to reduce by 2 to 12 seconds during three the peak hours, as compared to future total traffic condition with optimized signal timing plans for bus movements.

7 RECOMMENDATIONS

For the future (2024) total traffic conditions, the following signal improvement measures are recommended to improve bus operations and reduce delays for bus movements:

- A protected plus permissive phase was proposed for the northbound left movement at Lakeshore Drive and Tiffin Street intersection (transit signal priority exists in the existing condition);
- A protected plus permissive phase was proposed for the westbound left movement at Essa Road/Bradford Street and Tiffin Street intersection (signal head with green arrow light exists in the existing condition); and,
- Actuated-coordinated phase setting was applied to Tiffin Street intersections at the Essa Road/Bradford Street and Lakeshore Drive intersection.

Additionally, Transit Signal Priority (TSP) could be considered to further reduce the transit delays in the study area. Dedicated bus-only turn lanes are recommended for eastbound right and westbound left movements at Lakeshore Drive and Tiffin Street. Additional through lane in the east-west direction could be considered beyond 2024 to provide additional vehicular capacity on Tiffin Street.

The primary purpose of the traffic analysis for this study was to assess the various alternatives developed for the Allandale Transit Station. The traffic analysis has been conducted using Synchro based model, which estimates vehicular delays using empirical formulas considering traffic volumes, intersection lane configuration and signal timing plans, etc. It is of note that delay estimated using Synchro model may be not precise as estimated using a micro-simulation model (such as Vissim and Aimsun). The micro-simulation model takes into account potential impacts of skipped signal phases, signal gap-out, transit call, etc. Considering the limitations of Synchro model, we recommend City to conduct further study using a micro-simulation model to assess impacts of transit priority measures within the study area.

APPENDIX

A Existing Traffic Count Reports

Ontario Traffic Inc.

Morning Peak Diagram

Specified Period
From: 6:00:00
To: 9:00:00

One Hour Peak
From: 8:00:00
To: 9:00:00

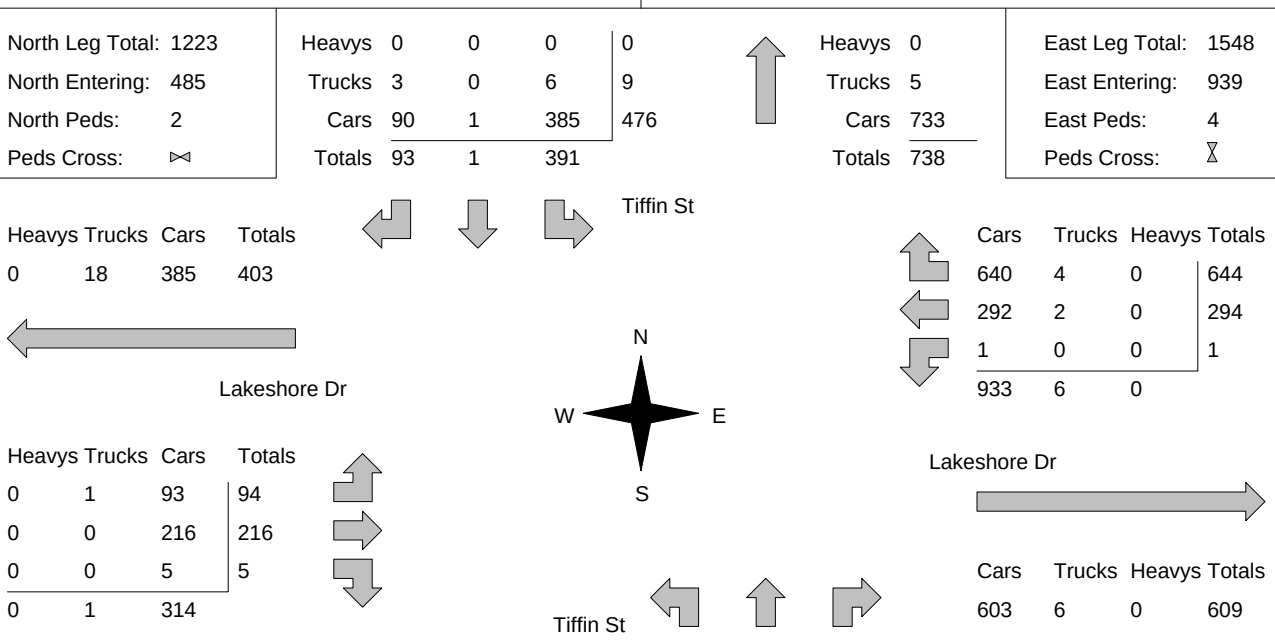
Municipality: Barrie
Site #: 1807000009
Intersection: Lakeshore Dr & Tiffin St
TFR File #: 1
Count date: 20-Feb-18

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Lakeshore Dr runs W/E



Comments

Ontario Traffic Inc.

Mid-day Peak Diagram

Specified Period
From: 12:00:00
To: 14:00:00

One Hour Peak
From: 13:00:00
To: 14:00:00

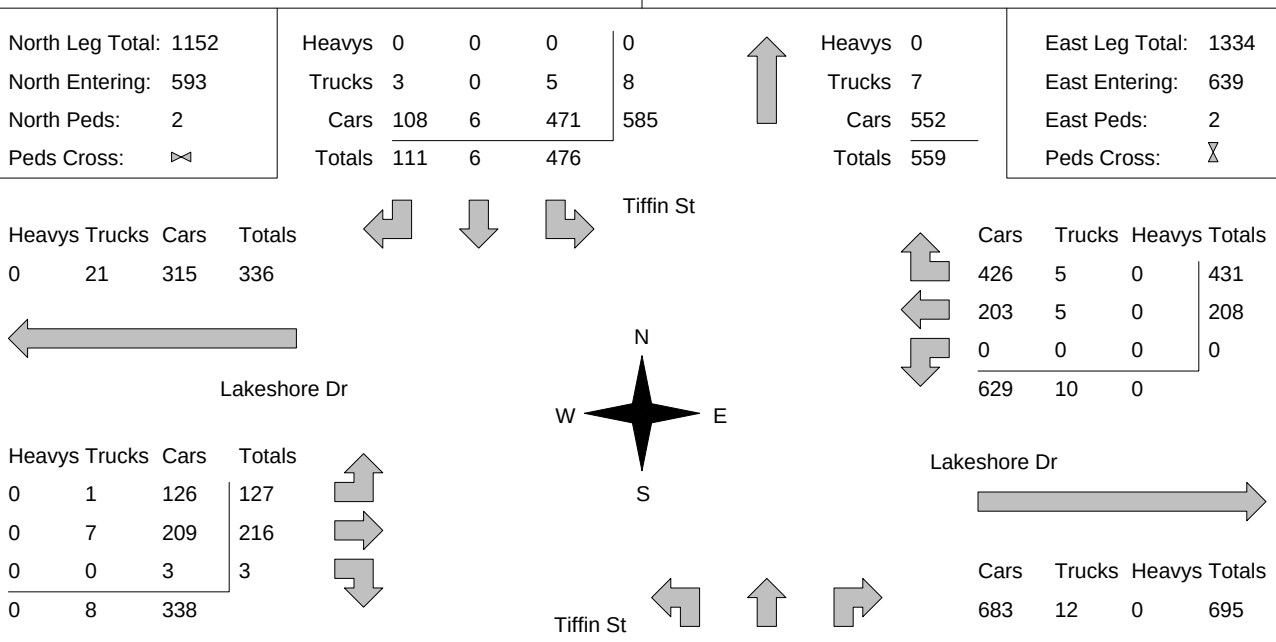
Municipality: Barrie
Site #: 1807000009
Intersection: Lakeshore Dr & Tiffin St
TFR File #: 1
Count date: 20-Feb-18

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Lakeshore Dr runs W/E



Comments

Ontario Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:30:00
To: 17:30:00

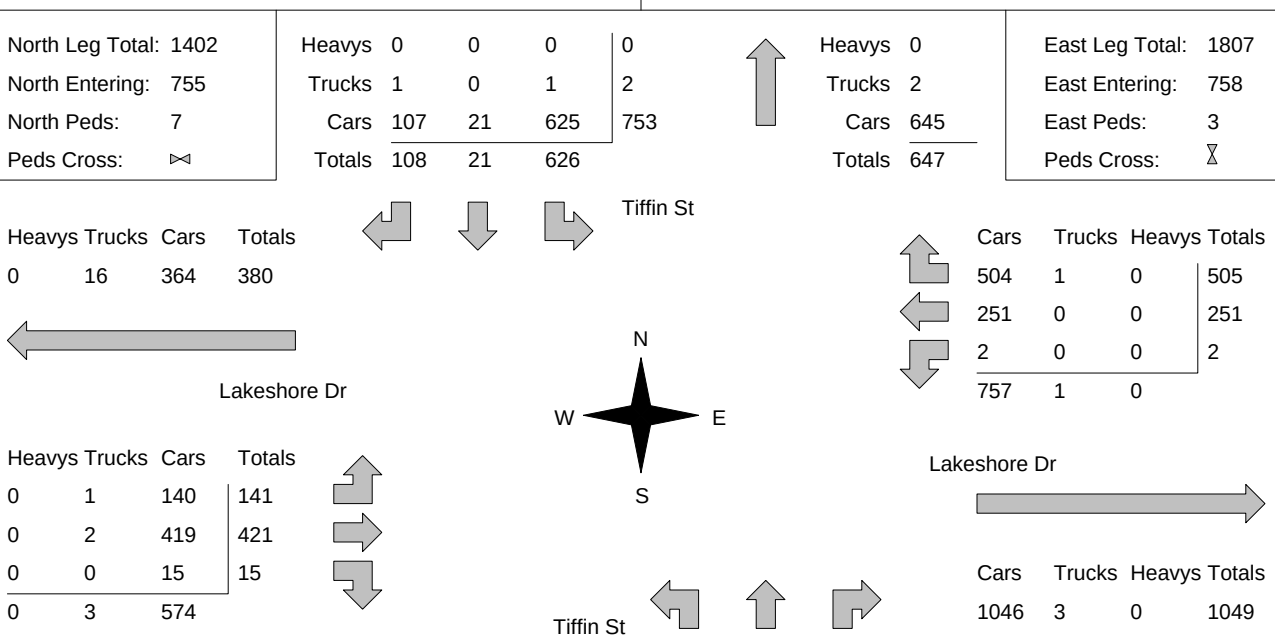
Municipality: Barrie
Site #: 1807000009
Intersection: Lakeshore Dr & Tiffin St
TFR File #: 1
Count date: 20-Feb-18

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Lakeshore Dr runs W/E



Comments

Ontario Traffic Inc.

Total Count Diagram

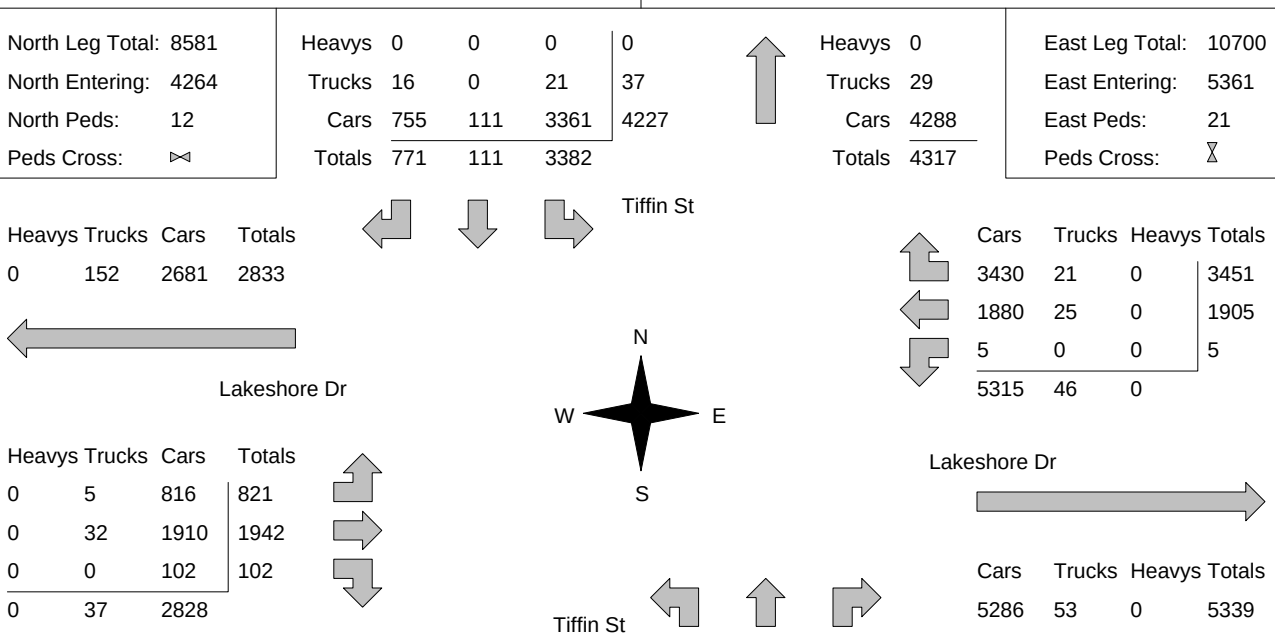
Municipality: Barrie
Site #: 1807000009
Intersection: Lakeshore Dr & Tiffin St
TFR File #: 1
Count date: 20-Feb-18

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Lakeshore Dr runs W/E



Comments

Ontario Traffic Inc.
Traffic Count Summary

Intersection: Lakeshore Dr & Tiffin St | **Count Date:** 20-Feb-18 | **Municipality:** Barrie

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
6:00:00	0	0	0	0	0	0
7:00:00	158	36	46	240	0	276
8:00:00	319	21	76	416	0	443
9:00:00	391	1	93	485	2	503
12:00:00	0	0	0	0	0	0
13:00:00	396	11	125	532	0	555
14:00:00	476	6	111	593	2	614
15:00:00	0	0	0	0	0	0
16:00:00	515	4	114	633	1	654
17:00:00	601	7	119	727	4	747
18:00:00	526	25	87	638	3	689
Totals:	3382	111	771	4264	12	4481

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
6:00:00	0	0	0	0	0
7:00:00	20	15	1	36	3
8:00:00	18	8	1	27	0
9:00:00	16	0	2	18	1
12:00:00	0	0	0	0	0
13:00:00	18	1	4	23	0
14:00:00	17	1	3	21	0
15:00:00	0	0	0	0	0
16:00:00	18	1	2	21	1
17:00:00	20	0	0	20	4
18:00:00	30	19	2	51	1
Totals:	157	45	15	217	10

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
6:00:00	0	0	0	0	0	0
7:00:00	0	177	168	345	1	466
8:00:00	0	273	423	696	0	947
9:00:00	1	294	644	939	4	1254
12:00:00	0	0	0	0	0	0
13:00:00	0	203	379	582	0	929
14:00:00	0	208	431	639	2	985
15:00:00	0	0	0	0	0	0
16:00:00	0	246	418	664	2	1125
17:00:00	1	273	498	772	5	1293
18:00:00	3	231	490	724	7	1227
Totals:	5	1905	3451	5361	21	8226

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
6:00:00	0	0	0	0	0
7:00:00	17	67	37	121	1
8:00:00	52	178	21	251	2
9:00:00	94	216	5	315	0
12:00:00	0	0	0	0	0
13:00:00	126	218	3	347	0
14:00:00	127	216	3	346	0
15:00:00	0	0	0	0	0
16:00:00	143	315	3	461	1
17:00:00	125	393	3	521	1
18:00:00	137	339	27	503	1
Totals:	821	1942	102	2865	6

Calculated Values for Traffic Crossing Major Street

Hours Ending:	7:00	8:00	9:00	13:00	14:00	16:00	17:00	18:00
Crossing Values:	216	360	412	425	501	540	634	589

Ontario Traffic Inc.

Count Date: 20-Feb-18 Site #: 1807000009

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	22	22	9	9	9	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30:00	53	31	14	5	19	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45:00	106	53	33	19	29	10	1	1	0	0	0	0	0	0	0	0	0	0	0	0
7:00:00	156	50	36	3	44	15	2	1	0	0	2	2	0	0	0	0	0	0	0	0
7:15:00	229	73	51	15	56	12	2	0	0	0	2	0	0	0	0	0	0	0	0	0
7:30:00	295	66	51	0	68	12	2	0	0	0	2	0	0	0	0	0	0	0	0	0
7:45:00	380	85	51	0	95	27	2	0	0	0	3	1	0	0	0	0	0	0	0	0
8:00:00	473	93	57	6	119	24	4	2	0	0	3	0	0	0	0	0	0	0	0	0
8:15:00	585	112	57	0	139	20	5	1	0	0	3	0	0	0	0	0	0	0	1	1
8:30:00	685	100	58	1	161	22	6	1	0	0	4	1	0	0	0	0	0	0	1	0
8:45:00	774	89	58	0	183	22	8	2	0	0	4	0	0	0	0	0	0	0	1	0
9:00:00	858	84	58	0	209	26	10	2	0	0	6	2	0	0	0	0	0	0	2	1
9:01:55	858	0	58	0	209	0	10	0	0	0	6	0	0	0	0	0	0	0	2	0
12:00:00	858	0	58	0	209	0	10	0	0	0	6	0	0	0	0	0	0	0	2	0
12:15:00	977	119	60	2	232	23	10	0	0	0	6	0	0	0	0	0	0	0	2	0
12:30:00	1089	112	63	3	273	41	10	0	0	0	6	0	0	0	0	0	0	0	2	0
12:45:00	1179	90	65	2	303	30	10	0	0	0	6	0	0	0	0	0	0	0	2	0
13:00:00	1254	75	69	4	334	31	10	0	0	0	6	0	0	0	0	0	0	0	2	0
13:15:00	1379	125	69	0	364	30	11	1	0	0	6	0	0	0	0	0	0	0	3	1
13:30:00	1507	128	71	2	399	35	14	3	0	0	6	0	0	0	0	0	0	0	3	0
13:45:00	1613	106	73	2	419	20	14	0	0	0	7	1	0	0	0	0	0	0	3	0
14:00:00	1725	112	75	2	442	23	15	1	0	0	9	2	0	0	0	0	0	0	4	1
14:02:12	1725	0	75	0	442	0	15	0	0	0	9	0	0	0	0	0	0	0	4	0
15:00:00	1725	0	75	0	442	0	15	0	0	0	9	0	0	0	0	0	0	0	4	0
15:15:00	1859	134	76	1	469	27	16	1	0	0	9	0	0	0	0	0	0	0	4	0
15:30:00	1965	106	76	0	495	26	16	0	0	0	10	1	0	0	0	0	0	0	5	1
15:45:00	2089	124	77	1	524	29	17	1	0	0	10	0	0	0	0	0	0	0	5	0
16:00:00	2235	146	79	2	554	30	20	3	0	0	11	1	0	0	0	0	0	0	5	0
16:15:00	2375	140	79	0	583	29	20	0	0	0	13	2	0	0	0	0	0	0	5	0
16:30:00	2525	150	80	1	614	31	20	0	0	0	13	0	0	0	0	0	0	0	5	0
16:45:00	2680	155	80	0	645	31	20	0	0	0	14	1	0	0	0	0	0	0	5	0
17:00:00	2836	156	86	6	670	25	20	0	0	0	14	0	0	0	0	0	0	0	9	4
17:15:00	2989	153	89	3	697	27	21	1	0	0	14	0	0	0	0	0	0	0	11	2
17:30:00	3150	161	101	12	721	24	21	0	0	0	14	0	0	0	0	0	0	0	12	1
17:45:00	3279	129	107	6	736	15	21	0	0	0	16	2	0	0	0	0	0	0	12	0
18:00:00	3361	82	111	4	755	19	21	0	0	0	16	0	0	0	0	0	0	0	12	0
18:15:00	3361	0	111	0	755	0	21	0	0	0	16	0	0	0	0	0	0	0	12	0
18:17:27	3361	0	111	0	755	0	21	0	0	0	16	0	0	0	0	0	0	0	12	0

Ontario Traffic Inc.

Count Date: 20-Feb-18 Site #: 1807000009

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	0	0	27	27	29	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30:00	0	0	69	42	72	43	0	0	0	0	1	1	0	0	0	0	0	0	1	1
6:45:00	0	0	133	64	119	47	0	0	0	0	1	0	0	0	0	0	0	0	1	0
7:00:00	0	0	176	43	167	48	0	0	1	1	1	0	0	0	0	0	0	0	1	0
7:15:00	0	0	227	51	244	77	0	0	1	0	2	1	0	0	0	0	0	0	1	0
7:30:00	0	0	290	63	337	93	0	0	2	1	2	0	0	0	0	0	0	0	1	0
7:45:00	0	0	366	76	446	109	0	0	2	0	2	0	0	0	0	0	0	0	1	0
8:00:00	0	0	448	82	589	143	0	0	2	0	2	0	0	0	0	0	0	0	1	0
8:15:00	1	1	532	84	734	145	0	0	3	1	2	0	0	0	0	0	0	0	2	1
8:30:00	1	0	594	62	908	174	0	0	3	0	4	2	0	0	0	0	0	0	3	1
8:45:00	1	0	666	72	1063	155	0	0	4	1	6	2	0	0	0	0	0	0	3	0
9:00:00	1	0	740	74	1229	166	0	0	4	0	6	0	0	0	0	0	0	0	5	2
9:01:55	1	0	740	0	1229	0	0	0	4	0	6	0	0	0	0	0	0	0	5	0
12:00:00	1	0	740	0	1229	0	0	0	4	0	6	0	0	0	0	0	0	0	5	0
12:15:00	1	0	783	43	1325	96	0	0	5	1	6	0	0	0	0	0	0	0	5	0
12:30:00	1	0	839	56	1407	82	0	0	5	0	7	1	0	0	0	0	0	0	5	0
12:45:00	1	0	898	59	1505	98	0	0	5	0	8	1	0	0	0	0	0	0	5	0
13:00:00	1	0	940	42	1605	100	0	0	7	2	9	1	0	0	0	0	0	0	5	0
13:15:00	1	0	986	46	1710	105	0	0	8	1	9	0	0	0	0	0	0	0	5	0
13:30:00	1	0	1045	59	1831	121	0	0	9	1	11	2	0	0	0	0	0	0	5	0
13:45:00	1	0	1093	48	1946	115	0	0	11	2	14	3	0	0	0	0	0	0	5	0
14:00:00	1	0	1143	50	2031	85	0	0	12	1	14	0	0	0	0	0	0	0	7	2
14:02:12	1	0	1143	0	2031	0	0	0	12	0	14	0	0	0	0	0	0	0	7	0
15:00:00	1	0	1143	0	2031	0	0	0	12	0	14	0	0	0	0	0	0	0	7	0
15:15:00	1	0	1199	56	2119	88	0	0	14	2	14	0	0	0	0	0	0	0	8	1
15:30:00	1	0	1262	63	2219	100	0	0	17	3	15	1	0	0	0	0	0	0	9	1
15:45:00	1	0	1314	52	2335	116	0	0	19	2	17	2	0	0	0	0	0	0	9	0
16:00:00	1	0	1381	67	2446	111	0	0	20	1	17	0	0	0	0	0	0	0	9	0
16:15:00	2	1	1460	79	2563	117	0	0	21	1	17	0	0	0	0	0	0	0	10	1
16:30:00	2	0	1526	66	2690	127	0	0	24	3	19	2	0	0	0	0	0	0	12	2
16:45:00	2	0	1587	61	2821	131	0	0	24	0	19	0	0	0	0	0	0	0	12	0
17:00:00	2	0	1650	63	2941	120	0	0	24	0	20	1	0	0	0	0	0	0	14	2
17:15:00	4	2	1716	66	3073	132	0	0	24	0	20	0	0	0	0	0	0	0	15	1
17:30:00	4	0	1777	61	3194	121	0	0	24	0	20	0	0	0	0	0	0	0	15	0
17:45:00	5	1	1826	49	3316	122	0	0	25	1	20	0	0	0	0	0	0	0	18	3
18:00:00	5	0	1880	54	3430	114	0	0	25	0	21	1	0	0	0	0	0	0	21	3
18:15:00	5	0	1880	0	3430	0	0	0	25	0	21	0	0	0	0	0	0	0	21	0
18:17:27	5	0	1880	0	3430	0	0	0	25	0	21	0	0	0	0	0	0	0	21	0

Ontario Traffic Inc.

Count Date: 20-Feb-18 Site #: 1807000009

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	1	1	2	2	0	0	4	4	0	0	0	0	0	0	0	0	0	0	1	1
6:30:00	4	3	4	2	0	0	6	2	0	0	0	0	0	0	0	0	0	0	2	1
6:45:00	6	2	12	8	0	0	9	3	0	0	0	0	0	0	0	0	0	0	3	1
7:00:00	8	2	15	3	1	1	12	3	0	0	0	0	0	0	0	0	0	0	3	0
7:15:00	12	4	18	3	2	1	19	7	0	0	0	0	0	0	0	0	0	0	3	0
7:30:00	12	0	22	4	2	0	20	1	1	1	0	0	0	0	0	0	0	0	3	0
7:45:00	12	0	22	0	2	0	23	3	1	0	0	0	0	0	0	0	0	0	3	0
8:00:00	12	0	22	0	2	0	26	3	1	0	0	0	0	0	0	0	0	0	3	0
8:15:00	12	0	22	0	2	0	30	4	1	0	0	0	0	0	0	0	0	0	3	0
8:30:00	14	2	22	0	3	1	33	3	1	0	0	0	0	0	0	0	0	0	3	0
8:45:00	15	1	22	0	4	1	38	5	1	0	0	0	0	0	0	0	0	0	4	1
9:00:00	15	0	22	0	4	0	39	1	1	0	0	0	0	0	0	0	0	0	4	0
9:01:55	15	0	22	0	4	0	39	0	1	0	0	0	0	0	0	0	0	0	4	0
12:00:00	15	0	22	0	4	0	39	0	1	0	0	0	0	0	0	0	0	0	4	0
12:15:00	15	0	22	0	5	1	43	4	1	0	0	0	0	0	0	0	0	0	4	0
12:30:00	15	0	22	0	5	0	45	2	1	0	0	0	0	0	0	0	0	0	4	0
12:45:00	16	1	22	0	5	0	50	5	1	0	0	0	0	0	0	0	0	0	4	0
13:00:00	18	2	23	1	8	3	54	4	1	0	0	0	0	0	0	0	0	0	4	0
13:15:00	18	0	23	0	8	0	59	5	1	0	0	0	0	0	0	0	0	0	4	0
13:30:00	19	1	23	0	10	2	60	1	1	0	0	0	0	0	0	0	0	0	4	0
13:45:00	21	2	23	0	11	1	64	4	1	0	0	0	0	0	0	0	0	0	4	0
14:00:00	22	1	23	0	11	0	67	3	2	1	0	0	0	0	0	0	0	0	4	0
14:02:12	22	0	23	0	11	0	67	0	2	0	0	0	0	0	0	0	0	0	4	0
15:00:00	22	0	23	0	11	0	67	0	2	0	0	0	0	0	0	0	0	0	4	0
15:15:00	24	2	23	0	11	0	70	3	3	1	0	0	0	0	0	0	0	0	4	0
15:30:00	25	1	23	0	11	0	71	1	3	0	0	0	0	0	0	0	0	0	4	0
15:45:00	25	0	23	0	12	1	77	6	3	0	0	0	0	0	0	0	0	0	5	1
16:00:00	26	1	23	0	13	1	81	4	3	0	0	0	0	0	0	0	0	0	5	0
16:15:00	27	1	23	0	13	0	86	5	3	0	0	0	0	0	0	0	0	0	5	0
16:30:00	28	1	23	0	13	0	87	1	3	0	0	0	0	0	0	0	0	0	7	2
16:45:00	28	0	23	0	13	0	93	6	3	0	0	0	0	0	0	0	0	0	7	0
17:00:00	31	3	23	0	13	0	96	3	3	0	0	0	0	0	0	0	0	0	9	2
17:15:00	33	2	24	1	15	2	100	4	3	0	0	0	0	0	0	0	0	0	10	1
17:30:00	34	1	24	0	15	0	102	2	3	0	0	0	0	0	0	0	0	0	10	0
17:45:00	41	7	38	14	15	0	104	2	3	0	0	0	0	0	0	0	0	0	10	0
18:00:00	46	5	42	4	15	0	111	7	3	0	0	0	0	0	0	0	0	0	10	0
18:15:00	46	0	42	0	15	0	111	0	3	0	0	0	0	0	0	0	0	0	10	0
18:17:27	46	0	42	0	15	0	111	0	3	0	0	0	0	0	0	0	0	0	10	0

Ontario Traffic Inc.

Count Date: 20-Feb-18 Site #: 1807000009

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	0	0	13	13	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30:00	5	5	28	15	14	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45:00	11	6	48	20	28	14	0	0	0	0	0	0	0	0	0	0	0	0	1	1
7:00:00	16	5	67	19	37	9	1	1	0	0	0	0	0	0	0	0	0	0	1	0
7:15:00	22	6	99	32	57	20	1	0	3	3	0	0	0	0	0	0	0	0	3	2
7:30:00	35	13	140	41	58	1	1	0	6	3	0	0	0	0	0	0	0	0	3	0
7:45:00	54	19	186	46	58	0	1	0	6	0	0	0	0	0	0	0	0	0	3	0
8:00:00	68	14	237	51	58	0	1	0	8	2	0	0	0	0	0	0	0	0	3	0
8:15:00	94	26	292	55	58	0	1	0	8	0	0	0	0	0	0	0	0	0	3	0
8:30:00	109	15	345	53	60	2	1	0	8	0	0	0	0	0	0	0	0	0	3	0
8:45:00	134	25	398	53	62	2	2	1	8	0	0	0	0	0	0	0	0	0	3	0
9:00:00	161	27	453	55	63	1	2	0	8	0	0	0	0	0	0	0	0	0	3	0
9:01:55	161	0	453	0	63	0	2	0	8	0	0	0	0	0	0	0	0	0	3	0
12:00:00	161	0	453	0	63	0	2	0	8	0	0	0	0	0	0	0	0	0	3	0
12:15:00	187	26	512	59	64	1	2	0	9	1	0	0	0	0	0	0	0	0	3	0
12:30:00	225	38	560	48	64	0	2	0	14	5	0	0	0	0	0	0	0	0	3	0
12:45:00	257	32	616	56	64	0	2	0	16	2	0	0	0	0	0	0	0	0	3	0
13:00:00	286	29	663	47	66	2	3	1	16	0	0	0	0	0	0	0	0	0	3	0
13:15:00	312	26	715	52	66	0	3	0	18	2	0	0	0	0	0	0	0	0	3	0
13:30:00	342	30	767	52	68	2	4	1	20	2	0	0	0	0	0	0	0	0	3	0
13:45:00	378	36	818	51	69	1	4	0	21	1	0	0	0	0	0	0	0	0	3	0
14:00:00	412	34	872	54	69	0	4	0	23	2	0	0	0	0	0	0	0	0	3	0
14:02:12	412	0	872	0	69	0	4	0	23	0	0	0	0	0	0	0	0	0	3	0
15:00:00	412	0	872	0	69	0	4	0	23	0	0	0	0	0	0	0	0	0	3	0
15:15:00	438	26	961	89	70	1	4	0	23	0	0	0	0	0	0	0	0	0	3	0
15:30:00	477	39	1029	68	71	1	4	0	25	2	0	0	0	0	0	0	0	0	4	1
15:45:00	525	48	1102	73	71	0	4	0	27	2	0	0	0	0	0	0	0	0	4	0
16:00:00	555	30	1183	81	72	1	4	0	27	0	0	0	0	0	0	0	0	0	4	0
16:15:00	584	29	1286	103	73	1	4	0	29	2	0	0	0	0	0	0	0	0	4	0
16:30:00	613	29	1351	65	74	1	4	0	30	1	0	0	0	0	0	0	0	0	5	1
16:45:00	641	28	1466	115	75	1	4	0	31	1	0	0	0	0	0	0	0	0	5	0
17:00:00	679	38	1572	106	75	0	5	1	31	0	0	0	0	0	0	0	0	0	5	0
17:15:00	710	31	1677	105	82	7	5	0	32	1	0	0	0	0	0	0	0	0	5	0
17:30:00	753	43	1770	93	89	7	5	0	32	0	0	0	0	0	0	0	0	0	5	0
17:45:00	789	36	1845	75	94	5	5	0	32	0	0	0	0	0	0	0	0	0	6	1
18:00:00	816	27	1910	65	102	8	5	0	32	0	0	0	0	0	0	0	0	0	6	0
18:15:00	816	0	1910	0	102	0	5	0	32	0	0	0	0	0	0	0	0	0	6	0
18:17:27	816	0	1910	0	102	0	5	0	32	0	0	0	0	0	0	0	0	0	6	0

Ontario Traffic Inc.

Mid-day Peak Diagram

Specified Period
From: 10:00:00
To: 14:00:00

One Hour Peak
From: 13:00:00
To: 14:00:00

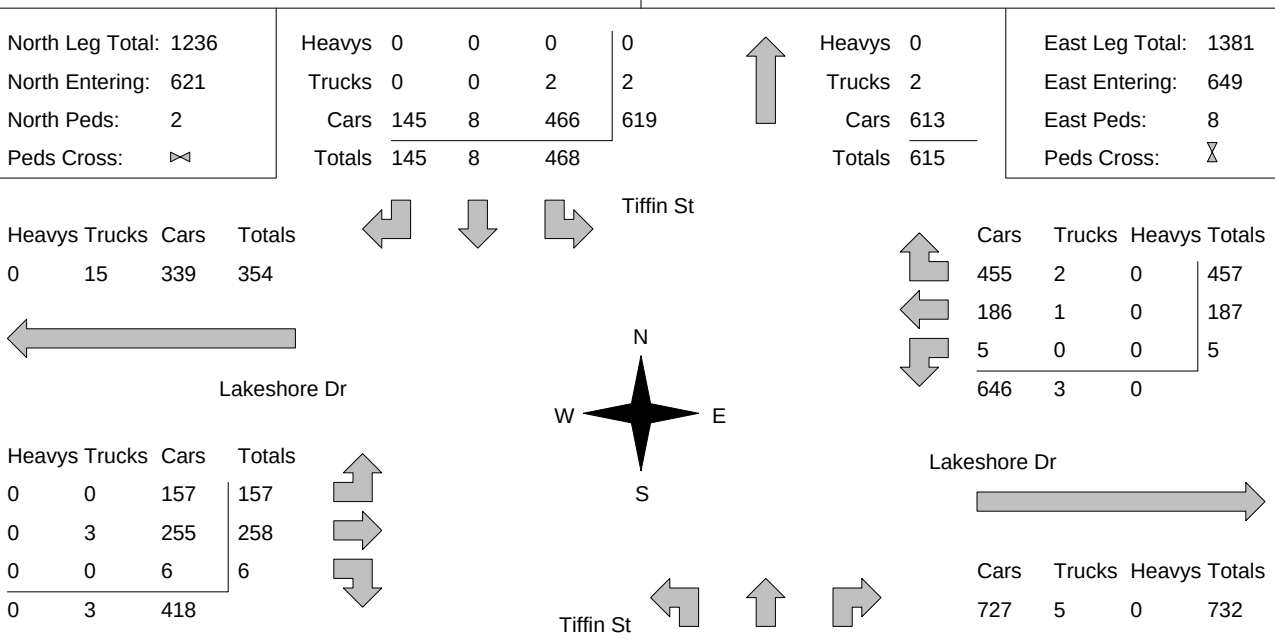
Municipality: Barrie
Site #: 1807000004
Intersection: Lakeshore Dr & Tiffin St
TFR File #: 1
Count date: 17-Feb-18

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Lakeshore Dr runs W/E



Comments

Ontario Traffic Inc.

Total Count Diagram

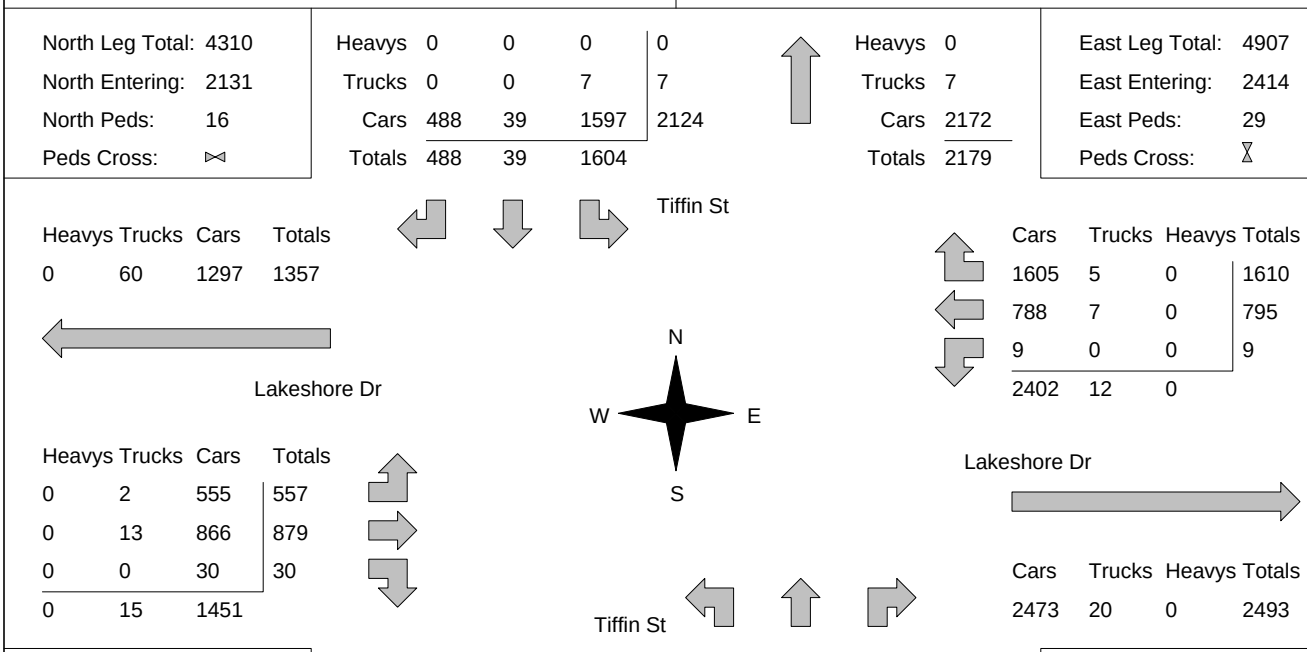
Municipality: Barrie
Site #: 1807000004
Intersection: Lakeshore Dr & Tiffin St
TFR File #: 1
Count date: 17-Feb-18

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Lakeshore Dr runs W/E



Comments

Ontario Traffic Inc.
Traffic Count Summary

Intersection: Lakeshore Dr & Tiffin St | **Count Date:** 17-Feb-18 | **Municipality:** Barrie

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
10:00:00	0	0	0	0	0	0
11:00:00	335	15	111	461	5	488
12:00:00	384	10	107	501	4	520
13:00:00	417	6	125	548	5	569
14:00:00	468	8	145	621	2	650
Totals:	1604	39	488	2131	16	2227

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
10:00:00	0	0	0	0	0
11:00:00	18	8	1	27	8
12:00:00	15	2	2	19	2
13:00:00	19	1	1	21	6
14:00:00	22	1	6	29	6
Totals:	74	12	10	96	22

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
10:00:00	0	0	0	0	0	0
11:00:00	0	180	362	542	10	850
12:00:00	3	227	380	610	4	931
13:00:00	1	201	411	613	7	1029
14:00:00	5	187	457	649	8	1070
Totals:	9	795	1610	2414	29	3880

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
10:00:00	0	0	0	0	0
11:00:00	122	174	12	308	2
12:00:00	118	198	5	321	3
13:00:00	160	249	7	416	2
14:00:00	157	258	6	421	0
Totals:	557	879	30	1466	7

Calculated Values for Traffic Crossing Major Street

Hours Ending:	0:00	0:00	0:00	10:00	11:00	12:00	13:00	14:00
Crossing Values:	0	0	0	0	380	416	451	506

Ontario Traffic Inc.

Count Date: 17-Feb-18 Site #: 1807000004

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	75	75	5	5	32	32	1	1	0	0	0	0	0	0	0	0	0	0	1	1
10:30:00	149	74	6	1	59	27	1	0	0	0	0	0	0	0	0	0	0	0	3	2
10:45:00	239	90	7	1	85	26	1	0	0	0	0	0	0	0	0	0	0	0	4	1
11:00:00	334	95	15	8	111	26	1	0	0	0	0	0	0	0	0	0	0	0	5	1
11:15:00	413	79	22	7	136	25	2	1	0	0	0	0	0	0	0	0	0	0	5	0
11:30:00	517	104	23	1	159	23	2	0	0	0	0	0	0	0	0	0	0	0	8	3
11:45:00	612	95	24	1	182	23	3	1	0	0	0	0	0	0	0	0	0	0	8	0
12:00:00	716	104	25	1	218	36	3	0	0	0	0	0	0	0	0	0	0	0	9	1
12:15:00	818	102	25	0	248	30	3	0	0	0	0	0	0	0	0	0	0	0	10	1
12:30:00	915	97	28	3	275	27	3	0	0	0	0	0	0	0	0	0	0	0	10	0
12:45:00	1026	111	28	0	312	37	3	0	0	0	0	0	0	0	0	0	0	0	13	3
13:00:00	1131	105	31	3	343	31	5	2	0	0	0	0	0	0	0	0	0	0	14	1
13:15:00	1238	107	31	0	383	40	6	1	0	0	0	0	0	0	0	0	0	0	15	1
13:30:00	1361	123	34	3	425	42	6	0	0	0	0	0	0	0	0	0	0	0	15	0
13:45:00	1477	116	34	0	452	27	7	1	0	0	0	0	0	0	0	0	0	0	15	0
14:00:00	1597	120	39	5	488	36	7	0	0	0	0	0	0	0	0	0	0	0	16	1
14:15:00	1597	0	39	0	488	0	7	0	0	0	0	0	0	0	0	0	0	0	16	0
14:17:14	1597	0	39	0	488	0	7	0	0	0	0	0	0	0	0	0	0	0	16	0

Ontario Traffic Inc.

Count Date: 17-Feb-18 Site #: 1807000004

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	0	0	45	45	79	79	0	0	0	0	0	0	0	0	0	0	0	0	2	2
10:30:00	0	0	92	47	166	87	0	0	0	0	1	1	0	0	0	0	0	0	4	2
10:45:00	0	0	138	46	256	90	0	0	0	0	2	1	0	0	0	0	0	0	5	1
11:00:00	0	0	180	42	360	104	0	0	0	0	2	0	0	0	0	0	0	0	10	5
11:15:00	2	2	231	51	440	80	0	0	1	1	2	0	0	0	0	0	0	0	10	0
11:30:00	2	0	283	52	554	114	0	0	2	1	2	0	0	0	0	0	0	0	10	0
11:45:00	3	1	342	59	645	91	0	0	3	1	2	0	0	0	0	0	0	0	11	1
12:00:00	3	0	404	62	740	95	0	0	3	0	2	0	0	0	0	0	0	0	14	3
12:15:00	4	1	461	57	835	95	0	0	4	1	2	0	0	0	0	0	0	0	14	0
12:30:00	4	0	499	38	956	121	0	0	4	0	3	1	0	0	0	0	0	0	16	2
12:45:00	4	0	547	48	1049	93	0	0	5	1	3	0	0	0	0	0	0	0	21	5
13:00:00	4	0	602	55	1150	101	0	0	6	1	3	0	0	0	0	0	0	0	21	0
13:15:00	5	1	641	39	1273	123	0	0	6	0	3	0	0	0	0	0	0	0	24	3
13:30:00	6	1	688	47	1372	99	0	0	6	0	3	0	0	0	0	0	0	0	26	2
13:45:00	7	1	742	54	1495	123	0	0	7	1	3	0	0	0	0	0	0	0	29	3
14:00:00	9	2	788	46	1605	110	0	0	7	0	5	2	0	0	0	0	0	0	29	0
14:15:00	9	0	788	0	1605	0	0	0	7	0	5	0	0	0	0	0	0	0	29	0
14:17:14	9	0	788	0	1605	0	0	0	7	0	5	0	0	0	0	0	0	0	29	0

Ontario Traffic Inc.

Count Date: 17-Feb-18 Site #: 1807000004

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	0	0	7	7	0	0	4	4	0	0	0	0	0	0	0	0	0	0	2	2
10:30:00	0	0	8	1	0	0	7	3	0	0	0	0	0	0	0	0	0	0	5	3
10:45:00	1	1	8	0	1	1	11	4	0	0	0	0	0	0	0	0	0	0	6	1
11:00:00	4	3	8	0	1	0	14	3	0	0	0	0	0	0	0	0	0	0	8	2
11:15:00	6	2	9	1	1	0	16	2	0	0	0	0	0	0	0	0	0	0	8	0
11:30:00	7	1	9	0	1	0	21	5	0	0	0	0	0	0	0	0	0	0	8	0
11:45:00	7	0	9	0	1	0	24	3	0	0	0	0	0	0	0	0	0	0	8	0
12:00:00	8	1	10	1	3	2	25	1	0	0	0	0	0	0	0	0	0	0	10	2
12:15:00	9	1	11	1	3	0	30	5	0	0	0	0	0	0	0	0	0	0	10	0
12:30:00	11	2	11	0	3	0	32	2	0	0	0	0	0	0	0	0	0	0	10	0
12:45:00	12	1	11	0	4	1	38	6	0	0	0	0	0	0	0	0	0	0	15	5
13:00:00	13	1	11	0	4	0	39	1	0	0	0	0	0	0	0	0	0	0	16	1
13:15:00	18	5	11	0	4	0	44	5	0	0	0	0	0	0	0	0	0	0	18	2
13:30:00	19	1	12	1	7	3	47	3	0	0	0	0	0	0	0	0	0	0	20	2
13:45:00	19	0	12	0	8	1	51	4	0	0	0	0	0	0	0	0	0	0	22	2
14:00:00	21	2	12	0	10	2	53	2	0	0	0	0	0	0	0	0	0	0	22	0
14:15:00	21	0	12	0	10	0	53	0	0	0	0	0	0	0	0	0	0	0	22	0
14:17:14	21	0	12	0	10	0	53	0	0	0	0	0	0	0	0	0	0	0	22	0

Ontario Traffic Inc.

Count Date: 17-Feb-18 Site #: 1807000004

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	37	37	43	43	3	3	0	0	1	1	0	0	0	0	0	0	0	0	1	1
10:30:00	62	25	85	42	3	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
10:45:00	94	32	127	42	4	1	1	1	2	1	0	0	0	0	0	0	0	0	1	0
11:00:00	120	26	172	45	12	8	2	1	2	0	0	0	0	0	0	0	0	0	2	1
11:15:00	150	30	217	45	15	3	2	0	3	1	0	0	0	0	0	0	0	0	2	0
11:30:00	179	29	265	48	15	0	2	0	6	3	0	0	0	0	0	0	0	0	5	3
11:45:00	206	27	318	53	15	0	2	0	7	1	0	0	0	0	0	0	0	0	5	0
12:00:00	238	32	364	46	17	2	2	0	8	1	0	0	0	0	0	0	0	0	5	0
12:15:00	266	28	439	75	20	3	2	0	9	1	0	0	0	0	0	0	0	0	5	0
12:30:00	309	43	500	61	20	0	2	0	9	0	0	0	0	0	0	0	0	0	6	1
12:45:00	349	40	554	54	20	0	2	0	10	1	0	0	0	0	0	0	0	0	6	0
13:00:00	398	49	611	57	24	4	2	0	10	0	0	0	0	0	0	0	0	0	7	1
13:15:00	428	30	670	59	26	2	2	0	12	2	0	0	0	0	0	0	0	0	7	0
13:30:00	465	37	728	58	28	2	2	0	12	0	0	0	0	0	0	0	0	0	7	0
13:45:00	511	46	786	58	29	1	2	0	13	1	0	0	0	0	0	0	0	0	7	0
14:00:00	555	44	866	80	30	1	2	0	13	0	0	0	0	0	0	0	0	0	7	0
14:15:00	555	0	866	0	30	0	2	0	13	0	0	0	0	0	0	0	0	0	7	0
14:17:14	555	0	866	0	30	0	2	0	13	0	0	0	0	0	0	0	0	0	7	0

Ontario Traffic Inc.

Morning Peak Diagram

Specified Period
From: 6:00:00
To: 9:00:00

One Hour Peak
From: 8:00:00
To: 9:00:00

Municipality: Barrie
Site #: 1807000008
Intersection: Essa Rd & Tiffin St
TFR File #: 1
Count date: 20-Feb-18

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Essa Rd runs N/S

North Leg Total:	661			
North Entering:	282			
North Peds:	2			
Peds Cross:	⋈			

Heavys	0	0	0	0
Trucks	1	16	0	17
Cars	34	198	33	265
Totals	35	214	33	

Heavys	0	
Trucks	10	
Cars	369	
Totals	379	

East Leg Total:	612	
East Entering:	281	
East Peds:	7	
Peds Cross:	⧖	

Essa Rd

Heavys	Trucks	Cars	Totals
0	7	270	277

Cars	Trucks	Heavys	Totals
1	0	0	1
182	5	0	187
84	9	0	93
267	14	0	

Tiffin St

N
W E
S

Heavys	Trucks	Cars	Totals
0	1	59	60
0	1	196	197
0	7	60	67
0	9	315	

Tiffin St

Cars	Trucks	Heavys	Totals
330	1	0	331

Essa Rd

Peds Cross:	⧖	
West Peds:	1	
West Entering:	324	
West Leg Total:	601	

Cars	342			
Trucks	32			
Heavys	0			
Totals	374			

Cars	54	309	101	464
Trucks	1	9	0	10
Heavys	0	0	0	0
Totals	55	318	101	

Peds Cross:	⋈	
South Peds:	1	
South Entering:	474	
South Leg Total:	848	

Comments

Ontario Traffic Inc.

Mid-day Peak Diagram

Specified Period
From: 12:00:00
To: 14:00:00

One Hour Peak
From: 12:15:00
To: 13:15:00

Municipality: Barrie
Site #: 1807000008
Intersection: Essa Rd & Tiffin St
TFR File #: 1
Count date: 20-Feb-18

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Essa Rd runs N/S

North Leg Total:	707
North Entering:	337
North Peds:	3
Peds Cross:	⋈

Heavys	0	0	0	0
Trucks	1	12	1	14
Cars	39	249	35	323
Totals	40	261	36	

Heavys	0
Trucks	10
Cars	360
Totals	370

East Leg Total:	615
East Entering:	281
East Peds:	5
Peds Cross:	⧖

Essa Rd

Heavys	Trucks	Cars	Totals
0	10	238	248

Tiffin St

Cars	Trucks	Heavys	Totals
1	0	0	1
149	6	0	155
119	6	0	125
269	12	0	

N
W E
S

Heavys	Trucks	Cars	Totals
0	2	35	37
0	6	185	191
0	3	55	58
0	11	275	

Tiffin St

Cars	Trucks	Heavys	Totals
325	9	0	334

Essa Rd

Peds Cross:	⧖
West Peds:	4
West Entering:	286
West Leg Total:	534

Cars	423
Trucks	21
Heavys	0
Totals	444

Cars	50	324	105	479
Trucks	3	8	2	13
Heavys	0	0	0	0
Totals	53	332	107	

Peds Cross:	⋈
South Peds:	1
South Entering:	492
South Leg Total:	936

Comments

Ontario Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:30:00
To: 17:30:00

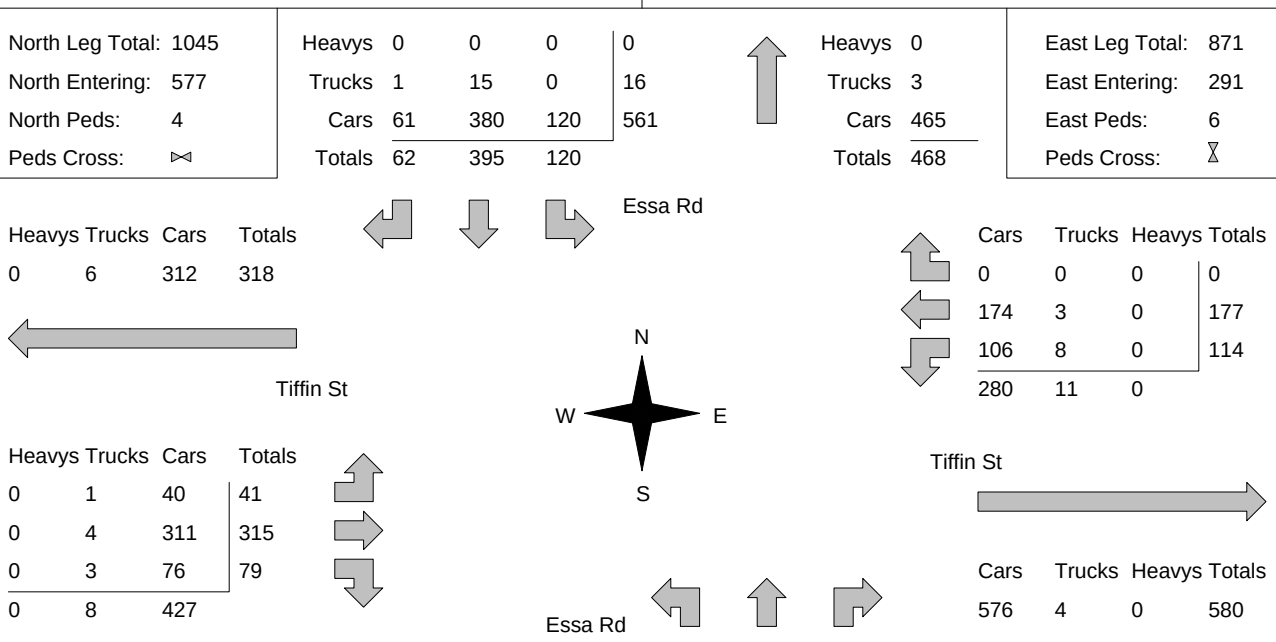
Municipality: Barrie
Site #: 1807000008
Intersection: Essa Rd & Tiffin St
TFR File #: 1
Count date: 20-Feb-18

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Essa Rd runs N/S



Comments

Ontario Traffic Inc.

Total Count Diagram

Municipality: Barrie
Site #: 1807000008
Intersection: Essa Rd & Tiffin St
TFR File #: 1
Count date: 20-Feb-18

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Essa Rd runs N/S

North Leg Total:	5509
North Entering:	2849
North Peds:	12
Peds Cross:	⋈

Heavys	0	0	0	0
Trucks	10	98	3	111
Cars	280	2014	444	2738
Totals	290	2112	447	

Heavys	0
Trucks	71
Cars	2589
Totals	2660

East Leg Total:	5089
East Entering:	2188
East Peds:	29
Peds Cross:	⧖

Essa Rd

Heavys	Trucks	Cars	Totals
0	71	2080	2151

Cars	Trucks	Heavys	Totals
12	0	0	12
1330	52	0	1382
735	59	0	794
2077	111	0	

Tiffin St

N
W E
S

Heavys	Trucks	Cars	Totals
0	11	260	271
0	30	1602	1632
0	35	512	547
0	76	2374	

Tiffin St

Cars	Trucks	Heavys	Totals
2862	39	0	2901

Essa Rd

Peds Cross:	⧖
West Peds:	32
West Entering:	2450
West Leg Total:	4601

Cars	3261			
Trucks	192			
Heavys	0			
Totals	3453			

Cars	470	2317	816	3603
Trucks	9	60	6	75
Heavys	0	0	0	0
Totals	479	2377	822	

Peds Cross:	⋈
South Peds:	22
South Entering:	3678
South Leg Total:	7131

Comments

Ontario Traffic Inc.
Traffic Count Summary

Intersection: Essa Rd & Tiffin St | **Count Date:** 20-Feb-18 | **Municipality:** Barrie

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
6:00:00	0	0	0	0	0	0
7:00:00	23	161	8	192	1	324
8:00:00	30	220	30	280	0	582
9:00:00	33	214	35	282	2	756
12:00:00	0	0	0	0	0	0
13:00:00	36	277	40	353	3	826
14:00:00	54	249	36	339	2	819
15:00:00	0	0	0	0	0	0
16:00:00	69	286	41	396	0	964
17:00:00	111	356	58	525	3	1136
18:00:00	91	349	42	482	1	1120
Totals:	447	2112	290	2849	12	6527

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
6:00:00	0	0	0	0	0
7:00:00	30	76	26	132	0
8:00:00	44	197	61	302	0
9:00:00	55	318	101	474	1
12:00:00	0	0	0	0	0
13:00:00	58	303	112	473	0
14:00:00	52	314	114	480	2
15:00:00	0	0	0	0	0
16:00:00	77	361	130	568	11
17:00:00	86	405	120	611	4
18:00:00	77	403	158	638	4
Totals:	479	2377	822	3678	22

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
6:00:00	0	0	0	0	0	0
7:00:00	59	136	1	196	2	326
8:00:00	79	192	1	272	1	523
9:00:00	93	187	1	281	7	605
12:00:00	0	0	0	0	0	0
13:00:00	123	153	1	277	3	564
14:00:00	102	167	2	271	8	567
15:00:00	0	0	0	0	0	0
16:00:00	113	189	4	306	2	682
17:00:00	116	191	1	308	3	718
18:00:00	109	167	1	277	3	653
Totals:	794	1382	12	2188	29	4638

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
6:00:00	0	0	0	0	0
7:00:00	5	72	53	130	0
8:00:00	18	171	62	251	1
9:00:00	60	197	67	324	1
12:00:00	0	0	0	0	0
13:00:00	43	194	50	287	7
14:00:00	32	183	81	296	3
15:00:00	0	0	0	0	0
16:00:00	38	261	77	376	11
17:00:00	37	290	83	410	6
18:00:00	38	264	74	376	3
Totals:	271	1632	547	2450	32

Calculated Values for Traffic Crossing Major Street

Hours Ending:	7:00	8:00	9:00	13:00	14:00	16:00	17:00	18:00
Crossing Values:	201	289	353	363	321	423	450	416

Ontario Traffic Inc.

Count Date: 20-Feb-18 Site #: 1807000008

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	5	5	24	24	1	1	0	0	2	2	0	0	0	0	0	0	0	0	0	0
6:30:00	9	4	69	45	4	3	0	0	4	2	0	0	0	0	0	0	0	0	0	0
6:45:00	19	10	114	45	4	0	0	0	6	2	0	0	0	0	0	0	0	0	1	1
7:00:00	23	4	152	38	8	4	0	0	9	3	0	0	0	0	0	0	0	0	1	0
7:15:00	34	11	194	42	11	3	1	1	11	2	0	0	0	0	0	0	0	0	1	0
7:30:00	36	2	234	40	19	8	1	0	16	5	0	0	0	0	0	0	0	0	1	0
7:45:00	43	7	289	55	23	4	1	0	17	1	1	1	0	0	0	0	0	0	1	0
8:00:00	52	9	360	71	36	13	1	0	21	4	2	1	0	0	0	0	0	0	1	0
8:15:00	58	6	427	67	48	12	1	0	24	3	3	1	0	0	0	0	0	0	2	1
8:30:00	66	8	472	45	55	7	1	0	29	5	3	0	0	0	0	0	0	0	2	0
8:45:00	77	11	512	40	64	9	1	0	31	2	3	0	0	0	0	0	0	0	2	0
9:00:00	85	8	558	46	70	6	1	0	37	6	3	0	0	0	0	0	0	0	3	1
9:00:46	85	0	558	0	70	0	1	0	37	0	3	0	0	0	0	0	0	0	3	0
12:00:00	85	0	558	0	70	0	1	0	37	0	3	0	0	0	0	0	0	0	3	0
12:15:00	99	14	627	69	78	8	1	0	40	3	4	1	0	0	0	0	0	0	3	0
12:30:00	103	4	690	63	92	14	2	1	44	4	4	0	0	0	0	0	0	0	3	0
12:45:00	111	8	758	68	101	9	2	0	46	2	4	0	0	0	0	0	0	0	5	2
13:00:00	120	9	822	64	108	7	2	0	50	4	5	1	0	0	0	0	0	0	6	1
13:15:00	134	14	876	54	117	9	2	0	52	2	5	0	0	0	0	0	0	0	6	0
13:30:00	145	11	948	72	125	8	3	1	55	3	5	0	0	0	0	0	0	0	8	2
13:45:00	153	8	1013	65	127	2	3	0	56	1	6	1	0	0	0	0	0	0	8	0
14:00:00	173	20	1060	47	141	14	3	0	61	5	8	2	0	0	0	0	0	0	8	0
14:01:24	173	0	1060	0	141	0	3	0	61	0	8	0	0	0	0	0	0	0	8	0
15:00:00	173	0	1060	0	141	0	3	0	61	0	8	0	0	0	0	0	0	0	8	0
15:15:00	197	24	1123	63	152	11	3	0	61	0	8	0	0	0	0	0	0	0	8	0
15:30:00	205	8	1204	81	162	10	3	0	65	4	8	0	0	0	0	0	0	0	8	0
15:45:00	227	22	1270	66	173	11	3	0	67	2	9	1	0	0	0	0	0	0	8	0
16:00:00	242	15	1335	65	181	8	3	0	72	5	9	0	0	0	0	0	0	0	8	0
16:15:00	274	32	1415	80	191	10	3	0	74	2	9	0	0	0	0	0	0	0	8	0
16:30:00	294	20	1494	79	207	16	3	0	76	2	9	0	0	0	0	0	0	0	8	0
16:45:00	325	31	1600	106	228	21	3	0	80	4	9	0	0	0	0	0	0	0	8	0
17:00:00	353	28	1680	80	239	11	3	0	83	3	9	0	0	0	0	0	0	0	11	3
17:15:00	391	38	1791	111	252	13	3	0	85	2	9	0	0	0	0	0	0	0	12	1
17:30:00	414	23	1874	83	268	16	3	0	91	6	10	1	0	0	0	0	0	0	12	0
17:45:00	434	20	1941	67	274	6	3	0	95	4	10	0	0	0	0	0	0	0	12	0
18:00:00	444	10	2014	73	280	6	3	0	98	3	10	0	0	0	0	0	0	0	12	0
18:15:00	444	0	2014	0	280	0	3	0	98	0	10	0	0	0	0	0	0	0	12	0
18:17:24	444	0	2014	0	280	0	3	0	98	0	10	0	0	0	0	0	0	0	12	0

Ontario Traffic Inc.

Count Date: 20-Feb-18 Site #: 1807000008

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	11	11	16	16	0	0	2	2	0	0	0	0	0	0	0	0	0	0	1	1
6:30:00	25	14	43	27	1	1	3	1	1	1	0	0	0	0	0	0	0	0	1	0
6:45:00	35	10	89	46	1	0	4	1	1	0	0	0	0	0	0	0	0	0	2	1
7:00:00	53	18	132	43	1	0	6	2	4	3	0	0	0	0	0	0	0	0	2	0
7:15:00	68	15	161	29	1	0	10	4	5	1	0	0	0	0	0	0	0	0	2	0
7:30:00	81	13	205	44	2	1	10	0	7	2	0	0	0	0	0	0	0	0	3	1
7:45:00	104	23	256	51	2	0	11	1	8	1	0	0	0	0	0	0	0	0	3	0
8:00:00	126	22	319	63	2	0	12	1	9	1	0	0	0	0	0	0	0	0	3	0
8:15:00	144	18	370	51	2	0	14	2	10	1	0	0	0	0	0	0	0	0	8	5
8:30:00	162	18	405	35	3	1	17	3	12	2	0	0	0	0	0	0	0	0	10	2
8:45:00	185	23	452	47	3	0	18	1	13	1	0	0	0	0	0	0	0	0	10	0
9:00:00	210	25	501	49	3	0	21	3	14	1	0	0	0	0	0	0	0	0	10	0
9:00:46	210	0	501	0	3	0	21	0	14	0	0	0	0	0	0	0	0	0	10	0
12:00:00	210	0	501	0	3	0	21	0	14	0	0	0	0	0	0	0	0	0	10	0
12:15:00	231	21	535	34	3	0	23	2	17	3	0	0	0	0	0	0	0	0	10	0
12:30:00	266	35	573	38	4	1	23	0	18	1	0	0	0	0	0	0	0	0	10	0
12:45:00	297	31	615	42	4	0	25	2	20	2	0	0	0	0	0	0	0	0	11	1
13:00:00	327	30	646	31	4	0	27	2	22	2	0	0	0	0	0	0	0	0	13	2
13:15:00	350	23	684	38	4	0	29	2	23	1	0	0	0	0	0	0	0	0	15	2
13:30:00	385	35	732	48	4	0	29	0	25	2	0	0	0	0	0	0	0	0	20	5
13:45:00	397	12	768	36	6	2	31	2	28	3	0	0	0	0	0	0	0	0	21	1
14:00:00	422	25	805	37	6	0	34	3	30	2	0	0	0	0	0	0	0	0	21	0
14:01:24	422	0	805	0	6	0	34	0	30	0	0	0	0	0	0	0	0	0	21	0
15:00:00	422	0	805	0	6	0	34	0	30	0	0	0	0	0	0	0	0	0	21	0
15:15:00	453	31	844	39	7	1	36	2	31	1	0	0	0	0	0	0	0	0	21	0
15:30:00	476	23	890	46	7	0	37	1	36	5	0	0	0	0	0	0	0	0	22	1
15:45:00	501	25	933	43	9	2	39	2	39	3	0	0	0	0	0	0	0	0	23	1
16:00:00	528	27	982	49	10	1	41	2	42	3	0	0	0	0	0	0	0	0	23	0
16:15:00	561	33	1032	50	11	1	44	3	43	1	0	0	0	0	0	0	0	0	23	0
16:30:00	585	24	1083	51	11	0	45	1	47	4	0	0	0	0	0	0	0	0	23	0
16:45:00	613	28	1126	43	11	0	48	3	47	0	0	0	0	0	0	0	0	0	26	3
17:00:00	635	22	1167	41	11	0	50	2	48	1	0	0	0	0	0	0	0	0	26	0
17:15:00	664	29	1213	46	11	0	53	3	49	1	0	0	0	0	0	0	0	0	28	2
17:30:00	691	27	1257	44	11	0	53	0	50	1	0	0	0	0	0	0	0	0	29	1
17:45:00	713	22	1295	38	11	0	56	3	51	1	0	0	0	0	0	0	0	0	29	0
18:00:00	735	22	1330	35	12	1	59	3	52	1	0	0	0	0	0	0	0	0	29	0
18:15:00	735	0	1330	0	12	0	59	0	52	0	0	0	0	0	0	0	0	0	29	0
18:17:24	735	0	1330	0	12	0	59	0	52	0	0	0	0	0	0	0	0	0	29	0

Ontario Traffic Inc.

Count Date: 20-Feb-18 Site #: 1807000008

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	3	3	8	8	3	3	0	0	3	3	0	0	0	0	0	0	0	0	0	0
6:30:00	6	3	25	17	8	5	1	1	6	3	1	1	0	0	0	0	0	0	0	0
6:45:00	18	12	44	19	16	8	1	0	8	2	1	0	0	0	0	0	0	0	0	0
7:00:00	29	11	66	22	25	9	1	0	10	2	1	0	0	0	0	0	0	0	0	0
7:15:00	39	10	100	34	35	10	1	0	11	1	1	0	0	0	0	0	0	0	0	0
7:30:00	51	12	131	31	50	15	1	0	14	3	1	0	0	0	0	0	0	0	0	0
7:45:00	58	7	184	53	66	16	1	0	16	2	1	0	0	0	0	0	0	0	0	0
8:00:00	71	13	256	72	86	20	3	2	17	1	1	0	0	0	0	0	0	0	0	0
8:15:00	85	14	329	73	110	24	3	0	18	1	1	0	0	0	0	0	0	0	0	0
8:30:00	96	11	396	67	128	18	3	0	20	2	1	0	0	0	0	0	0	0	1	1
8:45:00	111	15	475	79	154	26	3	0	24	4	1	0	0	0	0	0	0	0	1	0
9:00:00	125	14	565	90	187	33	4	1	26	2	1	0	0	0	0	0	0	0	1	0
9:00:46	125	0	565	0	187	0	4	0	26	0	1	0	0	0	0	0	0	0	1	0
12:00:00	125	0	565	0	187	0	4	0	26	0	1	0	0	0	0	0	0	0	1	0
12:15:00	143	18	628	63	219	32	4	0	28	2	2	1	0	0	0	0	0	0	1	0
12:30:00	155	12	711	83	243	24	5	1	30	2	2	0	0	0	0	0	0	0	1	0
12:45:00	166	11	778	67	269	26	5	0	32	2	3	1	0	0	0	0	0	0	1	0
13:00:00	181	15	861	83	296	27	6	1	33	1	4	1	0	0	0	0	0	0	1	0
13:15:00	193	12	952	91	324	28	7	1	36	3	4	0	0	0	0	0	0	0	2	1
13:30:00	205	12	1013	61	351	27	7	0	39	3	4	0	0	0	0	0	0	0	2	0
13:45:00	216	11	1084	71	382	31	7	0	43	4	4	0	0	0	0	0	0	0	3	1
14:00:00	232	16	1163	79	409	27	7	0	45	2	5	1	0	0	0	0	0	0	3	0
14:01:24	232	0	1163	0	409	0	7	0	45	0	5	0	0	0	0	0	0	0	3	0
15:00:00	232	0	1163	0	409	0	7	0	45	0	5	0	0	0	0	0	0	0	3	0
15:15:00	248	16	1262	99	435	26	7	0	47	2	5	0	0	0	0	0	0	0	5	2
15:30:00	273	25	1337	75	470	35	7	0	50	3	5	0	0	0	0	0	0	0	7	2
15:45:00	297	24	1419	82	508	38	7	0	52	2	5	0	0	0	0	0	0	0	12	5
16:00:00	309	12	1515	96	539	31	7	0	54	2	5	0	0	0	0	0	0	0	14	2
16:15:00	322	13	1617	102	574	35	7	0	56	2	5	0	0	0	0	0	0	0	14	0
16:30:00	346	24	1708	91	602	28	7	0	57	1	6	1	0	0	0	0	0	0	15	1
16:45:00	363	17	1809	101	628	26	7	0	57	0	6	0	0	0	0	0	0	0	17	2
17:00:00	393	30	1917	108	658	30	9	2	57	0	6	0	0	0	0	0	0	0	18	1
17:15:00	405	12	2034	117	701	43	9	0	58	1	6	0	0	0	0	0	0	0	20	2
17:30:00	423	18	2133	99	747	46	9	0	59	1	6	0	0	0	0	0	0	0	21	1
17:45:00	455	32	2237	104	783	36	9	0	60	1	6	0	0	0	0	0	0	0	22	1
18:00:00	470	15	2317	80	816	33	9	0	60	0	6	0	0	0	0	0	0	0	22	0
18:15:00	470	0	2317	0	816	0	9	0	60	0	6	0	0	0	0	0	0	0	22	0
18:17:24	470	0	2317	0	816	0	9	0	60	0	6	0	0	0	0	0	0	0	22	0

Ontario Traffic Inc.

Count Date: 20-Feb-18 Site #: 1807000008

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	0	0	12	12	17	17	0	0	0	0	1	1	0	0	0	0	0	0	0	0
6:30:00	0	0	29	17	31	14	1	1	0	0	1	0	0	0	0	0	0	0	0	0
6:45:00	2	2	51	22	43	12	1	0	0	0	3	2	0	0	0	0	0	0	0	0
7:00:00	4	2	71	20	49	6	1	0	1	1	4	1	0	0	0	0	0	0	0	0
7:15:00	5	1	109	38	62	13	2	1	3	2	5	1	0	0	0	0	0	0	0	0
7:30:00	8	3	148	39	73	11	2	0	6	3	6	1	0	0	0	0	0	0	0	0
7:45:00	12	4	188	40	88	15	2	0	6	0	7	1	0	0	0	0	0	0	0	0
8:00:00	21	9	235	47	107	19	2	0	8	2	8	1	0	0	0	0	0	0	1	1
8:15:00	31	10	290	55	118	11	3	1	8	0	9	1	0	0	0	0	0	0	2	1
8:30:00	47	16	330	40	133	15	3	0	8	0	13	4	0	0	0	0	0	0	2	0
8:45:00	63	16	377	47	149	16	3	0	9	1	14	1	0	0	0	0	0	0	2	0
9:00:00	80	17	431	54	167	18	3	0	9	0	15	1	0	0	0	0	0	0	2	0
9:00:46	80	0	431	0	167	0	3	0	9	0	15	0	0	0	0	0	0	0	2	0
12:00:00	80	0	431	0	167	0	3	0	9	0	15	0	0	0	0	0	0	0	2	0
12:15:00	92	12	477	46	180	13	5	2	9	0	16	1	0	0	0	0	0	0	5	3
12:30:00	101	9	531	54	192	12	6	1	13	4	16	0	0	0	0	0	0	0	6	1
12:45:00	111	10	581	50	202	10	6	0	14	1	18	2	0	0	0	0	0	0	8	2
13:00:00	119	8	620	39	214	12	7	1	14	0	18	0	0	0	0	0	0	0	9	1
13:15:00	127	8	662	42	235	21	7	0	15	1	19	1	0	0	0	0	0	0	9	0
13:30:00	133	6	707	45	249	14	7	0	17	2	20	1	0	0	0	0	0	0	9	0
13:45:00	142	9	753	46	270	21	8	1	18	1	21	1	0	0	0	0	0	0	12	3
14:00:00	150	8	798	45	289	19	8	0	19	1	24	3	0	0	0	0	0	0	12	0
14:01:24	150	0	798	0	289	0	8	0	19	0	24	0	0	0	0	0	0	0	12	0
15:00:00	150	0	798	0	289	0	8	0	19	0	24	0	0	0	0	0	0	0	12	0
15:15:00	158	8	866	68	308	19	9	1	20	1	26	2	0	0	0	0	0	0	14	2
15:30:00	169	11	924	58	321	13	9	0	22	2	27	1	0	0	0	0	0	0	17	3
15:45:00	177	8	985	61	339	18	10	1	24	2	29	2	0	0	0	0	0	0	22	5
16:00:00	186	9	1054	69	360	21	10	0	24	0	30	1	0	0	0	0	0	0	23	1
16:15:00	196	10	1124	70	382	22	10	0	26	2	31	1	0	0	0	0	0	0	24	1
16:30:00	206	10	1174	50	403	21	10	0	26	0	31	0	0	0	0	0	0	0	27	3
16:45:00	212	6	1260	86	423	20	10	0	27	1	32	1	0	0	0	0	0	0	27	0
17:00:00	223	11	1339	79	440	17	10	0	29	2	33	1	0	0	0	0	0	0	29	2
17:15:00	237	14	1411	72	457	17	10	0	30	1	34	1	0	0	0	0	0	0	29	0
17:30:00	246	9	1485	74	479	22	11	1	30	0	34	0	0	0	0	0	0	0	29	0
17:45:00	250	4	1547	62	498	19	11	0	30	0	35	1	0	0	0	0	0	0	30	1
18:00:00	260	10	1602	55	512	14	11	0	30	0	35	0	0	0	0	0	0	0	32	2
18:15:00	260	0	1602	0	512	0	11	0	30	0	35	0	0	0	0	0	0	0	32	0
18:17:24	260	0	1602	0	512	0	11	0	30	0	35	0	0	0	0	0	0	0	32	0

Ontario Traffic Inc.

Mid-day Peak Diagram

Specified Period
From: 10:00:00
To: 14:00:00

One Hour Peak
From: 13:00:00
To: 14:00:00

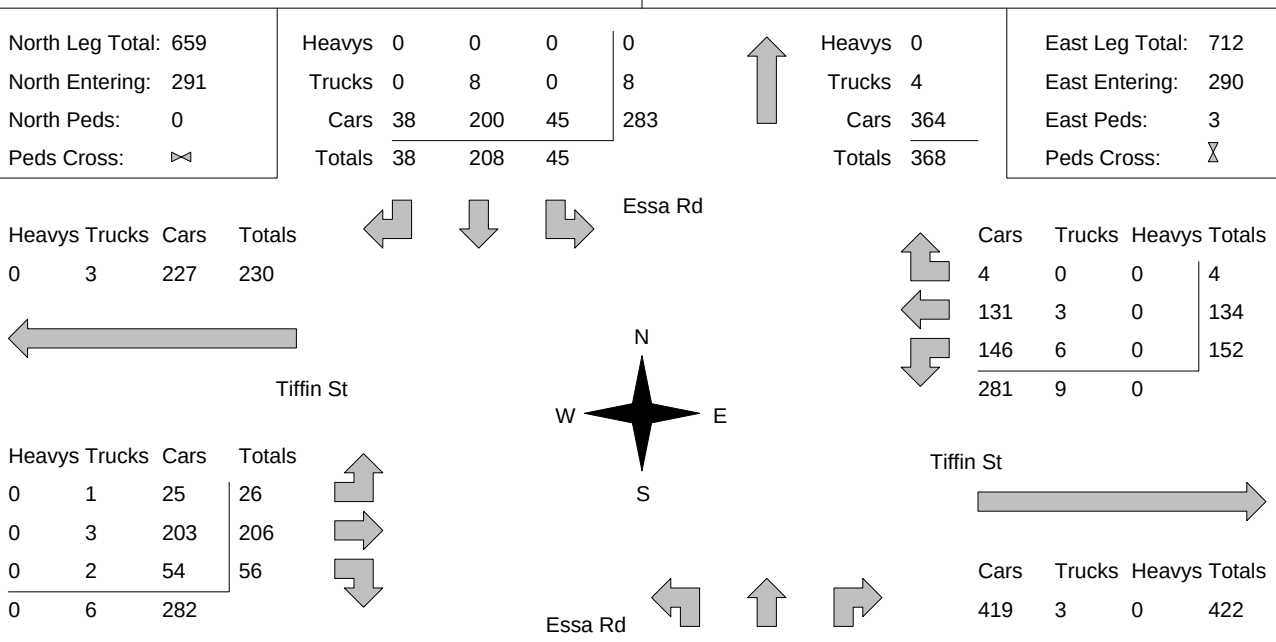
Municipality: Barrie
Site #: 1807000003
Intersection: Essa Rd & Tiffin St
TFR File #: 1
Count date: 17-Feb-18

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Essa Rd runs N/S



Comments

Ontario Traffic Inc.

Total Count Diagram

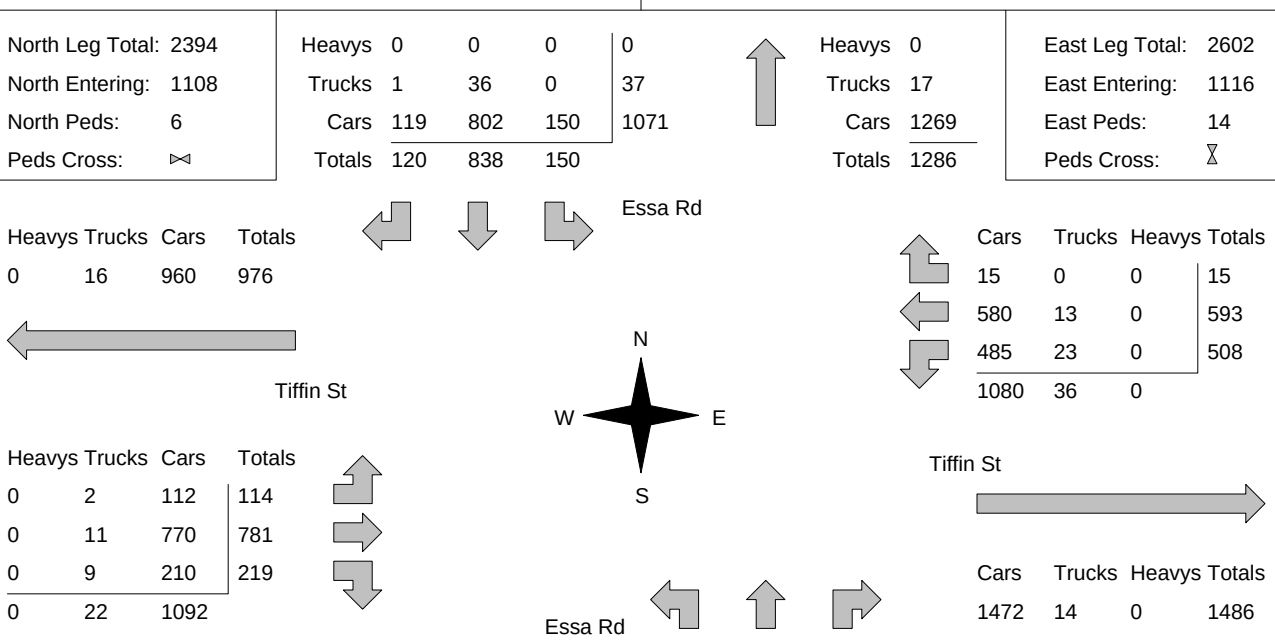
Municipality: Barrie
Site #: 1807000003
Intersection: Essa Rd & Tiffin St
TFR File #: 1
Count date: 17-Feb-18

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Essa Rd runs N/S



Comments

Ontario Traffic Inc.
Traffic Count Summary

Intersection: Essa Rd & Tiffin St | **Count Date:** 17-Feb-18 | **Municipality:** Barrie

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
10:00:00	0	0	0	0	0	0
11:00:00	22	209	25	256	1	670
12:00:00	36	224	34	294	3	739
13:00:00	47	197	23	267	2	816
14:00:00	45	208	38	291	0	858
Totals:	150	838	120	1108	6	3083

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys Left	Thru	Right	Grand Total	Total Peds
10:00:00	0	0	0	0	0
11:00:00	50	245	119	414	4
12:00:00	74	262	109	445	0
13:00:00	81	312	156	549	2
14:00:00	58	338	171	567	3
Totals:	263	1157	555	1975	9

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
10:00:00	0	0	0	0	0	0
11:00:00	124	134	1	259	7	504
12:00:00	106	159	3	268	1	553
13:00:00	126	166	7	299	3	595
14:00:00	152	134	4	290	3	578
Totals:	508	593	15	1116	14	2230

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys Left	Thru	Right	Grand Total	Total Peds
10:00:00	0	0	0	0	0
11:00:00	25	177	43	245	5
12:00:00	34	181	70	285	2
13:00:00	29	217	50	296	1
14:00:00	26	206	56	288	5
Totals:	114	781	219	1114	13

Calculated Values for Traffic Crossing Major Street

Hours Ending:	0:00	0:00	0:00	10:00	11:00	12:00	13:00	14:00
Crossing Values:	0	0	0	0	331	324	376	387

Ontario Traffic Inc.

Count Date: 17-Feb-18 Site #: 1807000003

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	5	5	38	38	6	6	0	0	2	2	0	0	0	0	0	0	0	0	1	1
10:30:00	13	8	85	47	11	5	0	0	5	3	0	0	0	0	0	0	0	0	1	0
10:45:00	18	5	138	53	23	12	0	0	8	3	0	0	0	0	0	0	0	0	1	0
11:00:00	22	4	199	61	25	2	0	0	10	2	0	0	0	0	0	0	0	0	1	0
11:15:00	31	9	257	58	35	10	0	0	11	1	0	0	0	0	0	0	0	0	1	0
11:30:00	40	9	316	59	47	12	0	0	15	4	0	0	0	0	0	0	0	0	2	1
11:45:00	50	10	366	50	53	6	0	0	15	0	0	0	0	0	0	0	0	0	2	0
12:00:00	58	8	414	48	59	6	0	0	19	4	0	0	0	0	0	0	0	0	4	2
12:15:00	68	10	473	59	67	8	0	0	20	1	0	0	0	0	0	0	0	0	4	0
12:30:00	83	15	532	59	70	3	0	0	23	3	1	1	0	0	0	0	0	0	4	0
12:45:00	97	14	570	38	74	4	0	0	24	1	1	0	0	0	0	0	0	0	5	1
13:00:00	105	8	602	32	81	7	0	0	28	4	1	0	0	0	0	0	0	0	6	1
13:15:00	117	12	643	41	89	8	0	0	30	2	1	0	0	0	0	0	0	0	6	0
13:30:00	131	14	704	61	97	8	0	0	34	4	1	0	0	0	0	0	0	0	6	0
13:45:00	137	6	747	43	109	12	0	0	35	1	1	0	0	0	0	0	0	0	6	0
14:00:00	150	13	802	55	119	10	0	0	36	1	1	0	0	0	0	0	0	0	6	0
14:15:00	150	0	802	0	119	0	0	0	36	0	1	0	0	0	0	0	0	0	6	0
14:16:38	150	0	802	0	119	0	0	0	36	0	1	0	0	0	0	0	0	0	6	0

Ontario Traffic Inc.

Count Date: 17-Feb-18 Site #: 1807000003

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	27	27	39	39	1	1	2	2	0	0	0	0	0	0	0	0	0	0	3	3
10:30:00	55	28	71	32	1	0	3	1	1	1	0	0	0	0	0	0	0	0	4	1
10:45:00	83	28	100	29	1	0	6	3	1	0	0	0	0	0	0	0	0	0	5	1
11:00:00	117	34	132	32	1	0	7	1	2	1	0	0	0	0	0	0	0	0	7	2
11:15:00	146	29	166	34	1	0	7	0	3	1	0	0	0	0	0	0	0	0	7	0
11:30:00	171	25	202	36	1	0	9	2	5	2	0	0	0	0	0	0	0	0	7	0
11:45:00	191	20	242	40	2	1	10	1	5	0	0	0	0	0	0	0	0	0	8	1
12:00:00	219	28	288	46	4	2	11	1	5	0	0	0	0	0	0	0	0	0	8	0
12:15:00	250	31	328	40	6	2	14	3	6	1	0	0	0	0	0	0	0	0	8	0
12:30:00	276	26	362	34	8	2	15	1	7	1	0	0	0	0	0	0	0	0	8	0
12:45:00	307	31	410	48	11	3	17	2	8	1	0	0	0	0	0	0	0	0	11	3
13:00:00	339	32	449	39	11	0	17	0	10	2	0	0	0	0	0	0	0	0	11	0
13:15:00	381	42	478	29	13	2	20	3	10	0	0	0	0	0	0	0	0	0	12	1
13:30:00	413	32	516	38	15	2	21	1	11	1	0	0	0	0	0	0	0	0	12	0
13:45:00	445	32	547	31	15	0	23	2	12	1	0	0	0	0	0	0	0	0	13	1
14:00:00	485	40	580	33	15	0	23	0	13	1	0	0	0	0	0	0	0	0	14	1
14:15:00	485	0	580	0	15	0	23	0	13	0	0	0	0	0	0	0	0	0	14	0
14:16:38	485	0	580	0	15	0	23	0	13	0	0	0	0	0	0	0	0	0	14	0

Ontario Traffic Inc.

Count Date: 17-Feb-18 Site #: 1807000003

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	9	9	61	61	33	33	0	0	2	2	0	0	0	0	0	0	0	0	2	2
10:30:00	28	19	118	57	61	28	1	1	2	0	1	1	0	0	0	0	0	0	2	0
10:45:00	38	10	186	68	89	28	1	0	4	2	1	0	0	0	0	0	0	0	3	1
11:00:00	49	11	241	55	117	28	1	0	4	0	2	1	0	0	0	0	0	0	4	1
11:15:00	62	13	306	65	142	25	1	0	5	1	2	0	0	0	0	0	0	0	4	0
11:30:00	83	21	358	52	170	28	1	0	6	1	3	1	0	0	0	0	0	0	4	0
11:45:00	110	27	427	69	194	24	1	0	9	3	3	0	0	0	0	0	0	0	4	0
12:00:00	123	13	498	71	225	31	1	0	9	0	3	0	0	0	0	0	0	0	4	0
12:15:00	139	16	571	73	253	28	2	1	9	0	3	0	0	0	0	0	0	0	5	1
12:30:00	167	28	638	67	297	44	2	0	10	1	3	0	0	0	0	0	0	0	5	0
12:45:00	181	14	720	82	328	31	2	0	11	1	3	0	0	0	0	0	0	0	6	1
13:00:00	203	22	807	87	381	53	2	0	12	1	3	0	0	0	0	0	0	0	6	0
13:15:00	216	13	887	80	413	32	2	0	13	1	3	0	0	0	0	0	0	0	6	0
13:30:00	232	16	974	87	447	34	2	0	13	0	3	0	0	0	0	0	0	0	7	1
13:45:00	246	14	1049	75	494	47	2	0	14	1	3	0	0	0	0	0	0	0	8	1
14:00:00	261	15	1142	93	552	58	2	0	15	1	3	0	0	0	0	0	0	0	9	1
14:15:00	261	0	1142	0	552	0	2	0	15	0	3	0	0	0	0	0	0	0	9	0
14:16:38	261	0	1142	0	552	0	2	0	15	0	3	0	0	0	0	0	0	0	9	0

Ontario Traffic Inc.

Count Date: 17-Feb-18 Site #: 1807000003

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	7	7	46	46	7	7	0	0	1	1	1	1	0	0	0	0	0	0	1	1
10:30:00	13	6	83	37	20	13	0	0	1	0	1	0	0	0	0	0	0	0	1	0
10:45:00	18	5	129	46	28	8	0	0	2	1	2	1	0	0	0	0	0	0	2	1
11:00:00	25	7	175	46	41	13	0	0	2	0	2	0	0	0	0	0	0	0	5	3
11:15:00	39	14	219	44	57	16	0	0	3	1	4	2	0	0	0	0	0	0	6	1
11:30:00	49	10	264	45	72	15	0	0	6	3	4	0	0	0	0	0	0	0	7	1
11:45:00	56	7	309	45	95	23	0	0	6	0	5	1	0	0	0	0	0	0	7	0
12:00:00	59	3	351	42	108	13	0	0	7	1	5	0	0	0	0	0	0	0	7	0
12:15:00	64	5	418	67	119	11	1	1	8	1	6	1	0	0	0	0	0	0	7	0
12:30:00	70	6	465	47	130	11	1	0	8	0	6	0	0	0	0	0	0	0	7	0
12:45:00	77	7	516	51	145	15	1	0	8	0	7	1	0	0	0	0	0	0	7	0
13:00:00	87	10	567	51	156	11	1	0	8	0	7	0	0	0	0	0	0	0	8	1
13:15:00	92	5	622	55	170	14	1	0	10	2	8	1	0	0	0	0	0	0	9	1
13:30:00	99	7	665	43	183	13	1	0	10	0	8	0	0	0	0	0	0	0	12	3
13:45:00	106	7	714	49	195	12	1	0	11	1	9	1	0	0	0	0	0	0	13	1
14:00:00	112	6	770	56	210	15	2	1	11	0	9	0	0	0	0	0	0	0	13	0
14:15:00	112	0	770	0	210	0	2	0	11	0	9	0	0	0	0	0	0	0	13	0
14:16:38	112	0	770	0	210	0	2	0	11	0	9	0	0	0	0	0	0	0	13	0

Ontario Traffic Inc.

Morning Peak Diagram

Specified Period
From: 6:00:00
To: 9:00:00

One Hour Peak
From: 7:45:00
To: 8:45:00

Municipality: Barrie
Site #: 1807000010
Intersection: Lakeshore Dr & GO Access
TFR File #: 1
Count date: 20-Feb-18

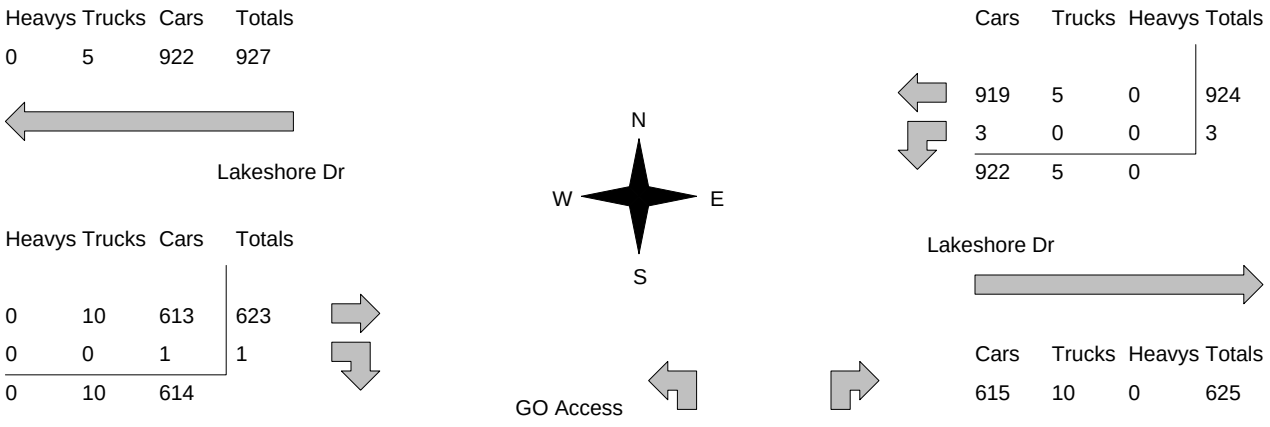
Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Lakeshore Dr runs W/E

East Leg Total: 1552
East Entering: 927
East Peds: 0
Peds Cross: ⧖



Peds Cross: ⧖
West Peds: 0
West Entering: 624
West Leg Total: 1551

Cars 4
Trucks 0
Heavys 0
Totals 4

Cars 3 2 5
Trucks 0 0 0
Heavys 0 0 0
Totals 3 2

Peds Cross: ⋈
South Peds: 0
South Entering: 5
South Leg Total: 9

Comments

Ontario Traffic Inc.

Mid-day Peak Diagram

Specified Period	One Hour Peak
From: 12:00:00	**From:** 13:00:00
To: 14:00:00	**To:** 14:00:00

Municipality: Barrie
Site #: 1807000010
Intersection: Lakeshore Dr & GO Access
TFR File #: 1
Count date: 20-Feb-18

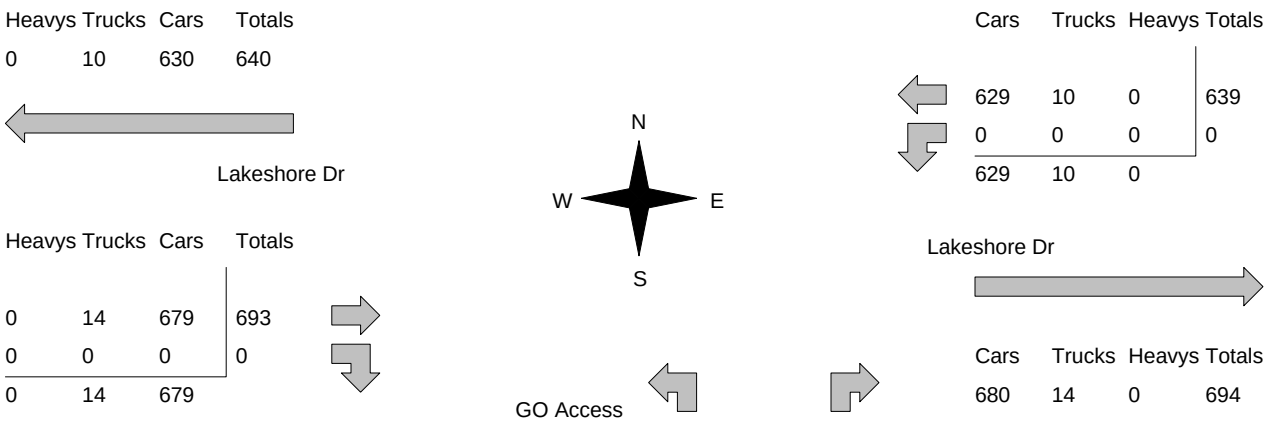
Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Lakeshore Dr runs W/E

East Leg Total: 1333
East Entering: 639
East Peds: 0
Peds Cross: ⧖



Peds Cross: ⧖
West Peds: 2
West Entering: 693
West Leg Total: 1333

Cars 0
Trucks 0
Heavys 0
Totals 0

Cars 1 1 2
Trucks 0 0 0
Heavys 0 0 0
Totals 1 1

Peds Cross: ⋈
South Peds: 0
South Entering: 2
South Leg Total: 2

Comments

Ontario Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:30:00
To: 17:30:00

Municipality: Barrie
Site #: 1807000010
Intersection: Lakeshore Dr & GO Access
TFR File #: 1
Count date: 20-Feb-18

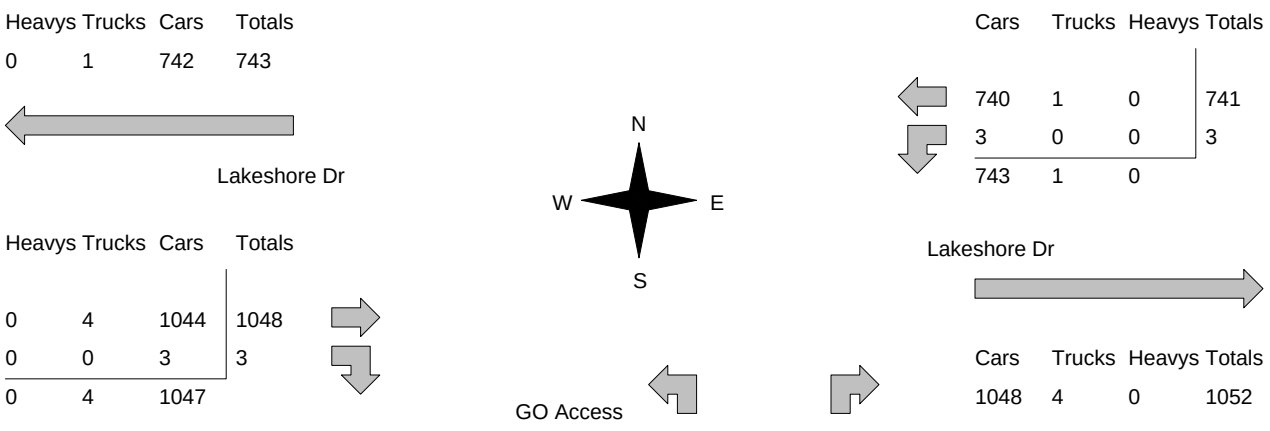
Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Lakeshore Dr runs W/E

East Leg Total: 1796
East Entering: 744
East Peds: 2
Peds Cross: ⧖



Peds Cross: ⧖
West Peds: 5
West Entering: 1051
West Leg Total: 1794

Cars 6
Trucks 0
Heavys 0
Totals 6

Cars 2 4 6
Trucks 0 0 0
Heavys 0 0 0
Totals 2 4

Peds Cross: ⋈
South Peds: 1
South Entering: 6
South Leg Total: 12

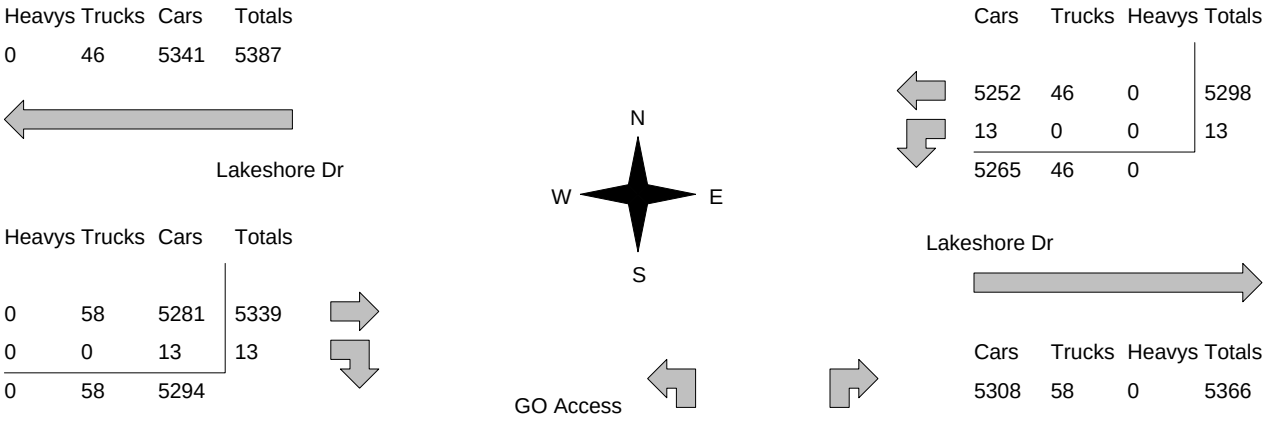
Comments

Ontario Traffic Inc.

Total Count Diagram

Municipality: Barrie	**Weather conditions:**
Site #: 1807000010	
Intersection: Lakeshore Dr & GO Access	**Person(s) who counted:**
TFR File #: 1	
Count date: 20-Feb-18	
**** Signalized Intersection ****	**Major Road:** Lakeshore Dr runs W/E

East Leg Total: 10677
East Entering: 5311
East Peds: 3
Peds Cross: ⧖



Peds Cross:	⧖		Cars	26		Cars	89	27	116	Peds Cross:	⋈
West Peds:	16		Trucks	0		Trucks	0	0	0	South Peds:	2
West Entering:	5352		Heavys	0		Heavys	0	0	0	South Entering:	116
West Leg Total:	10739		Totals	26		Totals	89	27		South Leg Total:	142

Comments

Ontario Traffic Inc.
Traffic Count Summary

Intersection: Lakeshore Dr & GO Access | **Count Date:** 20-Feb-18 | **Municipality:** Barrie

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
6:00:00	0	0	0	0	0	0
7:00:00	0	0	0	0	0	43
8:00:00	0	0	0	0	0	25
9:00:00	0	0	0	0	0	6
12:00:00	0	0	0	0	0	0
13:00:00	0	0	0	0	0	6
14:00:00	0	0	0	0	0	2
15:00:00	0	0	0	0	0	0
16:00:00	0	0	0	0	0	1
17:00:00	0	0	0	0	0	5
18:00:00	0	0	0	0	0	28
Totals:	0	0	0	0	0	116

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys Left	Thru	Right	Grand Total	Total Peds
6:00:00	0	0	0	0	0
7:00:00	37	0	6	43	0
8:00:00	20	0	5	25	0
9:00:00	4	0	2	6	0
12:00:00	0	0	0	0	0
13:00:00	2	0	4	6	0
14:00:00	1	0	1	2	0
15:00:00	0	0	0	0	0
16:00:00	0	0	1	1	1
17:00:00	3	0	2	5	1
18:00:00	22	0	6	28	0
Totals:	89	0	27	116	2

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
6:00:00	0	0	0	0	0	0
7:00:00	3	315	0	318	0	544
8:00:00	0	690	0	690	0	1189
9:00:00	3	931	0	934	0	1547
12:00:00	0	0	0	0	0	0
13:00:00	0	581	0	581	0	1207
14:00:00	0	639	0	639	0	1332
15:00:00	0	0	0	0	0	0
16:00:00	0	668	0	668	0	1498
17:00:00	2	776	0	778	0	1774
18:00:00	5	698	0	703	3	1572
Totals:	13	5298	0	5311	3	10663

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys Left	Thru	Right	Grand Total	Total Peds
6:00:00	0	0	0	0	0
7:00:00	0	225	1	226	1
8:00:00	0	494	5	499	0
9:00:00	0	612	1	613	0
12:00:00	0	0	0	0	0
13:00:00	0	626	0	626	0
14:00:00	0	693	0	693	2
15:00:00	0	0	0	0	0
16:00:00	0	829	1	830	3
17:00:00	0	995	1	996	5
18:00:00	0	865	4	869	5
Totals:	0	5339	13	5352	16

Calculated Values for Traffic Crossing Major Street

Hours Ending:	7:00	8:00	9:00	13:00	14:00	16:00	17:00	18:00
Crossing Values:	38	20	4	2	3	3	8	30

Ontario Traffic Inc.

Count Date: 20-Feb-18 Site #: 1807000010

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:01:44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00:36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15:43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ontario Traffic Inc.

Count Date: 20-Feb-18 Site #: 1807000010

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	1	1	50	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30:00	2	1	130	80	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
6:45:00	3	1	227	97	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
7:00:00	3	0	314	87	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
7:15:00	3	0	431	117	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0
7:30:00	3	0	585	154	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
7:45:00	3	0	775	190	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0
8:00:00	3	0	1002	227	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0
8:15:00	4	1	1237	235	0	0	0	0	5	2	0	0	0	0	0	0	0	0	0	0
8:30:00	4	0	1458	221	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0
8:45:00	6	2	1694	236	0	0	0	0	8	3	0	0	0	0	0	0	0	0	0	0
9:00:00	6	0	1928	234	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0
9:01:44	6	0	1928	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0
12:00:00	6	0	1928	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0
12:15:00	6	0	2074	146	0	0	0	0	9	1	0	0	0	0	0	0	0	0	0	0
12:30:00	6	0	2214	140	0	0	0	0	10	1	0	0	0	0	0	0	0	0	0	0
12:45:00	6	0	2358	144	0	0	0	0	11	1	0	0	0	0	0	0	0	0	0	0
13:00:00	6	0	2503	145	0	0	0	0	14	3	0	0	0	0	0	0	0	0	0	0
13:15:00	6	0	2652	149	0	0	0	0	15	1	0	0	0	0	0	0	0	0	0	0
13:30:00	6	0	2835	183	0	0	0	0	19	4	0	0	0	0	0	0	0	0	0	0
13:45:00	6	0	2997	162	0	0	0	0	23	4	0	0	0	0	0	0	0	0	0	0
14:00:00	6	0	3132	135	0	0	0	0	24	1	0	0	0	0	0	0	0	0	0	0
14:00:36	6	0	3132	0	0	0	0	0	24	0	0	0	0	0	0	0	0	0	0	0
15:00:00	6	0	3132	0	0	0	0	0	24	0	0	0	0	0	0	0	0	0	0	0
15:15:00	6	0	3276	144	0	0	0	0	27	3	0	0	0	0	0	0	0	0	0	0
15:30:00	6	0	3444	168	0	0	0	0	30	3	0	0	0	0	0	0	0	0	0	0
15:45:00	6	0	3618	174	0	0	0	0	33	3	0	0	0	0	0	0	0	0	0	0
16:00:00	6	0	3790	172	0	0	0	0	34	1	0	0	0	0	0	0	0	0	0	0
16:15:00	6	0	3991	201	0	0	0	0	35	1	0	0	0	0	0	0	0	0	0	0
16:30:00	7	1	4185	194	0	0	0	0	42	7	0	0	0	0	0	0	0	0	0	0
16:45:00	8	1	4368	183	0	0	0	0	42	0	0	0	0	0	0	0	0	0	0	0
17:00:00	8	0	4558	190	0	0	0	0	42	0	0	0	0	0	0	0	0	0	0	0
17:15:00	9	1	4749	191	0	0	0	0	43	1	0	0	0	0	0	0	0	0	0	0
17:30:00	10	1	4925	176	0	0	0	0	43	0	0	0	0	0	0	0	0	0	2	2
17:45:00	11	1	5080	155	0	0	0	0	44	1	0	0	0	0	0	0	0	0	2	0
18:00:00	13	2	5252	172	0	0	0	0	46	2	0	0	0	0	0	0	0	0	3	1
18:15:00	13	0	5252	0	0	0	0	0	46	0	0	0	0	0	0	0	0	0	3	0
18:15:43	13	0	5252	0	0	0	0	0	46	0	0	0	0	0	0	0	0	0	3	0

Ontario Traffic Inc.

Count Date: 20-Feb-18 Site #: 1807000010

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	11	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30:00	16	5	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45:00	29	13	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00:00	37	8	0	0	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	54	17	0	0	11	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	57	3	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	57	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	57	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	60	3	0	0	12	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30:00	60	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45:00	60	0	0	0	13	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00:00	61	1	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:01:44	61	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00:00	61	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15:00	61	0	0	0	15	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30:00	63	2	0	0	16	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45:00	63	0	0	0	17	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00:00	63	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15:00	63	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30:00	64	1	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45:00	64	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00:00	64	0	0	0	18	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00:36	64	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00:00	64	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15:00	64	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30:00	64	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45:00	64	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
16:00:00	64	0	0	0	19	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
16:15:00	66	2	0	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
16:30:00	67	1	0	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
16:45:00	67	0	0	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
17:00:00	67	0	0	0	21	2	0	0	0	0	0	0	0	0	0	0	0	0	2	1
17:15:00	68	1	0	0	22	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0
17:30:00	69	1	0	0	23	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0
17:45:00	86	17	0	0	26	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0
18:00:00	89	3	0	0	27	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0
18:15:00	89	0	0	0	27	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
18:15:43	89	0	0	0	27	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0

Ontario Traffic Inc.

Count Date: 20-Feb-18 Site #: 1807000010

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	0	0	35	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30:00	0	0	84	49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45:00	0	0	154	70	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1
7:00:00	0	0	223	69	1	1	0	0	2	1	0	0	0	0	0	0	0	0	1	0
7:15:00	0	0	325	102	5	4	0	0	5	3	0	0	0	0	0	0	0	0	1	0
7:30:00	0	0	432	107	6	1	0	0	8	3	0	0	0	0	0	0	0	0	1	0
7:45:00	0	0	561	129	6	0	0	0	8	0	0	0	0	0	0	0	0	0	1	0
8:00:00	0	0	707	146	6	0	0	0	12	4	0	0	0	0	0	0	0	0	1	0
8:15:00	0	0	874	167	7	1	0	0	14	2	0	0	0	0	0	0	0	0	1	0
8:30:00	0	0	1026	152	7	0	0	0	16	2	0	0	0	0	0	0	0	0	1	0
8:45:00	0	0	1174	148	7	0	0	0	18	2	0	0	0	0	0	0	0	0	1	0
9:00:00	0	0	1311	137	7	0	0	0	20	2	0	0	0	0	0	0	0	0	1	0
9:01:44	0	0	1311	0	7	0	0	0	20	0	0	0	0	0	0	0	0	0	1	0
12:00:00	0	0	1311	0	7	0	0	0	20	0	0	0	0	0	0	0	0	0	1	0
12:15:00	0	0	1486	175	7	0	0	0	21	1	0	0	0	0	0	0	0	0	1	0
12:30:00	0	0	1651	165	7	0	0	0	25	4	0	0	0	0	0	0	0	0	1	0
12:45:00	0	0	1799	148	7	0	0	0	27	2	0	0	0	0	0	0	0	0	1	0
13:00:00	0	0	1930	131	7	0	0	0	27	0	0	0	0	0	0	0	0	0	1	0
13:15:00	0	0	2103	173	7	0	0	0	31	4	0	0	0	0	0	0	0	0	3	2
13:30:00	0	0	2284	181	7	0	0	0	37	6	0	0	0	0	0	0	0	0	3	0
13:45:00	0	0	2442	158	7	0	0	0	38	1	0	0	0	0	0	0	0	0	3	0
14:00:00	0	0	2609	167	7	0	0	0	41	3	0	0	0	0	0	0	0	0	3	0
14:00:36	0	0	2609	0	7	0	0	0	41	0	0	0	0	0	0	0	0	0	3	0
15:00:00	0	0	2609	0	7	0	0	0	41	0	0	0	0	0	0	0	0	0	3	0
15:15:00	0	0	2831	222	8	1	0	0	43	2	0	0	0	0	0	0	0	0	3	0
15:30:00	0	0	3001	170	8	0	0	0	45	2	0	0	0	0	0	0	0	0	4	1
15:45:00	0	0	3204	203	8	0	0	0	48	3	0	0	0	0	0	0	0	0	4	0
16:00:00	0	0	3428	224	8	0	0	0	51	3	0	0	0	0	0	0	0	0	6	2
16:15:00	0	0	3677	249	8	0	0	0	53	2	0	0	0	0	0	0	0	0	8	2
16:30:00	0	0	3889	212	9	1	0	0	54	1	0	0	0	0	0	0	0	0	10	2
16:45:00	0	0	4150	261	9	0	0	0	55	1	0	0	0	0	0	0	0	0	11	1
17:00:00	0	0	4418	268	9	0	0	0	56	1	0	0	0	0	0	0	0	0	11	0
17:15:00	0	0	4676	258	12	3	0	0	58	2	0	0	0	0	0	0	0	0	15	4
17:30:00	0	0	4933	257	12	0	0	0	58	0	0	0	0	0	0	0	0	0	15	0
17:45:00	0	0	5130	197	12	0	0	0	58	0	0	0	0	0	0	0	0	0	16	1
18:00:00	0	0	5281	151	13	1	0	0	58	0	0	0	0	0	0	0	0	0	16	0
18:15:00	0	0	5281	0	13	0	0	0	58	0	0	0	0	0	0	0	0	0	16	0
18:15:43	0	0	5281	0	13	0	0	0	58	0	0	0	0	0	0	0	0	0	16	0

Ontario Traffic Inc.

Mid-day Peak Diagram

Specified Period
From: 10:00:00
To: 14:00:00

One Hour Peak
From: 13:00:00
To: 14:00:00

Municipality: Barrie
Site #: 1807000005
Intersection: Lakeshore Dr & GO Access
TFR File #: 1
Count date: 17-Feb-18

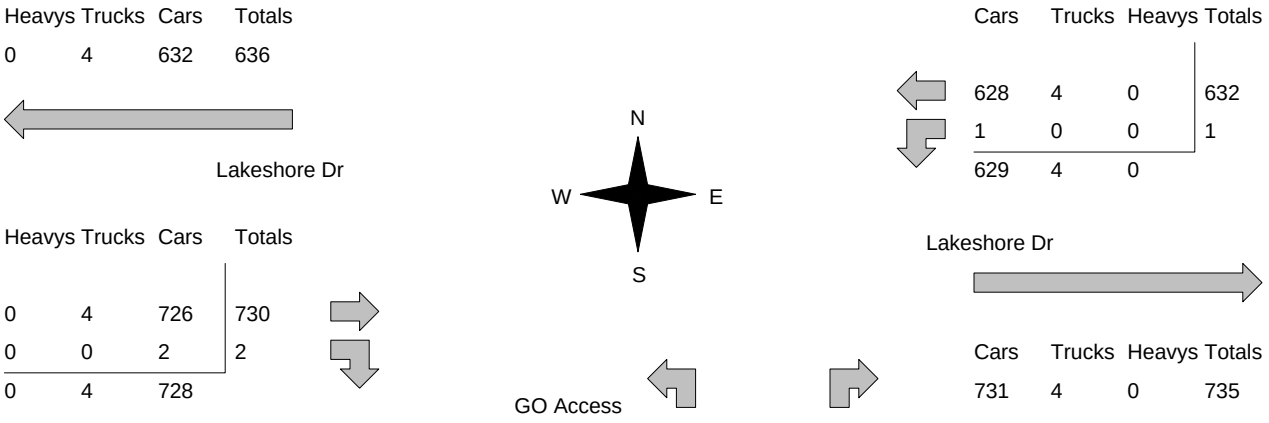
Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Lakeshore Dr runs W/E

East Leg Total: 1368
East Entering: 633
East Peds: 1
Peds Cross: ⧖



Peds Cross: ⧖
West Peds: 9
West Entering: 732
West Leg Total: 1368

Cars 3
Trucks 0
Heavys 0
Totals 3

Cars 4 5 9
Trucks 0 0 0
Heavys 0 0 0
Totals 4 5

Peds Cross: ⋈
South Peds: 1
South Entering: 9
South Leg Total: 12

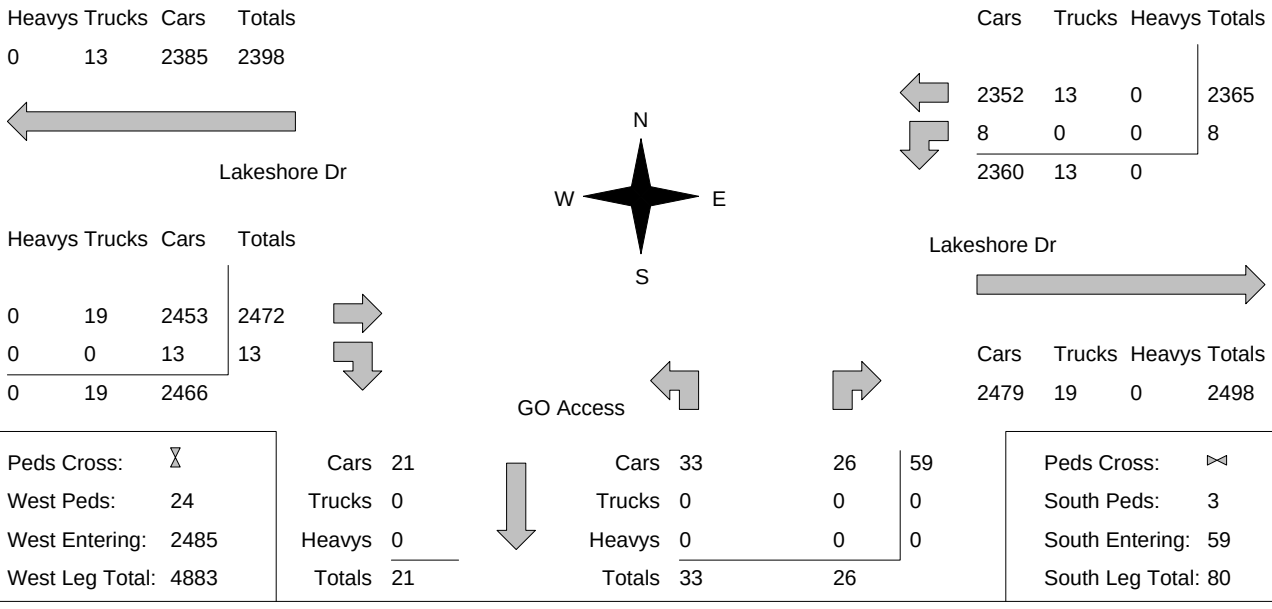
Comments

Ontario Traffic Inc.

Total Count Diagram

Municipality: Barrie	**Weather conditions:**
Site #: 1807000005	
Intersection: Lakeshore Dr & GO Access	**Person(s) who counted:**
TFR File #: 1	
Count date: 17-Feb-18	
**** Signalized Intersection ****	**Major Road:** Lakeshore Dr runs W/E

East Leg Total: 4871
East Entering: 2373
East Peds: 10
Peds Cross: ⧖



Peds Cross: ⧖
West Peds: 24
West Entering: 2485
West Leg Total: 4883

Cars 21
Trucks 0
Heavys 0
Totals 21

Cars 33 26 59
Trucks 0 0 0
Heavys 0 0 0
Totals 33 26

Peds Cross: ⋈
South Peds: 3
South Entering: 59
South Leg Total: 80

Comments

Ontario Traffic Inc.
Traffic Count Summary

Intersection: Lakeshore Dr & GO Access | **Count Date:** 17-Feb-18 | **Municipality:** Barrie

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
10:00:00	0	0	0	0	0	0
11:00:00	0	0	0	0	0	22
12:00:00	0	0	0	0	0	19
13:00:00	0	0	0	0	0	9
14:00:00	0	0	0	0	0	9
Totals:	0	0	0	0	0	59

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
10:00:00	0	0	0	0	0
11:00:00	13	0	9	22	0
12:00:00	12	0	7	19	1
13:00:00	4	0	5	9	1
14:00:00	4	0	5	9	1
Totals:	33	0	26	59	3

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
10:00:00	0	0	0	0	0	0
11:00:00	4	530	0	534	5	1041
12:00:00	1	599	0	600	0	1184
13:00:00	2	604	0	606	4	1268
14:00:00	1	632	0	633	1	1365
Totals:	8	2365	0	2373	10	4858

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
10:00:00	0	0	0	0	0
11:00:00	0	501	6	507	3
12:00:00	0	582	2	584	9
13:00:00	0	659	3	662	3
14:00:00	0	730	2	732	9
Totals:	0	2472	13	2485	24

Calculated Values for Traffic Crossing Major Street

Hours Ending:	0:00	0:00	0:00	10:00	11:00	12:00	13:00	14:00
Crossing Values:	0	0	0	0	21	21	11	14

Ontario Traffic Inc.

Count Date: 17-Feb-18 Site #: 1807000005

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:16:49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ontario Traffic Inc.

Count Date: 17-Feb-18 Site #: 1807000005

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	2	2	118	118	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30:00	2	0	251	133	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
10:45:00	3	1	387	136	0	0	0	0	2	0	0	0	0	0	0	0	0	0	3	3
11:00:00	4	1	528	141	0	0	0	0	2	0	0	0	0	0	0	0	0	0	5	2
11:15:00	4	0	660	132	0	0	0	0	3	1	0	0	0	0	0	0	0	0	5	0
11:30:00	4	0	822	162	0	0	0	0	5	2	0	0	0	0	0	0	0	0	5	0
11:45:00	4	0	966	144	0	0	0	0	5	0	0	0	0	0	0	0	0	0	5	0
12:00:00	5	1	1124	158	0	0	0	0	5	0	0	0	0	0	0	0	0	0	5	0
12:15:00	5	0	1280	156	0	0	0	0	6	1	0	0	0	0	0	0	0	0	9	4
12:30:00	5	0	1431	151	0	0	0	0	7	1	0	0	0	0	0	0	0	0	9	0
12:45:00	6	1	1578	147	0	0	0	0	8	1	0	0	0	0	0	0	0	0	9	0
13:00:00	7	1	1724	146	0	0	0	0	9	1	0	0	0	0	0	0	0	0	9	0
13:15:00	7	0	1887	163	0	0	0	0	9	0	0	0	0	0	0	0	0	0	9	0
13:30:00	7	0	2037	150	0	0	0	0	10	1	0	0	0	0	0	0	0	0	9	0
13:45:00	7	0	2203	166	0	0	0	0	11	1	0	0	0	0	0	0	0	0	10	1
14:00:00	8	1	2352	149	0	0	0	0	13	2	0	0	0	0	0	0	0	0	10	0
14:15:00	8	0	2352	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	10	0
14:16:49	8	0	2352	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	10	0

Ontario Traffic Inc.

Count Date: 17-Feb-18 Site #: 1807000005

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	3	3	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30:00	3	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45:00	4	1	0	0	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00:00	13	9	0	0	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15:00	21	8	0	0	14	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30:00	23	2	0	0	15	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45:00	23	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
12:00:00	25	2	0	0	16	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12:15:00	25	0	0	0	17	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12:30:00	26	1	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1
12:45:00	28	2	0	0	18	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0
13:00:00	29	1	0	0	21	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0
13:15:00	29	0	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
13:30:00	31	2	0	0	22	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0
13:45:00	32	1	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1
14:00:00	33	1	0	0	26	4	0	0	0	0	0	0	0	0	0	0	0	0	3	0
14:15:00	33	0	0	0	26	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
14:16:49	33	0	0	0	26	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0

Ontario Traffic Inc.

Count Date: 17-Feb-18 Site #: 1807000005

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	0	0	114	114	4	4	0	0	2	2	0	0	0	0	0	0	0	0	0	0
10:30:00	0	0	229	115	5	1	0	0	2	0	0	0	0	0	0	0	0	0	2	2
10:45:00	0	0	360	131	5	0	0	0	3	1	0	0	0	0	0	0	0	0	3	1
11:00:00	0	0	498	138	6	1	0	0	3	0	0	0	0	0	0	0	0	0	3	0
11:15:00	0	0	624	126	6	0	0	0	5	2	0	0	0	0	0	0	0	0	7	4
11:30:00	0	0	769	145	6	0	0	0	8	3	0	0	0	0	0	0	0	0	7	0
11:45:00	0	0	922	153	6	0	0	0	10	2	0	0	0	0	0	0	0	0	8	1
12:00:00	0	0	1072	150	8	2	0	0	11	1	0	0	0	0	0	0	0	0	12	4
12:15:00	0	0	1244	172	9	1	0	0	13	2	0	0	0	0	0	0	0	0	12	0
12:30:00	0	0	1399	155	9	0	0	0	13	0	0	0	0	0	0	0	0	0	14	2
12:45:00	0	0	1567	168	10	1	0	0	13	0	0	0	0	0	0	0	0	0	14	0
13:00:00	0	0	1727	160	11	1	0	0	15	2	0	0	0	0	0	0	0	0	15	1
13:15:00	0	0	1893	166	12	1	0	0	17	2	0	0	0	0	0	0	0	0	18	3
13:30:00	0	0	2081	188	12	0	0	0	17	0	0	0	0	0	0	0	0	0	21	3
13:45:00	0	0	2252	171	12	0	0	0	19	2	0	0	0	0	0	0	0	0	22	1
14:00:00	0	0	2453	201	13	1	0	0	19	0	0	0	0	0	0	0	0	0	24	2
14:15:00	0	0	2453	0	13	0	0	0	19	0	0	0	0	0	0	0	0	0	24	0
14:16:49	0	0	2453	0	13	0	0	0	19	0	0	0	0	0	0	0	0	0	24	0

Ontario Traffic Inc.

Morning Peak Diagram

Specified Period
From: 6:00:00
To: 9:00:00

One Hour Peak
From: 8:00:00
To: 9:00:00

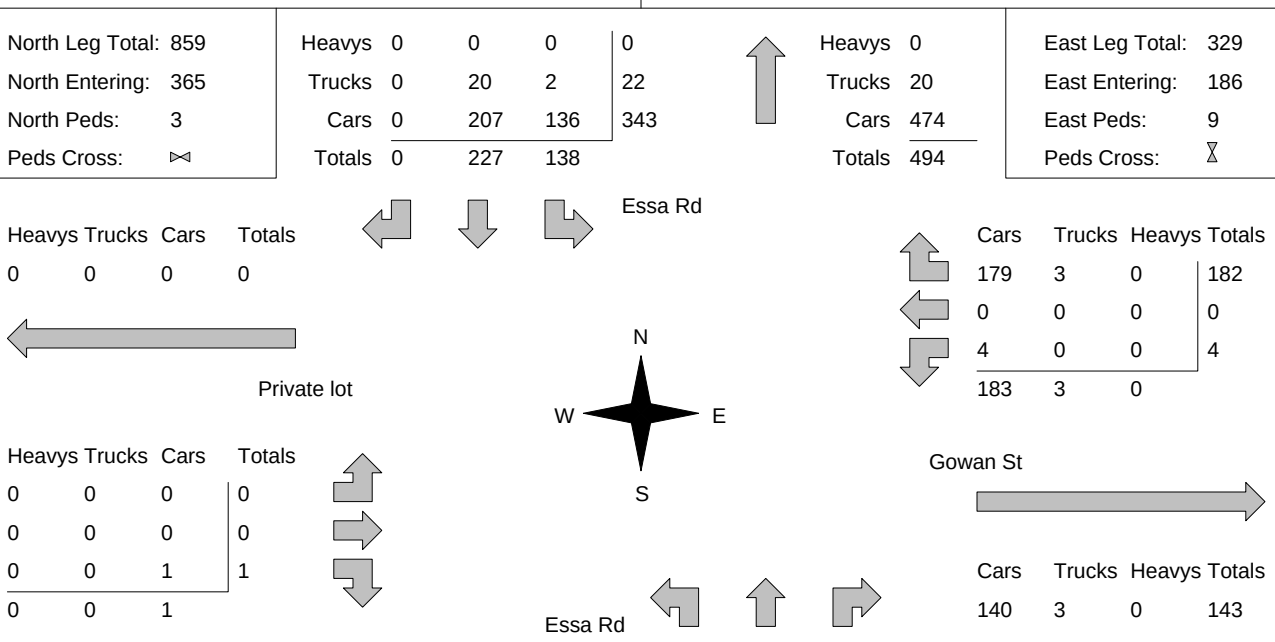
Municipality: Barrie
Site #: 1807000006
Intersection: Essa Rd & Gowan St
TFR File #: 1
Count date: 20-Feb-18

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Essa Rd runs N/S



Comments

Ontario Traffic Inc.

Mid-day Peak Diagram

Specified Period
From: 12:00:00
To: 14:00:00

One Hour Peak
From: 12:15:00
To: 13:15:00

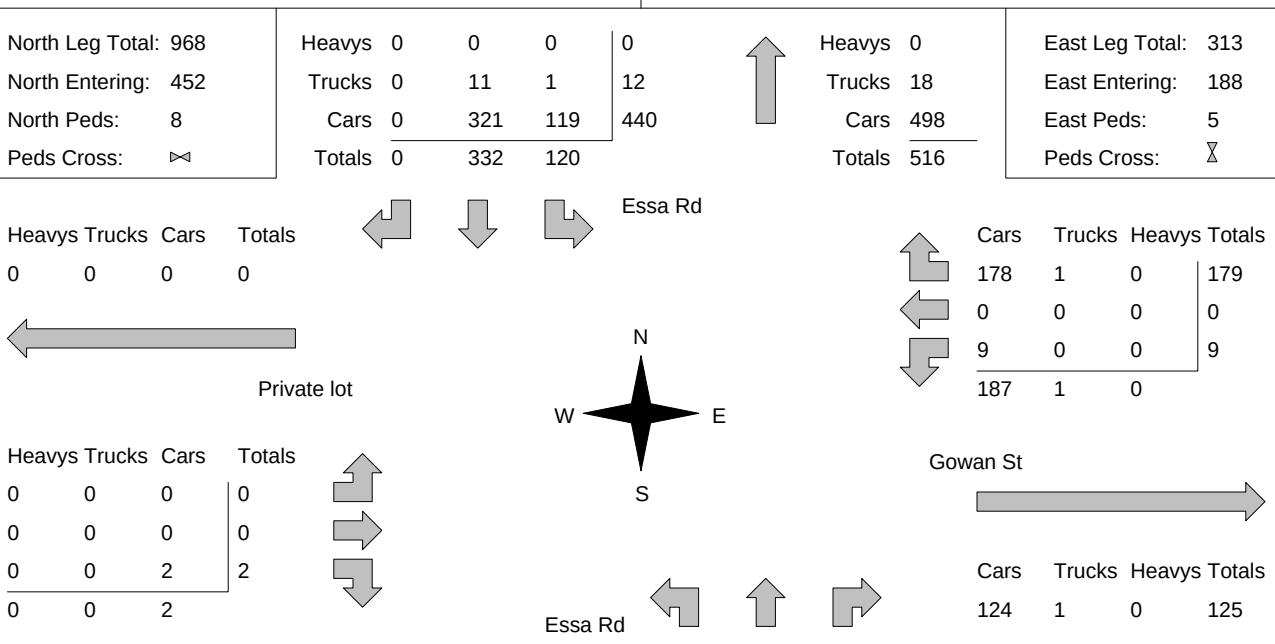
Municipality: Barrie
Site #: 1807000006
Intersection: Essa Rd & Gowan St
TFR File #: 1
Count date: 20-Feb-18

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Essa Rd runs N/S



Comments

Ontario Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:30:00
To: 17:30:00

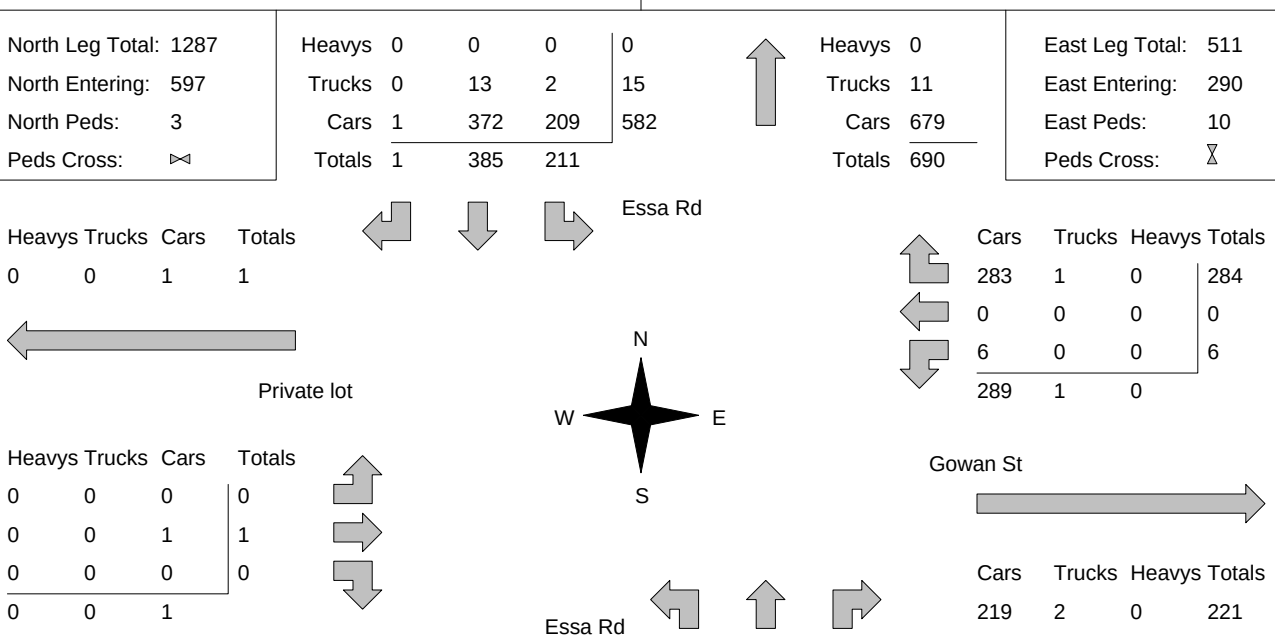
Municipality: Barrie
Site #: 1807000006
Intersection: Essa Rd & Gowan St
TFR File #: 1
Count date: 20-Feb-18

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Essa Rd runs N/S



Comments

Ontario Traffic Inc.

Total Count Diagram

Municipality: Barrie
Site #: 1807000006
Intersection: Essa Rd & Gowan St
TFR File #: 1
Count date: 20-Feb-18

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Essa Rd runs N/S

North Leg Total:	7330			
North Entering:	3489			
North Peds:	30			
Peds Cross:	⋈			

Heavys	0	0	0	0
Trucks	0	106	10	116
Cars	4	2204	1165	3373
Totals	4	2310	1175	

Heavys	0
Trucks	124
Cars	3717
Totals	3841

East Leg Total:	2848		
East Entering:	1615		
East Peds:	61		
Peds Cross:	⧖		

Essa Rd

Heavys	Trucks	Cars	Totals
0	0	8	8

Private lot

Heavys	Trucks	Cars	Totals
0	0	4	4
0	0	2	2
0	0	7	7
0	0	13	

Cars	Trucks	Heavys	Totals
1541	12	0	1553
0	0	0	0
62	0	0	62
1603	12	0	

N
W E
S

Gowan St

Cars	Trucks	Heavys	Totals
1222	11	0	1233

Essa Rd

Peds Cross:	⧖		
West Peds:	74		
West Entering:	13		
West Leg Total:	21		

Cars	2273			
Trucks	106			
Heavys	0			
Totals	2379			

Cars	4	2172	55	2231
Trucks	0	112	1	113
Heavys	0	0	0	0
Totals	4	2284	56	

Peds Cross:	⋈		
South Peds:	29		
South Entering:	2344		
South Leg Total:	4723		

Comments

Ontario Traffic Inc.
Traffic Count Summary

Intersection: Essa Rd & Gowan St | **Count Date:** 20-Feb-18 | **Municipality:** Barrie

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
6:00:00	0	0	0	0	0	0
7:00:00	134	129	0	263	1	359
8:00:00	152	211	0	363	2	562
9:00:00	138	227	0	365	3	682
12:00:00	0	0	0	0	0	0
13:00:00	123	333	0	456	7	779
14:00:00	119	315	0	434	4	764
15:00:00	0	0	0	0	0	0
16:00:00	141	354	2	497	8	841
17:00:00	210	369	2	581	2	958
18:00:00	158	372	0	530	3	888
Totals:	1175	2310	4	3489	30	5833

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys Left	Thru	Right	Grand Total	Total Peds
6:00:00	0	0	0	0	0
7:00:00	0	84	12	96	0
8:00:00	0	193	6	199	0
9:00:00	0	312	5	317	2
12:00:00	0	0	0	0	0
13:00:00	0	316	7	323	5
14:00:00	0	324	6	330	8
15:00:00	0	0	0	0	0
16:00:00	3	338	3	344	10
17:00:00	0	366	11	377	4
18:00:00	1	351	6	358	0
Totals:	4	2284	56	2344	29

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
6:00:00	0	0	0	0	0	0
7:00:00	6	0	59	65	6	65
8:00:00	4	0	134	138	5	140
9:00:00	4	0	182	186	9	187
12:00:00	0	0	0	0	0	0
13:00:00	8	0	172	180	4	182
14:00:00	11	0	191	202	10	203
15:00:00	0	0	0	0	0	0
16:00:00	6	0	254	260	5	263
17:00:00	3	0	277	280	15	281
18:00:00	20	0	284	304	7	307
Totals:	62	0	1553	1615	61	1628

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys Left	Thru	Right	Grand Total	Total Peds
6:00:00	0	0	0	0	0
7:00:00	0	0	0	0	5
8:00:00	1	0	1	2	0
9:00:00	0	0	1	1	1
12:00:00	0	0	0	0	0
13:00:00	0	0	2	2	5
14:00:00	0	0	1	1	15
15:00:00	0	0	0	0	0
16:00:00	1	0	2	3	22
17:00:00	1	0	0	1	13
18:00:00	1	2	0	3	13
Totals:	4	2	7	13	74

Calculated Values for Traffic Crossing Major Street

Hours Ending:	7:00	8:00	9:00	13:00	14:00	16:00	17:00	18:00
Crossing Values:	7	7	9	20	23	25	10	26

Ontario Traffic Inc.

Count Date: 20-Feb-18 Site #: 1807000006

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	40	40	23	23	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
6:30:00	75	35	56	33	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0
6:45:00	105	30	89	33	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0
7:00:00	134	29	123	34	0	0	0	0	6	2	0	0	0	0	0	0	0	0	1	1
7:15:00	164	30	167	44	0	0	0	0	11	5	0	0	0	0	0	0	0	0	3	2
7:30:00	190	26	204	37	0	0	0	0	14	3	0	0	0	0	0	0	0	0	3	0
7:45:00	235	45	260	56	0	0	0	0	16	2	0	0	0	0	0	0	0	0	3	0
8:00:00	285	50	321	61	0	0	1	1	19	3	0	0	0	0	0	0	0	0	3	0
8:15:00	320	35	378	57	0	0	1	0	22	3	0	0	0	0	0	0	0	0	5	2
8:30:00	356	36	422	44	0	0	2	1	29	7	0	0	0	0	0	0	0	0	5	0
8:45:00	383	27	479	57	0	0	2	0	32	3	0	0	0	0	0	0	0	0	5	0
9:00:00	421	38	528	49	0	0	3	1	39	7	0	0	0	0	0	0	0	0	6	1
9:00:43	421	0	528	0	0	0	3	0	39	0	0	0	0	0	0	0	0	0	6	0
12:00:00	421	0	528	0	0	0	3	0	39	0	0	0	0	0	0	0	0	0	6	0
12:15:00	451	30	609	81	0	0	3	0	42	3	0	0	0	0	0	0	0	0	7	1
12:30:00	478	27	691	82	0	0	3	0	44	2	0	0	0	0	0	0	0	0	8	1
12:45:00	512	34	776	85	0	0	4	1	47	3	0	0	0	0	0	0	0	0	10	2
13:00:00	543	31	849	73	0	0	4	0	51	4	0	0	0	0	0	0	0	0	13	3
13:15:00	570	27	930	81	0	0	4	0	53	2	0	0	0	0	0	0	0	0	15	2
13:30:00	605	35	1007	77	0	0	4	0	55	2	0	0	0	0	0	0	0	0	15	0
13:45:00	629	24	1088	81	0	0	4	0	58	3	0	0	0	0	0	0	0	0	15	0
14:00:00	661	32	1150	62	0	0	5	1	65	7	0	0	0	0	0	0	0	0	17	2
14:01:50	661	0	1150	0	0	0	5	0	65	0	0	0	0	0	0	0	0	0	17	0
15:00:00	661	0	1150	0	0	0	5	0	65	0	0	0	0	0	0	0	0	0	17	0
15:15:00	702	41	1242	92	0	0	6	1	68	3	0	0	0	0	0	0	0	0	21	4
15:30:00	731	29	1331	89	2	2	6	0	71	3	0	0	0	0	0	0	0	0	23	2
15:45:00	766	35	1404	73	2	0	6	0	74	3	0	0	0	0	0	0	0	0	23	0
16:00:00	800	34	1491	87	2	0	7	1	78	4	0	0	0	0	0	0	0	0	25	2
16:15:00	851	51	1582	91	2	0	8	1	83	5	0	0	0	0	0	0	0	0	26	1
16:30:00	891	40	1679	97	3	1	8	0	84	1	0	0	0	0	0	0	0	0	27	1
16:45:00	955	64	1776	97	4	1	8	0	89	5	0	0	0	0	0	0	0	0	27	0
17:00:00	1009	54	1846	70	4	0	8	0	92	3	0	0	0	0	0	0	0	0	27	0
17:15:00	1060	51	1965	119	4	0	9	1	95	3	0	0	0	0	0	0	0	0	27	0
17:30:00	1100	40	2051	86	4	0	10	1	97	2	0	0	0	0	0	0	0	0	30	3
17:45:00	1136	36	2127	76	4	0	10	0	103	6	0	0	0	0	0	0	0	0	30	0
18:00:00	1165	29	2204	77	4	0	10	0	106	3	0	0	0	0	0	0	0	0	30	0
18:15:00	1165	0	2204	0	4	0	10	0	106	0	0	0	0	0	0	0	0	0	30	0
18:17:06	1165	0	2204	0	4	0	10	0	106	0	0	0	0	0	0	0	0	0	30	0

Ontario Traffic Inc.

Count Date: 20-Feb-18 Site #: 1807000006

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30:00	1	1	0	0	20	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45:00	2	1	0	0	41	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00:00	6	4	0	0	59	18	0	0	0	0	0	0	0	0	0	0	0	0	6	6
7:15:00	10	4	0	0	81	22	0	0	0	0	0	0	0	0	0	0	0	0	7	1
7:30:00	10	0	0	0	110	29	0	0	0	0	0	0	0	0	0	0	0	0	8	1
7:45:00	10	0	0	0	145	35	0	0	0	0	1	1	0	0	0	0	0	0	9	1
8:00:00	10	0	0	0	191	46	0	0	0	0	2	1	0	0	0	0	0	0	11	2
8:15:00	10	0	0	0	235	44	0	0	0	0	2	0	0	0	0	0	0	0	12	1
8:30:00	11	1	0	0	273	38	0	0	0	0	2	0	0	0	0	0	0	0	14	2
8:45:00	12	1	0	0	318	45	0	0	0	0	2	0	0	0	0	0	0	0	17	3
9:00:00	14	2	0	0	370	52	0	0	0	0	5	3	0	0	0	0	0	0	20	3
9:00:43	14	0	0	0	370	0	0	0	0	0	5	0	0	0	0	0	0	0	20	0
12:00:00	14	0	0	0	370	0	0	0	0	0	5	0	0	0	0	0	0	0	20	0
12:15:00	17	3	0	0	413	43	0	0	0	0	5	0	0	0	0	0	0	0	21	1
12:30:00	19	2	0	0	466	53	0	0	0	0	5	0	0	0	0	0	0	0	21	0
12:45:00	22	3	0	0	499	33	0	0	0	0	5	0	0	0	0	0	0	0	23	2
13:00:00	22	0	0	0	541	42	0	0	0	0	6	1	0	0	0	0	0	0	24	1
13:15:00	26	4	0	0	591	50	0	0	0	0	6	0	0	0	0	0	0	0	26	2
13:30:00	26	0	0	0	630	39	0	0	0	0	7	1	0	0	0	0	0	0	29	3
13:45:00	30	4	0	0	678	48	0	0	0	0	7	0	0	0	0	0	0	0	32	3
14:00:00	33	3	0	0	731	53	0	0	0	0	7	0	0	0	0	0	0	0	34	2
14:01:50	33	0	0	0	731	0	0	0	0	0	7	0	0	0	0	0	0	0	34	0
15:00:00	33	0	0	0	731	0	0	0	0	0	7	0	0	0	0	0	0	0	34	0
15:15:00	36	3	0	0	797	66	0	0	0	0	7	0	0	0	0	0	0	0	35	1
15:30:00	36	0	0	0	863	66	0	0	0	0	8	1	0	0	0	0	0	0	36	1
15:45:00	37	1	0	0	926	63	0	0	0	0	10	2	0	0	0	0	0	0	39	3
16:00:00	39	2	0	0	981	55	0	0	0	0	11	1	0	0	0	0	0	0	39	0
16:15:00	41	2	0	0	1055	74	0	0	0	0	11	0	0	0	0	0	0	0	42	3
16:30:00	42	1	0	0	1112	57	0	0	0	0	11	0	0	0	0	0	0	0	46	4
16:45:00	42	0	0	0	1189	77	0	0	0	0	11	0	0	0	0	0	0	0	51	5
17:00:00	42	0	0	0	1257	68	0	0	0	0	12	1	0	0	0	0	0	0	54	3
17:15:00	48	6	0	0	1338	81	0	0	0	0	12	0	0	0	0	0	0	0	56	2
17:30:00	48	0	0	0	1395	57	0	0	0	0	12	0	0	0	0	0	0	0	56	0
17:45:00	59	11	0	0	1487	92	0	0	0	0	12	0	0	0	0	0	0	0	59	3
18:00:00	62	3	0	0	1541	54	0	0	0	0	12	0	0	0	0	0	0	0	61	2
18:15:00	62	0	0	0	1541	0	0	0	0	0	12	0	0	0	0	0	0	0	61	0
18:17:06	62	0	0	0	1541	0	0	0	0	0	12	0	0	0	0	0	0	0	61	0

Ontario Traffic Inc.

Count Date: 20-Feb-18 Site #: 1807000006

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	0	0	14	14	2	2	0	0	5	5	0	0	0	0	0	0	0	0	0	0
6:30:00	0	0	26	12	6	4	0	0	10	5	0	0	0	0	0	0	0	0	0	0
6:45:00	0	0	44	18	8	2	0	0	16	6	0	0	0	0	0	0	0	0	0	0
7:00:00	0	0	66	22	12	4	0	0	18	2	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	103	37	16	4	0	0	22	4	0	0	0	0	0	0	0	0	0	0
7:30:00	0	0	136	33	17	1	0	0	26	4	0	0	0	0	0	0	0	0	0	0
7:45:00	0	0	185	49	17	0	0	0	29	3	0	0	0	0	0	0	0	0	0	0
8:00:00	0	0	246	61	18	1	0	0	31	2	0	0	0	0	0	0	0	0	0	0
8:15:00	0	0	310	64	19	1	0	0	34	3	0	0	0	0	0	0	0	0	0	0
8:30:00	0	0	377	67	19	0	0	0	38	4	0	0	0	0	0	0	0	0	0	0
8:45:00	0	0	453	76	20	1	0	0	43	5	0	0	0	0	0	0	0	0	1	1
9:00:00	0	0	541	88	22	2	0	0	48	5	1	1	0	0	0	0	0	0	2	1
9:00:43	0	0	541	0	22	0	0	0	48	0	1	0	0	0	0	0	0	0	2	0
12:00:00	0	0	541	0	22	0	0	0	48	0	1	0	0	0	0	0	0	0	2	0
12:15:00	0	0	607	66	24	2	0	0	54	6	1	0	0	0	0	0	0	0	3	1
12:30:00	0	0	687	80	26	2	0	0	56	2	1	0	0	0	0	0	0	0	4	1
12:45:00	0	0	753	66	27	1	0	0	60	4	1	0	0	0	0	0	0	0	6	2
13:00:00	0	0	842	89	29	2	0	0	63	3	1	0	0	0	0	0	0	0	7	1
13:15:00	0	0	927	85	29	0	0	0	71	8	1	0	0	0	0	0	0	0	7	0
13:30:00	0	0	1000	73	30	1	0	0	71	0	1	0	0	0	0	0	0	0	9	2
13:45:00	0	0	1067	67	30	0	0	0	78	7	1	0	0	0	0	0	0	0	10	1
14:00:00	0	0	1147	80	35	5	0	0	82	4	1	0	0	0	0	0	0	0	15	5
14:01:50	0	0	1147	0	35	0	0	0	82	0	1	0	0	0	0	0	0	0	15	0
15:00:00	0	0	1147	0	35	0	0	0	82	0	1	0	0	0	0	0	0	0	15	0
15:15:00	0	0	1229	82	35	0	0	0	85	3	1	0	0	0	0	0	0	0	16	1
15:30:00	0	0	1295	66	35	0	0	0	88	3	1	0	0	0	0	0	0	0	20	4
15:45:00	1	1	1389	94	37	2	0	0	91	3	1	0	0	0	0	0	0	0	22	2
16:00:00	3	2	1474	85	38	1	0	0	93	2	1	0	0	0	0	0	0	0	25	3
16:15:00	3	0	1553	79	41	3	0	0	97	4	1	0	0	0	0	0	0	0	25	0
16:30:00	3	0	1627	74	43	2	0	0	98	1	1	0	0	0	0	0	0	0	25	0
16:45:00	3	0	1714	87	45	2	0	0	102	4	1	0	0	0	0	0	0	0	29	4
17:00:00	3	0	1829	115	49	4	0	0	104	2	1	0	0	0	0	0	0	0	29	0
17:15:00	3	0	1927	98	50	1	0	0	108	4	1	0	0	0	0	0	0	0	29	0
17:30:00	3	0	2023	96	52	2	0	0	108	0	1	0	0	0	0	0	0	0	29	0
17:45:00	4	1	2101	78	54	2	0	0	110	2	1	0	0	0	0	0	0	0	29	0
18:00:00	4	0	2172	71	55	1	0	0	112	2	1	0	0	0	0	0	0	0	29	0
18:15:00	4	0	2172	0	55	0	0	0	112	0	1	0	0	0	0	0	0	0	29	0
18:17:06	4	0	2172	0	55	0	0	0	112	0	1	0	0	0	0	0	0	0	29	0

Ontario Traffic Inc.

Count Date: 20-Feb-18 Site #: 1807000006

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
6:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2
6:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1
7:15:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
7:30:00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
7:45:00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
8:00:00	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	5	0
8:15:00	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
8:30:00	1	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	5	0
8:45:00	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1
9:00:00	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0
9:00:43	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0
12:00:00	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0
12:15:00	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	7	1
12:30:00	1	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	10	3
12:45:00	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0
13:00:00	1	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	11	1
13:15:00	1	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	14	3
13:30:00	1	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	19	5
13:45:00	1	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	21	2
14:00:00	1	0	0	0	5	1	0	0	0	0	0	0	0	0	0	0	0	0	26	5
14:01:50	1	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	26	0
15:00:00	1	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	26	0
15:15:00	1	0	0	0	6	1	0	0	0	0	0	0	0	0	0	0	0	0	32	6
15:30:00	2	1	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	39	7
15:45:00	2	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	42	3
16:00:00	2	0	0	0	7	1	0	0	0	0	0	0	0	0	0	0	0	0	48	6
16:15:00	2	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	50	2
16:30:00	3	1	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	54	4
16:45:00	3	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	61	7
17:00:00	3	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	61	0
17:15:00	3	0	1	1	7	0	0	0	0	0	0	0	0	0	0	0	0	0	61	0
17:30:00	3	0	1	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	63	2
17:45:00	4	1	1	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	70	7
18:00:00	4	0	2	1	7	0	0	0	0	0	0	0	0	0	0	0	0	0	74	4
18:15:00	4	0	2	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	74	0
18:17:06	4	0	2	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	74	0

Ontario Traffic Inc.

Mid-day Peak Diagram

Specified Period
From: 10:00:00
To: 14:00:00

One Hour Peak
From: 13:00:00
To: 14:00:00

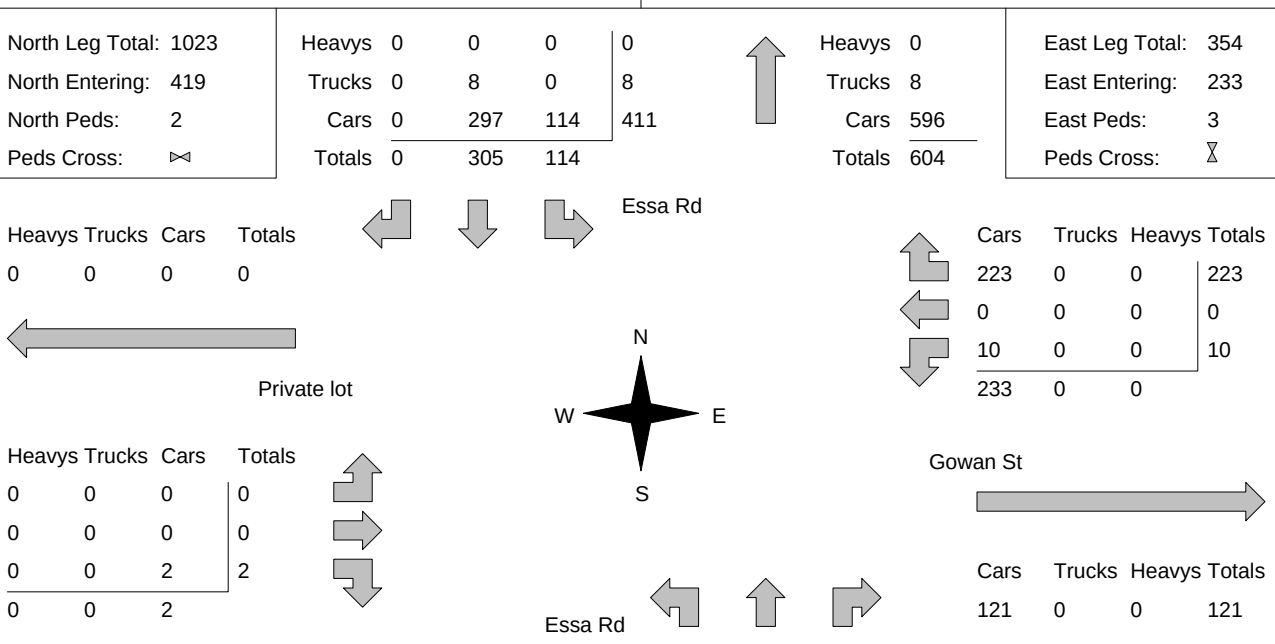
Municipality: Barrie
Site #: 1807000001
Intersection: Essa Rd & Gowan St
TFR File #: 1
Count date: 17-Feb-18

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Essa Rd runs N/S



Comments

Ontario Traffic Inc.

Total Count Diagram

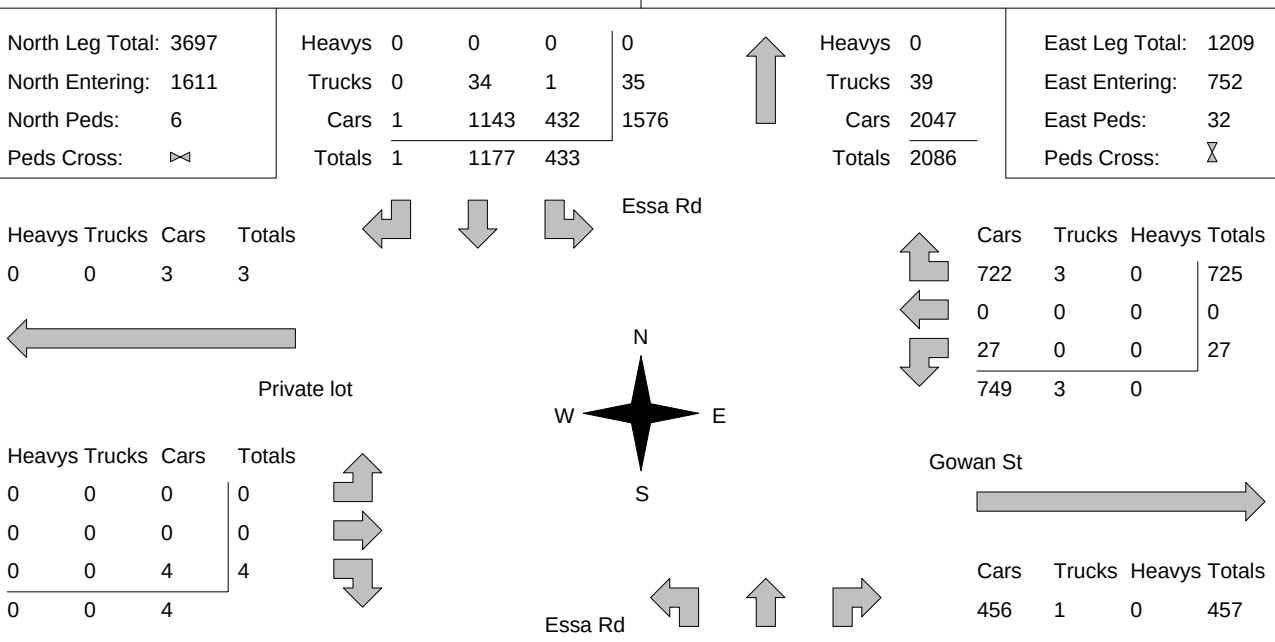
Municipality: Barrie
Site #: 1807000001
Intersection: Essa Rd & Gowan St
TFR File #: 1
Count date: 17-Feb-18

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Essa Rd runs N/S



Comments

Ontario Traffic Inc.
Traffic Count Summary

Intersection: Essa Rd & Gowan St | **Count Date:** 17-Feb-18 | **Municipality:** Barrie

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
10:00:00	0	0	0	0	0	0
11:00:00	104	283	1	388	2	702
12:00:00	111	297	0	408	1	714
13:00:00	104	292	0	396	1	775
14:00:00	114	305	0	419	2	807
Totals:	433	1177	1	1611	6	2998

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys Left	Thru	Right	Grand Total	Total Peds
10:00:00	0	0	0	0	0
11:00:00	0	308	6	314	5
12:00:00	0	302	4	306	6
13:00:00	2	370	7	379	2
14:00:00	0	381	7	388	4
Totals:	2	1361	24	1387	17

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
10:00:00	0	0	0	0	0	0
11:00:00	4	0	131	135	5	136
12:00:00	8	0	158	166	12	166
13:00:00	5	0	213	218	12	219
14:00:00	10	0	223	233	3	235
Totals:	27	0	725	752	32	756

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys Left	Thru	Right	Grand Total	Total Peds
10:00:00	0	0	0	0	0
11:00:00	0	0	1	1	10
12:00:00	0	0	0	0	7
13:00:00	0	0	1	1	4
14:00:00	0	0	2	2	7
Totals:	0	0	4	4	28

Calculated Values for Traffic Crossing Major Street

Hours Ending:	0:00	0:00	0:00	10:00	11:00	12:00	13:00	14:00
Crossing Values:	0	0	0	0	11	15	8	16

Ontario Traffic Inc.

Count Date: 17-Feb-18 Site #: 1807000001

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	20	20	60	60	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
10:30:00	37	17	126	66	0	0	0	0	5	2	0	0	0	0	0	0	0	0	0	0
10:45:00	65	28	195	69	0	0	1	1	8	3	0	0	0	0	0	0	0	0	0	0
11:00:00	103	38	274	79	1	1	1	0	9	1	0	0	0	0	0	0	0	0	2	2
11:15:00	138	35	341	67	1	0	1	0	11	2	0	0	0	0	0	0	0	0	2	0
11:30:00	154	16	431	90	1	0	1	0	13	2	0	0	0	0	0	0	0	0	2	0
11:45:00	187	33	491	60	1	0	1	0	14	1	0	0	0	0	0	0	0	0	2	0
12:00:00	214	27	562	71	1	0	1	0	18	4	0	0	0	0	0	0	0	0	3	1
12:15:00	243	29	642	80	1	0	1	0	19	1	0	0	0	0	0	0	0	0	3	0
12:30:00	267	24	709	67	1	0	1	0	22	3	0	0	0	0	0	0	0	0	4	1
12:45:00	291	24	783	74	1	0	1	0	24	2	0	0	0	0	0	0	0	0	4	0
13:00:00	318	27	846	63	1	0	1	0	26	2	0	0	0	0	0	0	0	0	4	0
13:15:00	348	30	906	60	1	0	1	0	30	4	0	0	0	0	0	0	0	0	4	0
13:30:00	376	28	985	79	1	0	1	0	32	2	0	0	0	0	0	0	0	0	4	0
13:45:00	397	21	1068	83	1	0	1	0	34	2	0	0	0	0	0	0	0	0	4	0
14:00:00	432	35	1143	75	1	0	1	0	34	0	0	0	0	0	0	0	0	0	6	2
14:15:00	432	0	1143	0	1	0	1	0	34	0	0	0	0	0	0	0	0	0	6	0
14:17:13	432	0	1143	0	1	0	1	0	34	0	0	0	0	0	0	0	0	0	6	0

Ontario Traffic Inc.

Count Date: 17-Feb-18 Site #: 1807000001

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	1	1	0	0	34	34	0	0	0	0	1	1	0	0	0	0	0	0	1	1
10:30:00	1	0	0	0	63	29	0	0	0	0	1	0	0	0	0	0	0	0	3	2
10:45:00	4	3	0	0	91	28	0	0	0	0	1	0	0	0	0	0	0	0	3	0
11:00:00	4	0	0	0	130	39	0	0	0	0	1	0	0	0	0	0	0	0	5	2
11:15:00	6	2	0	0	173	43	0	0	0	0	1	0	0	0	0	0	0	0	6	1
11:30:00	9	3	0	0	199	26	0	0	0	0	2	1	0	0	0	0	0	0	9	3
11:45:00	9	0	0	0	242	43	0	0	0	0	2	0	0	0	0	0	0	0	12	3
12:00:00	12	3	0	0	286	44	0	0	0	0	3	1	0	0	0	0	0	0	17	5
12:15:00	12	0	0	0	328	42	0	0	0	0	3	0	0	0	0	0	0	0	18	1
12:30:00	12	0	0	0	393	65	0	0	0	0	3	0	0	0	0	0	0	0	23	5
12:45:00	15	3	0	0	448	55	0	0	0	0	3	0	0	0	0	0	0	0	27	4
13:00:00	17	2	0	0	499	51	0	0	0	0	3	0	0	0	0	0	0	0	29	2
13:15:00	17	0	0	0	549	50	0	0	0	0	3	0	0	0	0	0	0	0	30	1
13:30:00	21	4	0	0	609	60	0	0	0	0	3	0	0	0	0	0	0	0	32	2
13:45:00	24	3	0	0	662	53	0	0	0	0	3	0	0	0	0	0	0	0	32	0
14:00:00	27	3	0	0	722	60	0	0	0	0	3	0	0	0	0	0	0	0	32	0
14:15:00	27	0	0	0	722	0	0	0	0	0	3	0	0	0	0	0	0	0	32	0
14:17:13	27	0	0	0	722	0	0	0	0	0	3	0	0	0	0	0	0	0	32	0

Ontario Traffic Inc.

Count Date: 17-Feb-18 Site #: 1807000001

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	0	0	76	76	2	2	0	0	4	4	0	0	0	0	0	0	0	0	1	1
10:30:00	0	0	154	78	4	2	0	0	6	2	0	0	0	0	0	0	0	0	1	0
10:45:00	0	0	231	77	6	2	0	0	10	4	0	0	0	0	0	0	0	0	5	4
11:00:00	0	0	297	66	6	0	0	0	11	1	0	0	0	0	0	0	0	0	5	0
11:15:00	0	0	370	73	6	0	0	0	14	3	0	0	0	0	0	0	0	0	5	0
11:30:00	0	0	432	62	7	1	0	0	17	3	0	0	0	0	0	0	0	0	5	0
11:45:00	0	0	524	92	9	2	0	0	19	2	0	0	0	0	0	0	0	0	5	0
12:00:00	0	0	590	66	10	1	0	0	20	1	0	0	0	0	0	0	0	0	11	6
12:15:00	0	0	681	91	11	1	0	0	23	3	0	0	0	0	0	0	0	0	11	0
12:30:00	1	1	752	71	13	2	0	0	24	1	0	0	0	0	0	0	0	0	12	1
12:45:00	2	1	849	97	16	3	0	0	27	3	0	0	0	0	0	0	0	0	13	1
13:00:00	2	0	952	103	17	1	0	0	28	1	0	0	0	0	0	0	0	0	13	0
13:15:00	2	0	1038	86	20	3	0	0	32	4	0	0	0	0	0	0	0	0	13	0
13:30:00	2	0	1127	89	22	2	0	0	32	0	0	0	0	0	0	0	0	0	17	4
13:45:00	2	0	1219	92	23	1	0	0	36	4	0	0	0	0	0	0	0	0	17	0
14:00:00	2	0	1325	106	24	1	0	0	36	0	0	0	0	0	0	0	0	0	17	0
14:15:00	2	0	1325	0	24	0	0	0	36	0	0	0	0	0	0	0	0	0	17	0
14:17:13	2	0	1325	0	24	0	0	0	36	0	0	0	0	0	0	0	0	0	17	0

Ontario Traffic Inc.

Count Date: 17-Feb-18 Site #: 1807000001

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
10:30:00	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	4	1
10:45:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	8	4
11:00:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	10	2
11:15:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	11	1
11:30:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	12	1
11:45:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	15	3
12:00:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	17	2
12:15:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	19	2
12:30:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	20	1
12:45:00	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	21	1
13:00:00	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	21	0
13:15:00	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	21	0
13:30:00	0	0	0	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0	24	3
13:45:00	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	28	4
14:00:00	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	28	0
14:15:00	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	28	0
14:17:13	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	28	0

Ontario Traffic Inc.

Morning Peak Diagram

Specified Period
From: 6:00:00
To: 9:00:00

One Hour Peak
From: 8:00:00
To: 9:00:00

Municipality: Barrie
Site #: 1807000007
Intersection: Essa Rd & GO Access
TFR File #: 1
Count date: 20-Feb-18

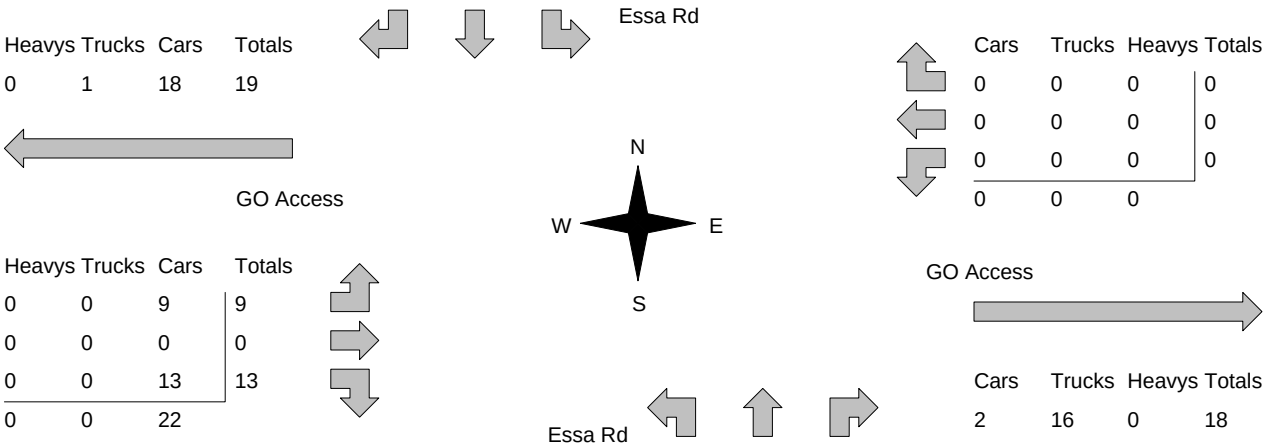
Weather conditions:

Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Essa Rd runs N/S

North Leg Total:	856			
North Entering:	375			
North Peds:	3			
Peds Cross:	⋈			
Heavys	0	0	0	0
Trucks	0	19	12	31
Cars	5	339	0	344
Totals	5	358	12	
Heavys	0			
Trucks	10			
Cars	471			
Totals	481			
East Leg Total:	18			
East Entering:	0			
East Peds:	9			
Peds Cross:	⧖			



Peds Cross:	⧖			
West Peds:	1			
West Entering:	22			
West Leg Total:	41			
Cars	352			
Trucks	19			
Heavys	0			
Totals	371			
Cars	13	462	2	477
Trucks	1	10	4	15
Heavys	0	0	0	0
Totals	14	472	6	
Peds Cross:	⋈			
South Peds:	1			
South Entering:	492			
South Leg Total:	863			

Comments

Ontario Traffic Inc.

Mid-day Peak Diagram

Specified Period
From: 12:00:00
To: 14:00:00

One Hour Peak
From: 12:15:00
To: 13:15:00

Municipality: Barrie
Site #: 1807000007
Intersection: Essa Rd & GO Access
TFR File #: 1
Count date: 20-Feb-18

Weather conditions:

Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Essa Rd runs N/S

North Leg Total:	944			
North Entering:	447			
North Peds:	2			
Peds Cross:	⋈			

Heavys	0	0	0	0
Trucks	1	12	9	22
Cars	9	416	0	425
Totals	10	428	9	

Heavys	0	
Trucks	14	
Cars	483	
Totals	497	

East Leg Total:	15
East Entering:	0
East Peds:	4
Peds Cross:	⧖

Essa Rd

Heavys	Trucks	Cars	Totals
0	1	33	34

GO Access

Cars	Trucks	Heavys	Totals
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	

N
W E
S

Heavys	Trucks	Cars	Totals
0	1	9	10
0	0	0	0
0	0	26	26
0	1	35	

GO Access

Cars	Trucks	Heavys	Totals
0	15	0	15

Essa Rd

Peds Cross:	⧖	
West Peds:	5	
West Entering:	36	
West Leg Total:	70	

Cars	442			
Trucks	12			
Heavys	0			
Totals	454			

Cars	24	474	0	498
Trucks	0	13	6	19
Heavys	0	0	0	0
Totals	24	487	6	

Peds Cross:	⋈
South Peds:	7
South Entering:	517
South Leg Total:	971

Comments

Ontario Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:30:00
To: 17:30:00

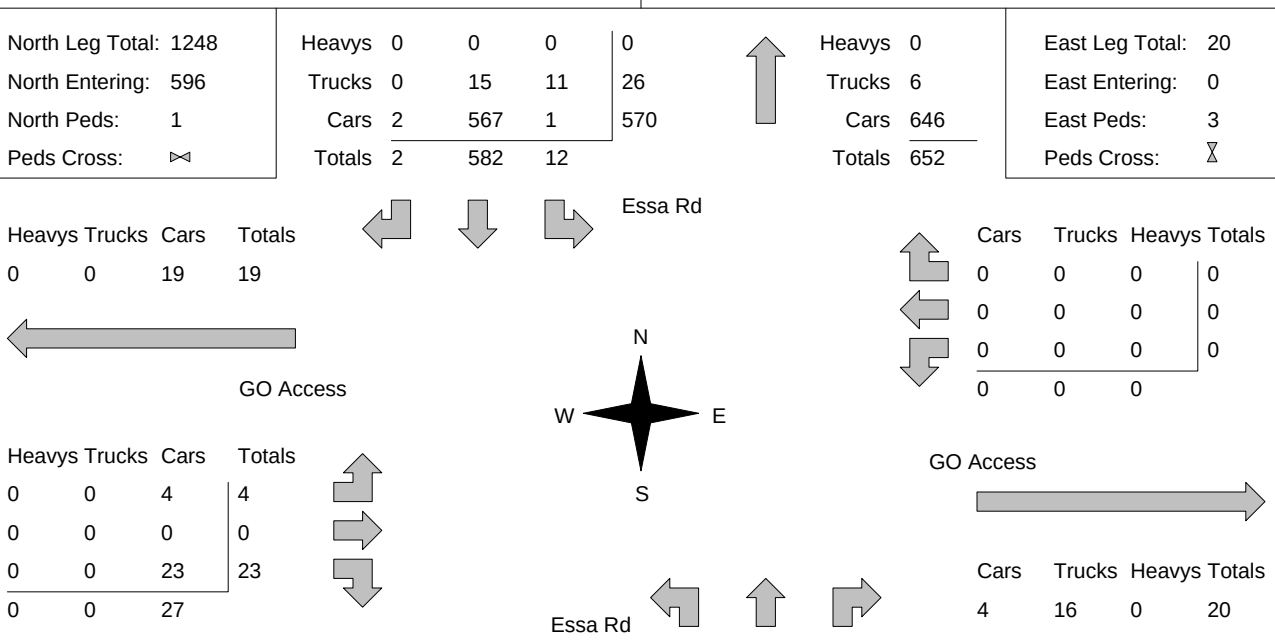
Municipality: Barrie
Site #: 1807000007
Intersection: Essa Rd & GO Access
TFR File #: 1
Count date: 20-Feb-18

Weather conditions:

Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Essa Rd runs N/S



Comments

Ontario Traffic Inc.

Total Count Diagram

Municipality: Barrie
Site #: 1807000007
Intersection: Essa Rd & GO Access
TFR File #: 1
Count date: 20-Feb-18

Weather conditions:

Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Essa Rd runs N/S

North Leg Total: 7167
North Entering: 3473
North Peds: 10
Peds Cross: ⋈

Heavys	0	0	0	0
Trucks	1	113	79	193
Cars	46	3228	6	3280
Totals	47	3341	85	

Heavys	0
Trucks	78
Cars	3616
Totals	3694

East Leg Total: 141
East Entering: 11
East Peds: 37
Peds Cross: ⧖

Essa Rd

Heavys	Trucks	Cars	Totals
0	4	169	173

GO Access

Heavys	Trucks	Cars	Totals
0	1	39	40
0	0	0	0
0	0	143	143
0	1	182	

Cars	Trucks	Heavys	Totals
6	0	0	6
0	0	0	0
5	0	0	5
11	0	0	

N
W E
S

GO Access

Cars	Trucks	Heavys	Totals
14	116	0	130

Essa Rd

Peds Cross: ⧖
West Peds: 19
West Entering: 183
West Leg Total: 356

Cars	3376
Trucks	113
Heavys	0
Totals	3489

Cars	123	3571	8	3702
Trucks	3	77	37	117
Heavys	0	0	0	0
Totals	126	3648	45	

Peds Cross: ⋈
South Peds: 38
South Entering: 3819
South Leg Total: 7308

Comments

Ontario Traffic Inc.
Traffic Count Summary

Intersection: Essa Rd & GO Access | **Count Date:** 20-Feb-18 | **Municipality:** Barrie

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
6:00:00	0	0	0	0	0	0
7:00:00	12	263	0	275	0	410
8:00:00	11	350	2	363	0	675
9:00:00	12	358	5	375	3	867
12:00:00	0	0	0	0	0	0
13:00:00	8	433	6	447	4	938
14:00:00	11	406	15	432	1	944
15:00:00	0	0	0	0	0	0
16:00:00	10	464	9	483	1	1075
17:00:00	9	542	7	558	0	1203
18:00:00	12	525	3	540	1	1180
Totals:	85	3341	47	3473	10	7292

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
6:00:00	0	0	0	0	0
7:00:00	1	130	4	135	7
8:00:00	7	300	5	312	4
9:00:00	14	472	6	492	1
12:00:00	0	0	0	0	0
13:00:00	21	465	5	491	7
14:00:00	31	476	5	512	5
15:00:00	0	0	0	0	0
16:00:00	21	565	6	592	7
17:00:00	21	617	7	645	1
18:00:00	10	623	7	640	6
Totals:	126	3648	45	3819	38

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
6:00:00	0	0	0	0	0	0
7:00:00	2	0	1	3	0	5
8:00:00	1	0	0	1	2	14
9:00:00	0	0	0	0	9	22
12:00:00	0	0	0	0	0	0
13:00:00	0	0	0	0	3	34
14:00:00	0	0	0	0	8	20
15:00:00	0	0	0	0	0	0
16:00:00	2	0	0	2	2	40
17:00:00	0	0	0	0	10	30
18:00:00	0	0	5	5	3	29
Totals:	5	0	6	11	37	194

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
6:00:00	0	0	0	0	0
7:00:00	1	0	1	2	0
8:00:00	2	0	11	13	0
9:00:00	9	0	13	22	1
12:00:00	0	0	0	0	0
13:00:00	9	0	25	34	6
14:00:00	5	0	15	20	2
15:00:00	0	0	0	0	0
16:00:00	7	0	31	38	3
17:00:00	2	0	28	30	4
18:00:00	5	0	19	24	3
Totals:	40	0	143	183	19

Calculated Values for Traffic Crossing Major Street

Hours Ending:	7:00	8:00	9:00	13:00	14:00	16:00	17:00	18:00
Crossing Values:	10	7	13	20	11	17	3	12

Ontario Traffic Inc.

Count Date: 20-Feb-18 Site #: 1807000007

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	1	1	52	52	0	0	3	3	2	2	0	0	0	0	0	0	0	0	0	0
6:30:00	3	2	123	71	0	0	4	1	4	2	0	0	0	0	0	0	0	0	0	0
6:45:00	3	0	191	68	0	0	7	3	6	2	0	0	0	0	0	0	0	0	0	0
7:00:00	3	0	254	63	0	0	9	2	9	3	0	0	0	0	0	0	0	0	0	0
7:15:00	4	1	322	68	1	1	13	4	13	4	0	0	0	0	0	0	0	0	0	0
7:30:00	5	1	386	64	1	0	14	1	17	4	0	0	0	0	0	0	0	0	0	0
7:45:00	5	0	479	93	1	0	16	2	19	2	0	0	0	0	0	0	0	0	0	0
8:00:00	5	0	590	111	2	1	18	2	23	4	0	0	0	0	0	0	0	0	0	0
8:15:00	5	0	685	95	2	0	21	3	26	3	0	0	0	0	0	0	0	0	2	2
8:30:00	5	0	762	77	4	2	25	4	33	7	0	0	0	0	0	0	0	0	2	0
8:45:00	5	0	841	79	5	1	27	2	36	3	0	0	0	0	0	0	0	0	2	0
9:00:00	5	0	929	88	7	2	30	3	42	6	0	0	0	0	0	0	0	0	3	1
9:02:20	5	0	929	0	7	0	30	0	42	0	0	0	0	0	0	0	0	0	3	0
12:00:00	5	0	929	0	7	0	30	0	42	0	0	0	0	0	0	0	0	0	3	0
12:15:00	5	0	1029	100	7	0	32	2	46	4	0	0	0	0	0	0	0	0	5	2
12:30:00	5	0	1138	109	9	2	35	3	47	1	0	0	0	0	0	0	0	0	6	1
12:45:00	5	0	1246	108	10	1	36	1	52	5	0	0	0	0	0	0	0	0	7	1
13:00:00	5	0	1349	103	13	3	38	2	55	3	0	0	0	0	0	0	0	0	7	0
13:15:00	5	0	1445	96	16	3	41	3	58	3	1	1	0	0	0	0	0	0	7	0
13:30:00	5	0	1560	115	20	4	43	2	60	2	1	0	0	0	0	0	0	0	7	0
13:45:00	5	0	1654	94	25	5	45	2	62	2	1	0	0	0	0	0	0	0	8	1
14:00:00	5	0	1741	87	27	2	49	4	69	7	1	0	0	0	0	0	0	0	8	0
14:01:38	5	0	1741	0	27	0	49	0	69	0	1	0	0	0	0	0	0	0	8	0
15:00:00	5	0	1741	0	27	0	49	0	69	0	1	0	0	0	0	0	0	0	8	0
15:15:00	5	0	1853	112	29	2	50	1	72	3	1	0	0	0	0	0	0	0	9	1
15:30:00	5	0	1970	117	31	2	53	3	75	3	1	0	0	0	0	0	0	0	9	0
15:45:00	5	0	2080	110	34	3	55	2	79	4	1	0	0	0	0	0	0	0	9	0
16:00:00	5	0	2192	112	36	2	59	4	82	3	1	0	0	0	0	0	0	0	9	0
16:15:00	5	0	2321	129	40	4	61	2	88	6	1	0	0	0	0	0	0	0	9	0
16:30:00	5	0	2446	125	43	3	62	1	90	2	1	0	0	0	0	0	0	0	9	0
16:45:00	5	0	2601	155	43	0	66	4	94	4	1	0	0	0	0	0	0	0	9	0
17:00:00	5	0	2718	117	43	0	68	2	98	4	1	0	0	0	0	0	0	0	9	0
17:15:00	6	1	2874	156	45	2	71	3	101	3	1	0	0	0	0	0	0	0	10	1
17:30:00	6	0	3013	139	45	0	73	2	105	4	1	0	0	0	0	0	0	0	10	0
17:45:00	6	0	3120	107	45	0	77	4	109	4	1	0	0	0	0	0	0	0	10	0
18:00:00	6	0	3228	108	46	1	79	2	113	4	1	0	0	0	0	0	0	0	10	0
18:15:00	6	0	3228	0	46	0	79	0	113	0	1	0	0	0	0	0	0	0	10	0
18:16:07	6	0	3228	0	46	0	79	0	113	0	1	0	0	0	0	0	0	0	10	0

Ontario Traffic Inc.

Count Date: 20-Feb-18 Site #: 1807000007

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45:00	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00:00	2	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	3	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
7:30:00	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:45:00	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1
8:00:00	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
8:15:00	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5	3
8:30:00	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	7	2
8:45:00	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	10	3
9:00:00	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	11	1
9:02:20	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0
12:00:00	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0
12:15:00	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0
12:30:00	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0
12:45:00	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	13	2
13:00:00	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	14	1
13:15:00	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	15	1
13:30:00	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	19	4
13:45:00	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	21	2
14:00:00	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	22	1
14:01:38	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	22	0
15:00:00	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	22	0
15:15:00	4	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	22	0
15:30:00	5	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	23	1
15:45:00	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	24	1
16:00:00	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0
16:15:00	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	28	4
16:30:00	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	31	3
16:45:00	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	32	1
17:00:00	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	34	2
17:15:00	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	34	0
17:30:00	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	34	0
17:45:00	5	0	0	0	4	3	0	0	0	0	0	0	0	0	0	0	0	0	37	3
18:00:00	5	0	0	0	6	2	0	0	0	0	0	0	0	0	0	0	0	0	37	0
18:15:00	5	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	37	0
18:16:07	5	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	37	0

Ontario Traffic Inc.

Count Date: 20-Feb-18 Site #: 1807000007

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	0	0	14	14	1	1	0	0	3	3	1	1	0	0	0	0	0	0	1	1
6:30:00	0	0	39	25	1	0	0	0	8	5	1	0	0	0	0	0	0	0	6	5
6:45:00	1	1	78	39	1	0	0	0	10	2	3	2	0	0	0	0	0	0	7	1
7:00:00	1	0	118	40	1	0	0	0	12	2	3	0	0	0	0	0	0	0	7	0
7:15:00	4	3	173	55	1	0	1	1	13	1	5	2	0	0	0	0	0	0	9	2
7:30:00	5	1	231	58	1	0	1	0	16	3	6	1	0	0	0	0	0	0	9	0
7:45:00	6	1	305	74	1	0	1	0	18	2	7	1	0	0	0	0	0	0	10	1
8:00:00	7	1	409	104	1	0	1	0	21	3	8	1	0	0	0	0	0	0	11	1
8:15:00	8	1	519	110	2	1	1	0	22	1	9	1	0	0	0	0	0	0	11	0
8:30:00	11	3	614	95	3	1	1	0	24	2	10	1	0	0	0	0	0	0	12	1
8:45:00	13	2	735	121	3	0	1	0	28	4	12	2	0	0	0	0	0	0	12	0
9:00:00	20	7	871	136	3	0	2	1	31	3	12	0	0	0	0	0	0	0	12	0
9:02:20	20	0	871	0	3	0	2	0	31	0	12	0	0	0	0	0	0	0	12	0
12:00:00	20	0	871	0	3	0	2	0	31	0	12	0	0	0	0	0	0	0	12	0
12:15:00	24	4	980	109	3	0	2	0	34	3	13	1	0	0	0	0	0	0	14	2
12:30:00	28	4	1098	118	3	0	2	0	36	2	14	1	0	0	0	0	0	0	16	2
12:45:00	31	3	1201	103	3	0	2	0	40	4	16	2	0	0	0	0	0	0	16	0
13:00:00	41	10	1324	123	3	0	2	0	43	3	17	1	0	0	0	0	0	0	19	3
13:15:00	48	7	1454	130	3	0	2	0	47	4	19	2	0	0	0	0	0	0	21	2
13:30:00	57	9	1551	97	3	0	2	0	50	3	19	0	0	0	0	0	0	0	21	0
13:45:00	65	8	1663	112	3	0	2	0	54	4	21	2	0	0	0	0	0	0	22	1
14:00:00	72	7	1786	123	3	0	2	0	57	3	22	1	0	0	0	0	0	0	24	2
14:01:38	72	0	1786	0	3	0	2	0	57	0	22	0	0	0	0	0	0	0	24	0
15:00:00	72	0	1786	0	3	0	2	0	57	0	22	0	0	0	0	0	0	0	24	0
15:15:00	77	5	1924	138	3	0	2	0	59	2	24	2	0	0	0	0	0	0	25	1
15:30:00	85	8	2056	132	4	1	2	0	62	3	24	0	0	0	0	0	0	0	26	1
15:45:00	89	4	2198	142	4	0	3	1	64	2	26	2	0	0	0	0	0	0	26	0
16:00:00	92	3	2342	144	4	0	3	0	66	2	27	1	0	0	0	0	0	0	31	5
16:15:00	98	6	2492	150	5	1	3	0	68	2	29	2	0	0	0	0	0	0	32	1
16:30:00	101	3	2636	144	5	0	3	0	70	2	29	0	0	0	0	0	0	0	32	0
16:45:00	107	6	2783	147	6	1	3	0	72	2	31	2	0	0	0	0	0	0	32	0
17:00:00	113	6	2952	169	6	0	3	0	73	1	32	1	0	0	0	0	0	0	32	0
17:15:00	115	2	3117	165	8	2	3	0	75	2	34	2	0	0	0	0	0	0	33	1
17:30:00	118	3	3278	161	8	0	3	0	76	1	34	0	0	0	0	0	0	0	34	1
17:45:00	120	2	3451	173	8	0	3	0	77	1	35	1	0	0	0	0	0	0	37	3
18:00:00	123	3	3571	120	8	0	3	0	77	0	37	2	0	0	0	0	0	0	38	1
18:15:00	123	0	3571	0	8	0	3	0	77	0	37	0	0	0	0	0	0	0	38	0
18:16:07	123	0	3571	0	8	0	3	0	77	0	37	0	0	0	0	0	0	0	38	0

Ontario Traffic Inc.

Count Date: 20-Feb-18 Site #: 1807000007

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30:00	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45:00	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00:00	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	2	1	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	2	0	0	0	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	3	1	0	0	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	3	0	0	0	12	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	6	3	0	0	14	2	0	0	0	0	0	0	0	0	0	0	0	0	1	1
8:30:00	8	2	0	0	19	5	0	0	0	0	0	0	0	0	0	0	0	0	1	0
8:45:00	11	3	0	0	23	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0
9:00:00	12	1	0	0	25	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0
9:02:20	12	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12:00:00	12	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12:15:00	14	2	0	0	30	5	0	0	0	0	0	0	0	0	0	0	0	0	2	1
12:30:00	18	4	0	0	36	6	1	1	0	0	0	0	0	0	0	0	0	0	2	0
12:45:00	19	1	0	0	43	7	1	0	0	0	0	0	0	0	0	0	0	0	5	3
13:00:00	20	1	0	0	50	7	1	0	0	0	0	0	0	0	0	0	0	0	7	2
13:15:00	23	3	0	0	56	6	1	0	0	0	0	0	0	0	0	0	0	0	7	0
13:30:00	25	2	0	0	65	9	1	0	0	0	0	0	0	0	0	0	0	0	7	0
13:45:00	25	0	0	0	65	0	1	0	0	0	0	0	0	0	0	0	0	0	7	0
14:00:00	25	0	0	0	65	0	1	0	0	0	0	0	0	0	0	0	0	0	9	2
14:01:38	25	0	0	0	65	0	1	0	0	0	0	0	0	0	0	0	0	0	9	0
15:00:00	25	0	0	0	65	0	1	0	0	0	0	0	0	0	0	0	0	0	9	0
15:15:00	28	3	0	0	70	5	1	0	0	0	0	0	0	0	0	0	0	0	9	0
15:30:00	29	1	0	0	80	10	1	0	0	0	0	0	0	0	0	0	0	0	10	1
15:45:00	30	1	0	0	88	8	1	0	0	0	0	0	0	0	0	0	0	0	11	1
16:00:00	32	2	0	0	96	8	1	0	0	0	0	0	0	0	0	0	0	0	12	1
16:15:00	33	1	0	0	100	4	1	0	0	0	0	0	0	0	0	0	0	0	14	2
16:30:00	33	0	0	0	114	14	1	0	0	0	0	0	0	0	0	0	0	0	14	0
16:45:00	33	0	0	0	123	9	1	0	0	0	0	0	0	0	0	0	0	0	15	1
17:00:00	34	1	0	0	124	1	1	0	0	0	0	0	0	0	0	0	0	0	16	1
17:15:00	35	1	0	0	133	9	1	0	0	0	0	0	0	0	0	0	0	0	17	1
17:30:00	37	2	0	0	137	4	1	0	0	0	0	0	0	0	0	0	0	0	17	0
17:45:00	37	0	0	0	139	2	1	0	0	0	0	0	0	0	0	0	0	0	17	0
18:00:00	39	2	0	0	143	4	1	0	0	0	0	0	0	0	0	0	0	0	19	2
18:15:00	39	0	0	0	143	0	1	0	0	0	0	0	0	0	0	0	0	0	19	0
18:16:07	39	0	0	0	143	0	1	0	0	0	0	0	0	0	0	0	0	0	19	0

Ontario Traffic Inc.

Mid-day Peak Diagram

Specified Period
From: 10:00:00
To: 14:00:00

One Hour Peak
From: 12:45:00
To: 13:45:00

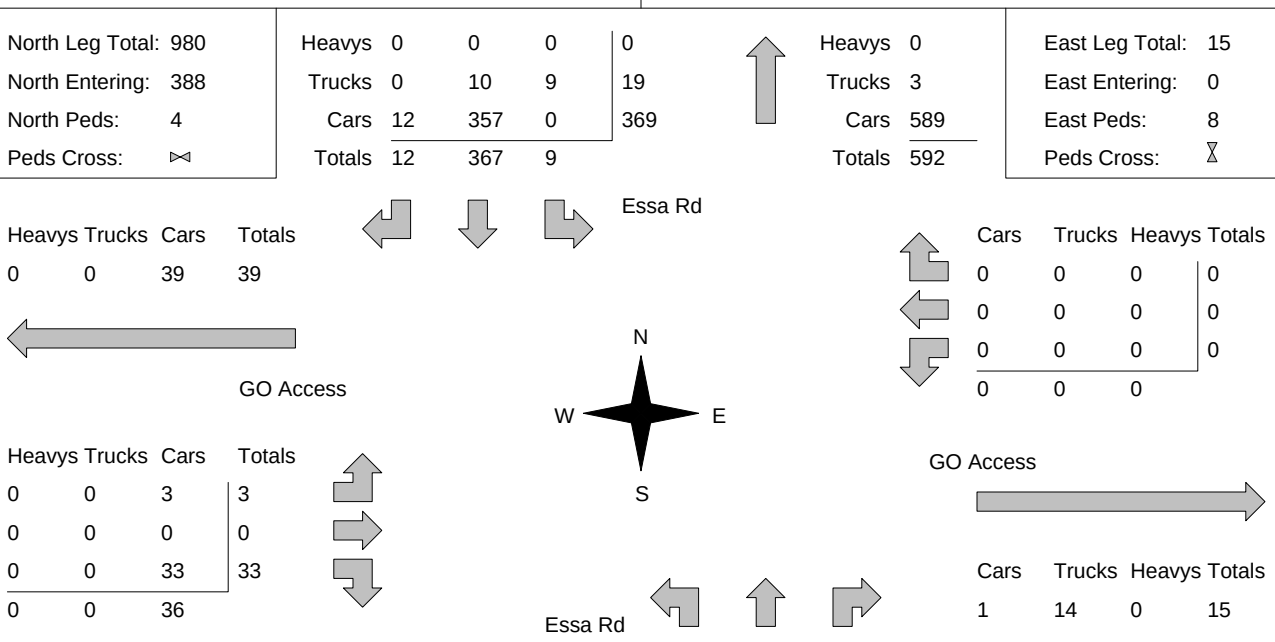
Municipality: Barrie
Site #: 1807000002
Intersection: Essa Rd & GO Access
TFR File #: 1
Count date: 17-Feb-18

Weather conditions:

Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Essa Rd runs N/S



Comments

Ontario Traffic Inc.

Total Count Diagram

Municipality: Barrie
Site #: 1807000002
Intersection: Essa Rd & GO Access
TFR File #: 1
Count date: 17-Feb-18

Weather conditions:

Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Essa Rd runs N/S

North Leg Total:	3556			
North Entering:	1562			
North Peds:	15			
Peds Cross:	⋈			

Heavys	0	0	0	0
Trucks	0	35	33	68
Cars	38	1455	1	1494
Totals	38	1490	34	

Heavys	0
Trucks	18
Cars	1976
Totals	1994

East Leg Total:	62			
East Entering:	2			
East Peds:	34			
Peds Cross:	⧖			

Essa Rd

Heavys	Trucks	Cars	Totals
0	0	145	145

GO Access

Heavys	Trucks	Cars	Totals
0	0	23	23
0	0	0	0
0	0	110	110
0	0	133	

Cars	Trucks	Heavys	Totals
0	0	0	0
0	0	0	0
2	0	0	2
2	0	0	

N
W E
S

GO Access

Cars	Trucks	Heavys	Totals
8	52	0	60

Essa Rd

Peds Cross:	⧖			
West Peds:	17			
West Entering:	133			
West Leg Total:	278			

Cars	1567			
Trucks	35			
Heavys	0			
Totals	1602			

Cars	107	1953	7	2067
Trucks	0	18	19	37
Heavys	0	0	0	0
Totals	107	1971	26	

Peds Cross:	⋈			
South Peds:	18			
South Entering:	2104			
South Leg Total:	3706			

Comments

Ontario Traffic Inc.
Traffic Count Summary

Intersection: Essa Rd & GO Access | **Count Date:** 17-Feb-18 | **Municipality:** Barrie

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
10:00:00	0	0	0	0	0	0
11:00:00	9	356	10	375	5	817
12:00:00	9	383	7	399	1	858
13:00:00	8	359	9	376	4	988
14:00:00	8	392	12	412	5	1003
Totals:	34	1490	38	1562	15	3666

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
10:00:00	0	0	0	0	0
11:00:00	35	399	8	442	3
12:00:00	14	438	7	459	6
13:00:00	31	576	5	612	1
14:00:00	27	558	6	591	8
Totals:	107	1971	26	2104	18

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
10:00:00	0	0	0	0	0	0
11:00:00	2	0	0	2	8	36
12:00:00	0	0	0	0	7	28
13:00:00	0	0	0	0	11	37
14:00:00	0	0	0	0	8	34
Totals:	2	0	0	2	34	135

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
10:00:00	0	0	0	0	0
11:00:00	7	0	27	34	5
12:00:00	7	0	21	28	6
13:00:00	4	0	33	37	4
14:00:00	5	0	29	34	2
Totals:	23	0	110	133	17

Calculated Values for Traffic Crossing Major Street

Hours Ending:	0:00	0:00	0:00	10:00	11:00	12:00	13:00	14:00
Crossing Values:	0	0	0	0	17	14	9	18

Ontario Traffic Inc.

Count Date: 17-Feb-18 Site #: 1807000002

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	0	0	68	68	4	4	2	2	3	3	0	0	0	0	0	0	0	0	1	1
10:30:00	0	0	151	83	5	1	4	2	5	2	0	0	0	0	0	0	0	0	1	0
10:45:00	1	1	240	89	7	2	7	3	9	4	0	0	0	0	0	0	0	0	4	3
11:00:00	1	0	345	105	10	3	8	1	11	2	0	0	0	0	0	0	0	0	5	1
11:15:00	1	0	444	99	13	3	10	2	12	1	0	0	0	0	0	0	0	0	5	0
11:30:00	1	0	539	95	16	3	13	3	15	3	0	0	0	0	0	0	0	0	5	0
11:45:00	1	0	632	93	16	0	14	1	16	1	0	0	0	0	0	0	0	0	5	0
12:00:00	1	0	721	89	17	1	17	3	18	2	0	0	0	0	0	0	0	0	6	1
12:15:00	1	0	819	98	19	2	19	2	21	3	0	0	0	0	0	0	0	0	6	0
12:30:00	1	0	913	94	21	2	20	1	23	2	0	0	0	0	0	0	0	0	6	0
12:45:00	1	0	996	83	23	2	23	3	25	2	0	0	0	0	0	0	0	0	7	1
13:00:00	1	0	1071	75	26	3	25	2	27	2	0	0	0	0	0	0	0	0	10	3
13:15:00	1	0	1163	92	27	1	27	2	31	4	0	0	0	0	0	0	0	0	10	0
13:30:00	1	0	1268	105	32	5	30	3	33	2	0	0	0	0	0	0	0	0	10	0
13:45:00	1	0	1353	85	35	3	32	2	35	2	0	0	0	0	0	0	0	0	11	1
14:00:00	1	0	1455	102	38	3	33	1	35	0	0	0	0	0	0	0	0	0	15	4
14:15:00	1	0	1455	0	38	0	33	0	35	0	0	0	0	0	0	0	0	0	15	0
14:15:47	1	0	1455	0	38	0	33	0	35	0	0	0	0	0	0	0	0	0	15	0

Ontario Traffic Inc.

Count Date: 17-Feb-18 Site #: 1807000002

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4
10:30:00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1
10:45:00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1
11:00:00	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	2
11:15:00	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0
11:30:00	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	2
11:45:00	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	2
12:00:00	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	3
12:15:00	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	1
12:30:00	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0
12:45:00	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	9
13:00:00	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	1
13:15:00	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	4
13:30:00	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31	1
13:45:00	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	2
14:00:00	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34	1
14:15:00	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34	0
14:15:47	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34	0

Ontario Traffic Inc.

Count Date: 17-Feb-18 Site #: 1807000002

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	9	9	102	102	1	1	0	0	2	2	3	3	0	0	0	0	0	0	1	1
10:30:00	17	8	198	96	2	1	0	0	4	2	3	0	0	0	0	0	0	0	1	0
10:45:00	25	8	300	102	2	0	0	0	6	2	4	1	0	0	0	0	0	0	1	0
11:00:00	35	10	392	92	3	1	0	0	7	1	5	1	0	0	0	0	0	0	3	2
11:15:00	40	5	493	101	4	1	0	0	8	1	7	2	0	0	0	0	0	0	5	2
11:30:00	44	4	591	98	4	0	0	0	10	2	8	1	0	0	0	0	0	0	6	1
11:45:00	47	3	710	119	4	0	0	0	11	1	9	1	0	0	0	0	0	0	9	3
12:00:00	49	2	826	116	5	1	0	0	11	0	10	1	0	0	0	0	0	0	9	0
12:15:00	55	6	939	113	5	0	0	0	13	2	11	1	0	0	0	0	0	0	9	0
12:30:00	66	11	1076	137	5	0	0	0	13	0	12	1	0	0	0	0	0	0	9	0
12:45:00	74	8	1206	130	6	1	0	0	14	1	14	2	0	0	0	0	0	0	10	1
13:00:00	80	6	1398	192	6	0	0	0	15	1	14	0	0	0	0	0	0	0	10	0
13:15:00	86	6	1521	123	6	0	0	0	16	1	16	2	0	0	0	0	0	0	10	0
13:30:00	93	7	1658	137	6	0	0	0	16	0	17	1	0	0	0	0	0	0	10	0
13:45:00	101	8	1792	134	7	1	0	0	17	1	19	2	0	0	0	0	0	0	16	6
14:00:00	107	6	1953	161	7	0	0	0	18	1	19	0	0	0	0	0	0	0	18	2
14:15:00	107	0	1953	0	7	0	0	0	18	0	19	0	0	0	0	0	0	0	18	0
14:15:47	107	0	1953	0	7	0	0	0	18	0	19	0	0	0	0	0	0	0	18	0

Ontario Traffic Inc.

Count Date: 17-Feb-18 Site #: 1807000002

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30:00	2	2	0	0	12	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45:00	4	2	0	0	20	8	0	0	0	0	0	0	0	0	0	0	0	0	2	2
11:00:00	7	3	0	0	27	7	0	0	0	0	0	0	0	0	0	0	0	0	5	3
11:15:00	8	1	0	0	34	7	0	0	0	0	0	0	0	0	0	0	0	0	5	0
11:30:00	11	3	0	0	42	8	0	0	0	0	0	0	0	0	0	0	0	0	9	4
11:45:00	12	1	0	0	44	2	0	0	0	0	0	0	0	0	0	0	0	0	10	1
12:00:00	14	2	0	0	48	4	0	0	0	0	0	0	0	0	0	0	0	0	11	1
12:15:00	17	3	0	0	54	6	0	0	0	0	0	0	0	0	0	0	0	0	13	2
12:30:00	18	1	0	0	61	7	0	0	0	0	0	0	0	0	0	0	0	0	14	1
12:45:00	18	0	0	0	70	9	0	0	0	0	0	0	0	0	0	0	0	0	15	1
13:00:00	18	0	0	0	81	11	0	0	0	0	0	0	0	0	0	0	0	0	15	0
13:15:00	19	1	0	0	89	8	0	0	0	0	0	0	0	0	0	0	0	0	15	0
13:30:00	20	1	0	0	95	6	0	0	0	0	0	0	0	0	0	0	0	0	16	1
13:45:00	21	1	0	0	103	8	0	0	0	0	0	0	0	0	0	0	0	0	16	0
14:00:00	23	2	0	0	110	7	0	0	0	0	0	0	0	0	0	0	0	0	17	1
14:15:00	23	0	0	0	110	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0
14:15:47	23	0	0	0	110	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0

APPENDIX

B Signal Warrant Analysis

Input Data Sheet

Analysis Sheet | Results Sheet | Proposed Collision

GO TO Justification:

What are the intersecting roadways? Essa Rd. & GO Access

What is the direction of the Main Road street? North-South

When was the data collected? 2018-03-08

Justification 1 - 4: Volume Warrants

a.- Number of lanes on the Main Road? 2 or more

b.- Number of lanes on the Minor Road? 1

c.- How many approaches? 4

d.- What is the operating environment? Urban **Population >= 10,000** **AND** **Speed < 70 km/hr**

e.- What is the eight hour vehicle volume at the intersection? (Please fill in table below)

Hour Ending	Main Northbound Approach			Minor Eastbound Approach			Main Southbound Approach			Minor Westbound Approach			Pedestrians Crossing Main Road
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
7:00	1	130	4	1	0	1	12	263	0	2	0	1	7
8:00	7	300	5	2	0	11	11	350	2	1	0	0	4
9:00	14	472	6	9	0	13	12	358	5	0	0	0	4
13:00	21	465	5	9	0	25	8	433	6	0	0	0	11
14:00	31	476	5	5	0	15	11	406	15	0	0	0	6
16:00	21	565	6	7	0	31	10	464	9	2	0	0	8
17:00	21	617	7	2	0	28	9	542	7	0	0	0	1
18:00	10	623	7	5	0	19	12	525	3	0	0	5	7
Total	**126**	**3,648**	**45**	**40**	**0**	**143**	**85**	**3,341**	**47**	**5**	**0**	**6**	**48**

Analysis Sheet

Input Sheet | Results Sheet | Proposed Collision

GO TO Justification:

Intersection: Essa Rd. & GO Access Count Date: 2018-03-08

Justification 1: Minimum Vehicle Volumes

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 Lanes		2 or More Lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	7:00	8:00	9:00	13:00	14:00	16:00	17:00	18:00		
1A	480	720	600	900	415	689	889	972	964	1,115	1,233	1,209		
	COMPLIANCE %				46	77	99	100	100	100	100	100	721	90
1B	120	170	120	170	5	14	22	34	20	40	30	29		
	COMPLIANCE %				3	8	13	20	12	24	18	17	114	14
Restricted Flow					Both 1A and 1B 100% Fulfilled each of 8 hours					Yes ☐		No ☑		
Signal Justification 1:					Lesser of 1A or 1B at least 80% fulfilled each of 8 hours					Yes ☐		No ☑		

Justification 2: Delay to Cross Traffic

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 lanes		2 or More lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	7:00	8:00	9:00	13:00	14:00	16:00	17:00	18:00		
2A	480	720	600	900	410	675	867	938	944	1,075	1,203	1,180		
	COMPLIANCE %				46	75	96	100	100	100	100	100	717	90
2B	50	75	50	75	10	7	13	20	11	17	3	12		
	COMPLIANCE %				13	9	17	27	15	23	4	16	124	16
Restricted Flow					Both 2A and 2B 100% fulfilled each of 8 hours					Yes ☐		No ☑		
Signal Justification 2:					Lesser of 2A or 2B at least 80% fulfilled each of 8 hours					Yes ☐		No ☑		

Justification 3: Combination

Combination Justification 1 and 2

	Justification Satisfied 80% or More			Two Justifications Satisfied 80% or More	
Justification 1	Minimum Vehicle Volume	YES ☐	NO ☑	YES ☐	NO ☑
Justification 2	Delay Cross Traffic	YES ☐	NO ☑		NOT JUSTIFIED

Justification 4: Four Hour Volume

Justification	Time Period	Total Volume of Both Approaches (Main)	Heaviest Minor Approach	Required Value	Average % Compliance	Overall % Compliance
		X	Y (actual)	Y (warrant threshold)		
Justification 4	14:00	944	20	215	9 %	18 %
	16:00	1,075	38	170	22 %	
	17:00	1,203	30	137	22 %	
	18:00	1,180	24	142	17 %	

Analysis Sheet

Input Sheet | Results Sheet | Proposed Collision

GO TO Justification:

Intersection: Essa Rd. & GO Access Count Date: 2018-03-08

Justification 6: Pedestrian Volume

Pedestrian Volume Analysis

8 Hour Vehicular Volume V_8		Net 8 Hour Pedestrian Volume				
		< 200	200 - 275	276 - 475	476 - 1000	>1000
Justification 6A	< 1440					
	1440 - 2600					
	2601 - 7000	Not Justified				
	> 7000					

Pedestrian Delay Analysis

Net Total 8 Hour Volume of Total Pedestrians		Net Total 8 Hour Volume of Delayed Pedestrians		
		< 75	75 - 130	> 130
Justification 6B	< 200	Not Justified		
	200 - 300			
	> 300			

Results Sheet

Input Sheet | Analysis Sheet | Proposed Collision

GO TO Justification:

Intersection: Essa Rd. & GO Access Count Date: 2018-03-08

Summary Results

Justification			Compliance		Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A	Total Volume	90	%	☐	☑
	B	Crossing Volume	14	%		
2. Delay to Cross Traffic	A	Main Road	90	%	☐	☑
	B	Crossing Road	16	%		
3. Combination	A	Justificaton 1	14	%	☐	☑
	B	Justification 2	16	%		
4. 4-Hr Volume			18	%	☐	☑
5. Collision Experience			0	%	☐	☑
6. Pedestrians	A	Volume	Justification not met		☐	☑
	B	Delay	Justification not met			

APPENDIX

C Existing (2018) Synchro Reports

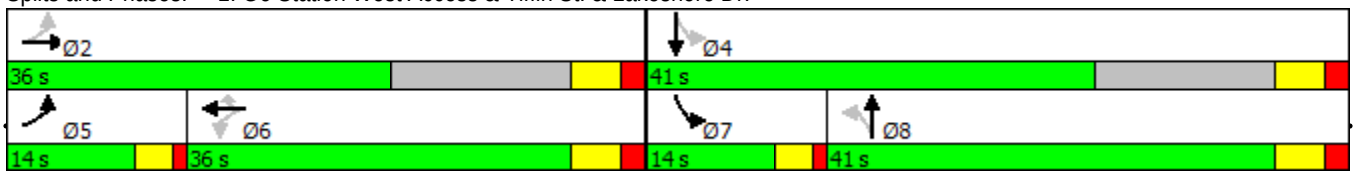
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	220	5	1	294	644	16	0	2	402	1	93
Future Volume (vph)	94	220	5	1	294	644	16	0	2	402	1	93
Satd. Flow (prot)	1787	1894	0	1805	3574	1599	1003	1615	0	1770	1570	0
Flt Permitted	0.504			0.611						0.519		
Satd. Flow (perm)	948	1894	0	1161	3574	1599	1056	1615	0	967	1570	0
Satd. Flow (RTOR)		1				657					102	
Lane Group Flow (vph)	99	237	0	1	300	657	25	3	0	442	103	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	5	2			6			8		7	4	
Permitted Phases	2			6		6	8			4		
Total Split (s)	14.0	36.0		36.0	36.0	36.0	41.0	41.0		14.0	41.0	
Total Lost Time (s)	4.0	6.0		6.0	6.0	6.0	6.0	6.0		4.0	6.0	
Act Effct Green (s)	42.3	40.3		30.9	30.9	30.9	10.7	10.7		17.4	15.4	
Actuated g/C Ratio	0.62	0.59		0.45	0.45	0.45	0.16	0.16		0.26	0.23	
v/c Ratio	0.14	0.21		0.00	0.18	0.61	0.15	0.01		1.15	0.24	
Control Delay	7.2	8.3		16.0	14.1	4.5	31.7	29.5		119.1	6.4	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	7.2	8.3		16.0	14.1	4.5	31.7	29.5		119.1	6.4	
LOS	A	A		B	B	A	C	C		F	A	
Approach Delay		7.9			7.5			31.5			97.8	
Approach LOS		A			A			C			F	
Queue Length 50th (m)	3.3	9.6		0.1	10.5	0.0	2.7	0.4		~72.5	0.1	
Queue Length 95th (m)	14.0	32.2		1.2	27.1	22.0	7.6	2.0		#135.4	10.6	
Internal Link Dist (m)		44.8			116.0			88.9			104.9	
Turn Bay Length (m)	35.0			23.0		55.0				75.0		
Base Capacity (vph)	716	1261		526	1622	1084	559	855		386	1190	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.14	0.19		0.00	0.18	0.61	0.04	0.00		1.15	0.09	

Intersection Summary	
Cycle Length: 105	
Actuated Cycle Length: 68	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 1.15	
Intersection Signal Delay: 34.3	Intersection LOS: C
Intersection Capacity Utilization 93.9%	ICU Level of Service F
Analysis Period (min) 15	

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

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

Splits and Phases: 1: Go Station West Access & Tiffin St. & Lakeshore Dr.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	197	67	93	187	0	56	324	103	33	215	35
Future Volume (vph)	60	197	67	93	187	0	56	324	103	33	215	35
Satd. Flow (prot)	1770	1770	0	1641	1845	0	0	3397	0	0	3352	1568
Flt Permitted	0.628			0.581				0.858			0.815	
Satd. Flow (perm)	1170	1770	0	1004	1845	0	0	2932	0	0	2751	1568
Satd. Flow (RTOR)		20						42				44
Lane Group Flow (vph)	67	293	0	103	208	0	0	568	0	0	314	44
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6	6	6
Total Split (s)	31.0	31.0		31.0	31.0		34.0	34.0		21.0	34.0	34.0
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	6.0
Act Effct Green (s)	25.1	25.1		25.1	25.1			14.4			14.4	14.4
Actuated g/C Ratio	0.49	0.49		0.49	0.49			0.28			0.28	0.28
v/c Ratio	0.12	0.34		0.21	0.23			0.67			0.41	0.09
Control Delay	9.0	9.7		10.1	9.4			19.3			16.6	5.5
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Delay	9.0	9.7		10.1	9.4			19.3			16.6	5.5
LOS	A	A		B	A			B			B	A
Approach Delay		9.5			9.6			19.3			15.2	
Approach LOS		A			A			B			B	
Queue Length 50th (m)	3.2	14.5		5.1	10.5			23.3			12.8	0.0
Queue Length 95th (m)	10.3	34.2		15.3	25.2			34.0			18.5	4.2
Internal Link Dist (m)		153.0			41.6			55.6			43.8	
Turn Bay Length (m)	47.0			23.0								89.0
Base Capacity (vph)	569	871		488	897			1616			2606	1487
Starvation Cap Reductn	0	0		0	0			0			0	0
Spillback Cap Reductn	0	0		0	0			0			0	0
Storage Cap Reductn	0	0		0	0			0			0	0
Reduced v/c Ratio	0.12	0.34		0.21	0.23			0.35			0.12	0.03

Intersection Summary

Cycle Length: 86
Actuated Cycle Length: 51.6
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 14.3 Intersection LOS: B
Intersection Capacity Utilization 82.2% ICU Level of Service E
Analysis Period (min) 15

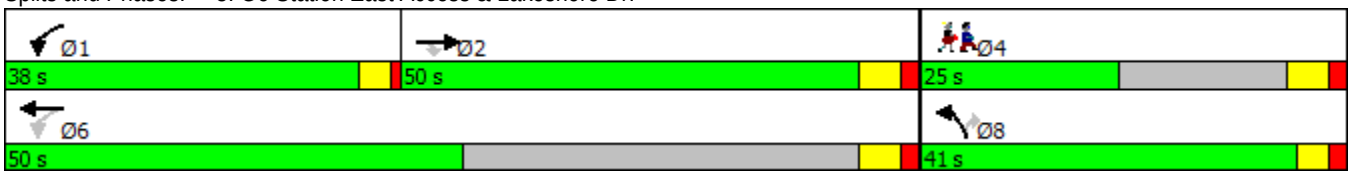
Splits and Phases: 2: Essa Rd./Bradford St. & Tiffin St.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø4
Lane Configurations							
Traffic Volume (vph)	623	1	3	936	3	2	
Future Volume (vph)	623	1	3	936	3	2	
Satd. Flow (prot)	1881	1615	1805	1881	1805	1615	
Flt Permitted			0.345		0.950		
Satd. Flow (perm)	1881	1615	656	1881	1805	1615	
Satd. Flow (RTOR)						6	
Lane Group Flow (vph)	677	1	3	975	10	6	
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm	
Protected Phases	2		1	6	8		4
Permitted Phases		2	6			8	
Total Split (s)	50.0	50.0	38.0	50.0	41.0	41.0	25.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	5.0	5.0	
Act Effct Green (s)	61.5	61.5	60.5	63.5	10.0	10.0	
Actuated g/C Ratio	0.92	0.92	0.90	0.94	0.15	0.15	
v/c Ratio	0.39	0.00	0.00	0.55	0.04	0.02	
Control Delay	4.2	4.0	1.3	3.5	27.0	17.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	4.2	4.0	1.3	3.5	27.0	17.5	
LOS	A	A	A	A	C	B	
Approach Delay	4.2			3.5	23.4		
Approach LOS	A			A	C		
Queue Length 50th (m)	0.0	0.0	0.0	0.0	1.1	0.0	
Queue Length 95th (m)	94.6	0.7	0.6	109.9	1.9	0.7	
Internal Link Dist (m)	144.3			137.6	30.3		
Turn Bay Length (m)		40.0	70.0				
Base Capacity (vph)	1723	1479	1174	1881	970	871	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.39	0.00	0.00	0.52	0.01	0.01	

Intersection Summary

Cycle Length: 129
Actuated Cycle Length: 67.2
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.55
Intersection Signal Delay: 3.9 Intersection LOS: A
Intersection Capacity Utilization 66.8% ICU Level of Service C
Analysis Period (min) 15

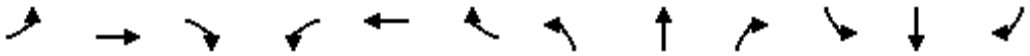
Splits and Phases: 3: Go Station East Access & Lakeshore Dr.



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	4	182	312	5	140	231
Future Volume (vph)	4	182	312	5	140	231
Satd. Flow (prot)	1616	0	3424	0	0	3342
Flt Permitted	0.999					0.688
Satd. Flow (perm)	1616	0	3424	0	0	2343
Satd. Flow (RTOR)	222		2			
Lane Group Flow (vph)	227	0	382	0	0	387
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases					6	
Total Split (s)	31.0		86.0		11.0	86.0
Total Lost Time (s)	6.0		6.0			6.0
Act Effct Green (s)	10.6		80.0			80.0
Actuated g/C Ratio	0.10		0.78			0.78
v/c Ratio	0.62		0.14			0.21
Control Delay	14.4		3.0			3.4
Queue Delay	0.0		0.0			0.0
Total Delay	14.4		3.0			3.4
LOS	B		A			A
Approach Delay	14.4		3.0			3.4
Approach LOS	B		A			A
Queue Length 50th (m)	1.0		8.0			8.6
Queue Length 95th (m)	16.7		12.3			15.0
Internal Link Dist (m)	120.4		80.7			19.9
Turn Bay Length (m)						
Base Capacity (vph)	561		2668			2077
Starvation Cap Reductn	0		0			0
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.40		0.14			0.19

Intersection Summary	
Cycle Length: 128	
Actuated Cycle Length: 102.7	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 5.8	Intersection LOS: A
Intersection Capacity Utilization 139.8%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 4: Essa Rd. & Gowan St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	0	13	0	0	0	14	474	6	12	358	5
Future Volume (Veh/h)	9	0	13	0	0	0	14	474	6	12	358	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.79	0.79	0.79	1.00	1.00	1.00	0.84	0.84	0.84	0.93	0.93	0.93
Hourly flow rate (vph)	11	0	16	0	0	0	17	564	7	13	385	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								44			80	
pX, platoon unblocked	0.99	0.99	0.98	0.99	0.99	0.98	0.98			0.98		
vC, conflicting volume	730	1018	195	836	1018	286	390			571		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	598	891	124	706	890	224	324			516		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.2			6.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			3.2		
p0 queue free %	97	100	98	100	100	100	99			98		
cM capacity (veh/h)	374	270	887	304	267	762	1168			572		

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	27	299	289	206	198
Volume Left	11	17	0	13	0
Volume Right	16	0	7	0	5
cSH	569	1168	1700	572	1700
Volume to Capacity	0.05	0.01	0.17	0.02	0.12
Queue Length 95th (m)	1.2	0.4	0.0	0.6	0.0
Control Delay (s)	11.6	0.6	0.0	1.0	0.0
Lane LOS	B	A		A	
Approach Delay (s)	11.6	0.3		0.5	
Approach LOS	B				

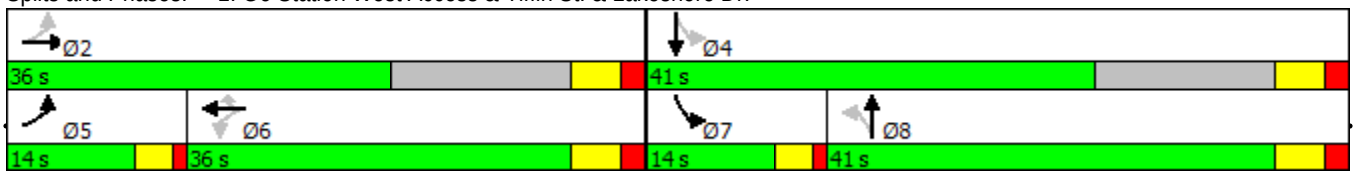
Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	33.4%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	141	422	15	2	251	505	21	1	2	627	21	108
Future Volume (vph)	141	422	15	2	251	505	21	1	2	627	21	108
Satd. Flow (prot)	1805	1890	0	1805	3610	1599	1031	1685	0	1805	1647	0
Flt Permitted	0.521			0.507			0.952			0.488		
Satd. Flow (perm)	990	1890	0	963	3610	1599	1034	1685	0	927	1647	0
Satd. Flow (RTOR)		2				532					113	
Lane Group Flow (vph)	142	441	0	2	264	532	31	4	0	653	135	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	5	2			6			8		7	4	
Permitted Phases	2			6		6	8			4		
Total Split (s)	14.0	36.0		36.0	36.0	36.0	41.0	41.0		14.0	41.0	
Total Lost Time (s)	4.0	6.0		6.0	6.0	6.0	6.0	6.0		4.0	6.0	
Act Effct Green (s)	45.1	43.1		30.5	30.5	30.5	10.9	10.9		17.7	15.7	
Actuated g/C Ratio	0.64	0.61		0.43	0.43	0.43	0.15	0.15		0.25	0.22	
v/c Ratio	0.20	0.38		0.00	0.17	0.54	0.20	0.02		1.75	0.30	
Control Delay	7.5	9.8		16.0	14.7	4.2	32.6	29.3		371.1	8.1	
Queue Delay	0.0	0.5		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	7.5	10.3		16.0	14.7	4.2	32.6	29.3		371.1	8.1	
LOS	A	B		B	B	A	C	C		F	A	
Approach Delay		9.6			7.7			32.2			308.9	
Approach LOS		A			A			C			F	
Queue Length 50th (m)	4.8	20.4		0.2	9.4	0.0	3.4	0.4		~130.3	2.4	
Queue Length 95th (m)	19.8	65.5		1.6	24.6	20.2	9.2	2.4		#219.1	14.5	
Internal Link Dist (m)		44.8			116.0			88.9			104.9	
Turn Bay Length (m)	35.0			23.0		55.0				75.0		
Base Capacity (vph)	746	1190		413	1549	990	517	843		373	1188	
Starvation Cap Reductn	0	361		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.19	0.53		0.00	0.17	0.54	0.06	0.00		1.75	0.11	

Intersection Summary

Cycle Length: 105
Actuated Cycle Length: 71
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 1.75
Intersection Signal Delay: 116.3 Intersection LOS: F
Intersection Capacity Utilization 106.4% ICU Level of Service G
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Go Station West Access & Tiffin St. & Lakeshore Dr.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	315	80	116	177	0	81	438	149	120	400	62
Future Volume (vph)	41	315	80	116	177	0	81	438	149	120	400	62
Satd. Flow (prot)	1752	1814	0	1687	1863	0	0	3431	0	0	3464	1599
Flt Permitted	0.637			0.433				0.782			0.629	
Satd. Flow (perm)	1175	1814	0	769	1863	0	0	2700	0	0	2203	1599
Satd. Flow (RTOR)		15						46				70
Lane Group Flow (vph)	43	416	0	126	192	0	0	711	0	0	591	70
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6	6	6
Total Split (s)	31.0	31.0		31.0	31.0		34.0	34.0		21.0	34.0	34.0
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	6.0
Act Effct Green (s)	25.2	25.2		25.2	25.2			21.8			21.8	21.8
Actuated g/C Ratio	0.43	0.43		0.43	0.43			0.37			0.37	0.37
v/c Ratio	0.09	0.53		0.39	0.24			0.69			0.73	0.11
Control Delay	12.6	16.4		17.9	13.2			18.4			21.6	3.8
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Delay	12.6	16.4		17.9	13.2			18.4			21.6	3.8
LOS	B	B		B	B			B			C	A
Approach Delay		16.1			15.1			18.4			19.7	
Approach LOS		B			B			B			B	
Queue Length 50th (m)	2.8	32.1		9.4	13.3			32.3			29.2	0.0
Queue Length 95th (m)	9.3	65.7		26.0	29.8			48.6			43.9	5.9
Internal Link Dist (m)		153.0			41.6			55.6			43.8	
Turn Bay Length (m)	47.0			23.0								89.0
Base Capacity (vph)	500	781		327	793			1312			1839	1346
Starvation Cap Reductn	0	0		0	0			0			0	0
Spillback Cap Reductn	0	0		0	0			0			0	0
Storage Cap Reductn	0	0		0	0			0			0	0
Reduced v/c Ratio	0.09	0.53		0.39	0.24			0.54			0.32	0.05

Intersection Summary

Cycle Length: 86
Actuated Cycle Length: 59.1
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 17.8 Intersection LOS: B
Intersection Capacity Utilization 95.2% ICU Level of Service F
Analysis Period (min) 15

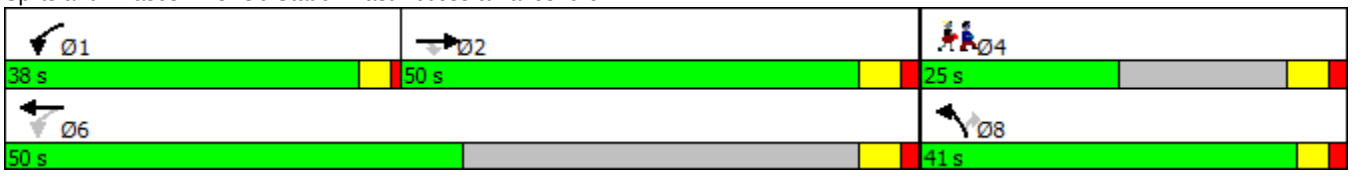
Splits and Phases: 2: Essa Rd./Bradford St. & Tiffin St.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø4
Lane Configurations							
Traffic Volume (vph)	1048	3	3	756	2	4	
Future Volume (vph)	1048	3	3	756	2	4	
Satd. Flow (prot)	1900	1615	1805	1900	1805	1615	
Flt Permitted			0.166		0.950		
Satd. Flow (perm)	1900	1615	315	1900	1805	1615	
Satd. Flow (RTOR)		1				5	
Lane Group Flow (vph)	1069	3	3	788	3	5	
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm	
Protected Phases	2		1	6	8		4
Permitted Phases		2	6			8	
Total Split (s)	50.0	50.0	38.0	50.0	41.0	41.0	25.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	5.0	5.0	
Act Effct Green (s)	62.6	62.6	61.4	64.4	10.1	10.1	
Actuated g/C Ratio	0.92	0.92	0.90	0.95	0.15	0.15	
v/c Ratio	0.61	0.00	0.01	0.44	0.01	0.02	
Control Delay	7.4	3.7	1.3	2.4	28.0	18.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	7.4	3.7	1.3	2.4	28.0	18.8	
LOS	A	A	A	A	C	B	
Approach Delay	7.4			2.4	22.2		
Approach LOS	A			A	C		
Queue Length 50th (m)	0.0	0.0	0.0	0.0	0.4	0.0	
Queue Length 95th (m)	#242.5	1.1	0.6	68.8	2.4	2.6	
Internal Link Dist (m)	144.3			137.6	30.3		
Turn Bay Length (m)		40.0	70.0				
Base Capacity (vph)	1748	1486	1034	1900	961	862	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.61	0.00	0.00	0.41	0.00	0.01	

Intersection Summary

Cycle Length: 129
Actuated Cycle Length: 68
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.61
Intersection Signal Delay: 5.3 Intersection LOS: A
Intersection Capacity Utilization 72.7% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

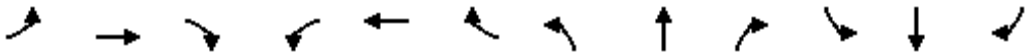
Splits and Phases: 3: Go Station East Access & Lakeshore Dr.



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	6	284	406	9	214	390
Future Volume (vph)	6	284	406	9	214	390
Satd. Flow (prot)	1632	0	3496	0	0	3344
Flt Permitted	0.999					0.661
Satd. Flow (perm)	1632	0	3496	0	0	2248
Satd. Flow (RTOR)	369		3			
Lane Group Flow (vph)	377	0	482	0	0	702
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases					6	
Total Split (s)	31.0		86.0		11.0	86.0
Total Lost Time (s)	6.0		6.0			6.0
Act Effct Green (s)	11.4		80.1			80.1
Actuated g/C Ratio	0.11		0.77			0.77
v/c Ratio	0.74		0.18			0.40
Control Delay	14.7		3.4			4.9
Queue Delay	0.0		0.0			0.2
Total Delay	14.7		3.4			5.1
LOS	B		A			A
Approach Delay	14.7		3.4			5.1
Approach LOS	B		A			A
Queue Length 50th (m)	1.5		10.3			19.1
Queue Length 95th (m)	12.3		19.3			35.0
Internal Link Dist (m)	120.4		80.7			19.9
Turn Bay Length (m)						
Base Capacity (vph)	674		2704			1977
Starvation Cap Reductn	0		0			591
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.56		0.18			0.51

Intersection Summary	
Cycle Length: 128	
Actuated Cycle Length: 103.5	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 6.9	Intersection LOS: A
Intersection Capacity Utilization 166.2%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 4: Essa Rd. & Gowan St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	0	23	0	0	0	18	664	8	12	582	2
Future Volume (Veh/h)	4	0	23	0	0	0	18	664	8	12	582	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.68	0.68	0.68	1.00	1.00	1.00	0.95	0.95	0.95	0.90	0.90	0.90
Hourly flow rate (vph)	6	0	34	0	0	0	19	699	8	13	647	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								44			80	
pX, platoon unblocked	0.92	0.92	0.91	0.92	0.92	0.97	0.91			0.97		
vC, conflicting volume	1062	1419	324	1124	1416	354	649			707		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	757	1146	45	825	1143	279	403			643		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			5.9		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			3.1		
p0 queue free %	98	100	96	100	100	100	98			97		
cM capacity (veh/h)	267	177	925	226	175	698	1056			507		

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	40	368	358	336	326
Volume Left	6	19	0	13	0
Volume Right	34	0	8	0	2
cSH	675	1056	1700	507	1700
Volume to Capacity	0.06	0.02	0.21	0.03	0.19
Queue Length 95th (m)	1.5	0.4	0.0	0.6	0.0
Control Delay (s)	10.7	0.6	0.0	0.8	0.0
Lane LOS	B	A		A	
Approach Delay (s)	10.7	0.3		0.4	
Approach LOS	B				

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	41.6%	ICU Level of Service		A
Analysis Period (min)	15			

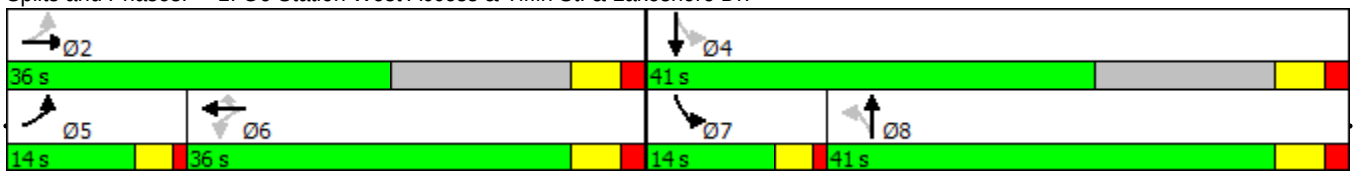
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	157	258	6	5	187	457	22	1	6	468	8	145
Future Volume (vph)	157	258	6	5	187	457	22	1	6	468	8	145
Satd. Flow (prot)	1805	1876	0	1805	3574	1615	1101	1647	0	1787	1630	0
Flt Permitted	0.558			0.589						0.513		
Satd. Flow (perm)	1060	1876	0	1119	3574	1615	1159	1647	0	965	1630	0
Satd. Flow (RTOR)		1				466					156	
Lane Group Flow (vph)	165	278	0	5	191	466	23	9	0	503	165	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	5	2			6			8		7	4	
Permitted Phases	2			6		6	8			4		
Total Split (s)	14.0	36.0		36.0	36.0	36.0	41.0	41.0		14.0	41.0	
Total Lost Time (s)	4.0	6.0		6.0	6.0	6.0	6.0	6.0		4.0	6.0	
Act Effct Green (s)	45.3	43.2		30.4	30.4	30.4	10.4	10.4		17.3	15.3	
Actuated g/C Ratio	0.64	0.61		0.43	0.43	0.43	0.15	0.15		0.24	0.22	
v/c Ratio	0.21	0.24		0.01	0.12	0.49	0.14	0.04		1.36	0.35	
Control Delay	7.2	8.2		15.6	14.3	3.9	31.7	30.0		204.7	6.7	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	7.2	8.2		15.6	14.3	3.9	31.7	30.0		204.7	6.7	
LOS	A	A		B	B	A	C	C		F	A	
Approach Delay		7.9			7.0			31.2			155.8	
Approach LOS		A			A			C			F	
Queue Length 50th (m)	5.7	11.6		0.3	6.8	0.0	2.6	1.0		~91.5	1.0	
Queue Length 95th (m)	21.4	37.2		2.7	17.9	18.8	10.3	4.5		#158.6	14.3	
Internal Link Dist (m)		44.8			116.0			88.9			104.9	
Turn Bay Length (m)	35.0			23.0		55.0				75.0		
Base Capacity (vph)	785	1183		481	1536	960	581	826		370	1191	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.21	0.23		0.01	0.12	0.49	0.04	0.01		1.36	0.14	

Intersection Summary		
Cycle Length: 105		
Actuated Cycle Length: 70.7		
Control Type: Semi Act-Uncoord		
Maximum v/c Ratio: 1.36		
Intersection Signal Delay: 62.7	Intersection LOS: E	
Intersection Capacity Utilization 97.6%	ICU Level of Service F	
Analysis Period (min) 15		

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

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

Splits and Phases: 1: Go Station West Access & Tiffin St. & Lakeshore Dr.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	206	56	152	134	0	61	357	180	45	208	38
Future Volume (vph)	26	206	56	152	134	0	61	357	180	45	208	38
Satd. Flow (prot)	1736	1810	0	1736	1863	0	0	3410	0	0	3464	1615
Flt Permitted	0.657			0.582				0.875			0.738	
Satd. Flow (perm)	1200	1810	0	1063	1863	0	0	2999	0	0	2579	1615
Satd. Flow (RTOR)		16						83				42
Lane Group Flow (vph)	29	291	0	179	158	0	0	665	0	0	281	42
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6	6	6
Total Split (s)	31.0	31.0		31.0	31.0		34.0	34.0		21.0	34.0	34.0
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	6.0
Act Effct Green (s)	25.1	25.1		25.1	25.1			15.7			15.7	15.7
Actuated g/C Ratio	0.47	0.47		0.47	0.47			0.30			0.30	0.30
v/c Ratio	0.05	0.34		0.36	0.18			0.70			0.37	0.08
Control Delay	9.3	10.4		12.6	9.7			18.5			15.8	5.2
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Delay	9.3	10.4		12.6	9.7			18.5			15.8	5.2
LOS	A	B		B	A			B			B	A
Approach Delay		10.3			11.2			18.5			14.4	
Approach LOS		B			B			B			B	
Queue Length 50th (m)	1.4	15.4		10.2	8.2			26.4			11.4	0.0
Queue Length 95th (m)	5.8	36.0		25.3	19.3			41.4			19.6	5.1
Internal Link Dist (m)		153.0			41.6			55.6			43.8	
Turn Bay Length (m)	47.0			23.0								89.0
Base Capacity (vph)	569	867		504	884			1632			2390	1499
Starvation Cap Reductn	0	0		0	0			0			0	0
Spillback Cap Reductn	0	0		0	0			0			0	0
Storage Cap Reductn	0	0		0	0			0			0	0
Reduced v/c Ratio	0.05	0.34		0.36	0.18			0.41			0.12	0.03

Intersection Summary

Cycle Length: 86
Actuated Cycle Length: 52.9
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 14.6 Intersection LOS: B
Intersection Capacity Utilization 85.7% ICU Level of Service E
Analysis Period (min) 15

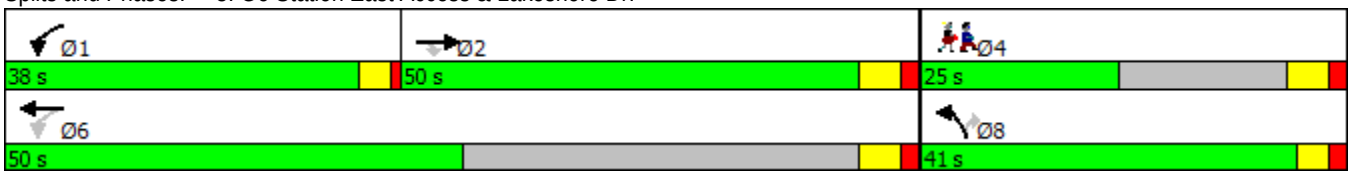
Splits and Phases: 2: Essa Rd./Bradford St. & Tiffin St.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø4
Lane Configurations							
Traffic Volume (vph)	730	2	1	645	4	6	
Future Volume (vph)	730	2	1	645	4	6	
Satd. Flow (prot)	1881	1615	1805	1881	1805	1615	
Flt Permitted			0.288		0.950		
Satd. Flow (perm)	1881	1615	547	1881	1805	1615	
Satd. Flow (RTOR)		1				10	
Lane Group Flow (vph)	793	2	1	672	7	10	
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm	
Protected Phases	2		1	6	8		4
Permitted Phases		2	6			8	
Total Split (s)	50.0	50.0	38.0	50.0	41.0	41.0	25.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	5.0	5.0	
Act Effct Green (s)	61.5	61.5	60.5	63.5	10.0	10.0	
Actuated g/C Ratio	0.92	0.92	0.90	0.94	0.15	0.15	
v/c Ratio	0.46	0.00	0.00	0.38	0.03	0.04	
Control Delay	4.9	3.5	2.0	2.1	26.8	16.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	4.9	3.5	2.0	2.1	26.8	16.0	
LOS	A	A	A	A	C	B	
Approach Delay	4.9			2.1	20.4		
Approach LOS	A			A	C		
Queue Length 50th (m)	0.0	0.0	0.0	0.0	0.8	0.0	
Queue Length 95th (m)	123.8	0.9	0.3	54.0	3.1	2.4	
Internal Link Dist (m)	144.3			137.6	30.3		
Turn Bay Length (m)		40.0	70.0				
Base Capacity (vph)	1723	1479	1131	1881	970	872	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.46	0.00	0.00	0.36	0.01	0.01	

Intersection Summary

Cycle Length: 129
Actuated Cycle Length: 67.2
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.46
Intersection Signal Delay: 3.8 Intersection LOS: A
Intersection Capacity Utilization 55.9% ICU Level of Service B
Analysis Period (min) 15

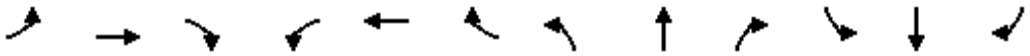
Splits and Phases: 3: Go Station East Access & Lakeshore Dr.



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	4	230	392	7	116	310
Future Volume (vph)	4	230	392	7	116	310
Satd. Flow (prot)	1646	0	3530	0	0	3487
Flt Permitted	0.999					0.703
Satd. Flow (perm)	1646	0	3530	0	0	2484
Satd. Flow (RTOR)	280		2			
Lane Group Flow (vph)	285	0	480	0	0	489
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases					6	
Total Split (s)	31.0		86.0		11.0	86.0
Total Lost Time (s)	6.0		6.0			6.0
Act Effct Green (s)	10.9		80.0			80.0
Actuated g/C Ratio	0.11		0.78			0.78
v/c Ratio	0.67		0.17			0.25
Control Delay	14.2		3.2			3.7
Queue Delay	0.0		0.0			0.2
Total Delay	14.2		3.2			3.8
LOS	B		A			A
Approach Delay	14.2		3.2			3.8
Approach LOS	B		A			A
Queue Length 50th (m)	1.0		10.3			11.4
Queue Length 95th (m)	17.4		16.4			19.4
Internal Link Dist (m)	120.4		80.7			19.9
Turn Bay Length (m)						
Base Capacity (vph)	611		2745			2197
Starvation Cap Reductn	0		0			848
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.47		0.17			0.36

Intersection Summary	
Cycle Length: 128	
Actuated Cycle Length: 102.9	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 5.9	Intersection LOS: A
Intersection Capacity Utilization 122.0%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 4: Essa Rd. & Gowan St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	0	33	0	0	0	27	589	6	10	393	13
Future Volume (Veh/h)	9	0	33	0	0	0	27	589	6	10	393	13
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	1.00	1.00	1.00	0.84	0.84	0.84	0.86	0.86	0.86
Hourly flow rate (vph)	11	0	40	0	0	0	32	701	7	12	457	15
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								44			80	
pX, platoon unblocked	0.98	0.98	0.98	0.98	0.98	0.97	0.98			0.97		
vC, conflicting volume	903	1260	236	1061	1264	354	472			708		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	752	1117	169	913	1121	268	411			634		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			6.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			3.2		
p0 queue free %	96	100	95	100	100	100	97			98		
cM capacity (veh/h)	285	194	832	205	190	707	1132			487		

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	51	382	358	240	244
Volume Left	11	32	0	12	0
Volume Right	40	0	7	0	15
cSH	588	1132	1700	487	1700
Volume to Capacity	0.09	0.03	0.21	0.02	0.14
Queue Length 95th (m)	2.3	0.7	0.0	0.6	0.0
Control Delay (s)	11.7	1.0	0.0	1.0	0.0
Lane LOS	B	A		A	
Approach Delay (s)	11.7	0.5		0.5	
Approach LOS	B				

Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	42.2%	ICU Level of Service		A
Analysis Period (min)	15			

APPENDIX

D Site Traffic Estimates

Allandale Mobility Hub Study

Road Network Modifications & Volume Assumptions

Growth Rate and Opening Year:

- Opening year assumed to be 2024 to coincide with the introduction of all-day rail service
- 2% annual compound growth rate

Peak Periods:

AM Peak – 8:00-9:00
PM Peak – 16:30-17:30
Weekend Peak – 13:00-14:00

Bus Volumes:

All routes are assumed to run twice per hour in both directions. Route 90 has been considered under the category of 'other services' because of its unusual headway and the possibility that it will eventually be taken over by Simcoe County. The current schedule of Route 90 does not overlap with any of the peak traffic periods identified.

Barrie Transit Services (Scenario 1):

Intersection Movement	Routes	Hourly Bus Volume
Bradford/Essa Rd & Tiffin St NBR	5	10
Bradford/Essa Rd & Tiffin St WBL	5	10
Bradford/Essa Rd & Tiffin St WBTH	6	12
Bradford/Essa Rd & Tiffin St EBTH	6	12
Bradford/Essa Rd & Tiffin St WBR	5	10
Bradford/Essa Rd & Tiffin St SBL	5	10
Lakeshore-Tiffin-Station Access EBR	7 Through (x4) 2 Terminating (x2)	32
Lakeshore-Tiffin-Station Access NBL	7 Through (x4) 2 Terminating (x2)	32

Barrie Transit Services (Scenario 2):

Intersection Movement	Routes	Hourly Bus Volume
Bradford/Essa Rd & Tiffin St NBR	5	10
Bradford/Essa Rd & Tiffin St WBL	5	10
Bradford/Essa Rd & Tiffin St WBTH	2	4
Bradford/Essa Rd & Tiffin St EBTH	2	4
Bradford/Essa Rd & Tiffin St WBR	5	10
Bradford/Essa Rd & Tiffin St SBL	5	10
Lakeshore-Tiffin-Station Access EBR	6 (bidirectional)	24
Lakeshore-Tiffin-Station Access NBL	6 (bidirectional)	24

Other Services:

Other Services are assumed to access the site via the 400 interchange at Essa Rd

Intersection Movement	Hourly Bus Volume
Bradford/Essa Rd & Tiffin St NBR	AM Peak: 2 PM Peak: Weekend: 1
Bradford/Essa Rd & Tiffin St WBL	
Lakeshore-Tiffin-Station Access EBR	
Lakeshore-Tiffin-Station Access NBL	
Barrie Transit Route 90	

Future Passenger Demand:

No GO Rail ridership estimates have been published for the year 2024 when RER is scheduled to begin operation. Forecasts from the GO Rail Station Access Strategy (2016) and the RER Initial Business Case (2014) are available that show current ridership as well as future ridership in 2031. Predicting rail ridership from Allandale Waterfront in the early years of RER is somewhat difficult as there is currently no comparable service from which to draw inferences. It is reasonable to assume that ridership will take several years to fully grow out as more people become aware of the service.

In order to estimate future ridership, current GO Rail annual ridership growth rates of 2.8% were extrapolated to 2024 and coupled with an additional factor to account for the start of all day service. The RER Initial Business Case, published in 2014, estimated that Allandale Waterfront would have about 40% of 2031 total ridership coming from off-peak trips. Accordingly 40% was added to the extrapolated 2024 ridership number to account for additional ridership coming from the introduction of a new type of service. For the AM and PM peak hours in Barrie it is reasonable to assume two train arrivals and departures. For the weekend peak period one rail arrival and departure should be expected. Both sources of ridership estimates predicted very few trips using the station as destination rather than origin. It is therefore reasonable to assume that pick-up and drop-off patterns are focused in one direction.

In order to estimate future passengers using specific modes, current ridership was applied the mode splits published in the GO Rail Station Access Strategy. Because no further parking expansion is anticipated at the station and parking utilization is currently full, all future growth was assumed to be allocated proportionally to walking, local transit and pick-up and drop-off. Of the current alternative forms of station access pick-up and drop-off represents about 50% while walking and local transit represent each about 25%.

Daily Weekday Ridership Estimates for Traffic Analysis

Mode	*Today*	*2024 Extrapolated*	*2024 + All Day Factor*	*Peak Traffic Hour Estimate*
Walk	29.25	20	40	n/a
Local Transit	22.75	20	40	n/a
Micro-Transit	-	-	-	n/a
Cycling	-	-	-	n/a
Pick Up/Drop Off	65	40	82	**25**
Drive and Park	208	-	-	n/a
Carpool	0	-	-	n/a
Subtotal	325	80	162	**50**
Total		405	567	n/a

Peak Hour Demand:

Passenger volumes during the peak traffic hour should be fairly low accessing the GO Station as most trains depart before the local AM peak and arrive after the local PM Peak. Only one train currently arrives during the PM peak hour at 17:26. Travel to the station is likely to be skewed to morning arrivals and evening departures from the station. RER ridership forecasts shows that almost all riders are expected to use Allandale Waterfront as their home station and long travel times to Union Station mean that trips are less likely to begin in the afternoon or evening. It is therefore assumed that traffic during the traffic peak our represents approximately 30% of the ridership added by the all-day factor.

Weekend ridership projections for RER are not publically available. Metrolinx has released figures for the existing summer weekend services on the Barrie corridor which began operating in 2012. The data shows that these trips average about 1,300 trips daily on the entire corridor. Allandale is assumed to represent about 10% of line ridership, more than its weekday share as weekend travel patterns differ from work day commutes. Of this ridership roughly 20% is estimated to take place during the peak hour as most trips are assumed to occur in the morning or early afternoon. The future estimate was derived by extrapolating the 2.8% annual growth rate of GO Rail and adding an additional 10% growth to account for the increased service frequency following RER implementation.

Weekend Peak Hour Rider Estimate

	Total Riders (Daily)	*Peak Traffic Hour Riders (1-2pm)*	*Pick-Up / Drop-Off Trips (20%)*
Estimate for Existing	130	26	5
Estimate for Opening Day	178	35	7

All future demand projections are on the high end of the likely range in order to provide a conservative estimate for the purposes of informing the traffic impact study.

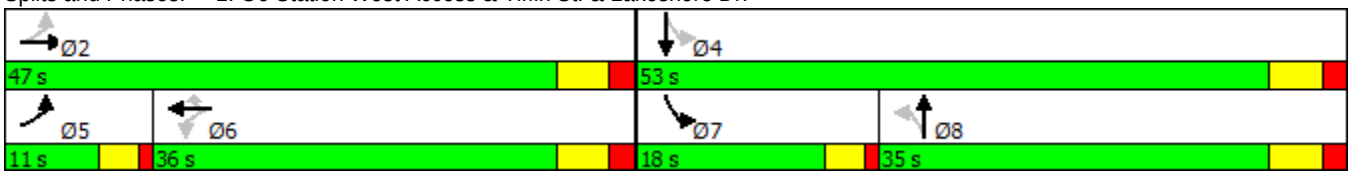
APPENDIX

E Synchro Reports for Future (2024) Background Traffic Analysis

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	248	19	1	331	725	26	5	2	453	5	105
Future Volume (vph)	106	248	19	1	331	725	26	5	2	453	5	105
Satd. Flow (prot)	1787	1879	0	1805	3574	1599	1805	1822	0	1770	1581	0
Flt Permitted	0.457			0.587			0.680			0.659		
Satd. Flow (perm)	860	1879	0	1115	3574	1599	1292	1822	0	1228	1581	0
Satd. Flow (RTOR)		5				740					115	
Lane Group Flow (vph)	112	281	0	1	338	740	41	11	0	498	120	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	5	2			6			8		7	4	
Permitted Phases	2			6		6	8			4		
Total Split (s)	11.0	47.0		36.0	36.0	36.0	35.0	35.0		18.0	53.0	
Total Lost Time (s)	4.0	6.0		6.0	6.0	6.0	6.0	6.0		4.0	6.0	
Act Effct Green (s)	43.0	41.0		30.0	30.0	30.0	29.0	29.0		49.0	47.0	
Actuated g/C Ratio	0.43	0.41		0.30	0.30	0.30	0.29	0.29		0.49	0.47	
v/c Ratio	0.26	0.36		0.00	0.32	0.74	0.11	0.02		0.74	0.15	
Control Delay	19.1	21.8		25.0	28.1	7.4	27.2	25.7		26.5	3.7	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	19.1	21.8		25.0	28.1	7.4	27.2	25.7		26.5	3.7	
LOS	B	C		C	C	A	C	C		C	A	
Approach Delay		21.0			13.9			26.8			22.1	
Approach LOS		C			B			C			C	
Queue Length 50th (m)	13.6	38.2		0.2	27.9	0.0	6.1	1.6		69.4	0.5	
Queue Length 95th (m)	24.7	59.3		1.4	40.2	32.3	10.2	4.1		101.9	10.0	
Internal Link Dist (m)		44.8			116.0			88.9			104.9	
Turn Bay Length (m)	35.0			23.0		55.0				75.0		
Base Capacity (vph)	434	773		334	1072	997	374	528		677	804	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.26	0.36		0.00	0.32	0.74	0.11	0.02		0.74	0.15	

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 17.9	Intersection LOS: B
Intersection Capacity Utilization 96.8%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 1: Go Station West Access & Tiffin St. & Lakeshore Dr.

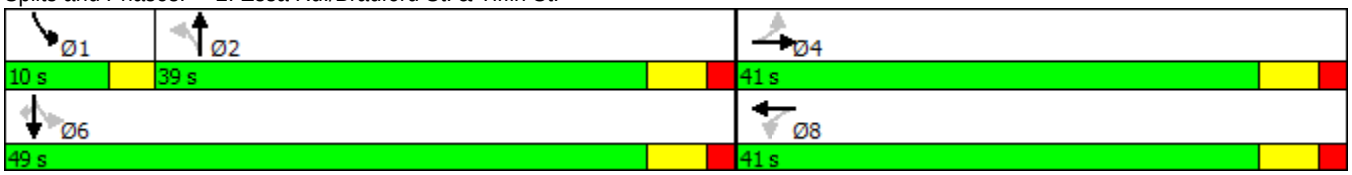


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	233	75	104	216	0	63	365	116	39	241	39
Future Volume (vph)	68	233	75	104	216	0	63	365	116	39	241	39
Satd. Flow (prot)	1770	1775	0	1641	1845	0	0	3397	0	0	3354	1568
Flt Permitted	0.610			0.535				0.847			0.747	
Satd. Flow (perm)	1136	1775	0	924	1845	0	0	2895	0	0	2523	1568
Satd. Flow (RTOR)		21						43				49
Lane Group Flow (vph)	76	342	0	116	240	0	0	639	0	0	354	49
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6	6	6
Total Split (s)	41.0	41.0		41.0	41.0		39.0	39.0		10.0	49.0	49.0
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	6.0
Act Effct Green (s)	35.2	35.2		35.2	35.2			19.0			19.0	19.0
Actuated g/C Ratio	0.53	0.53		0.53	0.53			0.29			0.29	0.29
v/c Ratio	0.13	0.36		0.24	0.24			0.74			0.49	0.10
Control Delay	9.9	10.6		11.3	10.2			25.5			21.8	6.0
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Delay	9.9	10.6		11.3	10.2			25.5			21.8	6.0
LOS	A	B		B	B			C			C	A
Approach Delay		10.5			10.5			25.5			19.8	
Approach LOS		B			B			C			B	
Queue Length 50th (m)	4.4	21.4		7.2	15.0			36.3			19.7	0.0
Queue Length 95th (m)	13.1	46.9		20.1	33.6			49.0			26.4	5.1
Internal Link Dist (m)		153.0			41.6			55.6			43.8	
Turn Bay Length (m)	47.0			23.0								89.0
Base Capacity (vph)	603	953		490	980			1471			1646	1040
Starvation Cap Reductn	0	0		0	0			0			0	0
Spillback Cap Reductn	0	0		0	0			0			0	0
Storage Cap Reductn	0	0		0	0			0			0	0
Reduced v/c Ratio	0.13	0.36		0.24	0.24			0.43			0.22	0.05

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 66.2
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 17.9 Intersection LOS: B
Intersection Capacity Utilization 84.0% ICU Level of Service E
Analysis Period (min) 15

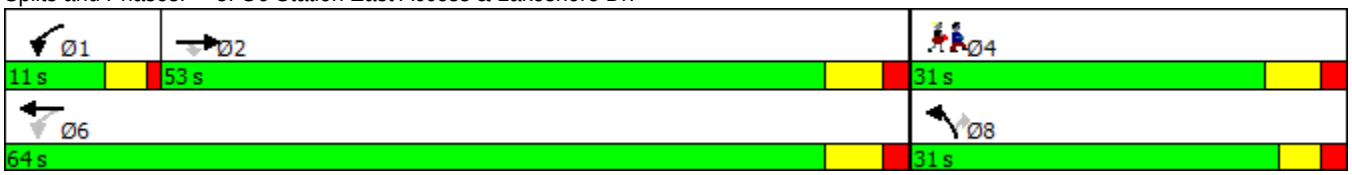
Splits and Phases: 2: Essa Rd./Bradford St. & Tiffin St.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø4
Lane Configurations							
Traffic Volume (vph)	702	1	12	1054	3	12	
Future Volume (vph)	702	1	12	1054	3	12	
Satd. Flow (prot)	1881	1615	1805	1881	1805	1615	
Flt Permitted			0.292		0.950		
Satd. Flow (perm)	1881	1615	555	1881	1805	1615	
Satd. Flow (RTOR)		1				39	
Lane Group Flow (vph)	763	1	13	1098	10	39	
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm	
Protected Phases	2		1	6	8		4
Permitted Phases		2	6			8	
Total Split (s)	53.0	53.0	11.0	64.0	31.0	31.0	31.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	5.0	5.0	
Act Effct Green (s)	64.8	64.8	66.6	67.1	10.0	10.0	
Actuated g/C Ratio	0.81	0.81	0.84	0.84	0.13	0.13	
v/c Ratio	0.50	0.00	0.02	0.69	0.04	0.16	
Control Delay	6.9	4.0	2.4	8.2	31.3	12.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	6.9	4.0	2.4	8.2	31.3	12.8	
LOS	A	A	A	A	C	B	
Approach Delay	6.9			8.2	16.5		
Approach LOS	A			A	B		
Queue Length 50th (m)	43.0	0.0	0.4	88.2	1.5	0.0	
Queue Length 95th (m)	114.2	0.6	1.4	147.6	2.0	0.0	
Internal Link Dist (m)	144.3			137.6	30.3		
Turn Bay Length (m)		40.0	70.0				
Base Capacity (vph)	1532	1315	574	1584	590	553	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.50	0.00	0.02	0.69	0.02	0.07	

Intersection Summary	
Cycle Length: 95	
Actuated Cycle Length: 79.6	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 7.9	Intersection LOS: A
Intersection Capacity Utilization 73.0%	ICU Level of Service C
Analysis Period (min) 15	

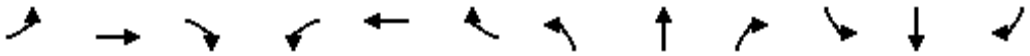
Splits and Phases: 3: Go Station East Access & Lakeshore Dr.



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	5	205	350	6	158	259
Future Volume (vph)	5	205	350	6	158	259
Satd. Flow (prot)	1616	0	3423	0	0	3342
Flt Permitted	0.999					0.668
Satd. Flow (perm)	1616	0	3423	0	0	2276
Satd. Flow (RTOR)	250		2			
Lane Group Flow (vph)	256	0	429	0	0	435
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases					6	
Total Split (s)	32.0		87.0		11.0	98.0
Total Lost Time (s)	6.0		6.0			6.0
Act Effct Green (s)	11.0		92.0			92.0
Actuated g/C Ratio	0.10		0.80			0.80
v/c Ratio	0.67		0.16			0.24
Control Delay	16.1		2.9			3.3
Queue Delay	0.0		0.0			0.0
Total Delay	16.1		2.9			3.3
LOS	B		A			A
Approach Delay	16.1		2.9			3.3
Approach LOS	B		A			A
Queue Length 50th (m)	1.3		9.1			10.0
Queue Length 95th (m)	18.1		14.7			18.4
Internal Link Dist (m)	120.4		80.7			19.9
Turn Bay Length (m)						
Base Capacity (vph)	558		2738			1820
Starvation Cap Reductn	0		0			0
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.46		0.16			0.24

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 115	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 6.1	Intersection LOS: A
Intersection Capacity Utilization 156.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 4: Essa Rd. & Gowan St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	15	0	0	0	16	534	6	12	402	6
Future Volume (Veh/h)	10	0	15	0	0	0	16	534	6	12	402	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.79	0.92	0.79	0.92	0.92	0.92	0.84	0.84	0.92	0.92	0.93	0.93
Hourly flow rate (vph)	13	0	19	0	0	0	19	636	7	13	432	6
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								44			80	
pX, platoon unblocked	0.96	0.96	0.95	0.96	0.96	0.98	0.95			0.98		
vC, conflicting volume	817	1142	219	938	1142	322	438			643		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	624	961	81	750	961	255	311			585		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	96	100	98	100	100	100	98			99		
cM capacity (veh/h)	352	242	924	277	239	726	1154			976		

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	32	337	325	229	222
Volume Left	13	19	0	13	0
Volume Right	19	0	7	0	6
cSH	557	1154	1700	976	1700
Volume to Capacity	0.06	0.02	0.19	0.01	0.13
Queue Length 95th (m)	1.5	0.4	0.0	0.3	0.0
Control Delay (s)	11.9	0.6	0.0	0.6	0.0
Lane LOS	B	A		A	
Approach Delay (s)	11.9	0.3		0.3	
Approach LOS	B				

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	36.5%	ICU Level of Service	A	
Analysis Period (min)	15			

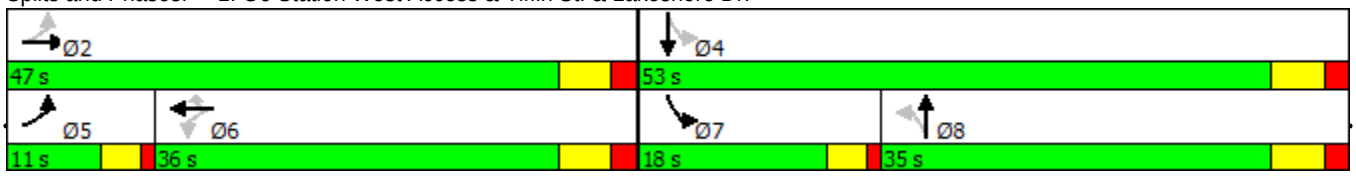
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	159	475	27	2	283	569	34	5	2	706	37	122
Future Volume (vph)	159	475	27	2	283	569	34	5	2	706	37	122
Satd. Flow (prot)	1805	1885	0	1805	3610	1599	1031	1814	0	1805	1669	0
Flt Permitted	0.491			0.380			0.652			0.660		
Satd. Flow (perm)	933	1885	0	722	3610	1599	708	1814	0	1254	1669	0
Satd. Flow (RTOR)		3				599					127	
Lane Group Flow (vph)	161	507	0	2	298	599	51	10	0	735	166	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	5	2			6			8		7	4	
Permitted Phases	2			6		6	8			4		
Total Split (s)	11.0	47.0		36.0	36.0	36.0	35.0	35.0		18.0	53.0	
Total Lost Time (s)	4.0	6.0		6.0	6.0	6.0	6.0	6.0		4.0	6.0	
Act Effct Green (s)	43.0	41.0		30.0	30.0	30.0	29.0	29.0		49.0	47.0	
Actuated g/C Ratio	0.43	0.41		0.30	0.30	0.30	0.29	0.29		0.49	0.47	
v/c Ratio	0.35	0.66		0.01	0.28	0.67	0.25	0.02		1.06	0.20	
Control Delay	20.3	28.6		25.0	27.6	6.5	31.2	25.6		77.6	5.2	
Queue Delay	0.0	6.5		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	20.3	35.1		25.0	27.6	6.5	31.2	25.6		77.6	5.2	
LOS	C	D		C	C	A	C	C		E	A	
Approach Delay		31.5			13.5			30.3			64.3	
Approach LOS		C			B			C			E	
Queue Length 50th (m)	20.0	81.1		0.3	24.3	0.0	8.0	1.5		~138.5	4.2	
Queue Length 95th (m)	34.0	117.9		2.0	35.6	27.7	13.2	4.0		#237.9	15.6	
Internal Link Dist (m)		44.8			116.0			88.9			104.9	
Turn Bay Length (m)	35.0			23.0		55.0				75.0		
Base Capacity (vph)	462	774		216	1083	899	205	526		691	851	
Starvation Cap Reductn	0	214		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.35	0.91		0.01	0.28	0.67	0.25	0.02		1.06	0.20	

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 1.06	
Intersection Signal Delay: 36.8	Intersection LOS: D
Intersection Capacity Utilization 112.4%	ICU Level of Service H
Analysis Period (min) 15	

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

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

Splits and Phases: 1: Go Station West Access & Tiffin St. & Lakeshore Dr.

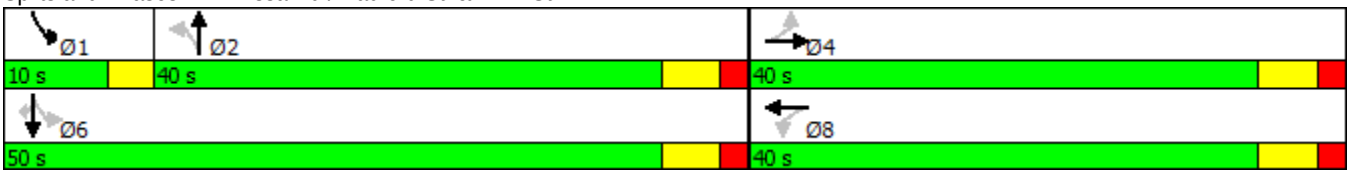


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	362	90	130	207	0	91	493	168	138	449	70
Future Volume (vph)	46	362	90	130	207	0	91	493	168	138	449	70
Satd. Flow (prot)	1752	1814	0	1687	1863	0	0	3431	0	0	3461	1599
Flt Permitted	0.614			0.353				0.718			0.581	
Satd. Flow (perm)	1133	1814	0	627	1863	0	0	2479	0	0	2035	1599
Satd. Flow (RTOR)		16						48				80
Lane Group Flow (vph)	48	476	0	141	225	0	0	800	0	0	667	80
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6	6	6
Total Split (s)	40.0	40.0		40.0	40.0		40.0	40.0		10.0	50.0	50.0
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	6.0
Act Effct Green (s)	34.4	34.4		34.4	34.4			31.6			31.6	31.6
Actuated g/C Ratio	0.44	0.44		0.44	0.44			0.40			0.40	0.40
v/c Ratio	0.10	0.59		0.51	0.27			0.78			0.81	0.12
Control Delay	16.5	21.6		27.2	17.1			24.2			28.9	3.7
Queue Delay	0.0	0.0		0.0	0.0			0.2			0.0	0.0
Total Delay	16.5	21.6		27.2	17.1			24.4			28.9	3.7
LOS	B	C		C	B			C			C	A
Approach Delay		21.1			21.0			24.4			26.2	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	4.3	52.5		15.4	21.7			51.5			46.4	0.0
Queue Length 95th (m)	13.3	105.0		#43.6	46.8			72.2			64.8	6.7
Internal Link Dist (m)		153.0			41.6			55.6			43.8	
Turn Bay Length (m)	47.0			23.0								89.0
Base Capacity (vph)	499	807		275	820			1192			1159	945
Starvation Cap Reductn	0	0		0	0			49			0	0
Spillback Cap Reductn	0	0		0	0			0			0	0
Storage Cap Reductn	0	0		0	0			0			0	0
Reduced v/c Ratio	0.10	0.59		0.51	0.27			0.70			0.58	0.08

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 78.1
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 23.7 Intersection LOS: C
Intersection Capacity Utilization 102.6% ICU Level of Service G
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Essa Rd./Bradford St. & Tiffin St.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø4
Lane Configurations							
Traffic Volume (vph)	1180	3	6	851	2	15	
Future Volume (vph)	1180	3	6	851	2	15	
Satd. Flow (prot)	1900	1615	1805	1900	1805	1615	
Flt Permitted			0.106		0.950		
Satd. Flow (perm)	1900	1615	201	1900	1805	1615	
Satd. Flow (RTOR)		1				20	
Lane Group Flow (vph)	1204	3	6	886	3	20	
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm	
Protected Phases	2		1	6	8		4
Permitted Phases		2	6			8	
Total Split (s)	53.0	53.0	11.0	64.0	31.0	31.0	31.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	5.0	5.0	
Act Effct Green (s)	69.9	69.9	70.4	72.1	10.0	10.0	
Actuated g/C Ratio	0.87	0.87	0.88	0.90	0.12	0.12	
v/c Ratio	0.73	0.00	0.02	0.52	0.01	0.09	
Control Delay	11.4	4.3	2.2	4.1	31.5	15.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	11.4	4.3	2.2	4.1	31.5	15.3	
LOS	B	A	A	A	C	B	
Approach Delay	11.4			4.1	17.4		
Approach LOS	B			A	B		
Queue Length 50th (m)	0.0	0.0	0.1	0.0	0.4	0.0	
Queue Length 95th (m)	#288.5	1.1	0.9	86.5	2.4	4.7	
Internal Link Dist (m)	144.3			137.6	30.3		
Turn Bay Length (m)		40.0	70.0				
Base Capacity (vph)	1653	1405	315	1706	585	536	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.73	0.00	0.02	0.52	0.01	0.04	

Intersection Summary

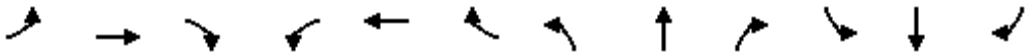
Cycle Length: 95
Actuated Cycle Length: 80.3
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 8.4 Intersection LOS: A
Intersection Capacity Utilization 79.6% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Go Station East Access & Lakeshore Dr.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	7	320	456	10	241	438
Future Volume (vph)	7	320	456	10	241	438
Satd. Flow (prot)	1632	0	3497	0	0	3344
Flt Permitted	0.999					0.642
Satd. Flow (perm)	1632	0	3497	0	0	2184
Satd. Flow (RTOR)	416		3			
Lane Group Flow (vph)	425	0	542	0	0	789
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases					6	
Total Split (s)	33.0		86.0		11.0	97.0
Total Lost Time (s)	6.0		6.0			6.0
Act Effct Green (s)	12.2		91.1			91.1
Actuated g/C Ratio	0.11		0.79			0.79
v/c Ratio	0.78		0.20			0.46
Control Delay	16.0		3.4			5.3
Queue Delay	0.0		0.0			0.8
Total Delay	16.0		3.4			6.2
LOS	B		A			A
Approach Delay	16.0		3.4			6.2
Approach LOS	B		A			A
Queue Length 50th (m)	2.0		11.9			23.2
Queue Length 95th (m)	11.6		24.0			46.2
Internal Link Dist (m)	120.4		80.7			19.9
Turn Bay Length (m)						
Base Capacity (vph)	700		2762			1725
Starvation Cap Reductn	0		0			590
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.61		0.20			0.70

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 115.3	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 7.7	Intersection LOS: A
Intersection Capacity Utilization 168.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 4: Essa Rd. & Gowan St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	26	0	0	0	20	748	8	12	654	2
Future Volume (Veh/h)	5	0	26	0	0	0	20	748	8	12	654	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.68	0.68	0.68	1.00	1.00	1.00	0.95	0.95	0.95	0.90	0.90	0.90
Hourly flow rate (vph)	7	0	38	0	0	0	21	787	8	13	727	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								44			80	
pX, platoon unblocked	0.90	0.90	0.88	0.90	0.90	0.97	0.88			0.97		
vC, conflicting volume	1190	1591	364	1260	1588	398	729			795		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	834	1280	21	913	1277	314	433			725		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	96	100	100	100	98			98		
cM capacity (veh/h)	231	145	936	195	146	666	1006			860		

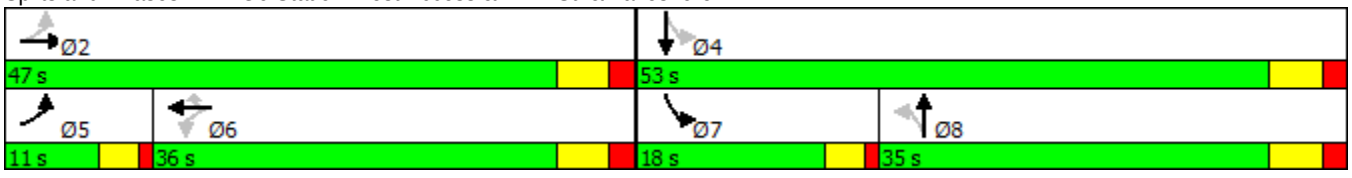
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	45	414	402	376	366
Volume Left	7	21	0	13	0
Volume Right	38	0	8	0	2
cSH	635	1006	1700	860	1700
Volume to Capacity	0.07	0.02	0.24	0.02	0.21
Queue Length 95th (m)	1.8	0.5	0.0	0.4	0.0
Control Delay (s)	11.1	0.7	0.0	0.5	0.0
Lane LOS	B	A		A	
Approach Delay (s)	11.1	0.3		0.2	
Approach LOS	B				

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	45.3%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	177	291	9	6	211	515	26	2	7	527	12	163
Future Volume (vph)	177	291	9	6	211	515	26	2	7	527	12	163
Satd. Flow (prot)	1805	1874	0	1805	3574	1615	1101	1682	0	1787	1634	0
Flt Permitted	0.545			0.569			0.639			0.658		
Satd. Flow (perm)	1036	1874	0	1081	3574	1615	740	1682	0	1238	1634	0
Satd. Flow (RTOR)		2				526					175	
Lane Group Flow (vph)	186	315	0	6	215	526	27	13	0	567	188	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	5	2			6			8		7	4	
Permitted Phases	2			6		6	8			4		
Total Split (s)	11.0	47.0		36.0	36.0	36.0	35.0	35.0		18.0	53.0	
Total Lost Time (s)	4.0	6.0		6.0	6.0	6.0	6.0	6.0		4.0	6.0	
Act Effct Green (s)	43.0	41.0		30.0	30.0	30.0	29.0	29.0		49.0	47.0	
Actuated g/C Ratio	0.43	0.41		0.30	0.30	0.30	0.29	0.29		0.49	0.47	
v/c Ratio	0.37	0.41		0.02	0.20	0.62	0.13	0.03		0.83	0.22	
Control Delay	20.7	22.8		25.0	26.7	6.0	28.2	25.8		32.7	3.6	
Queue Delay	0.0	1.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	20.7	23.8		25.0	26.7	6.0	28.2	25.8		32.7	3.6	
LOS	C	C		C	C	A	C	C		C	A	
Approach Delay		22.7			12.1			27.4			25.4	
Approach LOS		C			B			C			C	
Queue Length 50th (m)	23.5	44.3		0.9	17.1	0.0	4.1	1.9		83.1	1.4	
Queue Length 95th (m)	39.0	67.6		3.9	26.6	24.9	11.2	5.3		#133.9	13.0	
Internal Link Dist (m)		44.8			116.0			88.9			104.9	
Turn Bay Length (m)	35.0			23.0		55.0				75.0		
Base Capacity (vph)	499	769		324	1072	852	214	487		683	860	
Starvation Cap Reductn	0	242		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.37	0.60		0.02	0.20	0.62	0.13	0.03		0.83	0.22	

Intersection Summary		
Cycle Length: 100		
Actuated Cycle Length: 100		
Control Type: Semi Act-Uncoord		
Maximum v/c Ratio: 0.83		
Intersection Signal Delay: 19.9	Intersection LOS: B	
Intersection Capacity Utilization 100.9%	ICU Level of Service G	
Analysis Period (min) 15		
# 95th percentile volume exceeds capacity, queue may be longer.		
Queue shown is maximum after two cycles.		

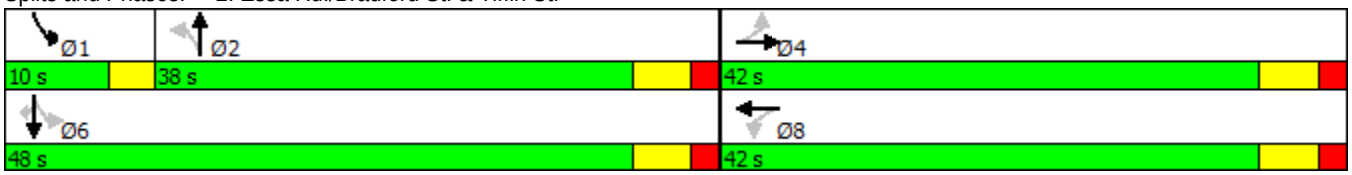
Splits and Phases: 1: Go Station West Access & Tiffin St. & Lakeshore Dr.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	234	63	170	153	0	69	402	203	51	233	43
Future Volume (vph)	29	234	63	170	153	0	69	402	203	51	233	43
Satd. Flow (prot)	1736	1810	0	1736	1863	0	0	3410	0	0	3464	1615
Flt Permitted	0.644			0.538				0.864			0.665	
Satd. Flow (perm)	1177	1810	0	983	1863	0	0	2961	0	0	2324	1615
Satd. Flow (RTOR)		18						83				48
Lane Group Flow (vph)	32	330	0	200	180	0	0	750	0	0	316	48
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6	6	6
Total Split (s)	42.0	42.0		42.0	42.0		38.0	38.0		10.0	48.0	48.0
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	6.0
Act Effct Green (s)	36.2	36.2		36.2	36.2			21.5			21.5	21.5
Actuated g/C Ratio	0.52	0.52		0.52	0.52			0.31			0.31	0.31
v/c Ratio	0.05	0.35		0.39	0.19			0.77			0.44	0.09
Control Delay	10.6	11.7		14.6	10.9			25.1			21.0	5.7
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Delay	10.6	11.7		14.6	10.9			25.1			21.0	5.7
LOS	B	B		B	B			C			C	A
Approach Delay		11.6			12.9			25.1			19.0	
Approach LOS		B			B			C			B	
Queue Length 50th (m)	2.0	23.3		15.5	12.3			43.1			18.0	0.0
Queue Length 95th (m)	7.5	50.1		35.4	26.6			61.8			28.4	6.3
Internal Link Dist (m)		153.0			41.6			55.6			43.8	
Turn Bay Length (m)	47.0			23.0								89.0
Base Capacity (vph)	610	947		509	966			1409			1405	995
Starvation Cap Reductn	0	0		0	0			7			0	0
Spillback Cap Reductn	0	0		0	0			0			0	0
Storage Cap Reductn	0	0		0	0			0			0	0
Reduced v/c Ratio	0.05	0.35		0.39	0.19			0.53			0.22	0.05

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 69.8	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 18.8	Intersection LOS: B
Intersection Capacity Utilization 87.9%	ICU Level of Service E
Analysis Period (min) 15	

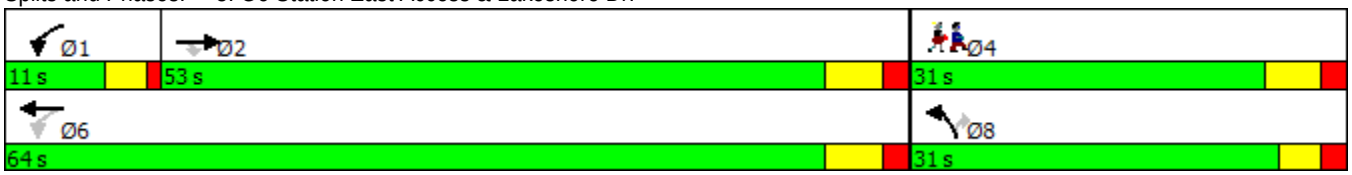
Splits and Phases: 2: Essa Rd./Bradford St. & Tiffin St.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø4
Lane Configurations							
Traffic Volume (vph)	822	2	3	726	5	9	
Future Volume (vph)	822	2	3	726	5	9	
Satd. Flow (prot)	1881	1615	1805	1881	1805	1615	
Flt Permitted			0.246		0.950		
Satd. Flow (perm)	1881	1615	467	1881	1805	1615	
Satd. Flow (RTOR)		1				15	
Lane Group Flow (vph)	893	2	3	756	8	15	
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm	
Protected Phases	2		1	6	8		4
Permitted Phases		2	6			8	
Total Split (s)	53.0	53.0	11.0	64.0	31.0	31.0	31.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	5.0	5.0	
Act Effct Green (s)	70.3	70.3	70.9	72.5	10.0	10.0	
Actuated g/C Ratio	0.87	0.87	0.88	0.90	0.12	0.12	
v/c Ratio	0.55	0.00	0.01	0.45	0.04	0.07	
Control Delay	6.9	4.5	2.0	3.4	32.2	16.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	6.9	4.5	2.0	3.4	32.2	16.8	
LOS	A	A	A	A	C	B	
Approach Delay	6.9			3.4	22.1		
Approach LOS	A			A	C		
Queue Length 50th (m)	0.0	0.0	0.0	0.0	1.1	0.0	
Queue Length 95th (m)	154.3	0.9	0.6	64.6	3.4	2.8	
Internal Link Dist (m)	144.3			137.6	30.3		
Turn Bay Length (m)		40.0	70.0				
Base Capacity (vph)	1638	1407	526	1691	582	531	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.55	0.00	0.01	0.45	0.01	0.03	

Intersection Summary			
Cycle Length: 95			
Actuated Cycle Length: 80.7			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.55			
Intersection Signal Delay: 5.6		Intersection LOS: A	
Intersection Capacity Utilization 60.8%		ICU Level of Service B	
Analysis Period (min) 15			

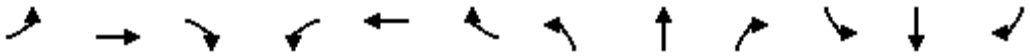
Splits and Phases: 3: Go Station East Access & Lakeshore Dr.



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	11	259	440	8	131	348
Future Volume (vph)	11	259	440	8	131	348
Satd. Flow (prot)	1650	0	3530	0	0	3484
Flt Permitted	0.998					0.674
Satd. Flow (perm)	1650	0	3530	0	0	2381
Satd. Flow (RTOR)	316		3			
Lane Group Flow (vph)	329	0	540	0	0	551
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases					6	
Total Split (s)	31.0		88.0		11.0	99.0
Total Lost Time (s)	6.0		6.0			6.0
Act Effct Green (s)	11.6		93.1			93.1
Actuated g/C Ratio	0.10		0.80			0.80
v/c Ratio	0.73		0.19			0.29
Control Delay	16.8		3.1			3.8
Queue Delay	0.0		0.0			0.5
Total Delay	16.8		3.1			4.2
LOS	B		A			A
Approach Delay	16.8		3.1			4.2
Approach LOS	B		A			A
Queue Length 50th (m)	2.9		11.8			13.4
Queue Length 95th (m)	20.2		20.6			25.2
Internal Link Dist (m)	120.4		80.7			19.9
Turn Bay Length (m)						
Base Capacity (vph)	602		2816			1899
Starvation Cap Reductn	0		0			858
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.55		0.19			0.53

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 116.7	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 6.7	Intersection LOS: A
Intersection Capacity Utilization 136.8%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 4: Essa Rd. & Gowan St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	37	0	0	0	30	663	6	10	442	15
Future Volume (Veh/h)	10	0	37	0	0	0	30	663	6	10	442	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	1.00	1.00	1.00	0.84	0.84	0.84	0.86	0.86	0.86
Hourly flow rate (vph)	12	0	45	0	0	0	36	789	7	12	514	17
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								44			80	
pX, platoon unblocked	0.97	0.97	0.96	0.97	0.97	0.97	0.96			0.97		
vC, conflicting volume	1013	1414	266	1190	1420	398	531			796		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	802	1214	140	984	1220	307	418			719		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	100	95	100	100	100	97			99		
cM capacity (veh/h)	262	170	850	183	169	671	1102			862		

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	57	430	402	269	274
Volume Left	12	36	0	12	0
Volume Right	45	0	7	0	17
cSH	577	1102	1700	862	1700
Volume to Capacity	0.10	0.03	0.24	0.01	0.16
Queue Length 95th (m)	2.6	0.8	0.0	0.3	0.0
Control Delay (s)	11.9	1.0	0.0	0.6	0.0
Lane LOS	B	A		A	
Approach Delay (s)	11.9	0.5		0.3	
Approach LOS	B				

Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	45.7%	ICU Level of Service		A
Analysis Period (min)	15			

APPENDIX

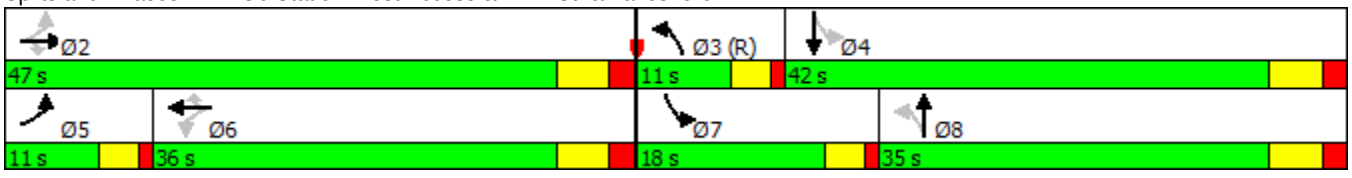
F Synchro Reports for Future (2024) Total Traffic Analysis

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	267	34	0	344	730	34	0	0	458	0	105
Future Volume (vph)	106	267	34	0	344	730	34	0	0	458	0	105
Satd. Flow (prot)	1787	1900	808	950	1881	1599	902	950	0	1770	1568	0
Flt Permitted	0.308						0.683			0.665		
Satd. Flow (perm)	579	1900	808	950	1881	1599	649	950	0	1239	1568	0
Satd. Flow (RTOR)			120			745					473	
Lane Group Flow (vph)	112	281	36	0	351	745	53	0	0	503	115	0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt			pm+pt	NA	
Protected Phases	5	2			6		3	8		7	4	
Permitted Phases	2		2	6		6	8			4		
Total Split (s)	11.0	47.0	47.0	36.0	36.0	36.0	11.0	35.0		18.0	42.0	
Total Lost Time (s)	4.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0		4.0	6.0	
Act Effct Green (s)	43.0	41.0	41.0		30.0	30.0	38.0			49.0	36.0	
Actuated g/C Ratio	0.43	0.41	0.41		0.30	0.30	0.38			0.49	0.36	
v/c Ratio	0.34	0.36	0.09		0.62	0.74	0.20			0.74	0.13	
Control Delay	30.5	36.4	1.6		35.9	7.5	16.7			26.7	0.3	
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0			0.0	0.0	
Total Delay	30.5	36.4	1.6		35.9	7.5	16.7			26.7	0.3	
LOS	C	D	A		D	A	B			C	A	
Approach Delay		31.9			16.6			16.7			21.8	
Approach LOS		C			B			B			C	
Queue Length 50th (m)	20.5	59.3	0.0		61.4	0.0	5.6			70.4	0.0	
Queue Length 95th (m)	m33.6	m85.6	m0.3		92.3	32.7	8.8			103.4	0.0	
Internal Link Dist (m)		44.8			116.0			88.9			104.9	
Turn Bay Length (m)	35.0		25.0			55.0				75.0		
Base Capacity (vph)	333	779	402		564	1001	264			681	867	
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	0.34	0.36	0.09		0.62	0.74	0.20			0.74	0.13	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 28 (28%), Referenced to phase 3:NBL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 21.0 Intersection LOS: C
Intersection Capacity Utilization 97.0% ICU Level of Service F
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Go Station West Access & Tiffin St. & Lakeshore Dr.

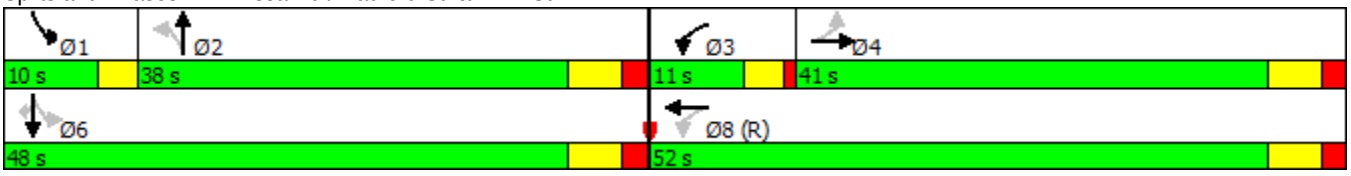


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	245	73	110	226	0	63	363	128	49	229	39
Future Volume (vph)	68	245	73	110	226	0	63	363	128	49	229	39
Satd. Flow (prot)	1770	1781	0	1641	1845	0	0	3388	0	0	3356	1568
Flt Permitted	0.603			0.354				0.806			0.620	
Satd. Flow (perm)	1123	1781	0	611	1845	0	0	2748	0	0	2100	1568
Satd. Flow (RTOR)		16						42				76
Lane Group Flow (vph)	76	353	0	122	251	0	0	652	0	0	352	49
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		4		3	8			2		1	6	
Permitted Phases	4			8			2			6	6	6
Total Split (s)	41.0	41.0		11.0	52.0		38.0	38.0		10.0	48.0	48.0
Total Lost Time (s)	6.0	6.0		4.0	6.0			6.0			6.0	6.0
Act Effct Green (s)	35.0	35.0		63.2	61.2			26.8			26.8	26.8
Actuated g/C Ratio	0.35	0.35		0.63	0.61			0.27			0.27	0.27
v/c Ratio	0.19	0.56		0.20	0.22			0.85			0.63	0.10
Control Delay	24.4	29.1		3.5	3.4			43.3			36.7	2.9
Queue Delay	0.0	0.0		0.0	0.0			0.1			0.0	0.0
Total Delay	24.4	29.1		3.5	3.4			43.4			36.7	2.9
LOS	C	C		A	A			D			D	A
Approach Delay		28.2			3.4			43.4			32.6	
Approach LOS		C			A			D			C	
Queue Length 50th (m)	10.7	54.9		3.1	6.8			62.5			33.3	0.0
Queue Length 95th (m)	22.0	84.0		m6.2	11.8			71.0			37.6	2.3
Internal Link Dist (m)		153.0			41.6			55.6			43.8	
Turn Bay Length (m)	47.0			23.0								89.0
Base Capacity (vph)	393	633		614	1129			915			882	702
Starvation Cap Reductn	0	0		0	0			12			0	0
Spillback Cap Reductn	0	0		0	0			0			0	0
Storage Cap Reductn	0	0		0	0			0			0	0
Reduced v/c Ratio	0.19	0.56		0.20	0.22			0.72			0.40	0.07

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 8:WBTL, Start of Green, Master Intersection
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 29.5 Intersection LOS: C
Intersection Capacity Utilization 84.3% ICU Level of Service E
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

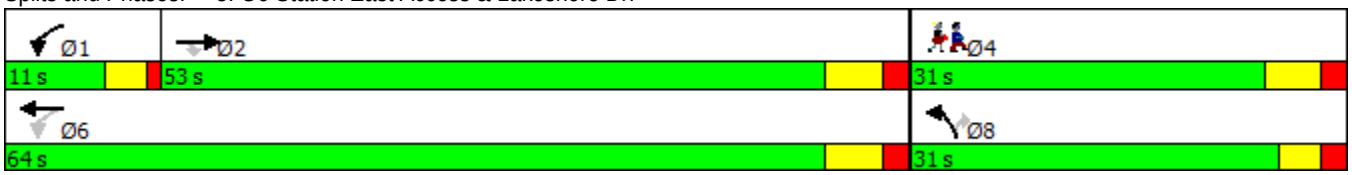
Splits and Phases: 2: Essa Rd./Bradford St. & Tiffin St.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø4
Lane Configurations							
Traffic Volume (vph)	700	25	13	1053	21	14	
Future Volume (vph)	700	25	13	1053	21	14	
Satd. Flow (prot)	1881	1615	1805	1881	1805	1615	
Flt Permitted			0.280		0.950		
Satd. Flow (perm)	1881	1615	532	1881	1805	1615	
Satd. Flow (RTOR)		16				45	
Lane Group Flow (vph)	761	27	14	1097	68	45	
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm	
Protected Phases	2		1	6	8		4
Permitted Phases		2	6			8	
Total Split (s)	53.0	53.0	11.0	64.0	31.0	31.0	31.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	5.0	5.0	
Act Effct Green (s)	60.0	60.0	63.0	62.2	10.2	10.2	
Actuated g/C Ratio	0.76	0.76	0.80	0.79	0.13	0.13	
v/c Ratio	0.53	0.02	0.03	0.74	0.29	0.18	
Control Delay	8.1	3.4	2.5	10.5	34.9	12.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	8.1	3.4	2.5	10.5	34.9	12.2	
LOS	A	A	A	B	C	B	
Approach Delay	7.9			10.4	25.9		
Approach LOS	A			B	C		
Queue Length 50th (m)	42.7	0.4	0.4	87.9	9.9	0.0	
Queue Length 95th (m)	118.0	3.8	1.6	157.2	7.1	0.0	
Internal Link Dist (m)	144.3			137.6	30.3		
Turn Bay Length (m)		40.0	70.0				
Base Capacity (vph)	1425	1227	535	1477	592	560	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.53	0.02	0.03	0.74	0.11	0.08	

Intersection Summary			
Cycle Length: 95			
Actuated Cycle Length: 79.2			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 10.3		Intersection LOS: B	
Intersection Capacity Utilization 72.9%		ICU Level of Service C	
Analysis Period (min) 15			

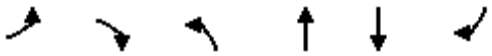
Splits and Phases: 3: Go Station East Access & Lakeshore Dr.



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	5	205	354	6	158	263
Future Volume (vph)	5	205	354	6	158	263
Satd. Flow (prot)	1616	0	3423	0	0	3345
Flt Permitted	0.999					0.667
Satd. Flow (perm)	1616	0	3423	0	0	2272
Satd. Flow (RTOR)	250		2			
Lane Group Flow (vph)	256	0	434	0	0	439
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases					6	
Total Split (s)	32.0		87.0		11.0	98.0
Total Lost Time (s)	6.0		6.0			6.0
Act Effct Green (s)	11.0		92.0			92.0
Actuated g/C Ratio	0.10		0.80			0.80
v/c Ratio	0.67		0.16			0.24
Control Delay	16.1		2.9			3.3
Queue Delay	0.0		0.0			0.0
Total Delay	16.1		2.9			3.3
LOS	B		A			A
Approach Delay	16.1		2.9			3.3
Approach LOS	B		A			A
Queue Length 50th (m)	1.3		9.2			10.2
Queue Length 95th (m)	18.1		14.9			18.6
Internal Link Dist (m)	120.4		80.7			19.9
Turn Bay Length (m)						
Base Capacity (vph)	558		2738			1817
Starvation Cap Reductn	0		0			0
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.46		0.16			0.24

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 115	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 6.1	Intersection LOS: A
Intersection Capacity Utilization 156.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 4: Essa Rd. & Gowan St.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	15	16	544	406	6
Future Volume (Veh/h)	10	15	16	544	406	6
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.84	0.84	0.93	0.93
Hourly flow rate (vph)	13	19	19	648	437	6
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				44	80	
pX, platoon unblocked	0.95	0.94	0.94			
vC, conflicting volume	802	222	443			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	579	48	284			
tC, single (s)	6.8	6.9	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	97	98	98			
cM capacity (veh/h)	423	957	1167			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	32	235	432	291	152
Volume Left	13	19	0	0	0
Volume Right	19	0	0	0	6
cSH	632	1167	1700	1700	1700
Volume to Capacity	0.05	0.02	0.25	0.17	0.09
Queue Length 95th (m)	1.3	0.4	0.0	0.0	0.0
Control Delay (s)	11.0	0.8	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	11.0	0.3		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	159	502	32	0	302	574	32	0	0	743	0	122
Future Volume (vph)	159	502	32	0	302	574	32	0	0	743	0	122
Satd. Flow (prot)	1805	1900	808	950	1900	1599	902	950	0	1805	1599	0
Flt Permitted	0.363						0.671			0.665		
Satd. Flow (perm)	690	1900	808	950	1900	1599	637	950	0	1264	1599	0
Satd. Flow (RTOR)			120			586					509	
Lane Group Flow (vph)	167	528	34	0	308	586	50	0	0	816	134	0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt			pm+pt	NA	
Protected Phases	5	2			6		3	8		7	4	
Permitted Phases	2		2	6		6	8			4		
Total Split (s)	11.0	47.0	47.0	36.0	36.0	36.0	11.0	35.0		18.0	42.0	
Total Lost Time (s)	4.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0		4.0	6.0	
Act Effct Green (s)	43.0	41.0	41.0		30.0	30.0	38.0			49.0	36.0	
Actuated g/C Ratio	0.43	0.41	0.41		0.30	0.30	0.38			0.49	0.36	
v/c Ratio	0.45	0.68	0.08		0.54	0.66	0.19			1.17	0.15	
Control Delay	28.2	38.1	0.5		33.5	6.4	16.5			118.1	0.4	
Queue Delay	0.0	30.1	0.0		0.0	0.0	0.0			0.0	0.0	
Total Delay	28.2	68.2	0.5		33.5	6.4	16.5			118.1	0.4	
LOS	C	E	A		C	A	B			F	A	
Approach Delay		55.9			15.7			16.5			101.5	
Approach LOS		E			B			B			F	
Queue Length 50th (m)	28.1	107.7	0.0		52.3	0.0	5.3			~200.0	0.0	
Queue Length 95th (m)	m29.8	m124.5	m0.0		79.7	27.2	8.4			#273.4	0.0	
Internal Link Dist (m)		44.8			116.0			88.9			104.9	
Turn Bay Length (m)	35.0		25.0			55.0				75.0		
Base Capacity (vph)	374	779	402		570	889	260			695	901	
Starvation Cap Reductn	0	269	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	0.45	1.04	0.08		0.54	0.66	0.19			1.17	0.15	

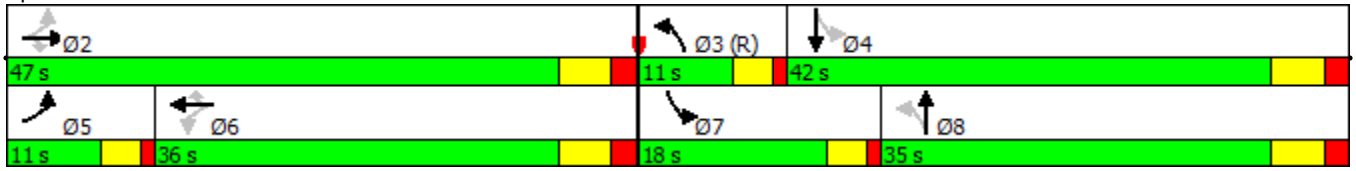
Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 31 (31%), Referenced to phase 3:NBL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.17	
Intersection Signal Delay: 58.0	Intersection LOS: E
Intersection Capacity Utilization 114.3%	ICU Level of Service H
Analysis Period (min) 15	

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

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

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

Splits and Phases: 1: Go Station West Access & Tiffin St. & Lakeshore Dr.

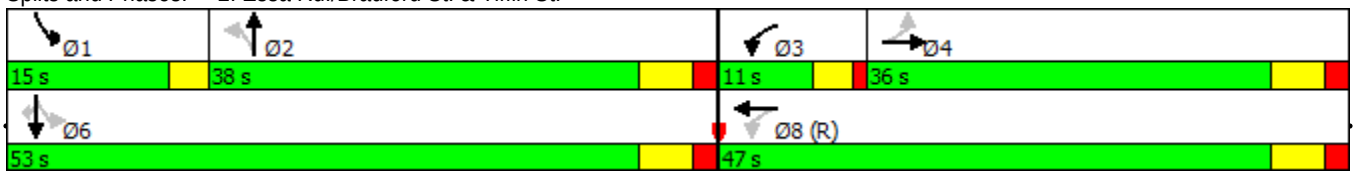


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	374	88	132	217	0	91	491	178	148	437	70
Future Volume (vph)	46	374	88	132	217	0	91	491	178	148	437	70
Satd. Flow (prot)	1752	1816	0	1687	1863	0	0	3428	0	0	3463	1599
Flt Permitted	0.609			0.118				0.675			0.549	
Satd. Flow (perm)	1123	1816	0	210	1863	0	0	2328	0	0	1924	1599
Satd. Flow (RTOR)		12						42				89
Lane Group Flow (vph)	51	514	0	147	241	0	0	894	0	0	740	89
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		4		3	8			2		1	6	
Permitted Phases	4			8			2			6	6	6
Total Split (s)	36.0	36.0		11.0	47.0		38.0	38.0		15.0	53.0	53.0
Total Lost Time (s)	6.0	6.0		4.0	6.0			6.0			6.0	6.0
Act Effct Green (s)	30.0	30.0		44.2	42.2			45.8			45.8	45.8
Actuated g/C Ratio	0.30	0.30		0.44	0.42			0.46			0.46	0.46
v/c Ratio	0.15	0.93		0.69	0.31			0.82			0.95dl	0.11
Control Delay	27.3	58.8		43.4	10.3			30.0			34.3	3.7
Queue Delay	0.0	0.2		0.0	0.0			5.7			8.9	0.0
Total Delay	27.3	58.9		43.4	10.3			35.7			43.2	3.7
LOS	C	E		D	B			D			D	A
Approach Delay		56.1			22.8			35.7			38.9	
Approach LOS		E			C			D			D	
Queue Length 50th (m)	7.6	99.4		11.9	13.6			80.3			70.2	0.0
Queue Length 95th (m)	17.2	#164.5		#43.8	21.0			93.7			74.7	6.0
Internal Link Dist (m)		153.0			41.6			55.6			43.8	
Turn Bay Length (m)	47.0			23.0								89.0
Base Capacity (vph)	336	553		214	786			1088			904	798
Starvation Cap Reductn	0	0		0	0			0			0	0
Spillback Cap Reductn	0	1		0	0			146			138	0
Storage Cap Reductn	0	0		0	0			0			0	0
Reduced v/c Ratio	0.15	0.93		0.69	0.31			0.95			0.97	0.11

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 8:WBTL, Start of Green, Master Intersection
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 39.1 Intersection LOS: D
Intersection Capacity Utilization 98.3% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 2: Essa Rd./Bradford St. & Tiffin St.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø4
Lane Configurations							
Traffic Volume (vph)	1178	67	8	849	26	17	
Future Volume (vph)	1178	67	8	849	26	17	
Satd. Flow (prot)	1900	1615	1805	1900	1805	1615	
Flt Permitted			0.064		0.950		
Satd. Flow (perm)	1900	1615	122	1900	1805	1615	
Satd. Flow (RTOR)		26				55	
Lane Group Flow (vph)	1280	73	8	884	84	55	
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm	
Protected Phases	2		1	6	8		4
Permitted Phases		2	6			8	
Total Split (s)	53.0	53.0	11.0	64.0	31.0	31.0	31.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	5.0	5.0	
Act Effct Green (s)	60.1	60.1	63.0	62.2	10.5	10.5	
Actuated g/C Ratio	0.76	0.76	0.79	0.78	0.13	0.13	
v/c Ratio	0.89	0.06	0.03	0.59	0.35	0.21	
Control Delay	21.7	3.8	2.9	7.1	35.9	11.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	21.7	3.8	2.9	7.1	35.9	11.5	
LOS	C	A	A	A	D	B	
Approach Delay	20.8			7.1	26.2		
Approach LOS	C			A	C		
Queue Length 50th (m)	131.3	1.6	0.3	55.3	12.3	0.0	
Queue Length 95th (m)	#327.9	8.4	1.2	97.9	8.2	0.0	
Internal Link Dist (m)	144.3			137.6	30.3		
Turn Bay Length (m)		40.0	70.0				
Base Capacity (vph)	1435	1226	244	1487	590	565	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.89	0.06	0.03	0.59	0.14	0.10	

Intersection Summary

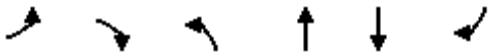
Cycle Length: 95
Actuated Cycle Length: 79.5
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 16.0 Intersection LOS: B
Intersection Capacity Utilization 79.5% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Go Station East Access & Lakeshore Dr.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	7	320	456	10	241	438
Future Volume (vph)	7	320	456	10	241	438
Satd. Flow (prot)	1632	0	3497	0	0	3344
Flt Permitted	0.999					0.637
Satd. Flow (perm)	1632	0	3497	0	0	2167
Satd. Flow (RTOR)	390		3			
Lane Group Flow (vph)	399	0	561	0	0	707
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases					6	
Total Split (s)	32.0		87.0		11.0	98.0
Total Lost Time (s)	6.0		6.0			6.0
Act Effct Green (s)	12.0		92.1			92.1
Actuated g/C Ratio	0.10		0.79			0.79
v/c Ratio	0.77		0.20			0.41
Control Delay	16.2		3.4			4.8
Queue Delay	0.0		0.0			0.7
Total Delay	16.2		3.4			5.5
LOS	B		A			A
Approach Delay	16.2		3.4			5.5
Approach LOS	B		A			A
Queue Length 50th (m)	2.0		12.4			19.6
Queue Length 95th (m)	18.8		23.2			41.5
Internal Link Dist (m)	120.4		80.7			19.9
Turn Bay Length (m)						
Base Capacity (vph)	668		2773			1718
Starvation Cap Reductn	0		0			624
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.60		0.20			0.65

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 116.1	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 7.3	Intersection LOS: A
Intersection Capacity Utilization 168.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 4: Essa Rd. & Gowan St.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	26	20	756	654	2
Future Volume (Veh/h)	5	26	20	756	654	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.84	0.84	0.93	0.93
Hourly flow rate (vph)	6	33	24	900	703	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				44	80	
pX, platoon unblocked	0.91	0.89	0.89			
vC, conflicting volume	1202	352	705			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	838	24	420			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	96	98			
cM capacity (veh/h)	274	937	1023			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	39	324	600	469	236
Volume Left	6	24	0	0	0
Volume Right	33	0	0	0	2
cSH	683	1023	1700	1700	1700
Volume to Capacity	0.06	0.02	0.35	0.28	0.14
Queue Length 95th (m)	1.5	0.6	0.0	0.0	0.0
Control Delay (s)	10.6	0.9	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	10.6	0.3		0.0	
Approach LOS	B				

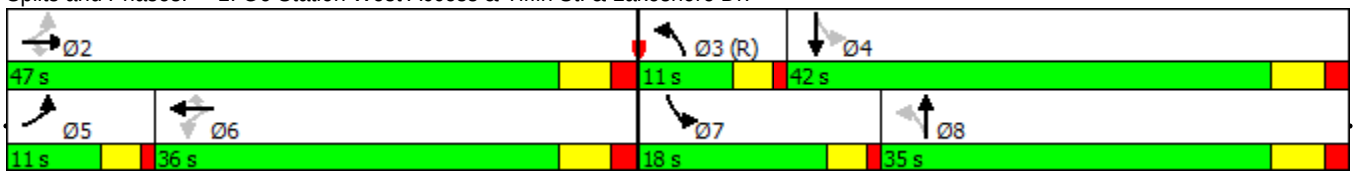
Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	177	300	33	0	223	517	33	0	0	539	0	163
Future Volume (vph)	177	300	33	0	223	517	33	0	0	539	0	163
Satd. Flow (prot)	1805	1881	808	950	1881	1615	902	950	0	1787	1615	0
Flt Permitted	0.468						0.644			0.665		
Satd. Flow (perm)	889	1881	808	950	1881	1615	612	950	0	1251	1615	0
Satd. Flow (RTOR)			120			528					590	
Lane Group Flow (vph)	186	316	35	0	228	528	52	0	0	592	179	0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt			pm+pt	NA	
Protected Phases	5	2			6		3	8		7	4	
Permitted Phases	2		2	6		6	8			4		
Total Split (s)	11.0	47.0	47.0	36.0	36.0	36.0	11.0	35.0		18.0	42.0	
Total Lost Time (s)	4.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0		4.0	6.0	
Act Effct Green (s)	43.0	41.0	41.0		30.0	30.0	38.0			49.0	36.0	
Actuated g/C Ratio	0.43	0.41	0.41		0.30	0.30	0.38			0.49	0.36	
v/c Ratio	0.42	0.41	0.09		0.40	0.62	0.21			0.86	0.19	
Control Delay	32.3	33.6	0.9		30.5	6.0	16.8			35.5	0.4	
Queue Delay	0.0	1.8	0.0		0.0	0.0	0.0			0.0	0.0	
Total Delay	32.3	35.4	0.9		30.5	6.0	16.8			35.5	0.4	
LOS	C	D	A		C	A	B			D	A	
Approach Delay		32.1			13.4			16.8			27.3	
Approach LOS		C			B			B			C	
Queue Length 50th (m)	37.9	68.5	0.0		36.9	0.0	5.5			88.6	0.0	
Queue Length 95th (m)	m52.6	m92.8	m0.0		58.8	25.2	8.7			#149.7	0.0	
Internal Link Dist (m)		44.8			116.0			88.9			104.9	
Turn Bay Length (m)	35.0		25.0			55.0				75.0		
Base Capacity (vph)	446	771	402		564	854	252			688	959	
Starvation Cap Reductn	0	299	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	0.42	0.67	0.09		0.40	0.62	0.21			0.86	0.19	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 26 (26%), Referenced to phase 3:NBL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 23.3 Intersection LOS: C
Intersection Capacity Utilization 101.5% ICU Level of Service G
Analysis Period (min) 15
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.

Splits and Phases: 1: Go Station West Access & Tiffin St. & Lakeshore Dr.

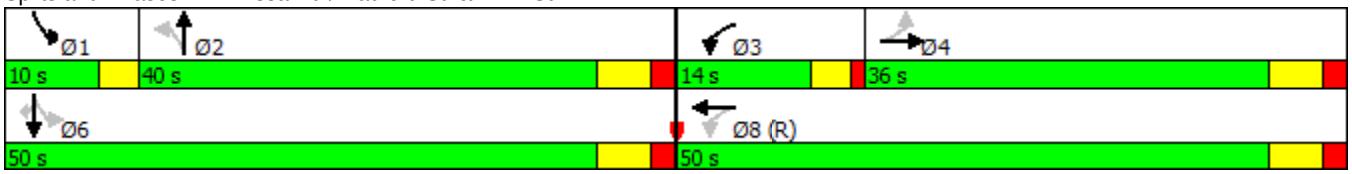


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	246	61	175	163	0	69	400	214	61	223	43
Future Volume (vph)	29	246	61	175	163	0	69	400	214	61	223	43
Satd. Flow (prot)	1736	1814	0	1736	1863	0	0	3403	0	0	3462	1615
Flt Permitted	0.643			0.321				0.827			0.553	
Satd. Flow (perm)	1175	1814	0	586	1863	0	0	2829	0	0	1936	1615
Satd. Flow (RTOR)		13						80				76
Lane Group Flow (vph)	32	341	0	194	181	0	0	804	0	0	359	54
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		4		3	8			2		1	6	
Permitted Phases	4			8			2			6	6	6
Total Split (s)	36.0	36.0		14.0	50.0		40.0	40.0		10.0	50.0	50.0
Total Lost Time (s)	6.0	6.0		4.0	6.0			6.0			6.0	6.0
Act Effct Green (s)	30.0	30.0		59.0	57.0			31.0			31.0	31.0
Actuated g/C Ratio	0.30	0.30		0.59	0.57			0.31			0.31	0.31
v/c Ratio	0.09	0.62		0.32	0.17			0.86			0.60	0.10
Control Delay	26.2	34.6		6.6	5.9			39.1			33.0	3.0
Queue Delay	0.0	0.0		0.0	0.0			0.6			0.0	0.0
Total Delay	26.2	34.6		6.6	5.9			39.8			33.0	3.0
LOS	C	C		A	A			D			C	A
Approach Delay		33.9			6.3			39.8			29.0	
Approach LOS		C			A			D			C	
Queue Length 50th (m)	4.7	57.2		8.5	8.2			73.4			32.3	0.0
Queue Length 95th (m)	12.1	87.7		15.3	15.0			81.1			36.4	3.0
Internal Link Dist (m)		153.0			41.6			55.6			43.8	
Turn Bay Length (m)	47.0			23.0								89.0
Base Capacity (vph)	352	553		610	1062			1035			851	753
Starvation Cap Reductn	0	0		0	0			54			0	0
Spillback Cap Reductn	0	0		0	0			0			0	0
Storage Cap Reductn	0	0		0	0			0			0	0
Reduced v/c Ratio	0.09	0.62		0.32	0.17			0.82			0.42	0.07

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 8:WBTL, Start of Green, Master Intersection
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 30.0 Intersection LOS: C
Intersection Capacity Utilization 88.2% ICU Level of Service E
Analysis Period (min) 15

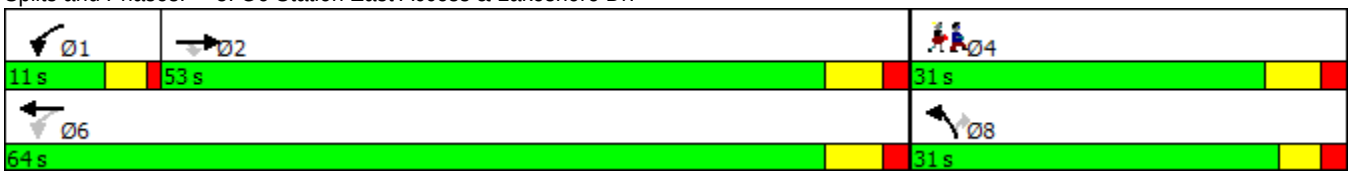
Splits and Phases: 2: Essa Rd./Bradford St. & Tiffin St.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø4
Lane Configurations							
Traffic Volume (vph)	815	23	9	720	19	16	
Future Volume (vph)	815	23	9	720	19	16	
Satd. Flow (prot)	1881	1615	1805	1881	1805	1615	
Flt Permitted			0.218		0.950		
Satd. Flow (perm)	1881	1615	414	1881	1805	1615	
Satd. Flow (RTOR)		13				52	
Lane Group Flow (vph)	886	25	9	750	61	52	
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm	
Protected Phases	2		1	6	8		4
Permitted Phases		2	6			8	
Total Split (s)	53.0	53.0	11.0	64.0	31.0	31.0	31.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	5.0	5.0	
Act Effct Green (s)	60.1	60.1	63.1	62.3	10.1	10.1	
Actuated g/C Ratio	0.76	0.76	0.80	0.79	0.13	0.13	
v/c Ratio	0.62	0.02	0.02	0.51	0.26	0.21	
Control Delay	9.8	3.5	2.4	5.7	34.4	11.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	9.8	3.5	2.4	5.7	34.4	11.9	
LOS	A	A	A	A	C	B	
Approach Delay	9.6			5.7	24.1		
Approach LOS	A			A	C		
Queue Length 50th (m)	56.0	0.4	0.4	41.8	8.9	0.0	
Queue Length 95th (m)	155.5	3.7	1.2	66.7	6.6	0.0	
Internal Link Dist (m)	144.3			137.6	30.3		
Turn Bay Length (m)		40.0	70.0				
Base Capacity (vph)	1426	1228	452	1478	593	565	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.62	0.02	0.02	0.51	0.10	0.09	

Intersection Summary	
Cycle Length: 95	
Actuated Cycle Length: 79.2	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 8.9	Intersection LOS: A
Intersection Capacity Utilization 60.4%	ICU Level of Service B
Analysis Period (min) 15	

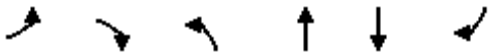
Splits and Phases: 3: Go Station East Access & Lakeshore Dr.



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	11	259	443	8	131	351
Future Volume (vph)	11	259	443	8	131	351
Satd. Flow (prot)	1650	0	3530	0	0	3487
Flt Permitted	0.998					0.680
Satd. Flow (perm)	1650	0	3530	0	0	2402
Satd. Flow (RTOR)	316		3			
Lane Group Flow (vph)	329	0	544	0	0	502
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases					6	
Total Split (s)	32.0		87.0		11.0	98.0
Total Lost Time (s)	6.0		6.0			6.0
Act Effct Green (s)	11.6		92.0			92.0
Actuated g/C Ratio	0.10		0.80			0.80
v/c Ratio	0.73		0.19			0.26
Control Delay	16.7		3.2			3.6
Queue Delay	0.0		0.0			0.4
Total Delay	16.7		3.2			4.0
LOS	B		A			A
Approach Delay	16.7		3.2			4.0
Approach LOS	B		A			A
Queue Length 50th (m)	2.9		11.9			11.8
Queue Length 95th (m)	20.0		20.6			23.5
Internal Link Dist (m)	120.4		80.7			19.9
Turn Bay Length (m)						
Base Capacity (vph)	616		2811			1912
Starvation Cap Reductn	0		0			890
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.53		0.19			0.49

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 115.6	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 6.7	Intersection LOS: A
Intersection Capacity Utilization 136.8%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 4: Essa Rd. & Gowan St.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	37	30	672	445	15
Future Volume (Veh/h)	10	37	30	672	445	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.84	0.84	0.93	0.93
Hourly flow rate (vph)	13	47	36	800	478	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				44	80	
pX, platoon unblocked	0.97	0.95	0.95			
vC, conflicting volume	958	247	494			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	724	96	357			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	95	97			
cM capacity (veh/h)	341	899	1150			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	60	303	533	319	175
Volume Left	13	36	0	0	0
Volume Right	47	0	0	0	16
cSH	664	1150	1700	1700	1700
Volume to Capacity	0.09	0.03	0.31	0.19	0.10
Queue Length 95th (m)	2.4	0.8	0.0	0.0	0.0
Control Delay (s)	11.0	1.2	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	11.0	0.5		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	45.6%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX

G Intersection Capacity Analysis for Scenario 2

Intersection Capacity Analysis for Scenario 2

Scenario 2 provides dual lanes for the northbound left movement at Lakeshore Drive and Tiffin Street intersection (one dedicated left turn lane plus one shared left/through/right lane). Similar to Scenario 1, signal improvement measures were implemented to facilitate bus movements egressing from the mobility hub:

- Due to dual left turn lanes, the northbound movement at Lakeshore Drive and Tiffin Street intersection was proposed to operate under a split phase, hence so was the southbound movement;
- A protected plus permissive phase was proposed for the westbound left movement at Essa Road/Bradford Street and Tiffin Street intersection; and,
- Actual-coordinated phase setting was applied to Tiffin Street intersections at Essa Road/Bradford Street and at Lakeshore Drive for the above mentioned two movements.

The evaluation elements for intersection capacity analysis include average delays, LOS, v/c ratio, and queue length. As compared with Scenario 1, Scenario 2 assumed different signal timing plans only for Tiffin Street intersections at Lakeshore Drive, and at Essa Road/Bradford Street. The intersection capacity analysis results for these two intersections for Scenario 2 are presented in Table 1. Detailed Synchro reports are presented in Appendix.

Table 1: Future (2024) Intersection Capacity Analysis Results-Scenario 2

Morning Peak Hour

Intersection	Overall Intersection		Weekday AM Peak				
	Delay	LOS	Movement	Delay (s)	LOS	V/C	Queue[1] (m)
Lakeshore Dr. & Tiffin St. (Signalized)	48	D	EBL	52	D	0.48	46
			EBT	55	D	0.43	103
			EBR	8	A	0.11	3
			WBT	53	D	0.75	116
			WBR	14	B	0.83	74
			NBL	38	D	0.13	10
			SBL	103	F	1.07	206
			SBT	1	A	0.14	0
Essa Rd. & Tiffin St. (Signalized)	37	D	EBL	29	C	0.19	26
			EBTR	34	C	0.56	99
			WBL	5	A	0.19	9
			WBT	5	A	0.21	19
			NBLTR	55	D	0.89	86
			SBLT	45	D	0.66	45
			SBR	5	A	0.11	4

Note: 1. Queue length reflects the 95th percentile queue length

Afternoon Peak Hour

Intersection	Overall Intersection		Weekday PM Peak				
	Delay	LOS	Movement	Delay (s)	LOS	V/C	Queue[1] (m)
Lakeshore Dr. & Tiffin St. (Signalized)	105	F	EBL	49	D	0.72	43
			EBT	106	F	0.88	156
			EBR	3	A	0.11	0
			WBT	56	E	0.70	111
			WBR	12	B	0.75	54
			NBL	46	D	0.25	16
			SBL	225	F	1.40	373
			SBTR	1	A	0.15	0
Essa Rd. & Tiffin St. (Signalized)	67	E	EBL	33	C	0.14	21
			EBTR	63	E	0.89	194
			WBL	46	D	0.53	43
			WBT	9	A	0.28	26
			NBLTR	92	F	0.89	122
			SBLT	73	E	1.07	95
			SBR	4	A	0.12	7

Note: 1. Queue length reflects the 95th percentile queue length

Weekend Peak Hour

Intersection	Overall Intersection		Weekend Peak				
	Delay	LOS	Movement	Delay (s)	LOS	V/C	Queue[1] (m)
Lakeshore Dr. & Tiffin St. (Signalized)	49	D	EBL	62	E	0.62	75
			EBT	66	E	0.53	121
			EBR	7	A	0.11	1
			WBT	49	D	0.53	82
			WBR	8	A	0.68	32
			NBL	46	D	0.26	17
			SBL	88	F	1.03	243
			SBTR	1	A	0.19	0
Essa Rd. & Tiffin St. (Signalized)	40	D	EBL	32	C	0.09	14
			EBTR	41	D	0.59	108
			WBL	9	A	0.30	24
			WBT	8	A	0.16	23
			NBLTR	56	E	0.91	108
			SBLT	43	D	0.63	47
			SBR	6	A	0.10	6

Note: 1. Queue length reflects the 95th percentile queue length

The analysis results for Scenario 2 show higher traffic delays for the Tiffin Street intersections, as compared to Scenario 1. The overall intersection delays are expected to increase and LOS will drop from 'C' to 'D' during morning and weekend peak hours, and from 'D/E' to 'E/F' during the afternoon peak hour.

Many turning movements at Tiffin Street intersections are expected to operate at LOS 'E/F'. The higher traffic delays are mainly caused by the longer cycle length (from 100 s to 130 s) required to accommodate the split phases for the northbound and southbound movements at the Lakeshore Drive and Tiffin Street intersection. Therefore, Scenario 1 is preferable over Scenario 2 in terms of traffic performance.

Appendix

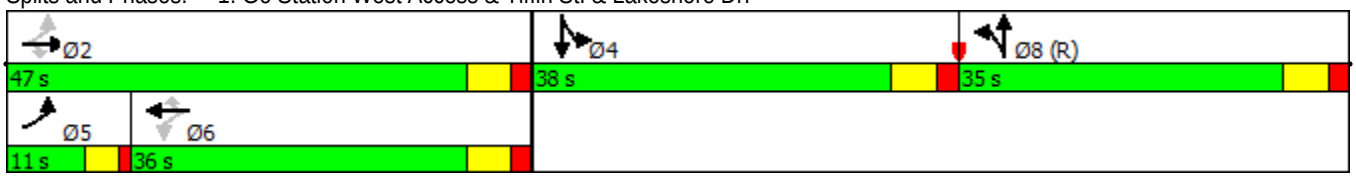
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	267	34	0	344	730	34	0	0	458	0	105
Future Volume (vph)	106	267	34	0	344	730	34	0	0	458	0	105
Satd. Flow (prot)	1787	1900	808	950	1881	1599	857	857	0	1770	1568	0
Flt Permitted	0.230						0.950	0.950		0.950		
Satd. Flow (perm)	433	1900	808	950	1881	1599	857	857	0	1770	1568	0
Satd. Flow (RTOR)			82			669					557	
Lane Group Flow (vph)	112	281	36	0	351	745	26	27	0	503	115	0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	
Protected Phases	5	2			6		8	8		4	4	
Permitted Phases	2		2	6		6						
Total Split (s)	11.0	47.0	47.0	36.0	36.0	36.0	35.0	35.0		38.0	38.0	
Total Lost Time (s)	4.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Act Effct Green (s)	43.0	41.0	41.0		30.0	30.0	29.0	29.0		32.0	32.0	
Actuated g/C Ratio	0.36	0.34	0.34		0.25	0.25	0.24	0.24		0.27	0.27	
v/c Ratio	0.48	0.43	0.11		0.75	0.83	0.13	0.13		1.07	0.14	
Control Delay	52.0	51.8	7.7		52.6	14.4	37.6	37.8		102.5	0.4	
Queue Delay	0.0	2.8	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	52.0	54.6	7.7		52.6	14.4	37.6	37.8		102.5	0.4	
LOS	D	D	A		D	B	D	D		F	A	
Approach Delay		50.0			26.6			37.7			83.5	
Approach LOS		D			C			D			F	
Queue Length 50th (m)	29.3	74.3	0.6		80.6	14.9	5.3	5.5		~137.7	0.0	
Queue Length 95th (m)	m45.8	103.2	m2.5		116.3	74.1	9.6	9.8		#205.8	0.0	
Internal Link Dist (m)		44.8			116.0			88.9			104.9	
Turn Bay Length (m)	35.0		25.0			55.0				75.0		
Base Capacity (vph)	234	649	330		470	901	207	207		472	826	
Starvation Cap Reductn	0	258	0		0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	0	0		0	0	
Reduced v/c Ratio	0.48	0.72	0.11		0.75	0.83	0.13	0.13		1.07	0.14	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 66 (55%), Referenced to phase 8:NBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.07
Intersection Signal Delay: 47.5 Intersection LOS: D
Intersection Capacity Utilization 97.0% ICU Level of Service F
Analysis Period (min) 15

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

Splits and Phases: 1: Go Station West Access & Tiffin St. & Lakeshore Dr.

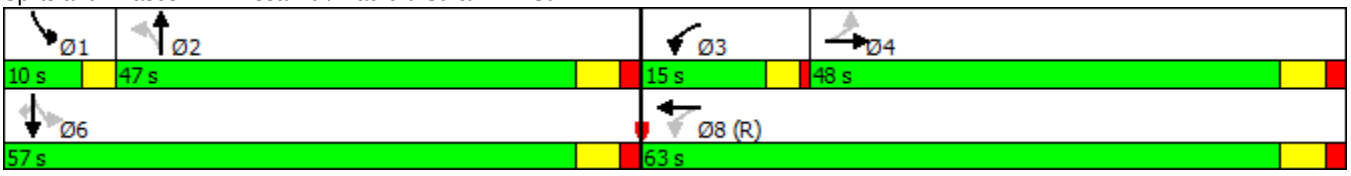


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	245	73	110	226	0	63	363	128	49	229	39
Future Volume (vph)	68	245	73	110	226	0	63	363	128	49	229	39
Satd. Flow (prot)	1770	1781	0	1641	1845	0	0	3388	0	0	3356	1568
Flt Permitted	0.603			0.346				0.784			0.598	
Satd. Flow (perm)	1123	1781	0	598	1845	0	0	2673	0	0	2025	1568
Satd. Flow (RTOR)		14						36				64
Lane Group Flow (vph)	76	353	0	122	251	0	0	652	0	0	352	49
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		4		3	8			2		1	6	
Permitted Phases	4			8			2			6	6	6
Total Split (s)	48.0	48.0		15.0	63.0		47.0	47.0		10.0	57.0	57.0
Total Lost Time (s)	6.0	6.0		4.0	6.0			6.0			6.0	6.0
Act Effct Green (s)	42.0	42.0		78.2	76.2			31.8			31.8	31.8
Actuated g/C Ratio	0.35	0.35		0.65	0.64			0.26			0.26	0.26
v/c Ratio	0.19	0.56		0.19	0.21			0.89			0.66	0.11
Control Delay	28.9	34.3		4.9	4.9			54.5			44.8	4.9
Queue Delay	0.0	0.0		0.0	0.4			0.2			0.1	0.0
Total Delay	28.9	34.3		4.9	5.3			54.8			44.8	4.9
LOS	C	C		A	A			D			D	A
Approach Delay		33.3			5.2			54.8			39.9	
Approach LOS		C			A			D			D	
Queue Length 50th (m)	13.1	67.4		5.5	12.0			78.2			41.0	0.0
Queue Length 95th (m)	25.6	98.9		m9.2	m18.6			86.3			45.2	4.1
Internal Link Dist (m)		153.0			41.6			55.6			43.8	
Turn Bay Length (m)	47.0			23.0								89.0
Base Capacity (vph)	393	632		652	1171			936			860	703
Starvation Cap Reductn	0	0		0	521			36			0	0
Spillback Cap Reductn	0	0		0	0			21			43	0
Storage Cap Reductn	0	0		0	0			0			0	0
Reduced v/c Ratio	0.19	0.56		0.19	0.39			0.72			0.43	0.07

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 8:WBTL, Start of Green, Master Intersection
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 36.6 Intersection LOS: D
Intersection Capacity Utilization 84.3% ICU Level of Service E
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Essa Rd./Bradford St. & Tiffin St.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	159	502	32	0	302	574	32	0	0	743	0	122
Future Volume (vph)	159	502	32	0	302	574	32	0	0	743	0	122
Satd. Flow (prot)	1805	1900	808	950	1900	1599	902	950	0	1805	1599	0
Flt Permitted	0.259						0.950			0.950		
Satd. Flow (perm)	492	1900	808	950	1900	1599	902	950	0	1805	1599	0
Satd. Flow (RTOR)			76			539					562	
Lane Group Flow (vph)	167	528	34	0	308	586	50	0	0	816	134	0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Split			Split	NA	
Protected Phases	5	2			6		8	8		4	4	
Permitted Phases	2		2	6		6						
Total Split (s)	11.0	47.0	47.0	36.0	36.0	36.0	35.0	35.0		48.0	48.0	
Total Lost Time (s)	4.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Act Effct Green (s)	43.0	41.0	41.0		30.0	30.0	29.0			42.0	42.0	
Actuated g/C Ratio	0.33	0.32	0.32		0.23	0.23	0.22			0.32	0.32	
v/c Ratio	0.72	0.88	0.11		0.70	0.75	0.25			1.40	0.15	
Control Delay	48.8	57.2	2.7		55.7	12.2	45.6			224.8	0.4	
Queue Delay	0.0	49.1	0.0		0.0	0.0	0.0			0.0	0.0	
Total Delay	48.8	106.3	2.7		55.7	12.2	45.6			224.8	0.4	
LOS	D	F	A		E	B	D			F	A	
Approach Delay		88.3			27.2			45.6			193.1	
Approach LOS		F			C			D			F	
Queue Length 50th (m)	35.9	117.8	0.0		76.8	10.1	11.2			~293.8	0.0	
Queue Length 95th (m)	m42.5	m#155.8	m0.0		110.6	54.1	16.3			#372.8	0.0	
Internal Link Dist (m)		44.8			116.0			88.9			104.9	
Turn Bay Length (m)	35.0		25.0			55.0				75.0		
Base Capacity (vph)	233	599	306		438	783	201			583	897	
Starvation Cap Reductn	0	119	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	0.72	1.10	0.11		0.70	0.75	0.25			1.40	0.15	

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 95 (73%), Referenced to phase 8:NBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.40
Intersection Signal Delay: 104.6 Intersection LOS: F
Intersection Capacity Utilization 114.3% ICU Level of Service H
Analysis Period (min) 15

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

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

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

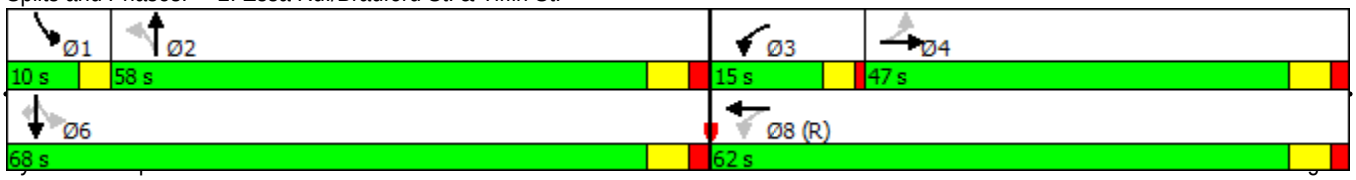
Splits and Phases: 1: Go Station West Access & Tiffin St. & Lakeshore Dr.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	374	88	132	217	0	91	491	178	148	437	70
Future Volume (vph)	46	374	88	132	217	0	91	491	178	148	437	70
Satd. Flow (prot)	1752	1816	0	1687	1863	0	0	3428	0	0	3463	1599
Flt Permitted	0.609			0.120				0.645			0.535	
Satd. Flow (perm)	1123	1816	0	213	1863	0	0	2225	0	0	1875	1599
Satd. Flow (RTOR)		10						37				89
Lane Group Flow (vph)	51	514	0	147	241	0	0	894	0	0	740	89
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		4		3	8			2		1	6	
Permitted Phases	4			8			2			6	6	6
Total Split (s)	47.0	47.0		15.0	62.0		58.0	58.0		10.0	68.0	68.0
Total Lost Time (s)	6.0	6.0		4.0	6.0			6.0			6.0	6.0
Act Effct Green (s)	41.0	41.0		62.6	60.6			57.4			57.4	57.4
Actuated g/C Ratio	0.32	0.32		0.48	0.47			0.44			0.44	0.44
v/c Ratio	0.14	0.89		0.53	0.28			0.89			1.07dl	0.12
Control Delay	33.4	60.2		46.0	8.7			43.7			47.6	4.0
Queue Delay	0.0	0.3		0.0	0.3			47.9			24.9	0.0
Total Delay	33.4	60.4		46.0	9.0			91.6			72.5	4.0
LOS	C	E		D	A			F			E	A
Approach Delay		58.0			23.0			91.6			65.1	
Approach LOS		E			C			F			E	
Queue Length 50th (m)	9.9	129.5		22.6	17.7			107.0			91.6	0.0
Queue Length 95th (m)	20.7	#194.2		m42.5	25.8			121.8			94.6	6.5
Internal Link Dist (m)		153.0			41.6			55.6			43.8	
Turn Bay Length (m)	47.0			23.0								89.0
Base Capacity (vph)	354	579		279	868			1019			894	809
Starvation Cap Reductn	0	0		0	251			211			0	0
Spillback Cap Reductn	0	3		0	0			202			178	0
Storage Cap Reductn	0	0		0	0			0			0	0
Reduced v/c Ratio	0.14	0.89		0.53	0.39			1.11			1.03	0.11

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 8:WBTL, Start of Green, Master Intersection
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 66.4 Intersection LOS: E
Intersection Capacity Utilization 98.3% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 2: Essa Rd./Bradford St. & Tiffin St.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	177	300	33	0	223	517	33	0	0	539	0	163
Future Volume (vph)	177	300	33	0	223	517	33	0	0	539	0	163
Satd. Flow (prot)	1805	1881	808	950	1881	1615	902	950	0	1787	1615	0
Flt Permitted	0.390						0.950			0.950		
Satd. Flow (perm)	741	1881	808	950	1881	1615	902	950	0	1787	1615	0
Satd. Flow (RTOR)			76			528					610	
Lane Group Flow (vph)	186	316	35	0	228	528	52	0	0	592	179	0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Split			Split	NA	
Protected Phases	5	2			6		8	8		4	4	
Permitted Phases	2		2	6		6						
Total Split (s)	11.0	47.0	47.0	36.0	36.0	36.0	35.0	35.0		48.0	48.0	
Total Lost Time (s)	4.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Act Effct Green (s)	43.0	41.0	41.0		30.0	30.0	29.0			42.0	42.0	
Actuated g/C Ratio	0.33	0.32	0.32		0.23	0.23	0.22			0.32	0.32	
v/c Ratio	0.62	0.53	0.11		0.53	0.68	0.26			1.03	0.19	
Control Delay	61.8	58.4	7.3		48.9	8.3	45.8			87.6	0.5	
Queue Delay	0.0	7.8	0.0		0.0	0.0	0.0			0.0	0.0	
Total Delay	61.8	66.2	7.3		48.9	8.3	45.8			87.6	0.5	
LOS	E	E	A		D	A	D			F	A	
Approach Delay		60.8			20.6			45.8			67.3	
Approach LOS		E			C			D			E	
Queue Length 50th (m)	53.0	90.6	0.3		54.2	0.0	11.6			~169.9	0.0	
Queue Length 95th (m)	m75.3	m121.5	m1.4		81.5	32.4	16.8			#243.3	0.0	
Internal Link Dist (m)		44.8			116.0			88.9			104.9	
Turn Bay Length (m)	35.0		25.0			55.0				75.0		
Base Capacity (vph)	302	593	306		434	778	201			577	934	
Starvation Cap Reductn	0	231	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	0.62	0.87	0.11		0.53	0.68	0.26			1.03	0.19	

Intersection Summary

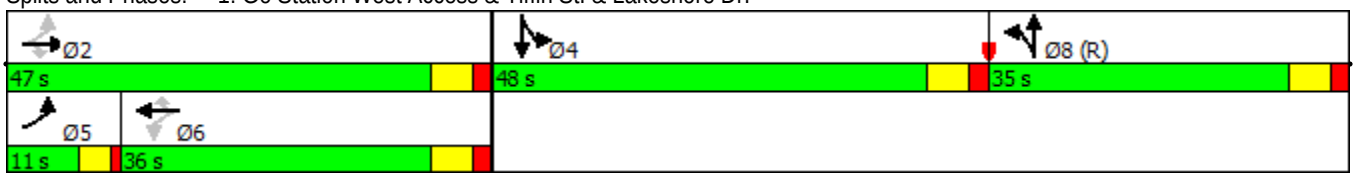
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 79 (61%), Referenced to phase 8:NBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.03
Intersection Signal Delay: 48.5 Intersection LOS: D
Intersection Capacity Utilization 101.5% ICU Level of Service G
Analysis Period (min) 15

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

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

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

Splits and Phases: 1: Go Station West Access & Tiffin St. & Lakeshore Dr.

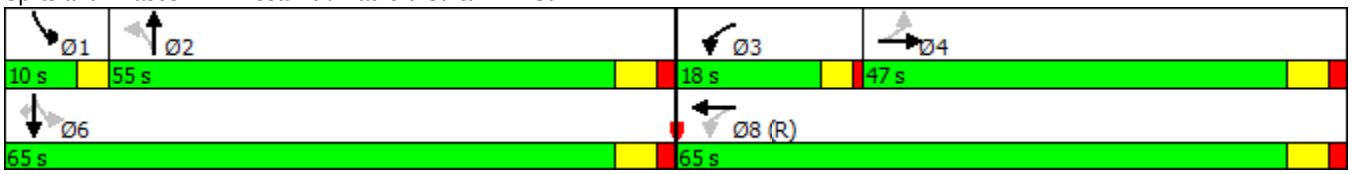


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	246	61	175	163	0	69	400	214	61	223	43
Future Volume (vph)	29	246	61	175	163	0	69	400	214	61	223	43
Satd. Flow (prot)	1736	1814	0	1736	1863	0	0	3403	0	0	3462	1615
Flt Permitted	0.643			0.324				0.797			0.530	
Satd. Flow (perm)	1175	1814	0	592	1863	0	0	2726	0	0	1855	1615
Satd. Flow (RTOR)		10						65				59
Lane Group Flow (vph)	32	341	0	194	181	0	0	804	0	0	359	54
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		4		3	8			2		1	6	
Permitted Phases	4			8			2			6	6	6
Total Split (s)	47.0	47.0		18.0	65.0		55.0	55.0		10.0	65.0	65.0
Total Lost Time (s)	6.0	6.0		4.0	6.0			6.0			6.0	6.0
Act Effct Green (s)	41.0	41.0		79.8	77.8			40.2			40.2	40.2
Actuated g/C Ratio	0.32	0.32		0.61	0.60			0.31			0.31	0.31
v/c Ratio	0.09	0.59		0.30	0.16			0.91			0.63	0.10
Control Delay	32.3	41.2		8.6	7.6			53.5			42.8	6.3
Queue Delay	0.0	0.0		0.0	0.0			2.8			0.1	0.0
Total Delay	32.3	41.2		8.6	7.6			56.3			43.0	6.3
LOS	C	D		A	A			E			D	A
Approach Delay		40.5			8.1			56.3			38.2	
Approach LOS		D			A			E			D	
Queue Length 50th (m)	6.1	75.0		14.2	13.5			101.7			43.4	0.0
Queue Length 95th (m)	14.4	108.0		24.1	23.1			107.7			46.8	5.8
Internal Link Dist (m)		153.0			41.6			55.6			43.8	
Turn Bay Length (m)	47.0			23.0								89.0
Base Capacity (vph)	370	578		651	1114			1067			841	765
Starvation Cap Reductn	0	0		0	0			161			0	0
Spillback Cap Reductn	0	0		0	0			71			71	0
Storage Cap Reductn	0	0		0	0			0			0	0
Reduced v/c Ratio	0.09	0.59		0.30	0.16			0.89			0.47	0.07

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 8:WBTL, Start of Green, Master Intersection
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 40.3 Intersection LOS: D
Intersection Capacity Utilization 88.2% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 2: Essa Rd./Bradford St. & Tiffin St.



APPENDIX

H Intersection Capacity Analysis for Sensitivity Scenario

Intersection Capacity Analysis for Sensitivity Scenario

A sensitivity scenario was conducted for the future total traffic condition, using optimized signal timing plans to reduce overall intersection delays and improve traffic operation. Following signal timing settings were considered at Lakeshore Drive and Tiffin Street intersection and at Essa Road and Tiffin Street intersection:

- A permissive phase was used for the northbound left movement at Lakeshore Drive and Tiffin Street intersection (traffic signal priority exists in the existing condition);
- A protected plus permissive phase was used for the westbound left movement at Essa Road/Bradford Street and Tiffin Street intersection (signal head with green arrow light exists in the existing condition); and,
- Both intersections were designed to operate under actuated phase setting (non-coordination).

The evaluation elements for intersection capacity analysis include average delays, LOS, v/c ratio, and queue length. The intersection capacity analysis results for this sensitivity scenario are presented in Table 1. Detailed Synchro reports are presented in the appendix.

Table 1: Future (2024) Intersection Capacity Analysis Results-Sensitivity Scenario

Morning Peak Hour

Intersection	Overall Intersection		Weekday AM Peak				
	Delay	LOS	Movement	Delay (s)	LOS	V/C	Queue[1] (m)
Lakeshore Dr. & Tiffin St. (Signalized)	19	B	EBL	21	C	0.34	24
			EBT	22	C	0.36	59
			EBR	1	A	0.10	1
			WBT	36	D	0.62	92
			WBR	8	A	0.74	32
			NBL	33	C	0.28	13
			SBL	27	C	0.74	103
			SBT	1	A	0.12	0
Essa Rd. & Tiffin St. (Signalized)	22	C	EBL	17	B	0.17	17
			EBTR	19	B	0.48	65
			WBL	9	A	0.24	17
			WBT	11	B	0.24	35
			NBLTR	30	C	0.78	56
			SBLT	26	C	0.56	30
			SBR	2	A	0.10	2

Note: 1. Queue length reflects the 95th percentile queue length

Afternoon Peak Hour

Intersection	Overall Intersection		Weekday PM Peak				
	Delay	LOS	Movement	Delay (s)	LOS	V/C	Queue[1] (m)
Lakeshore Dr. & Tiffin St. (Signalized)	47	D	EBL	22	C	0.45	35
			EBT	38	D	0.68	124
			EBR	1	A	0.09	1
			WBT	34	C	0.54	80
			WBR	6	A	0.66	27
			NBL	34	C	0.31	12
			SBL	101	F	1.13	276
			SBTR	1	A	0.14	0
Essa Rd. & Tiffin St. (Signalized)	36	D	EBL	26	C	0.14	17
			EBTR	48	D	0.87	164
			WBL	39	D	0.71	42
			WBT	21	C	0.30	52
			NBLTR	35	C	0.84	91
			SBLT	36	D	0.98	73
			SBR	4	A	0.12	5

Note: 1. Queue length reflects the 95th percentile queue length

Weekend Peak Hour

Intersection	Overall Intersection		Weekend Peak				
	Delay	LOS	Movement	Delay (s)	LOS	V/C	Queue[1] (m)
Lakeshore Dr. & Tiffin St. (Signalized)	21	C	EBL	22	C	0.42	39
			EBT	24	C	0.41	68
			EBR	1	A	0.09	1
			WBT	31	C	0.40	58
			WBR	6	A	0.62	25
			NBL	33	C	0.21	13
			SBL	36	D	0.86	149
			SBTR	1	A	0.19	0
Essa Rd. & Tiffin St. (Signalized)	22	C	EBL	18	B	0.07	9
			EBTR	22	C	0.51	68
			WBL	12	B	0.40	28
			WBT	11	B	0.19	28
			NBLTR	27	C	0.81	64
			SBLT	24	C	0.54	29
			SBR	2	A	0.09	2

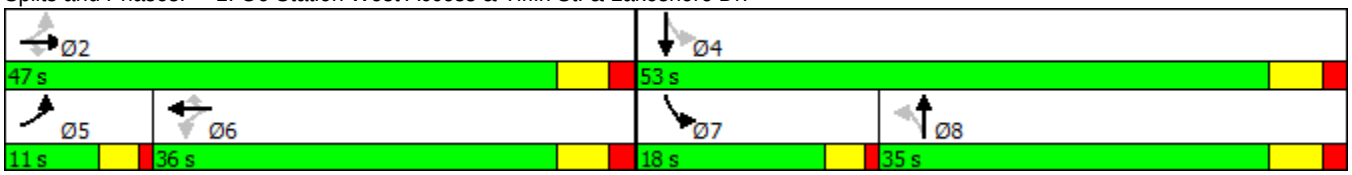
Note: 1. Queue length reflects the 95th percentile queue length

Appendix

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	267	34	0	344	730	34	0	0	458	0	105
Future Volume (vph)	106	267	34	0	344	730	34	0	0	458	0	105
Satd. Flow (prot)	1787	1900	808	950	1881	1599	902	950	0	1770	1568	0
Flt Permitted	0.308						0.683			0.665		
Satd. Flow (perm)	579	1900	808	950	1881	1599	649	950	0	1239	1568	0
Satd. Flow (RTOR)			76			745					398	
Lane Group Flow (vph)	112	281	36	0	351	745	53	0	0	503	115	0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm			pm+pt	NA	
Protected Phases	5	2			6			8		7	4	
Permitted Phases	2		2	6		6	8			4		
Total Split (s)	11.0	47.0	47.0	36.0	36.0	36.0	35.0	35.0		18.0	53.0	
Total Lost Time (s)	4.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		4.0	6.0	
Act Effct Green (s)	43.0	41.0	41.0		30.0	30.0	29.0			49.0	47.0	
Actuated g/C Ratio	0.43	0.41	0.41		0.30	0.30	0.29			0.49	0.47	
v/c Ratio	0.34	0.36	0.10		0.62	0.74	0.28			0.74	0.12	
Control Delay	20.3	22.1	1.1		35.9	7.5	32.5			26.7	0.3	
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0			0.0	0.0	
Total Delay	20.3	22.1	1.1		35.9	7.5	32.5			26.7	0.3	
LOS	C	C	A		D	A	C			C	A	
Approach Delay		19.9			16.6			32.5			21.8	
Approach LOS		B			B			C			C	
Queue Length 50th (m)	13.6	38.9	0.0		61.4	0.0	8.3			70.4	0.0	
Queue Length 95th (m)	24.7	59.9	1.2		92.3	32.7	13.2			103.4	0.0	
Internal Link Dist (m)		44.8			116.0			88.9			104.9	
Turn Bay Length (m)	35.0		25.0			55.0				75.0		
Base Capacity (vph)	333	779	376		564	1001	188			681	947	
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	0.34	0.36	0.10		0.62	0.74	0.28			0.74	0.12	

Intersection Summary		
Cycle Length: 100		
Actuated Cycle Length: 100		
Control Type: Semi Act-Uncoord		
Maximum v/c Ratio: 0.74		
Intersection Signal Delay: 19.1	Intersection LOS: B	
Intersection Capacity Utilization 97.0%	ICU Level of Service F	
Analysis Period (min) 15		

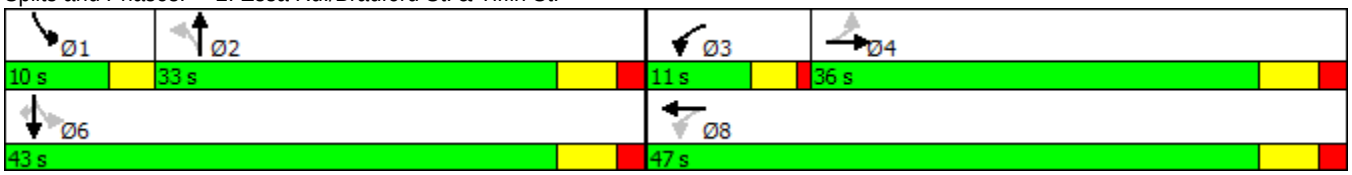
Splits and Phases: 1: Go Station West Access & Tiffin St. & Lakeshore Dr.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	245	73	110	226	0	63	363	128	49	229	39
Future Volume (vph)	68	245	73	110	226	0	63	363	128	49	229	39
Satd. Flow (prot)	1770	1781	0	1641	1845	0	0	3388	0	0	3356	1568
Flt Permitted	0.603			0.410				0.847			0.665	
Satd. Flow (perm)	1123	1781	0	708	1845	0	0	2887	0	0	2252	1568
Satd. Flow (RTOR)		18						45				85
Lane Group Flow (vph)	76	353	0	122	251	0	0	652	0	0	352	49
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		4		3	8			2		1	6	
Permitted Phases	4			8			2			6	6	6
Total Split (s)	36.0	36.0		11.0	47.0		33.0	33.0		10.0	43.0	43.0
Total Lost Time (s)	6.0	6.0		4.0	6.0			6.0			6.0	6.0
Act Effct Green (s)	30.1	30.1		43.2	41.2			20.7			20.7	20.7
Actuated g/C Ratio	0.41	0.41		0.58	0.56			0.28			0.28	0.28
v/c Ratio	0.17	0.48		0.24	0.24			0.78			0.56	0.10
Control Delay	16.7	18.9		9.3	10.1			29.5			26.1	2.1
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Delay	16.7	18.9		9.3	10.1			29.5			26.1	2.1
LOS	B	B		A	B			C			C	A
Approach Delay		18.5			9.8			29.5			23.2	
Approach LOS		B			A			C			C	
Queue Length 50th (m)	6.8	34.6		7.2	17.2			42.6			22.9	0.0
Queue Length 95th (m)	17.6	65.9		17.5	35.5			56.4			30.2	1.6
Internal Link Dist (m)		153.0			41.6			55.6			43.8	
Turn Bay Length (m)	47.0			23.0								89.0
Base Capacity (vph)	457	736		502	1027			1087			1131	830
Starvation Cap Reductn	0	0		0	0			0			0	0
Spillback Cap Reductn	0	0		0	0			0			0	0
Storage Cap Reductn	0	0		0	0			0			0	0
Reduced v/c Ratio	0.17	0.48		0.24	0.24			0.60			0.31	0.06

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 73.9	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 21.6	Intersection LOS: C
Intersection Capacity Utilization 84.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: Essa Rd./Bradford St. & Tiffin St.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	159	502	32	0	302	574	32	0	0	743	0	122
Future Volume (vph)	159	502	32	0	302	574	32	0	0	743	0	122
Satd. Flow (prot)	1805	1900	808	950	1900	1599	902	950	0	1805	1599	0
Flt Permitted	0.359						0.671			0.646		
Satd. Flow (perm)	682	1900	808	950	1900	1599	637	950	0	1227	1599	0
Satd. Flow (RTOR)			76			586					439	
Lane Group Flow (vph)	167	528	34	0	308	586	50	0	0	816	134	0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm			pm+pt	NA	
Protected Phases	5	2			6			8		7	4	
Permitted Phases	2		2	6		6	8			4		
Total Split (s)	11.0	47.0	47.0	36.0	36.0	36.0	35.0	35.0		18.0	53.0	
Total Lost Time (s)	4.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		4.0	6.0	
Act Effct Green (s)	43.0	41.0	41.0		30.0	30.0	25.2			49.0	47.0	
Actuated g/C Ratio	0.43	0.41	0.41		0.30	0.30	0.25			0.49	0.47	
v/c Ratio	0.45	0.68	0.09		0.54	0.66	0.31			1.13	0.14	
Control Delay	22.3	29.5	0.8		33.5	6.4	33.7			101.4	0.3	
Queue Delay	0.0	8.9	0.0		0.0	0.0	0.0			0.0	0.0	
Total Delay	22.3	38.4	0.8		33.5	6.4	33.7			101.4	0.3	
LOS	C	D	A		C	A	C			F	A	
Approach Delay		32.9			15.7			33.7			87.1	
Approach LOS		C			B			C			F	
Queue Length 50th (m)	20.9	86.2	0.0		52.3	0.0	7.8			~202.7	0.0	
Queue Length 95th (m)	35.4	124.7	0.9		79.7	27.2	12.7			#276.2	0.0	
Internal Link Dist (m)		44.8			116.0			88.9			104.9	
Turn Bay Length (m)	35.0		25.0			55.0				75.0		
Base Capacity (vph)	371	779	376		570	889	184			722	984	
Starvation Cap Reductn	0	215	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	0.45	0.94	0.09		0.54	0.66	0.27			1.13	0.14	

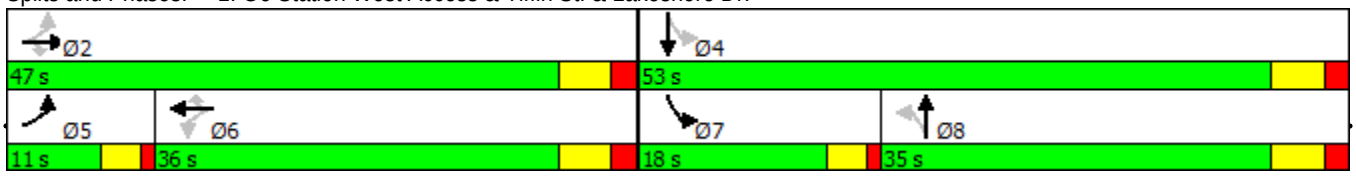
Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 1.13
Intersection Signal Delay: 46.7 — Intersection LOS: D
Intersection Capacity Utilization 114.3% — ICU Level of Service H
Analysis Period (min) 15

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

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

Splits and Phases: 1: Go Station West Access & Tiffin St. & Lakeshore Dr.

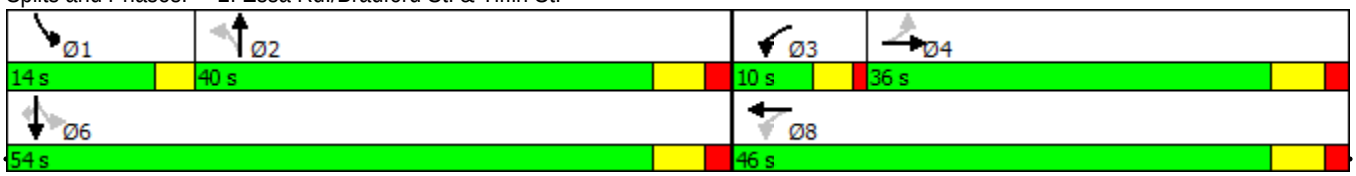


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	374	88	132	217	0	91	491	178	148	437	70
Future Volume (vph)	46	374	88	132	217	0	91	491	178	148	437	70
Satd. Flow (prot)	1752	1816	0	1687	1863	0	0	3428	0	0	3463	1599
Flt Permitted	0.609			0.147				0.676			0.548	
Satd. Flow (perm)	1123	1816	0	261	1863	0	0	2332	0	0	1921	1599
Satd. Flow (RTOR)		12						44				89
Lane Group Flow (vph)	51	514	0	147	241	0	0	894	0	0	740	89
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		4		3	8			2		1	6	
Permitted Phases	4			8			2			6	6	6
Total Split (s)	36.0	36.0		10.0	46.0		40.0	40.0		14.0	54.0	54.0
Total Lost Time (s)	6.0	6.0		4.0	6.0			6.0			6.0	6.0
Act Effct Green (s)	30.1	30.1		42.2	40.2			42.1			42.1	42.1
Actuated g/C Ratio	0.32	0.32		0.45	0.43			0.45			0.45	0.45
v/c Ratio	0.14	0.87		0.71	0.30			0.84			0.98dl	0.12
Control Delay	26.2	48.4		39.1	20.3			30.0			35.1	3.6
Queue Delay	0.0	0.0		0.0	0.0			4.6			0.0	0.0
Total Delay	26.2	48.4		39.1	20.3			34.6			35.1	3.6
LOS	C	D		D	C			C			D	A
Approach Delay		46.4			27.4			34.6			31.8	
Approach LOS		D			C			C			C	
Queue Length 50th (m)	7.2	93.3		17.2	30.8			73.7			64.7	0.0
Queue Length 95th (m)	17.2	#164.5		#42.8	52.7			91.3			73.1	5.8
Internal Link Dist (m)		153.0			41.6			55.6			43.8	
Turn Bay Length (m)	47.0			23.0								89.0
Base Capacity (vph)	358	588		207	793			1065			982	860
Starvation Cap Reductn	0	0		0	0			115			0	0
Spillback Cap Reductn	0	0		0	0			0			0	0
Storage Cap Reductn	0	0		0	0			0			0	0
Reduced v/c Ratio	0.14	0.87		0.71	0.30			0.94			0.75	0.10

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 94.3
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 35.2 Intersection LOS: D
Intersection Capacity Utilization 98.3% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 2: Essa Rd./Bradford St. & Tiffin St.

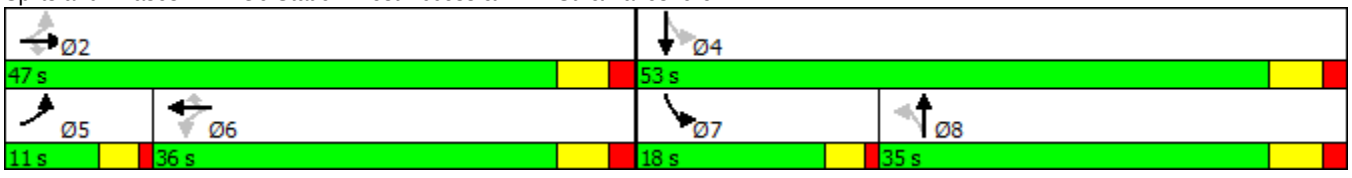


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	177	300	33	0	223	517	33	0	0	539	0	163
Future Volume (vph)	177	300	33	0	223	517	33	0	0	539	0	163
Satd. Flow (prot)	1805	1881	808	950	1881	1615	902	950	0	1787	1615	0
Flt Permitted	0.468						0.644			0.665		
Satd. Flow (perm)	889	1881	808	950	1881	1615	612	950	0	1251	1615	0
Satd. Flow (RTOR)			76			528					538	
Lane Group Flow (vph)	186	316	35	0	228	528	52	0	0	592	179	0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm			pm+pt	NA	
Protected Phases	5	2			6			8		7	4	
Permitted Phases	2		2	6		6	8			4		
Total Split (s)	11.0	47.0	47.0	36.0	36.0	36.0	35.0	35.0		18.0	53.0	
Total Lost Time (s)	4.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		4.0	6.0	
Act Effct Green (s)	43.0	41.0	41.0		30.0	30.0	29.0			49.0	47.0	
Actuated g/C Ratio	0.43	0.41	0.41		0.30	0.30	0.29			0.49	0.47	
v/c Ratio	0.42	0.41	0.09		0.40	0.62	0.29			0.86	0.17	
Control Delay	21.5	23.0	1.0		30.5	6.0	33.2			35.5	0.4	
Queue Delay	0.0	1.0	0.0		0.0	0.0	0.0			0.0	0.0	
Total Delay	21.5	24.0	1.0		30.5	6.0	33.2			35.5	0.4	
LOS	C	C	A		C	A	C			D	A	
Approach Delay		21.6			13.4			33.2			27.3	
Approach LOS		C			B			C			C	
Queue Length 50th (m)	23.5	44.8	0.0		36.9	0.0	8.2			88.6	0.0	
Queue Length 95th (m)	39.0	68.1	1.0		58.8	25.2	13.1			#149.7	0.0	
Internal Link Dist (m)		44.8			116.0			88.9			104.9	
Turn Bay Length (m)	35.0		25.0			55.0				75.0		
Base Capacity (vph)	446	771	376		564	854	177			688	1044	
Starvation Cap Reductn	0	244	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	0.42	0.60	0.09		0.40	0.62	0.29			0.86	0.17	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 21.1 Intersection LOS: C
Intersection Capacity Utilization 101.5% ICU Level of Service G
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Go Station West Access & Tiffin St. & Lakeshore Dr.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	246	61	175	163	0	69	400	214	61	223	43
Future Volume (vph)	29	246	61	175	163	0	69	400	214	61	223	43
Satd. Flow (prot)	1736	1814	0	1736	1863	0	0	3403	0	0	3462	1615
Flt Permitted	0.643			0.397				0.856			0.589	
Satd. Flow (perm)	1175	1814	0	725	1863	0	0	2928	0	0	2062	1615
Satd. Flow (RTOR)		14						88				85
Lane Group Flow (vph)	32	341	0	194	181	0	0	804	0	0	359	54
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		4		3	8			2		1	6	
Permitted Phases	4			8			2			6	6	6
Total Split (s)	33.0	33.0		11.0	44.0		36.0	36.0		10.0	46.0	46.0
Total Lost Time (s)	6.0	6.0		4.0	6.0			6.0			6.0	6.0
Act Effct Green (s)	27.1	27.1		40.2	38.2			23.7			23.7	23.7
Actuated g/C Ratio	0.37	0.37		0.54	0.52			0.32			0.32	0.32
v/c Ratio	0.07	0.51		0.40	0.19			0.81			0.54	0.09
Control Delay	17.8	21.7		12.4	11.3			27.2			23.7	2.2
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Delay	17.8	21.7		12.4	11.3			27.2			23.7	2.2
LOS	B	C		B	B			C			C	A
Approach Delay		21.4			11.9			27.2			20.9	
Approach LOS		C			B			C			C	
Queue Length 50th (m)	3.0	36.8		13.8	13.5			50.0			22.3	0.0
Queue Length 95th (m)	9.6	68.1		28.9	28.2			64.7			29.5	2.2
Internal Link Dist (m)		153.0			41.6			55.6			43.8	
Turn Bay Length (m)	47.0			23.0								89.0
Base Capacity (vph)	430	674		490	961			1245			1121	916
Starvation Cap Reductn	0	0		0	0			4			0	0
Spillback Cap Reductn	0	0		0	0			0			0	0
Storage Cap Reductn	0	0		0	0			0			0	0
Reduced v/c Ratio	0.07	0.51		0.40	0.19			0.65			0.32	0.06

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 73.9
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 21.9 Intersection LOS: C
Intersection Capacity Utilization 88.2% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 2: Essa Rd./Bradford St. & Tiffin St.