Appendix A
Transportation and Traffic Study Report

Region of Peel
Working for you

Hatch Mott MacDonald

Class Environmental Assessment Study for Winston Churchill Boulevard

From Highway 401 to Embleton Road

Transportation and Traffic Study Report

June 04, 2015

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Executive Summary

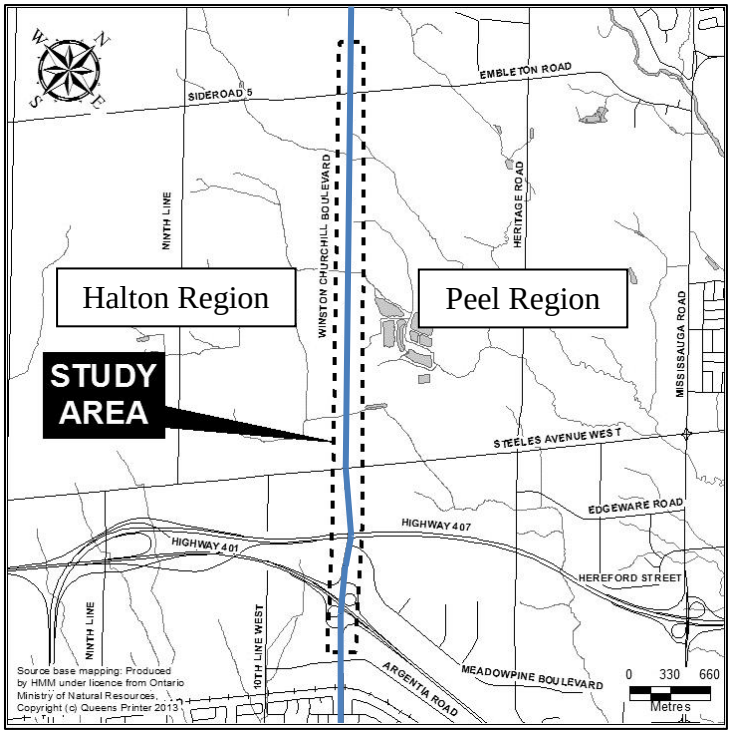
Study Overview

The Region of Peel (Region) Long Range Transportation Plan (LRTP) has identified a need to widen Winston Churchill Boulevard (Regional Road 19) from Highway 401 to Embleton Road to 6 traffic lanes by 2031. In 2014, the Region initiated a Municipal Class Environmental Assessment (EA), Schedule C, for improvements to Winston Churchill Boulevard for this section. The EA study was undertaken in accordance with the Municipal Engineer's Association's Municipal Class EA process to:

- Confirm the LRTP findings of Phases 1 and 2 of the EA process concerning potential solutions to address short and long-term transportation needs including improvements to transit, travel demand management and road widening;
- Complete Phases 3 and 4 of the EA process to examine design alternatives for widening and intersection improvements; and
- Identify a preferred design concept for these improvements.

The study area extends from the south off-ramp terminal at Highway 401 to 5 Side Road / Embleton Road and is illustrated in **Figure ES-1**.

Figure ES-1 – Study Area for Winston Churchill Boulevard Class EA – Highway 401 to Embleton Road / 5 Side Road



Winston Churchill Boulevard forms the east-west boundary between the Region of Halton and the Region of Peel. The Study Area extends approximately 4.2 km along Winston Churchill Boulevard. While capital funding for this project is split 50/50, the planning is led by the Region of Peel.

Planning Context

Numerous studies, projects and initiatives previously completed or currently underway by the Region and other public agencies provide the planning context for the Winston Churchill Boulevard Class EA. In particular, the 2012 Peel Region Long Range Transportation Plan (LRTP) and 2011 Halton Region Transportation Master Plan – The Road to Change establish the need and justification for the widening of Winston Churchill Boulevard through the Study Area and serve as the foundation for the Problem and Opportunity Statement for this Class EA study. Other notable documents include:

- Provincial Growth Plan for the Greater Golden Horseshoe (Places to Grow);
- Metrolinx Regional Transportation Plan (The Big Move);
- GTA West Corridor Planning and Environmental Assessment Study;
- Halton-Peel Boundary Area Transportation Study (HPBATS);
- Official Plans and Transportation Plans for the Region of Peel, Region of Halton, City of Brampton, Town of Caledon and Town of Halton Hills;
- Region of Peel Road Characterization Study, Strategic Goods Movement Network Study and Active Transportation Plan;
- Georgetown-Norval By-Pass; and
- Other on-going Class EA studies in the vicinity of the Study Area.

Existing Transportation Conditions

The existing transportation system serving the Study Area includes Winston Churchill Boulevard in the north-south direction and seven roads crossing in the east-west orientation: Embleton Road/ 5 Side Road, Maplelodge Farms Entrance, Steeles Avenue, Orlando Access, Meadowpine Boulevard, Highway 401 North Off-Ramp terminal and Highway 401 South Off-Ramp terminal. All the intersections with Winston Churchill Boulevard are signalized. There are currently two transit services within the vicinity of the study area. Brampton Transit operates route 51A on Steeles Avenue west to Winston Churchill Boulevard travelling south to Argentia Road; and Mississauga Transit operates the Creditview North and South route 38 on Winston Churchill Boulevard southerly from the Lisgar GO Station via Argentia Road. No Active Transportation facilities are located within the Study Area.

According to Region of Peel traffic count data obtained in 2013 and subsequent traffic counts conducted in November of 2014, existing peak directional traffic volumes along Winston Churchill Boulevard within the Study Area range from 915 to 1,810 vehicles per hour (veh/h) in the AM peak hour and 900 to 1,850 veh/h in the PM peak hour. Midday peak hour traffic is significantly lighter than AM and PM peak hour volumes along the corridor. The traffic operations analysis of existing conditions show that with the exception of Steeles Avenue, all signalized intersections along Winston Churchill Boulevard have a good operational performance with low delays, reserve capacity and only few critical movements. Steeles Avenue is approaching capacity under existing conditions, with some turning movements experiencing higher levels of delay. A midblock capacity analysis and intersection review indicates:

- A need to widen the section of Winston Churchill Boulevard from Steeles Avenue to the North Highway 401 Off-Ramp terminal from 4 lanes to 6 traffic lanes;
- A need to widen the east and west approaches to Steeles Avenue – Winston Churchill Boulevard intersection to 3 through lanes in each direction; and
- The section of Winston Churchill Boulevard from 5 Side Road/ Embleton Road to 2 km south of 5 Side Road/ Embleton Road needs to be widened from 2 lanes to 4 traffic lanes.

Future Transportation Conditions

There are a number of road improvements that have been included in the capital improvement plans of different agencies (Region of Peel, City of Brampton and Region of Halton) for the section of Winston Churchill Boulevard in the study area that are anticipated to be completed by the 2021 and/or 2031 horizon years. Since the GTA West Corridor Planning and EA Study is still in progress with unconfirmed alignment and interchange location, it is premature to assess its impact to Winston Churchill Boulevard. For this study, the future conditions traffic analysis considers traffic conditions prior to implementation of the GTA West corridor. However, a sensitivity analysis that examines potential impacts that the GTA West corridor will have on Winston Churchill Boulevard is discussed in this report.

The future conditions analysis has been based on a traffic forecast prepared using historically derived traffic growth rates approved by the Region. The long range traffic volumes do not consider the effects arising from other network improvements such as the GTA West corridor and other improvements, nor strategies encouraging greater use of non-automobile modes of travel. The LRTP has determined that additional measures including improvements to transit and transportation demand management in conjunction with road capacity improvements are required to accommodate future travel demand. Higher order transit services have been proposed for the connections between the Lisgar GO Station and Steeles Avenue, via Winston Churchill Boulevard and Argentia Road. Improved pedestrian and cyclist facilities in the Winston Churchill corridor and in other east – west corridors are also proposed that, working together are designed to reduce

future vehicular demand. The forecasts used in this analysis are likely higher than the actual demand that will occur as a result of these other initiatives. Operations of intersections along the Winston Churchill Boulevard corridor presented in this report are considered to be conservative.

2021 Horizon Year Requirements

The traffic operations analysis for future conditions indicates a need to widen Winston Churchill Boulevard to 6 lanes from the Highway 401 Off-Ramp terminal to Steeles Avenue by 2021; and a need to widen Winston Churchill Boulevard to 4 lanes from 2 km south of Embleton Road / 5 Side Road to Embleton Road / 5 Side Road. Along with these improvements, a dedicated eastbound left turn lane and westbound right turn lane is required at the intersection of Embleton Road / 5 Side Road with Winston Churchill Boulevard. An overlap traffic signal phasing is also recommended for the operation of the northbound right turn lane at the intersection of Steeles Avenue to permit movement in conjunction with the westbound left turn phase. When these improvements are implemented, all roads would operate at an acceptable level of service (LOS) of D or better with the exception of Steeles Avenue. During the AM peak hour, Steeles Avenue intersection will operate at LOS E with through movements approaching their effective capacity with some turning movements experiencing higher levels of delay.

2031 Horizon Year Requirements

Traffic volume projections to the year 2031 indicate the need to extend the widening on Winston Churchill Boulevard to 6 traffic lanes from Steeles Avenue to Embleton Road / 5 Side Road. With these improvements, the intersection of Steeles Avenue will be operating satisfactorily but will be approaching its effective capacity. Some turning movements including the westbound and northbound movements will experience higher levels of delay.

1. Introduction

1.1 Purpose

The Peel Region Long Range Transportation Plan (LRTP) identified a range of sustainable, integrated transportation solutions that balance economic, environmental, social and cultural strategic objectives for the next 20 to 30 years. The plan also identified a number of challenges in reaching these objectives that included population and employment growth and the resulting rapid growth in travel demand, limited physical opportunities to accommodate this demand, the need to reverse the growing auto dependence and to provide a variety of travel choices, including greater accessibility to transit, car-pooling/sharing and active transportation.

The LRTP recommended that a widening of Winston Churchill Boulevard to 6 travel lanes will be required by 2021 and by 2031 for the sections south and north of Steeles Avenue, respectively.

In accordance with the Municipal Class EA Process, in 2014 the Region initiated a Schedule 'C' Municipal Class Environmental Assessment (EA) study to study in more detail the recommendations of the LRTP, including the long-term transportation improvements to increase capacity of Winston Churchill Boulevard between Highway 401 and Embleton Road, a length of approximately 4.2 kilometers (km). The study was initiated to examine alternative solutions for providing this capacity and to recommend a design concept through a comprehensive and environmentally sound planning process involving public participation.

The purpose of this traffic study is to:

1. Review the existing and future transportation characteristics and patterns, traffic conditions and forecasted travel demand on Winston Churchill Boulevard between Highway 401 and Embleton Road;
2. Identify areas where additional traffic capacity may be required or areas where there is potential to improve traffic safety over the next 20 to 30 years;
3. Examine and evaluate alternatives to address these needs to identify a recommended strategy for meeting the projected travel demand.

The objective of the study is to confirm the long-term improvements necessary on Winston Churchill Boulevard for the horizon years of 2021 and 2031.

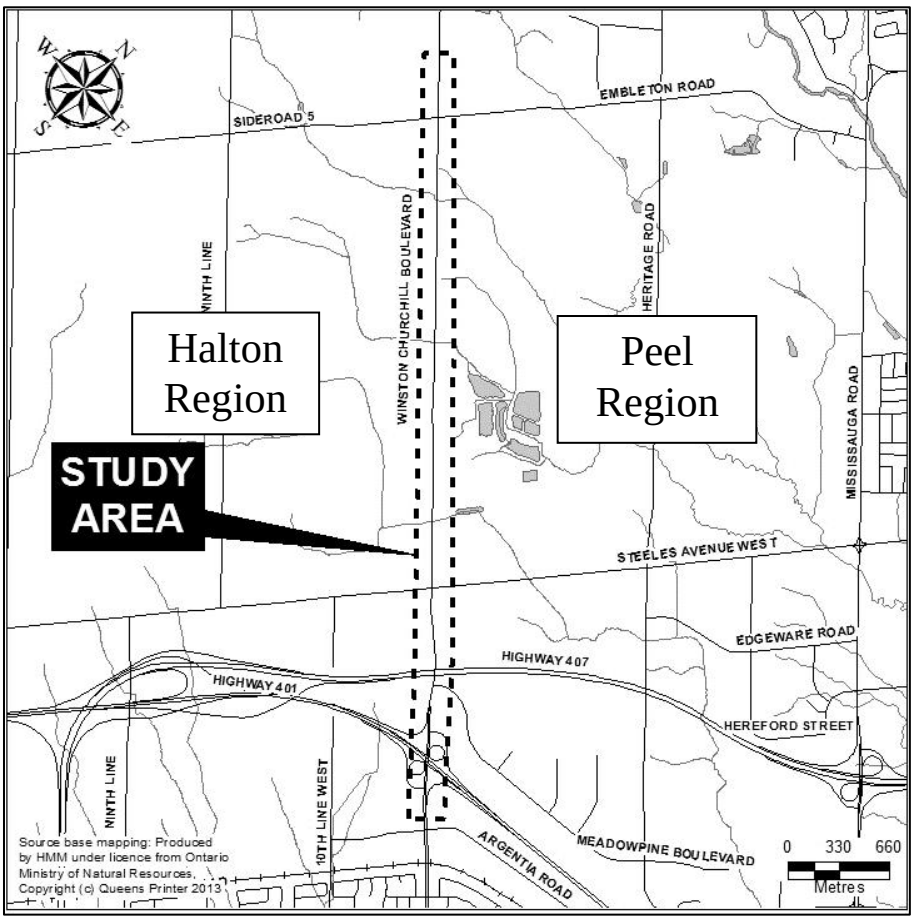
1.2 Study Area

The transportation and traffic analysis is being conducted for an intensive study area that includes the length of Winston Churchill Boulevard from Highway 401 to Embleton Road / 5 Side Road. The analysis of traffic patterns, trends and growth considers a broader study area that includes areas south of Steeles Avenue to Bovaird Drive in the north; and from Mississauga Road in the east to Trafalgar Road in the west. The immediate study area is shown on **Figure 1**.

1.3 Planning Horizons

The base year for the analysis is 2014, consistent with the availability of traffic data for roads within the study area. Forecast traffic conditions are considered for two planning horizons: a medium-term horizon of 2021 and a long-term horizon of 2031. These horizons are consistent with the horizon years in the Region of Peel Transportation Demand Model.

Figure 1 – Study Area



1.4 Relationship to Region of Peel LRTP

The LRTP provides a policy implementation framework for the Peel Regional Official Plan to address transportation challenges to the year 2031. The plan contains information on the state of the Region's transportation system, future trends and ways of addressing those trends identified through technical analysis and demand forecasting. The LRTP also serves as a Master Plan pursuant to *Approach 1* of the Municipal Class EA master planning process, recommending an implementation strategy to meet future transportation needs, including roadway expansion requirements. Approach 1 involves preparation of the Master Plan document at the conclusion of Phases 1 and 2 of the Municipal Class EA process. Since the LRTP was undertaken at a broad level of assessment, more detailed review is needed at the project-specific level through this study to fulfil the Municipal Class EA requirements.

The Winston Churchill Boulevard Class EA Transportation and Traffic Report is organized as follows:

- Chapter 2 provides the study area context for improvements to Winston Churchill Boulevard, summarizing the findings from other related studies that are relevant to the Winston Churchill Boulevard study area and may impact the proposed undertaking;
- Chapter 3 provides a summary of the existing transportation conditions and traffic operations for the 2014 base year;
- Chapter 4 provides a summary of the future transportation conditions and traffic operations for a long-term planning horizon of 2031 and an interim planning horizon of 2021;
- Chapter 5 provides a summary of identified capacity, operational and safety needs in the corridor and an assessment of alternative improvements to address these needs; and
- Chapter 6 provides a summary of the key findings and a transportation and traffic Problem Statement.

2. Study Area Planning Context

The following studies, projects and initiatives provide a planning context for the Winston Churchill Boulevard Class EA:

2.1 Provincial and Inter-Regional

2.1.1 Provincial Growth Plan

The Growth Plan for the Greater Golden Horseshoe – Places to Grow was adopted in June 2006 under the provisions of the Places to Grow Act, 2005. The plan provides the framework for implementing the Provincial government's vision for building stronger, prosperous communities by better managing growth to the year 2041 in the burgeoning Greater Toronto and Hamilton Area (GTHA).

The Growth Plan contains specific policies and directives regarding transportation, infrastructure, land use planning, urban form, natural heritage and resource protection to be considered by municipalities in their planning activities. Of particular interest, the Growth Plan provides direction around where growth can occur, the form of future development, and future population and employment forecasts, which have been reflected in the regional and local municipal Official Plans.

The plan also offers guidance regarding transportation system development, envisioning an "integrated transportation network that will allow people choices for easy travel both within and between urban centers." While travel by automobile will remain a significant means of transport, other travel mode choices, including efficient, convenient and affordable public transit, and walking and cycling, will become more important elements of the urban transportation system.

2.1.2 Metrolinx "The Big Move"

Pursuant to the Metrolinx Act, 2006, the Province created Metrolinx to develop, fund, coordinate and promote transportation within the GTHA municipalities. Metrolinx has developed a Regional Transportation Plan (RTP) for the GTHA, entitled "The Big Move: Transforming Transportation in the Greater Toronto and Hamilton Area", based on a seamless, integrated transportation network, focusing on public transit. The plan outlines a 25-year vision for sustainable transportation in the GTHA, as well as the policies, programs and infrastructure investments required to achieve the vision.

The Big Move is primarily focused on enhancing and expanding public transit. In the vicinity of the Study Area, the RTP identifies one rapid transit initiative of relevance, being the expansion of Regional Rail on the Kitchener GO line to full-day, two-way service. The plan also includes policies related to goods movement, Active Transportation (AT) and transit to be considered in developing and improving infrastructure.

2.1.3 GTA West Planning and Environmental Assessment Study

The Ministry of Transportation (MTO) is conducting the GTA West Corridor Planning and Environmental Assessment Study to identify the preferred solution for providing better linkages between Urban Growth Centres in the west part of the GTHA, including Downtown Guelph, Downtown Milton, Brampton City Centre and Vaughan Corporate Centre.

The GTA West Transportation Development Strategy (TDS) released in November 2012 recommends a broad range of measures to address future transportation needs in the northwest part of the GTHA, including building a new transportation (freeway) corridor from Highway 400 westerly to Highway 401 east of the Niagara Escarpment. The corridor is proposed to include six lanes along the north-south section near the Region of Halton and Region of Peel municipal boundary (once known as the Halton/Peel Freeway), and anticipated to provide interchanges at major arterial roads such as Ninth Line and 5 Side Road in Halton Hills and Bovaird Drive in Brampton, as well as Highways 401 and 407. The proposed new corridor would function in combination with the expansion of existing highway facilities, including the widening of Highway 401 to 12 lanes from Regional Road 25 (Milton) to Trafalgar Road (Regional Road 3). The Preliminary Route Planning Study Area for the new corridor, which will be identified through Stage 2 of the EA process, is shown in **Figure 2**. It is noted that the TDS assumed the future widening of several roads in the vicinity of the Study Area as part of the overall transportation network solution.

The GTA West study has also identified the need for several transit improvements including the expansion of all-day, two-way GO Train service to Milton and Georgetown, to meet future transportation demands in this growing part of the Greater Toronto and Hamilton Area (GTHA). These new services in combination with the proposed transportation corridor will have a significant influence on local and regional trip patterns in the Region, and future travel behavior for the Winston Churchill Boulevard Class EA Study Area.

2.1.4 Halton – Peel Boundary Area Transportation Study

The Halton-Peel Boundary Area Transportation Study (HPBATS) was initiated in response to commitments made by the Region of Halton for the approval of Halton Regional Official Plan Amendment (ROPA) 25. HPBATS was conducted jointly by the Region of Peel, Region of Halton, the City of Brampton, the Town of Caledon and the Town of Halton Hills to identify a long-term (2021-2031) transportation network to serve future demands in the municipal boundary area. Growth projections from the Growth Plan served as the basis for the demand forecasts.

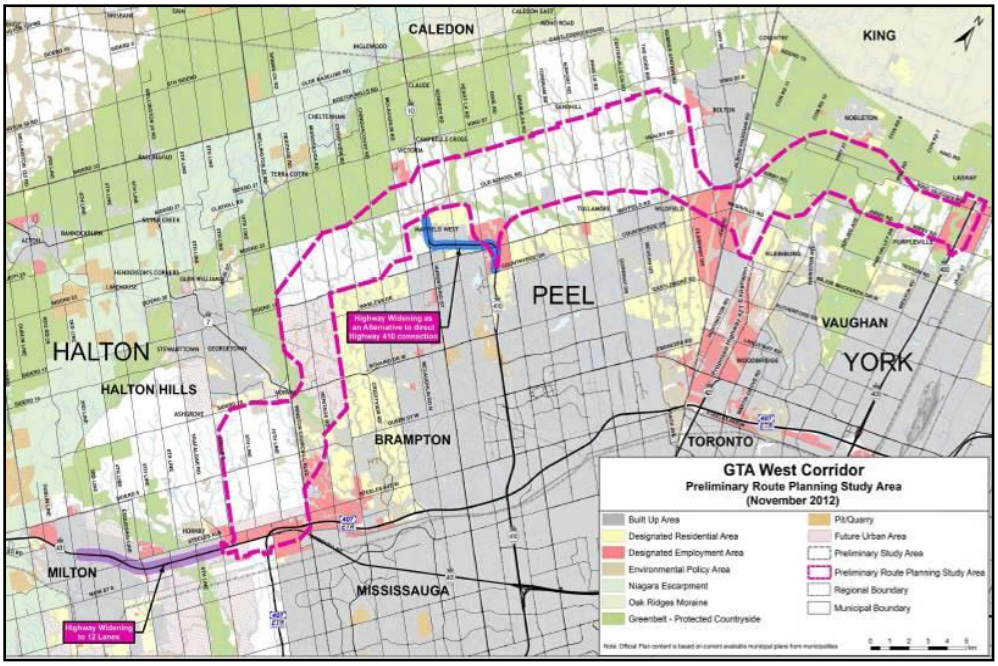


Figure 2 – GTA West Corridor – Preliminary Route Planning Study Area
(Source: GTA West Corridor Planning and EA Study
Transportation Development Strategy Report, November 2012)

The HPBATS transportation strategy endorsed by Town, City and Regional Councils in May 2012 includes a range of measures designed to promote change in travel behavior, in addition to essential infrastructure improvements. The strategy features enhancements to the transit and road networks, and Transportation Demand Management (TDM) initiatives to encourage employer-based trip reduction programs, to link transportation and land use decisions, and to promote High-Occupancy Vehicle (HOV) travel.

Figure 3 illustrates the recommended transportation network for the Halton/Peel boundary area from HPBATS. The figure identifies the improvements within the Study Area (proposed year of implementation noted) shown in **Table A**.

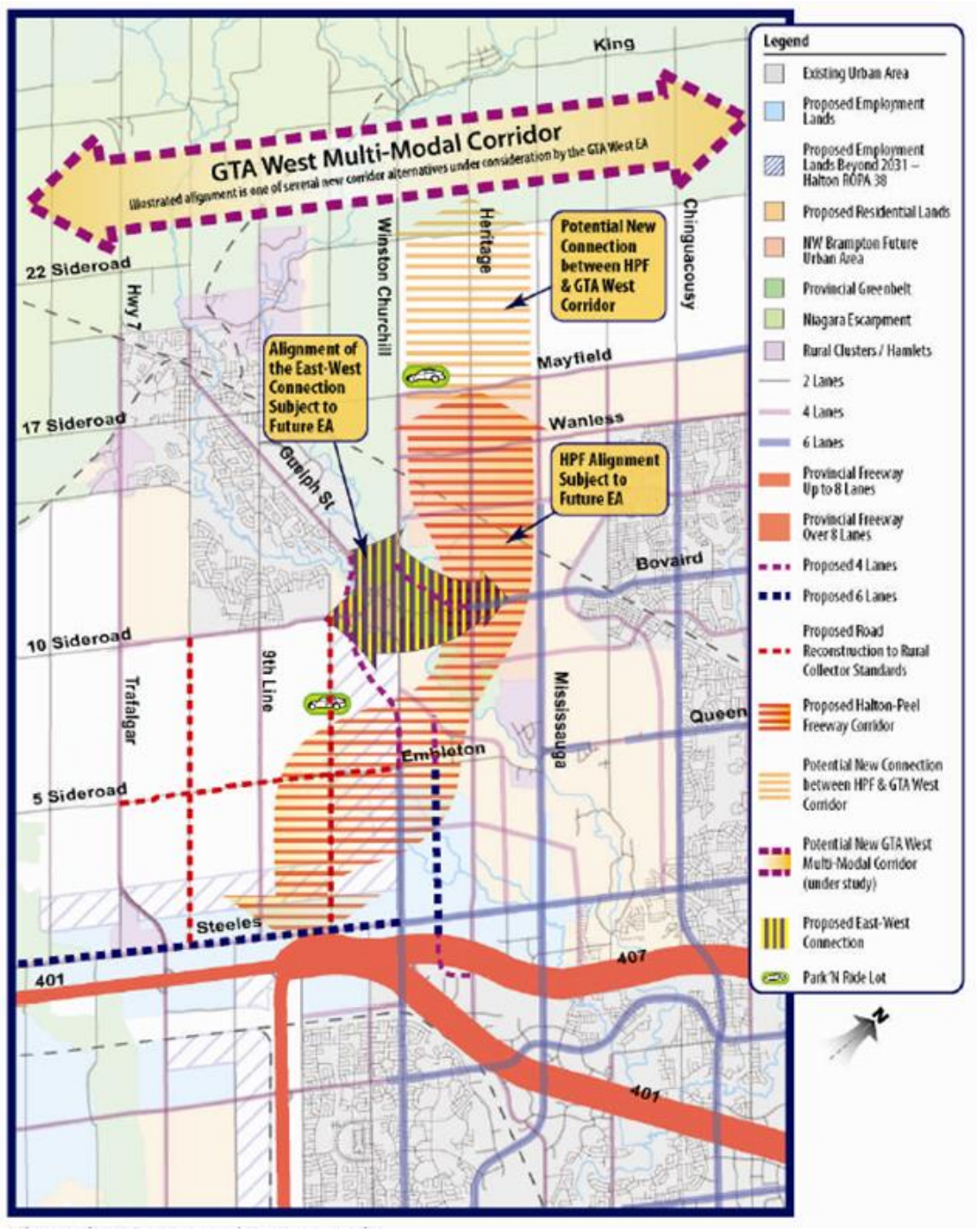


Figure 3 – HPBATS Recommended Road Network, 2031
(Source: Halton-Peel Boundary Area Transportation Study, May 2010)

Table A – HPBATS Improvements

Road Improvement	Year
Provision of Winston Churchill Bypass at four lanes from north of 5 Side Road / Embleton Road to 10 Side Road/Norval West Bypass	2016
Widening of Winston Churchill Boulevard from 5 Side Road/Embleton Road to the junction with Winston Churchill Bypass from two to four lanes	2016
Provision of Norval West Bypass at four lanes from 10 Side Road/Winston Churchill Bypass to Guelph Street	2016
Widening of Steeles Avenue from two to four general purpose lanes from Winston Churchill Boulevard to Milton	2021
Widening of Trafalgar Road from two to four lanes, from Steeles Avenue to Highway 7	2021
Widening of 10 Side Road from two to four lanes from Trafalgar Road to Winston Churchill Bypass/Norval West Bypass	2021
Provision of east-west connection from Bovaird Drive west of Halton/Peel Freeway to Georgetown (corridor to be determined by EA)	2021
Road reconstruction to rural collector standards for Eighth Line and Tenth Line from Steeles Avenue to 10 Side Road in Halton Hills	2021
Road reconstruction to rural collector standards for 5 Side Road	2021
Widening of Winston Churchill Boulevard from two to six lanes from Highway 401 to 5 Side Road/Embleton Road	2031
Provision of Halton/Peel Freeway at eight lanes from Highway 401/ 407 ETR interchanges west of Ninth Line in Halton to Bovaird Drive. (Subsequent to the completion of HPBATS, the Halton/Peel Freeway has become part of the GTA West Transportation Corridor. Its location and implementation will be determined through the GTA West Corridor Planning and Environmental Assessment Study being undertaken by MTO).	2031
Widening of Steeles Avenue from four to six lanes for transit (HOV) lanes from Winston Churchill Boulevard to Milton	2031

2.2 Regional

2.2.1 Region of Peel Long Range Transportation Plan

The LRTP is a high level, overarching document that provides a policy implementation framework for the Regional Official Plan to address transportation challenges and serves as a Transportation Master Plan for the Region. The plan identifies a range of sustainable, integrated transportation solutions that balance economic, environmental, social and cultural strategic objectives for the next 20 to 30 years. As a master plan, the LRTP Update addresses Phases 1 and 2 of the five-phase Municipal Class EA process (i.e., defining the problem, identifying alternative solutions, selecting a preferred solution and consulting with the public and key stakeholders).

The LRTP evaluated alternative solutions to addressing identified medium and long-term deficiencies in the existing and planned transportation network. The alternatives ranged from doing nothing to transportation demand management (TDM) only; road improvements only; and a combination of TDM and road improvements. The preferred solution indicated on Table 4.4 of the LRTP is Alternative 4: a combination of TDM and Road Improvement alternatives. Schedule E of the LRTP designates Winston Churchill Boulevard as a Major Road. Schedule F also designates the section from Highway 401 to Embleton Road / 5th Side Road as having a 45 metre right-of-way. The section north of Embleton Road is to have a 36 metre right-of-way.

Figure 4.14 of the LRTP -Planned Number of Lanes for Regional Roads for 2021, indicates that Winston Churchill Boulevard requires 4 basic travel lanes north of Steeles Avenue to north of Embleton Road / 5 Side Road; and 6 lanes south of Steeles Avenue. Figure 4.16, Regional Road Identified Needs for 2031, indicates that Winston Churchill Boulevard requires 6 travel lanes from Steeles Avenue to Embleton Road / 5 Side Road.

Schedule G of the LRTP indicates that Winston Churchill Boulevard from Argentia Road to Steeles Avenue is designated as an “Other Rapid Transit Corridor”, where rapid transit services may include both higher order transit and bus rapid transit.

2.2.2 Halton Region Transportation Master Plan (to 2031) – The Road to Change (2011)

The Halton Region Transportation Master Plan (RTMP) update approved by Council in 2011 provides a sustainable, integrated transportation plan and associated strategies that will consider all modes of travel to the year 2031. The plan known as “The Road to Change” identifies required network improvements that include widening Regional Roads to 6 lanes (where needed) and new regional links and network features to accommodate cycling, walking and transit. The purpose of the study was to develop a strategy that reflects Halton Region’s transportation vision over the next 20 years to 2031, which would be a dynamic integrated transportation strategy that considers all modes of travel.

The study provides the Region with the strategies, tools and policies needed to manage traffic safely, effectively and cost efficiently, to offer a range of transportation choices to meet the needs of Halton Region residents, to identify and protect future transportation corridors, and to identify the estimated costs and timing of transportation improvements.

The RTMP provides further direction regarding TDM and Active Transportation (AT) and recommends road improvements in the vicinity of the southeast area (proposed year of implementation noted) summarized in **Table B**.

Table B – Halton Region Transportation Master Plan Improvements

Road Improvement	Year
Widening of Ninth Line to four lanes from Steeles Avenue to 10 Side Road	2017
Widening of Winston Churchill Boulevard to four lanes from 2km south of 5 Side Road to 10 Side Road	2020
Widening of Winston Churchill Boulevard to six lanes from Highway 401 to Steeles Avenue	2021
Widening of Steeles Avenue to six lanes from Trafalgar Road to Winston Churchill Boulevard	2028
Widening of Winston Churchill Boulevard to six lanes from 2km south of 5 Side Road to 5 Side Road	2030
Widening of Winston Churchill Boulevard from five to seven lanes from Steeles Avenue to 2km south of 5 Side Road	2030
Widening of 10 Side Road/Regional Road 10 to four lanes from Trafalgar Road to Winston Churchill Boulevard	2031

2.2.3 Region of Peel Road Characterization Study

The Road Characterization Study (RCS) completed in May 2013 provides guidance on how to better reflect the local context and accommodate a broader range of transportation modes and users in the planning and design of Regional Roads. The main objectives of the study were to:

- Improve integration between transportation and land use;
- Support the Region's multi-modal transportation system; and
- Protect and maximize the current/future functionality and efficiency of the Region's arterial roads.

The RCS provides a series of illustrative roadway cross sections to be employed when considering changes to a Regional Road right-of-way. The cross sections

reflect different road typologies developed through a context-sensitive solutions approach that responds to current and envisioned future land uses. Recognizing the diverse land use contexts within the Region, the RCS includes a Road Character Matrix that correlates land use character with associated right-of-way considerations. Using this matrix, the RCS classifies Winston Churchill Boulevard from Highway 401 to Embleton Road as an Industrial Connector that supports both commuter and heavy vehicle/commercial traffic. The illustrative roadway cross section for an Industrial Connector is shown in **Figure 4**.

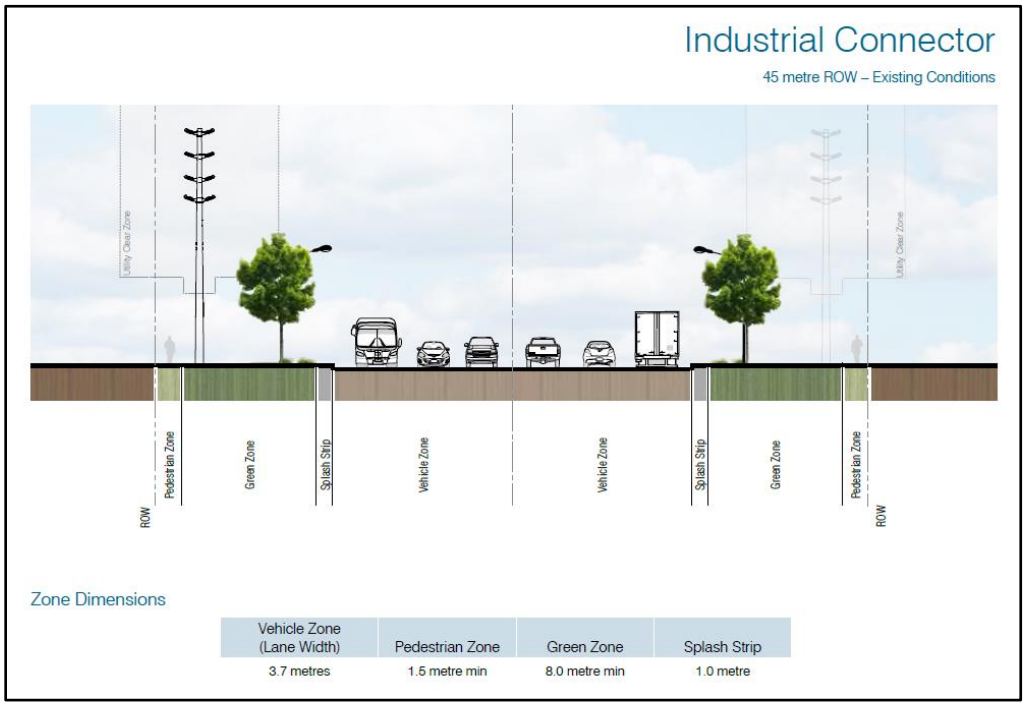


Figure 4 – Illustrative Roadway Cross Section for Industrial Connector
(Source: Region of Peel Road Characterization Study, Section 2: Illustrative Cross Sections, May 2013)

2.2.4 Region of Peel Strategic Goods Movement Network Study

The Strategic Goods Movement Network (SGMN) Study completed in May 2013 developed a systematic, hierarchical truck route network throughout the Region of Peel based on existing truck route networks and volumes, land uses and planning policies, overall network connectivity, trucks origins/destinations, best practices, as well as stakeholder outreach. The study recommends implementing the SGMN through a phased, logical approach that balances the needs of goods movement with local community requirements. This phased strategy includes strengthening the Official Plan to further support goods movement, prioritizing operational management/capital improvements to support the SGMN, implementing the

supportive improvements, and assessing SGMN impacts with ongoing improvements as needed.

The study identifies Winston Churchill Boulevard from Highway 407 to Steeles Avenue as a primary truck route connecting goods manufacturers with destinations and highways. In the future, it is expected that the GTA West Transportation Corridor will carry some of the goods movement travel demand currently using this road.

2.2.5 Region of Peel Active Transportation Plan

In May 2010, Peel Region launched a program called Walk and Roll Peel in order to encourage residents to start cycling and walking more. The program will be a cycling and walking hub to provide information and support efforts to encourage greater active transportation. The study recommends that Peel Region support area municipalities in the monitoring and implementation of public bike systems and support for a high-level feasibility review within next five years.

The Active Transportation Plan (ATP) completed in November 2011 articulates a vision for AT within the Region of Peel aimed at creating a place where walking, cycling, and rolling blading are safe, convenient, appealing and accessible for all citizens, especially children, youth, older adults, persons with disabilities and other priority populations. The Plan sets out policies that direct the practices of the Region to support more walking and cycling, recommends active transportation infrastructure improvements to expand the existing pedestrian and cycling networks, and recommends programs to shift travel behavior. The approach in developing the active transportation network is based on active transportation facilities and should be accommodated within all regional road corridors to provide access to adjacent land uses and destinations, and connect or integrate with existing and planned transit services.

The Region works closely with area municipalities and neighboring municipalities to plan and implement active transportation facilities on Regional Roads to create a comprehensive and integrated active transportation network.

The Active Transportation Plan suggests that active transportation should be accommodated within all regional road corridors to provide access to adjacent land uses and destinations.

Within the Study Area, the ATP identifies that in the City of Brampton:

- Three Proposed Class I Pathways (Multi- use off-street pathway) on an east-west orientation. These east-west pathways will connect to the east side of Winston Churchill Boulevard. One pathway is to be approximately 0.2 km south of the Highway 407 structure. A second pathway is to be located on Steeles Avenue from the intersection with Winston Churchill Boulevard easterly, and a third pathway will be located approximately 1.6 km south of Embleton Road running easterly. In addition to Class I

proposed pathways mentioned above, two Class II Pathways with on-street bike lanes will be connected to the east side of Winston Churchill Boulevard about 0.6 km and 1.2 km north of Embleton Road running easterly from Winston Churchill Boulevard (Source: Region of Peel Active Transportation Study – Exhibit 13). **Figure 5** shows the Proposed Pathways in the City of Brampton.

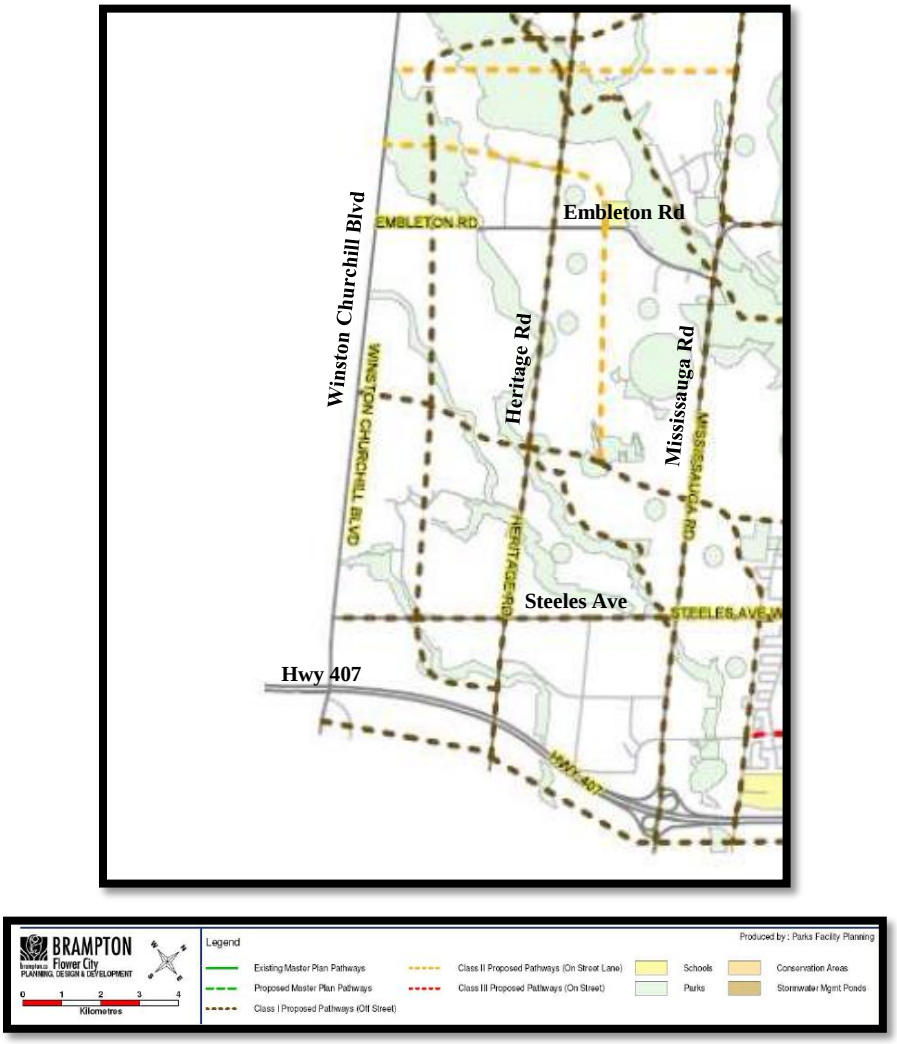


Figure 5 – City of Brampton Pathways Routing Plan (2010) in the Study Area
(Source: The Region of Peel's Active Transportation Study)

2.2.6 Halton Region Active Transportation Master Plan

Halton Region has started an Active Transportation Master Plan to develop the policy, infrastructure, and programs in order to encourage non-motorized trips throughout the region and to promote active transportation. The plan supports, outlines, and identifies Active Transportation objectives for the short, medium and long term. In order to achieve the vision for Active Transportation, Tier 1 and Tier 2 Alternatives have been provided in the study.

For the Tier 1 alternatives, the preferred solution suggests development of a walking and cycling network, education of residents on AT and updating policies and guidelines for better design and control.

For Tier 2, which focuses on the AT network, the preferred solution is to provide AT facilities on all Regional Roads and also develop a network of strategic regional corridors on which AT facilities are to be provided.

2.2.7 Class EA Study for the Reconstruction and Widening of Winston Churchill Boulevard from Steeles Avenue to Embleton Road

In 1996, the Region completed an Environmental Study Report (ESR) for the widening and reconstruction of Winston Churchill Boulevard from Steeles Avenue to Embleton Road. Although the report material is dated; the comments offered to the planning team concerning issues in the corridor along with the environmental assessments are relevant to the current study and have been considered.

2.2.8 Georgetown-Norval By-Pass

The Georgetown-Norval By-pass is an additional roadway to by-pass Norval from Bovaird Drive which would provide an alternative to commuter truck traffic passing through the communities in Georgetown and Norval and support development in Georgetown and Brampton. The roadway is currently being examined for routing options. Although still in the preliminary stages it is anticipated to connect to Winston Churchill Boulevard north of the study area. The additional roadway to by-pass Norval is expected to be in place for the 2021 horizon year.[1]

[1] Peel Region, *The Regional Municipality of Peel Bovaird Drive (Regional Road 107) Transportation Corridor from Lake Louise Drive/ Worthington Avenue to 1.45 km west of Heritage Road in the City of Brampton – Class Environmental Assessment Report*, April 2013, p.46.

2.3 Municipal

2.3.1 City of Brampton Transit and Transportation Master Plan

The City of Brampton is currently updating its Transit and Transportation Master Plan. The current 2009 TTMP contains a number of recommendations which apply to the roads in the vicinity of the Winston Churchill EA study area. These recommendations are summarized in **Table C**.

Table C – City of Brampton TMP Recommendations

Road Improvement	Year
Provision of 6 traffic lanes on Winston Churchill Boulevard from Highway 407 to Steeles Avenue	2016
Implementation of BRT service on the Argentia Road – Winston Churchill Boulevard – Steeles Avenue Corridors – with 10 – 15 min. headways	2016 – 2021
Provision of 4 traffic lanes on Winston Churchill Boulevard from Steeles Avenue northerly	2021
North – South and East West Cross Boundary Network Improvements as per HPBATS	2016 – 2031
Provision of 6 traffic lanes on Steeles Avenue from Winston Churchill Boulevard easterly	2031

The Brampton TMP also indicates that the Norval Bypass has been proposed by Halton Region to provide an alternative route for east-west traffic between Halton Hills and Brampton to bypass Norval. Although it would improve east-west inter-regional connectivity, the Norval Bypass is not required to accommodate planned development and growth in Brampton. An alternative alignment for the Norval Bypass as previously proposed by Halton, with a new crossing of the Credit River, is not recommended in the Brampton TMP because of its significant environmental impacts. However, the need for improved east-west connections and alternative network improvements between Halton Hills and Brampton are examined in the Halton-Peel Boundary Area Transportation Study which was jointly funded by the City of Brampton, Halton Region, and Peel Region.

2.3.2 Town of Halton Hills Transportation Master Plan

The Town's Strategic Plan guides the municipality's plans, programs and services, providing a Vision and Corporate Mission for Halton Hills to the year 2031. The Strategic Plan is implemented through the capital and operating budgets, planning documents, departmental/service area work plans and Council decisions.

The Strategic Plan identifies several strategic objectives related to transportation, which include:

- Encouraging air quality improvements through land use planning, transportation management and other programs and work with other orders of government to address greenhouse gas emissions;
- Conserving energy through means, such as community design, and land use and transportation planning;
- Sizing new urban areas appropriately relative to the planned growth and in conjunction with the required infrastructure improvements to achieve sustainable growth;
- Providing infrastructure and services that meet the needs of the community and ensuring that infrastructure required for growth is provided in a timely manner; and
- Working with other orders of government to ensure the provision of a safe, diverse and integrated transportation system.

The Halton Hills TMP recommended the immediate uploading of the section of Winston Churchill Boulevard from 32 Side Road to Guelph Street (Highway 7) to Halton Region for both jurisdictional and financial responsibilities, due to its regional road function of carrying a significant amount of long distance traffic that is not generated or destined locally.

2.3.3 Town of Halton Hills Cycling Master Plan

The Town of Halton Hills Cycling Master Plan recommends an on-road cycling route on Winston Churchill Boulevard from Steeles Avenue to north of 5 Side Road and the Norval west bypass. On-road cycling facilities are also recommended on Steeles Avenue and 5 Side Road/ Embleton Road east of Winston Churchill Boulevard.

2.4 Future Transportation Networks

As indicated in the planning studies that are relevant to this Class EA study, there are a number of significant future road improvements that will affect traffic movements on Winston Churchill Boulevard from Highway 401 northerly to Embleton Road. These include:

Mid-Term

- Widening of Steeles Avenue to 6 lanes, Winston Churchill Boulevard easterly after 2021
- Widening of Steeles Avenue, from Winston Churchill Boulevard to Milton, to 6 lanes with the assumption that the curb lane will operate as a HOV lane.
- Provision of BRT services and HOV lanes on the section of Winston Churchill Boulevard from Argentia Road to Steeles Avenue by 2021. This facility could be connected to the future HOV lanes on Steeles Avenue to Milton.

Long-Term

- Provision of the GTA West corridor
- Provision of the North-South corridor from HPBATS

Traffic forecasts provided by the Region in the form of weekday PM peak hour link traffic volumes for the 2021 and 2031 horizons include provision of these improvements.

3. Existing Transportation Operations

This section provides background context pertaining to the transportation system in and around the study area and an assessment of existing conditions.

3.1 Approach and Methodology

Sections 3.7 and **4.3** of this report detail the traffic operations analysis conducted for the six midblock sections and seven major intersections along Winston Churchill Boulevard within the Study Area. This analysis was completed for both existing (2014) and future (2021 and 2031) conditions during the weekday morning (AM) and afternoon (PM) peak hours to characterize operating conditions and identify locations requiring improvements. The methodologies applied for the midblock and intersection traffic operations analyses are described in the following sections:

3.1.1 Midblock Analysis

For midblock sections, the quality of service was characterized based on the **volume to capacity (v/c) ratio** for the link. The v/c ratio provides a measure of traffic volume demand to available capacity, with an at-capacity condition represented by a **v/c ratio of 1.00** (i.e., volume demand equals theoretical capacity). A **v/c ratio of 0.90 or less** was deemed acceptable operation for midblock locations, as the *Region of Peel Level of Service Policy* considers road segments with v/c ratios exceeding this threshold to be candidates for widening.

The midblock v/c ratios were calculated by dividing the traffic link volume (existing or forecasted) by the theoretical capacity for the subject link (i.e., the maximum hourly rate at which vehicles can be expected reasonably to traverse the section of roadway within a given time period, under prevailing roadway, traffic and control conditions). A theoretical capacity value of **900 vehicles per hour per lane** was used in the analysis. This capacity is intended to account for the type and number of local roads and accesses provided, the presence of pedestrians and crossing locations, driving characteristics for this type of facility and other factors. The value of 900

vehicles per hour per lane is the capacity specified for Winston Churchill Boulevard in the Peel Transportation Demand Model.

3.1.2 Intersection Analysis

Intersection **Level of Service (LOS)** was assigned based on average delay per vehicle and includes deceleration delay, queue move-up time, stopped delay, and final acceleration delay. LOS is a qualitative measure that describes the operating conditions within an intersection, and the perception of those conditions by road users. There are six levels of service defined. Each level has a letter identification from A to F with LOS A representing the best operating conditions and LOS F the worst. **Table D** summarizes the LOS criteria for signalized intersections according to the 2000 Highway Capacity Manual (HCM 2000).

The operational analysis for the signalized intersections was conducted using Synchro/SimTraffic software, Version 8.0, which implements the methods contained in HCM 2000 and HCM 2010. The Synchro network was developed specifically for this study and further refined through the analysis. The *Peel Region Guidelines for Using Synchro Version 7.73 Rev 8, December 2010* were followed in conducting the traffic analysis.

Table D – Intersection Level of Service Criteria for Automobile Mode

Level of Service	Average Control Delay per Vehicle (s/veh)
	Signalized Intersections[1]
A	=< 10
B	> 10 - 20
C	> 20 - 35
D	> 35 - 55
E	> 55 - 80
F	> 80

Source: 1. Highway Capacity Manual, 4th Edition (HCM 2000), Transportation Research Board, Chapter 16: Signalized Intersections, Exhibit 16-2

3.2 Existing Road Geometrics and Alignment

3.2.1 Lane Configurations

Figure 6 illustrates the lane configuration and intersection traffic control on Winston Churchill Boulevard within the study area. The posted speed limit on Winston Churchill Boulevard within the study area limits is 60 km/h with a transition to 80 km/h approximately 300 meters north of the Maple Lodge Farms entrance to 5 Side Road/ Embleton Road where the road narrows from two through lanes of traffic to one through lane in either direction. The major roadways in the study area include:

Winston Churchill Boulevard (Regional Road 19)

Winston Churchill Boulevard is a boundary road between the Region of Peel (east side) and Halton Region (west side). This roadway consists of a 4-lane arterial roadway, with added turning lanes at key intersections between the Highway 401 north ramp terminal and Steeles Avenue. South of the Highway 401 north ramp terminal to Argentia Road, the roadway consists of a 6-lane arterial cross section. North of Steeles Avenue to the entrance to Maple Lodge Farms the roadway is a 5-lane urban cross section with a two-way left turn lane along the centre. North of the Maple Lodge Farms access, Winston Churchill Boulevard narrows to a 2-lane cross section with a single traffic lane in each direction and a large painted median approximately 3 m wide that appears to serve as a centre turning lane providing access to adjacent properties despite not being signed this way. This cross section continues to 5 Side Road/ Embleton Road where additional turning lanes are provided at this signalized intersection.

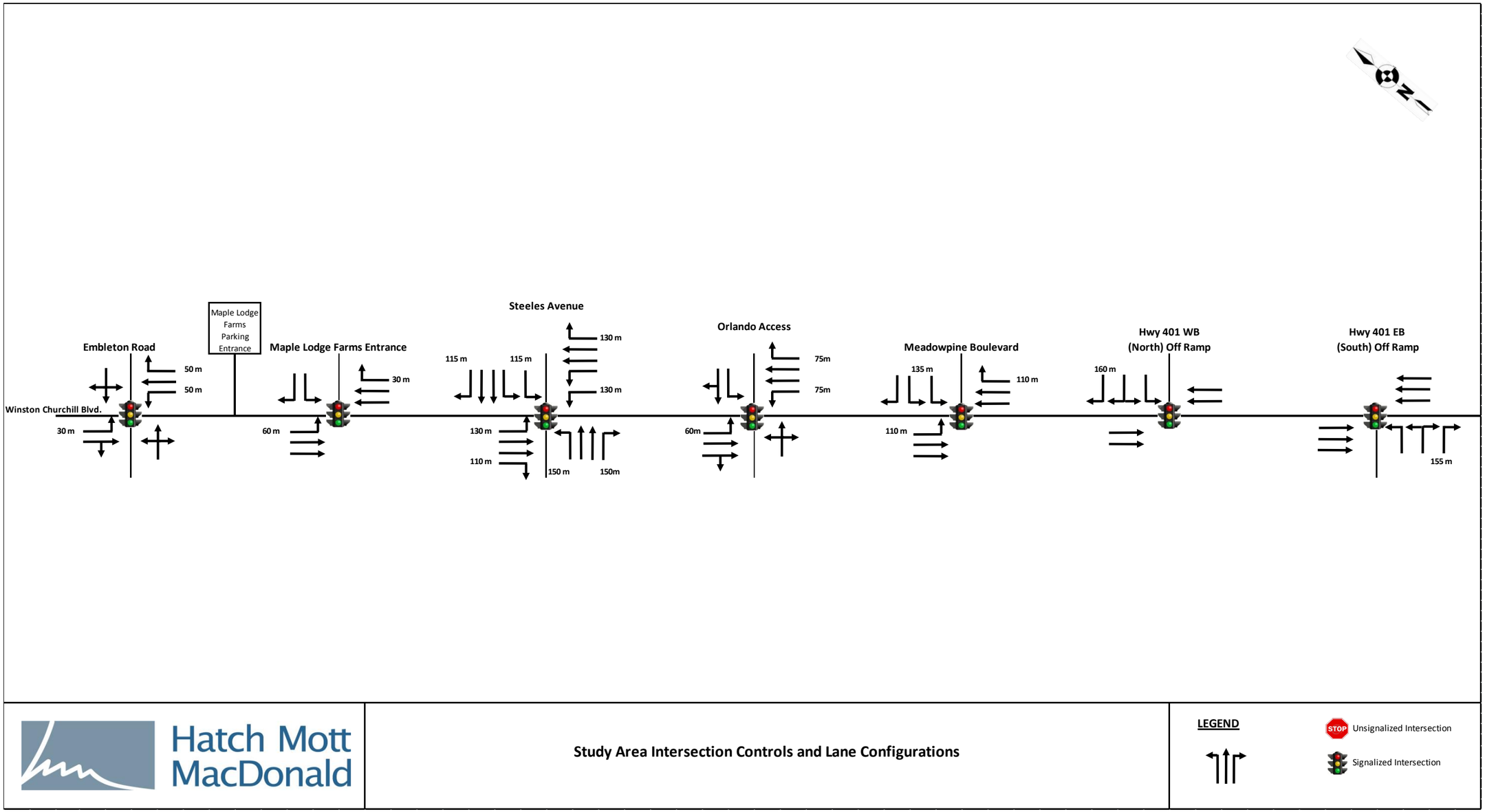
Highway 401 Interchange with Winston Churchill Boulevard

This interchange consists of a Parclo A-4 configuration with two signalized interchange terminals provided for E-N/S and W-N/S exit ramps that terminate at signalized intersections with Winston Churchill Boulevard. The spacing between the exit ramps is approximately 370 meters. Argentia Road, a signalized intersection with Winston Churchill Boulevard is located approximately 280 meters to the south of the south exit terminal. Meadowpine Boulevard, a signalized intersection is located approximately 310 meters to the north of the north exit terminal. At each off-ramp terminal, separate left, shared left/right and single right turn lanes are provided. No pedestrian facilities are provided at either terminal. See **Figure 6** for existing lane configurations.

Meadowpine Boulevard

Meadowpine Boulevard is an urban industrial collector roadway under the jurisdiction of the City of Mississauga. The road connects with Winston Churchill Boulevard at a signalized T-intersection just south of the Highway 407 fly-over and extends east. The posted speed limit on Meadowpine Boulevard is 60 km/h. Separate northbound right and southbound left turn lanes are provided on Winston Churchill Boulevard with dual westbound left turn lanes and a single westbound right turn lane provided on Meadowpine Boulevard. Meadowpine Boulevard consists of a four-lane urban cross section with sidewalks provided on both sides of the road. Pedestrian crosswalks are provided on the east and north approach at the Winston Churchill Boulevard intersection.

Figure 6 – Study Area Intersection Controls and Lane Configurations



Orlando Access

The access to the Orlando Development (7825 and 7995 Winston Churchill Boulevard) is located on Winston Churchill Boulevard, approximately 275 m south of Steeles Avenue. The access is a signalized intersection with a single westbound left and right turn lane, and single shared eastbound left/through/right turn lane provided. Separate turn lanes are provided into the access from Winston Churchill Boulevard with the exception of the shared southbound through/right turn lane. Pedestrian cross walks are provided on all four approaches of the intersection.

Steeles Avenue (Halton Regional Road 8 / Peel Road 15)

Within the study area, Steeles Avenue has a basic 4-lane cross section east of Winston Churchill Boulevard and a 2-lane cross section west of Winston Churchill Boulevard. Separate dual westbound left turn lanes and a separate westbound right turn lane are provided along with separate eastbound left and right turn lanes. On Winston Churchill Boulevard, dual northbound left turn lanes and separate northbound right turn lane are provided along with separate southbound left and right turn lanes. The posted speed limit on Steeles Avenue is 80 km/h.

Maple Lodge Farms Entrance

A signalized access to the Maple Lodge Farms site is located about one kilometer north of Steeles Avenue, on the east side of Winston Churchill Boulevard. The signalized access has a separate southbound left turn lane and a separate channelized right turn lane provided on Winston Churchill Boulevard. The access itself has an approach sufficient to accommodate separate westbound left and right turn lanes. Pedestrian crossings are provided on the east and north sides of the intersection.

Maple Lodge Farms Employee Parking Entrance

An unsignalized access is located 170 meters to the north of the Maple Lodge Farms Entrance and functions as an employee parking access. The access consists of a separate southbound left turn lane and northbound right turn taper into a single lane driveway to the site. One exit lane is provided to Winston Churchill Boulevard.

5 Side Road / Embleton Road

Embleton Road (Peel Road 6) intersects Winston Churchill Boulevard opposite 5 Side Road, a minor arterial road under the jurisdiction of the Town of Halton Hills. Both Embleton Road and 5 Side Road are 2-lane rural arterial roads with posted speed limits of 60 km/h (Embleton) and 80 km/h (5 Side Road). A separate northbound left turn lane and right turn lane are provided on Winston Churchill Boulevard along with a southbound left turn lane.

Local Access

On the section of Winston Churchill Boulevard between Steeles Avenue and the Highway 407 structure, three closely spaced driveways are located to the properties on the west side of Winston Churchill Boulevard. The most northerly driveway is to a storage business (#7954); the second driveway is to a private residence (#7940); and the third driveway is to a frontage road that serves another property to the south (#7886).

The Orlando Access intersection at Winston Churchill Boulevard is aligned with the connection to one of the properties (#7940). There is no access provided to the other properties (#7954 and #7886) via this connection to the Orlando Access.

The property north of the Orlando Access (#7954) is a self-storage business which attracts all types of vehicles, including heavy trucks and RVs. There is insufficient distance available between this driveway and the signalized Orlando Access immediately to the south for storage of northbound vehicles turning into the storage site.

The driveway south of the Orlando Access is also located in close proximity to the Signalized intersection. The driveway to the frontage road serving #7886 is very close to the Highway 407 structure and is located on a slope between the bridge and the Orlando Access.

The section of Winston Churchill Boulevard from Embleton Road/5 Side Road intersection to 2 km south of Embleton Road/ 5 Side Road has a 3-meter wide centre flush median bordered by two solid yellow lines in the middle of the existing 2-lane cross-section. This pavement marking provides space for drivers who are making turning movements into or out of properties fronting onto this section of Winston Churchill Boulevard. The ability to access or egress the adjacent properties without a designated turn lane will become increasingly difficult as traffic volumes grow in the future.

3.2.2 Road Geometry

From the Highway 401 south ramp terminal northerly to the north side of the existing structure over Highway 401, Winston Churchill Boulevard has an urban cross section, with concrete curb and gutter, raised concrete median and sidewalks on both sides of the road. Both the north and south ramp terminals are signalized.

North from the Highway 401 structure the cross section transitions into a semi-urban one, with concrete divisional islands in the centre and gravel shoulders and open ditches on either side to just north of the north ramp terminal at which point a concrete barrier curb is introduced on the east side only extending from just north of the Highway 401 north terminal to the Meadowpine Boulevard intersection and the structure over Highway 407. The Meadowpine Boulevard intersection is signalized. From this point northerly over the Highway 407 structure, the cross section includes

an urban cross section, with concrete barrier curbs, sidewalks and raised concrete divisional islands.

North of the Highway 407 structure, the cross section becomes semi-urban again with concrete curb and gutter extending on the east side to the Orlando development access. On the west side, the curb and gutter at the Highway 407 structure ends and there is a small gap until it recommences just south of the Orlando access and continues to just north of the access where it stops and a rural cross section continues on the west side. The Orlando access is signalized, with pedestrian crossings provided on all four legs of the intersection.

From north of the Orlando Access to approximately 130 m south of the Steeles Avenue intersection the cross section remains rural on the west side with gravel shoulders and open ditches, with concrete curb and gutter on the east side. This point is coincident with the limits of the separate dual northbound left and single right turning lanes to the Steeles Avenue intersection. From this point northerly, an urban cross section is carried to and through the Steeles Avenue intersection with concrete curb and gutter on both sides with a raised concrete divisional island in the centre of the road and concrete sidewalks on the west side and only an asphalt paved splash pad on the east functioning as a sidewalk.

North of Steeles Avenue, the urban curb and gutter cross section is maintained with the introduction of a two-way left turn lane in an area where there are fronting residential and commercial driveways. Asphalt paved splash pads are provided on either side of the road and are functioning as sidewalks.

The urban 5-lane cross section (with two-way left turn lane) continues across the watercourse crossing structure, northerly to the Maple Lodge Farms entrance on the east side of the road. This access is fully signalized with pedestrian crossings on the north and east approaches. A secondary access to the employee parking area of the Maple Lodge Farms site is located just north of the signalized entrance and is unsignalized with the urban cross section on Winston Churchill Boulevard continuing through these accesses. A separate southbound left turn lane is provided for this access, with a right turn taper provided in the northbound direction. The cross section also includes development of a raised concrete median in the area between the accesses that is transitioned to a flush median north of the employee parking area. North of the Maple Lodge Farms employee parking access, the cross section narrows to a 2-lane urban cross section, with a flush painted median between these lanes. The cross section becomes fully rural at this transition point going northerly to 5 Side Road/ Embleton Road. The median widens to a 3 m wide painted median with one lane in either direction. A wide 2 m paved shoulder is provided on the west side and a gravel shoulder on the east approximately 1.5 m wide before rolling into a ditch on either side of the road.

The rural 2-lane cross section continues to south of 5 Side Road/ Embleton Road at the limit of the development of a separate northbound left turn lane and separate right turn lane to the intersection. Concrete curb and gutter is provided only on the east side

with an asphalt paved splash pad functioning as a sidewalk. The paved shoulder provided on the west continues northerly to the intersection. North of this intersection a 2-lane rural cross section is maintained with gravel shoulders approximately 1 m wide.

There are no deficiencies in the roadway geometry. It is recommended that upon reconstruction of Winston Churchill Boulevard that the urban cross section with curb and gutter be continuous from Meadowpine Boulevard to Steeles Avenue with no rural cross section breaks. Where asphalt paved splash pads are present concrete sidewalks are recommended to create a safer walking environment for pedestrians as opposed to using the asphalt paved splash pads immediately adjacent to the roadway.

3.2.3 Roadway Structures

There are a total of 6 structures within the Winston Churchill Boulevard Corridor. There are two bridge structures for the Highway 401 and Highway 407 overpasses, one watercourse crossing between Steeles Avenue and Maple Lodge Farms Entrance, and 3 watercourse crossings from the section north of the Maple Lodge Farms Entrance to 5 Side Road/ Embleton Road. Two of these crossings are fairly closely spaced approaching the 5 Side Road/ Embleton Road intersection from the south.

3.2.4 Illumination

Winston Churchill Boulevard is fully illuminated along the entire corridor from the Highway 401 south ramp terminal to north of the Maple Lodge Farms employee parking entrance where the road transitions from a 5-lane cross section to a 2-lane cross section with a wide paved centre median and a speed limit change from 60 km/h to 80km/h. North of this transition point there is no illumination with the change to a rural cross section. Illumination becomes present again at 5 Side Road/ Embleton Road as the intersection is signalized. Beyond this point to the north, illumination is not present.

3.2.5 Existing Pavement Condition

The pavement quality the entire corridor is good and appears to have been recently repaved from north of Steeles Avenue to just north of 5 Side Road/ Embleton Road. The pavement structure from Steeles Avenue to Meadowpine Boulevard appears to show transition changes as a result of the construction of Steeles Avenue and the Orlando development. South of Meadowpine Boulevard the pavement structure appears more dated than the section north of Steeles Avenue however the pavement condition is still very good.

A geotechnical investigation is on-going as part of this Class EA study to identify the current pavement structure on Winston Churchill Boulevard.

3.2.6 Pavement Markings

The entire corridor of Winston Churchill Boulevard is paved with painted lane markings conforming to OTM Book 11 – Markings and Delineation. A site visit conducted August 19, 2014 reveals the following information regarding the existing conditions of the lane markings:

Highway 401 Interchange with Winston Churchill Boulevard

The approaches appear to be properly painted with clear lane differentiation. The stop bars are clearly painted and do not show deterioration.

Meadowpine Boulevard Intersection

Pavement markings on the south approach to Meadowpine Boulevard from the Highway 401 north terminal appear to be crossing into the traveled lanes, possibly as a result of vehicles driving over the painted lanes before they were dry. The remaining approaches appear to be adequate however show fading, especially on the north approach between Meadowpine Boulevard and the Orlando Access. The painted median in this section also appears to be very faded. The pedestrian crosswalks on the north and east approaches along with the stop bar on the south approach are worn.

The pedestrian crosswalks and stop bars need repainting along with the lane markings on the north approach to the intersection between Meadowpine Boulevard and the Orlando Access, including the centre median.

Orlando Access

The pavement markings on all approaches appear to be freshly painted including the crosswalk markings on all approaches.

Steeles Avenue (Halton Regional Road 8 / Peel Road 15)

Pavement markings on the approaches appear to be properly painted with clear lane differentiation. The painted centre median from just north of Steeles Avenue to the Orlando Access appears to be faded and worn. The pedestrian crosswalks on all approaches show wear due to the high volumes at this intersection.

The pedestrian crosswalks and stop bars need repainting along with the centre median on the north and south approaches to Steeles Avenue including the section approaching the Orlando Access.

Maple Lodge Farms Entrance

The pavement markings at all approaches appear to be clearly marked and do not show deterioration. The stop bars and crosswalks are clearly visible with the

exception of the east approach from the Maple Lodge Farms Entrance. Gravel material carried from adjacent property accesses is present at the accesses and on Winston Churchill Boulevard.

Maple Lodge Farms Employee Parking Entrance

The pavement lane markings on all approaches appear to be clearly marked and do not show deterioration. The stop bars at the entrance are also clearly marked.

5 Side Road / Embleton Road

The pavement lane markings on all approaches appear to be clearly marked and do not show deterioration. The stop bars at all approaches are also clearly visible with the exception of the crosswalk markings. These show much deterioration and need repainting.

3.2.7 Traffic Signage and Safety Guard Rails

All traffic signage is clearly visible and conforms to OTM Book 5 – Regulatory Signs and OTM Book 6 – Warning Signs for sign placement.

Guard rails and crash barriers are present at all structures crossing watercourses and at the bridge structures for the Highway 401 and Highway 407 overpasses. There is continuous guiderail present on both sides of the road from the Orlando Access, southerly to Meadowpine Boulevard as this section is elevated and crosses the Highway 407 overpass. The existing guiderail is adequate and does not need replacement.

3.3 Transit Services

Brampton Transit operates Route 51A on Steeles Avenue (east) to Winston Churchill Boulevard, on Winston Churchill Boulevard south to Argentia Road, and on Argentia Road (west) to the Lisgar GO Station. 30 – 60 min service is provided in the morning and afternoon peak hours and hourly service in the off-peak hours.

Mississauga Transit operates the Creditview North and South Route 38 (Winston Churchill Boulevard southerly from the Lisgar GO Station via Argentia Road (West) and the Matheson – Argentia Route 43 on Winston Churchill Boulevard southerly (AM) and northerly (PM) to/from the Meadowvale Town Centre to Argentia Road (east) and back to the Skymark Hub. The Creditview route operates at 20-minute headways in the peak hours. The Matheson – Argentia route operates on 20-minute headway in the morning only.

3.4 Active Transportation

Pedestrian and cycling activities are uncommon along Winston Churchill Boulevard likely because the Study Area currently does not feature any Active Transportation

(AT) facilities. One exception is the area of the Winston Churchill Boulevard interchange with Highway 401 and crossover structure with Highway 407 where a sidewalk has been provided on both sides of the road.

A summary of Active Transportation facilities that have been planned or proposed for the study area are listed below. **Figure 7** illustrates the location and alignment of planned and proposed AT facilities in the study area.

- Multi-use trail along the east side of Winston Churchill Boulevard from Highway 401 northerly to Norval;
- Multi-use trail south of Meadowpine Boulevard from Winston Churchill Boulevard easterly;
- Multiuse trail on the south side of Steeles Avenue from Winston Churchill Boulevard easterly and paved shoulder on the north side of Steeles Avenue easterly from Winston Churchill Boulevard;
- Bike lanes on Steeles Avenue westerly from Winston Churchill Boulevard
- Bike lanes and sidewalk on both sides on Embleton Road easterly and bike lanes on 5 Side Road westerly from Winston Churchill Boulevard.
- Paved shoulders along Winston Churchill Boulevard from 5 Side Road northerly.
- Bike lanes on both sides of Winston Churchill Boulevard from 5 Side Road to Steeles Avenue.
- An east-west off-street pathway approximately 1.6 km south of Embleton Road connecting to the east side of Winston Churchill Boulevard.

	proposed on-road bicycle lane (Halton Hills)		proposed multi-use trail
	proposed bike lane (Peel Region)		planned multi-use trail
	planned paved shoulder		proposed class I pathway (off-street)
	proposed sidewalk (two sides)		proposed sidewalk (one side)

Figure 7 – Proposed and Planned Active Transportation Facilities in the Study Area

The performance of active transportation network depends on the connectivity of the facilities to those provided on the cross roads. These facilities have to be accessible to everyone including users with limited mobility, or users with visual or hearing weaknesses. Also, the visibility of crosswalks is very important to AT users and motorists who are sharing the roads.

At intersections where east-west roads connect to Winston Churchill Boulevard, the AT facilities will be integrated with existing controlled crossings to provide safe and secure connections with the future facilities on the other approaches to the intersections. The details of the alignment and design of these crossings will be established during the development of the design concepts for the preferred planning solution (Phase 3).

3.4.1 On-Road Cycling Facilities

The on-road cycling lanes provide physical space for one-way bicycle riders and are identified by pavement marking and appropriate signage. **Figure 8** and **Figure 9** illustrate typical roadway cross-sections with on-road bike lanes.

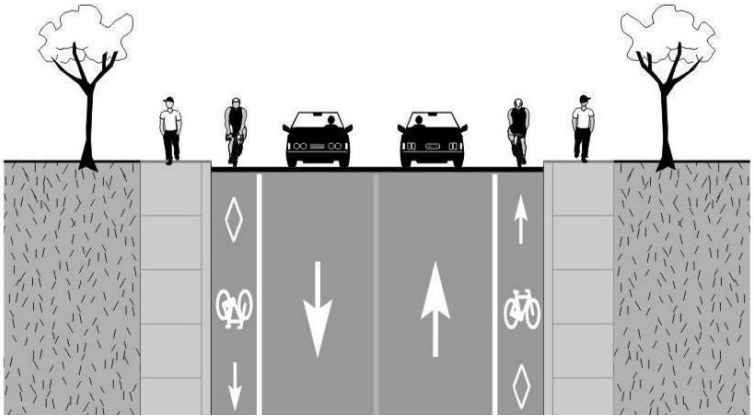


Figure 8 – Typical Bike Lanes (Source: Halton Hills Cycling Master Plan Final Report)

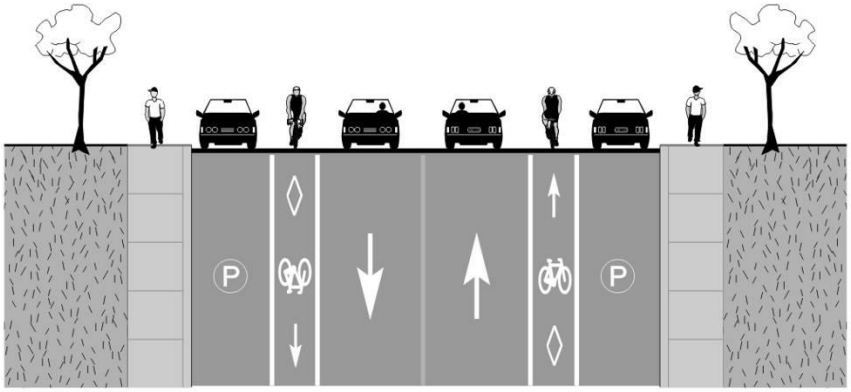


Figure 9 - Typical Bike Lanes Adjacent to On-street Parking (Source: Halton Hills Cycling Master Plan Final Report)

According to Ontario Traffic Manual (OTM) Book 18 on Cycling Facilities, lane width for signed bicycle routes with paved shoulders is between 1.5 and 2 metres depending on volume, speed, and traffic composition. A good practice is to consider wider paved shoulders or include a buffer zone in between vehicles and bicycle lanes wherever traffic volume increases. A bike lane with paved shoulder width of 2 metres or wider must include a minimum 0.5 metre wide buffer zone. The minimum width of 1.2 metres has to be dedicated to bike lane if road constraints make it impossible to provide wider bike lanes. **Figure 10** exhibits the bike lane configuration width and without buffer space along the roadside.

Since Winston Churchill Boulevard carries a high number of traffic volumes, a minimum of 0.5 metre wide buffer between bicycle lanes and vehicle travel lane should be considered for the section between 5 Side Road/Embleton Road to Steeles Avenue to increase safety of bicycle riders. Cross section requirements for the on-road bicycle lanes in this section will be determined during subsequent design concept development (Phase 3) of the study.

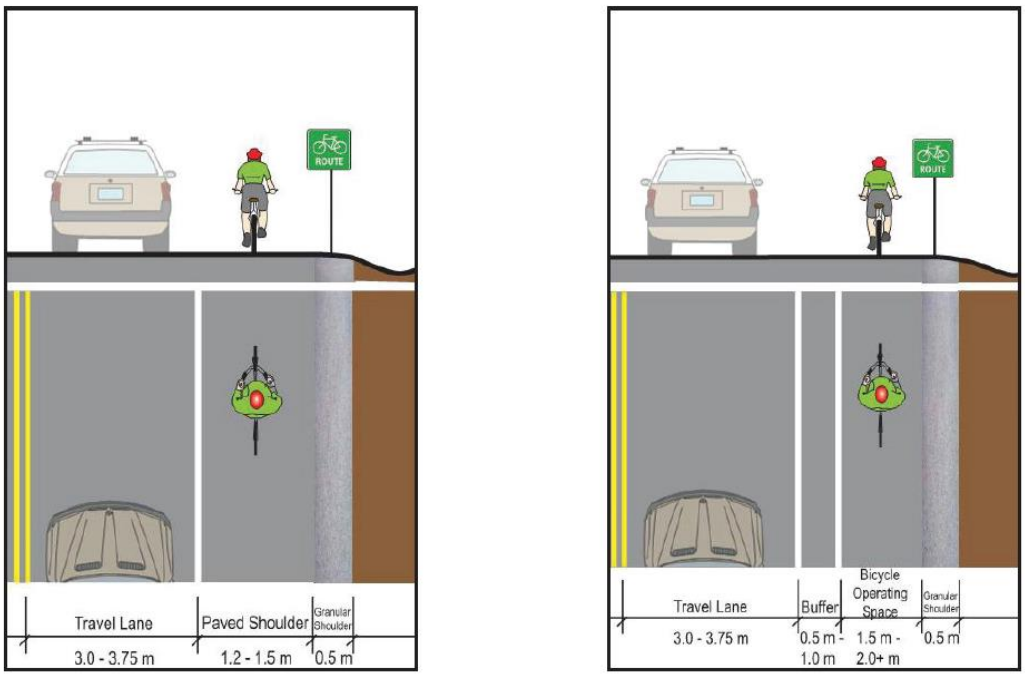


Figure 10 – The Ontario Traffic Manual Book 18 Guidelines for On-Road Bicycle Facilities

3.4.2 Multi-use Trails

Multi-use trails are shared pathways and have to be designed to accommodate a variety of users including pedestrians, bicycles and skaters. Pathways have to provide safe travel to the users and connect residents with desirable destinations. Pathways will be used for two purposes: Recreational and Utilitarian trips. Utilitirian trips include trips to work, school, shopping and visiting friends.

Figure 11 shows a typical cross-section for new industrial connector including multi-use pathes. The width of 2 metres for multi-use pathes are defined in the figure. For a shared-use path, Transportation Association of Canada (TAC) suggest 3 metres as a minimum width requrement.

Specific cross section requirements for the multi-use trial on the east side of Winston Churchill Boulevard between the south ramp terminal of the Highway 401

interchange to 5 Side Road/Embleton Road will be determined during subsequent design concept development (Phase 3) of the study.

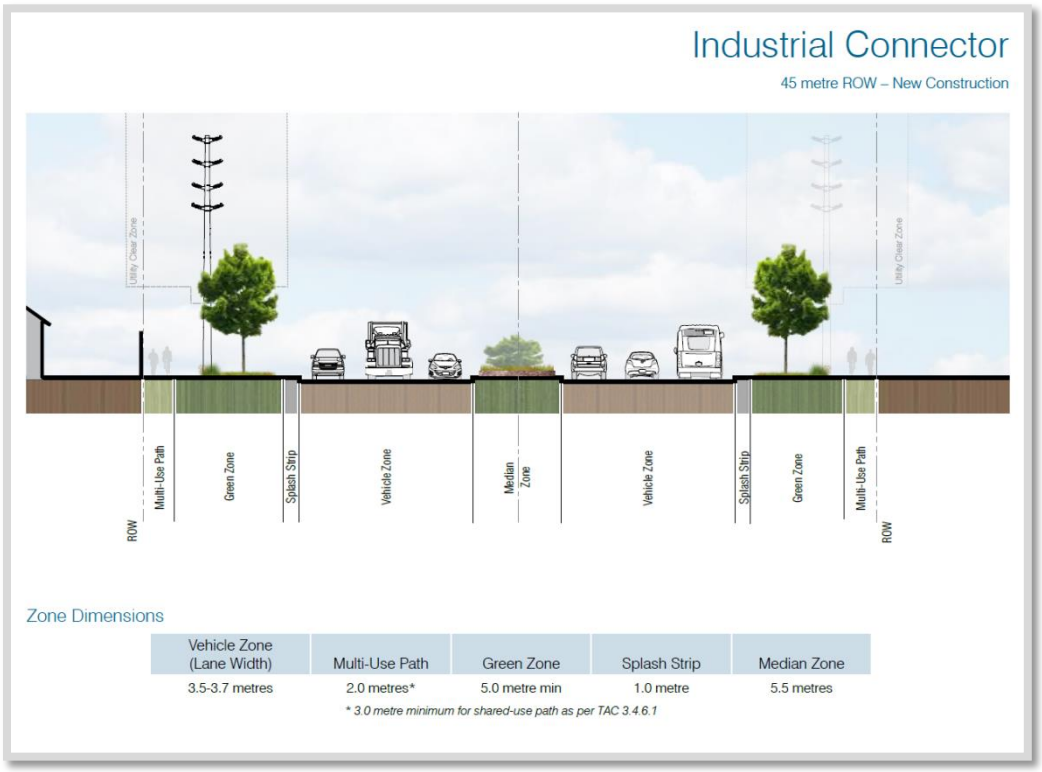


Figure 11 – Illustrative Roadway Cross Section for Industrial Connector (with multi-use path)
(Source: Region of Peel Road Characterization Study, Section 2: Illustrative Cross Sections, May 2013)

3.5 Planned Capital Works

There are a number of planned road improvements in proximity to the study area. The Region of Peel Capital Program identifies the following road widening projects:

- Winston Churchill Boulevard from Embleton Road to Mayfield Road – 2-lane reconstruction – 2015
- Winston Churchill Boulevard from 2 km south of Embleton Road (Maple Lodge Farms) to Potential By-pass of Norval – 2-lane to 4-lane widening – 2020 - 2024
- Winston Churchill Boulevard from Highway 401 to Steeles Avenue – 4-lane to 6-lane widening – 2020 – 2024
- Steeles Avenue from Mississauga Road to Winston Churchill Boulevard – 4-lane to 6-lane widening – 2020 – 2024

3.6 Roadway Design Criteria

The design criteria utilized in the preliminary design for the Winston Churchill Boulevard is presented in **Table E**.

Table E – Design Criteria for Winston Churchill Boulevard

POSTED SPEED	POSTED SPEED = 60 km/h (from Hwy 401EB off-ramp to 300 m north of Maple Lodge Farms Entrance)	
CRITERIA	REFERENCE/ NOTES	DESIGN STANDARD
CLASSIFICATION	REGION OF PEEL OFFICIAL PLAN	RURAL ARTERIAL
	TAC PAGE 1.3.2.2 TABLE 1.3.2.1	RAU80
DESIGN SPEED		80
POSTED SPEED		60
MIN. RADIUS	TAC Pg. 2.1.2.13 Table 2.1.2.6	250 m (e_{max}=0.06 m/m)
MIN. STOPPING SIGHT DISTANCE	TAC Pg. 1.2.5.4 Table 1.2.5.3	115-140 m
MIN.'K' VALUE - CREST	TAC Pg. 2.1.3.6 Table 2.1.3.2	K: 24-36
MIN.'K' VALUE - SAG	TAC Pg. 2.1.3.9 Table 2.1.3.4	K: 25-32 H K: 12-16 C
GRADES - MAX	TAC Pg. 2.1.3.2 Table 2.1.3.1	Rolling – 4%
GRADES - MIN	TAC Pg. 2.1.3.3 Rural Roadways	Level
DESIGN VEHICLES		WB-19
LANE WIDTH	TAC Pg. 2.2.2.1 Table 2.2.2.2	3.5-3.7 m
THROUGH LANES	TAC Pg. 2.2.2.2 Table 2.2.2.3	3.5-3.7 m
SHOULDERS	TAC Pg. 2.2.4.2 Table 2.2.4.1	3.0 m
LEFT-TURN LANES	TAC Pg. 2.2.3.1 Left-turn Lanes 2	3.3-3.5 m
FORESLOPES	STD. DWG. No. 5-1-2 Region of Peel	3:1 (MAX)
R.O.W WIDTH MIN.	Peel Region Official Plan - Schedule F - Right-of-Way Requirements	45 m
On-ROAD BIKE LANE WIDTH	OTM BOOK 18	1.5 – 2+ m
MULTI-USE PATHWAY WIDTH	TAC 3-4-6-1	2-3 m

3.7 Traffic Volumes

Existing midblock and intersection traffic volumes for Winston Churchill Boulevard within the study area were synthesized from traffic count data supplied by the Region

of Peel. The Region provided 2012 – 2013 automatic traffic recorder (ATR) traffic volumes and classification data for midblock locations along roads in the study area. These are summarized in **Table F**.

Table F – ATR Counts (Volumes and Class) for Study Area Intersections

Location ID	Date	Street	Location	Direction
607752	April 15, 2013	Embleton Road / Queen Street	0.3 km East of Winston Churchill Boulevard	East
1518894	April 23, 2012	Steeles Avenue	0.6 km West of Heritage Road	East
1918720	August 5, 2013	Winston Churchill Boulevard	0.6 km South of Steeles Avenue	North
1920920	August 5, 2013	Winston Churchill Boulevard	1.6 km North of Steeles Avenue	North
1924101 NS	January 10, 2013	Winston Churchill Boulevard	1.7 km North of Embleton Road	North

Table G is a list of turning movement counts provided by the Region at the five intersections on Winston Churchill Boulevard within the study area. In addition to these counts, supplementary counts were collected in November 2014 to confirm and update the existing data. These count locations are also shown in **Table G**.

Table G – Turning Movement Counts at Winston Churchill Boulevard Intersections

Intersection Location	Date	AM Peak Hour	PM Peak Hour
Argentia Road	June 26, 2012	7:30 – 8:30	16:15 – 17:15
Hwy 401 W-NS Off-Ramp	September 27, 2011	7:45 – 8:45	17:00 – 18:00
	November 18, 2014	7:45 – 8:45	17:00 – 18:00
Hwy 401 E-NS Off-Ramp	September 27, 2011	7:45 – 8:45	16:45 – 17:45
	November 18, 2014	7:45 – 8:45	17:00 – 18:00
Meadowpine Boulevard	June 14, 2006	7:45 – 8:45	16:45 – 17:45
	June 5, 2013	7:45 – 8:45	16:45 – 17:45
Orlando Access	November 18, 2014	7:30 – 8:30	17:00 – 18:00
Steeles Avenue	June 28, 2012	7:30 – 8:30	16:45 – 17:45
	May 2, 2013	7:30 – 8:30	16:30 – 17:30
Maple Lodge Farms Entrance	February 29, 2012	7:30 – 8:30	16:45 – 17:45
	June 5, 2013	7:30 – 8:30	16:45 – 17:45
	November 18, 2014	7:30 – 8:30	16:30 – 17:30
Embleton Road	March 8, 2011	7:15 – 8:15	16:45 – 17:45

Intersection Location	Date	AM Peak Hour	PM Peak Hour
	April 11, 2013	7:15 – 8:15	16:30 – 17:30

The traffic count information is provided in **Appendix A**. **Figure 12** summarizes the peak hour traffic volumes on Winston Churchill Boulevard within the study area. Following a detailed review of the operations at the intersections it was determined that a large majority of traffic at the Maple Lodge Farms Entrance travels north through the intersection to the employee parking lot just north of the intersection as a destination point. The same is evident for the southbound traffic, where a majority of the employees turn in from the north to access this lot. These trips then return north and south from their origin destinations. This operation explains why the road is only 1 through lane of traffic north of the parking lot and why road widening is separated into two segments between Steeles Avenue and Embleton Road to include a break 2 km south of Embleton Road, conveniently located just north of this parking lot. As a result the traffic volumes between the Maple Lodge Farms Entrance and Embleton Road will not balance as the trips to the Maple Lodge Farms Entrance are mainly employees traveling north to the parking lot and returning in the evening back to the south. The traffic volumes have been balanced accordingly to represent these existing traffic conditions.

Figure 13 summarizes the volumes of truck traffic observed at each intersection and in the midblock locations. **Figure 14** shows the corresponding truck percentage of total traffic based on the data provided in **Figure 12** and **Figure 13**. This truck composition was used for both the existing and future conditions analyses, assuming that the truck composition of the total traffic volume remains constant.

3.8 Existing Traffic Operations

3.8.1 2014 Existing Conditions – Midblock Analysis

Table H shows the AM peak direction and PM peak direction midblock volumes and volume-to-capacity (v/c) ratios for traffic on Winston Churchill Boulevard based on the 2014 midblock and intersection counts provided by Peel Region. As mentioned above with regards to the Maple Lodge Farms intersection traffic volumes, an additional segment was added for review of the operational midblock capacity. This section is the segment from Embleton Road to 2 km south of Embleton Road, located just north of the employee parking lot at Maple Lodge Farms. This coincides with the planned capital works as part of the Region of Peel Capital Program which includes a section of Winston Churchill Boulevard to be widened from Embleton Road to 2 km south of Embleton Road as a separate entity. The existing characteristics of this additional section consists of a single lane of traffic in either direction, therefore the analysis will include this section in order to determine whether the improvements are necessary.

Table H – 2014 Existing Conditions Midblock Capacity Analysis for Winston Churchill Boulevard

Section	AM Peak Direction Volume (veh/h)	AM Volume-to-Capacity Ratio (v/c)	PM Peak Direction Volume (veh/h)	PM Volume-to-Capacity Ratio (v/c)
Embleton Rd to 2 km South of Embleton Rd	914	1.02	894	0.99
2 km South of Embleton Rd to Maple Lodge Farm Entrance	1,136	0.63	1,214	0.67
Maple Lodge Farms Entrance to Steeles Ave	1,147	0.64	1,212	0.67
Steeles Ave to Orlando Access	1,807	1.00	1,831	1.02
Orlando Access to Meadowpine Blvd	1,810	1.01	1,849	1.03
Meadowpine Blvd to Hwy 401 North off-Ramp	1,776	0.99	1,703	0.95
Hwy 401 North off-Ramp to Hwy 401 South Off-Ramp	1,753	0.65	1,961	0.73

Figure 12 – 2014 Existing AM and PM Peak Hour Traffic Volumes

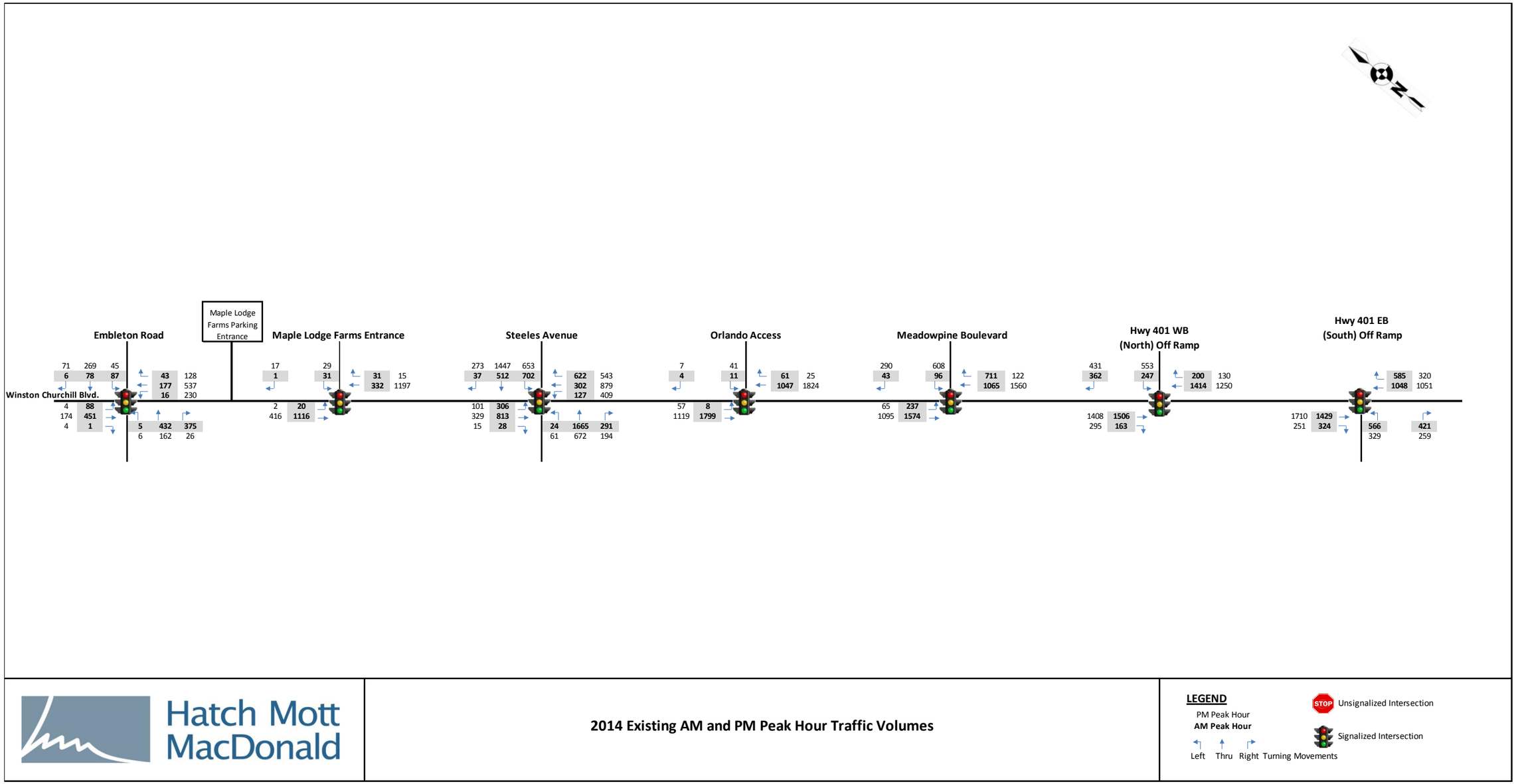


Figure 13 – 2014 Existing AM and PM Peak Hour Truck Traffic Volumes

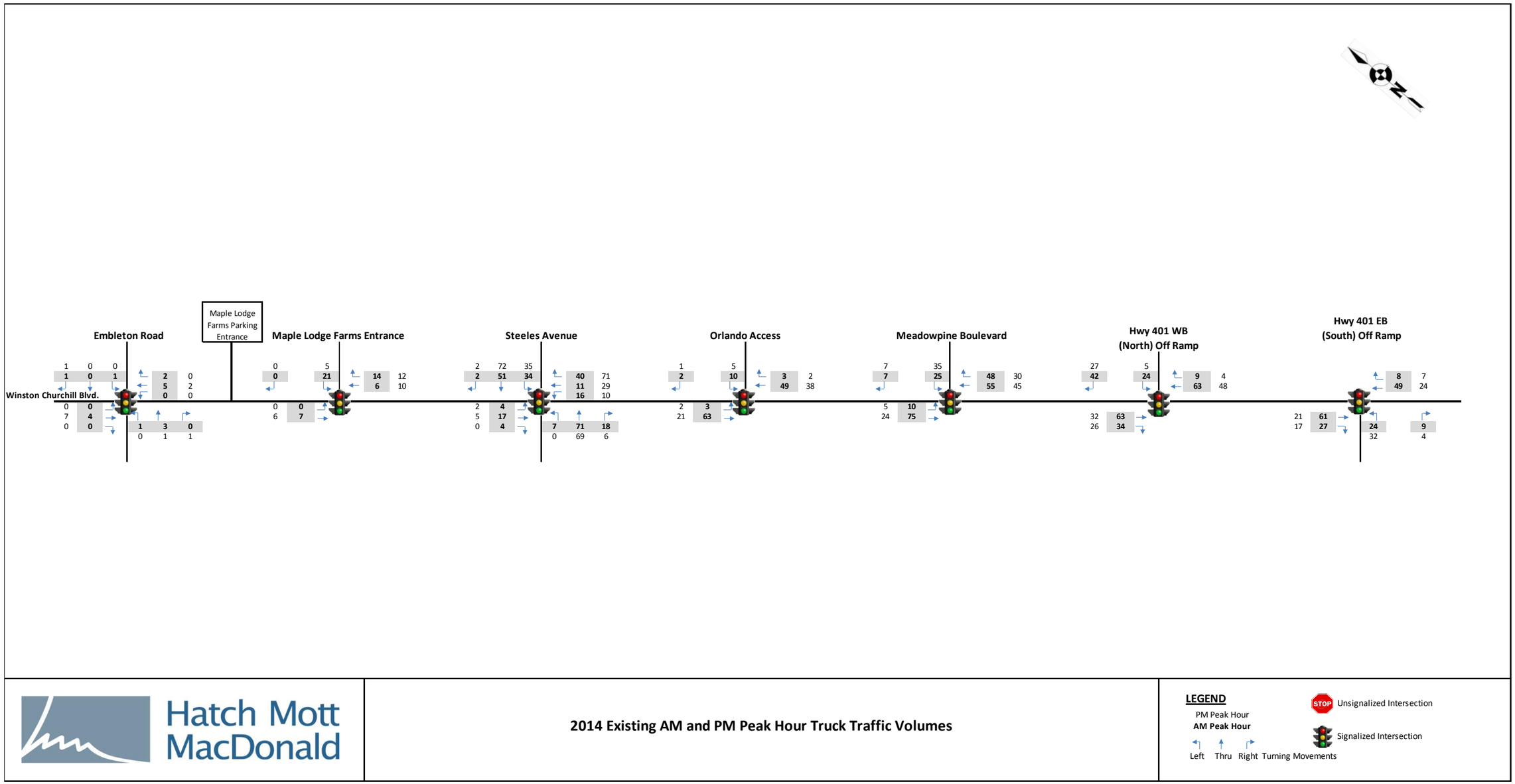
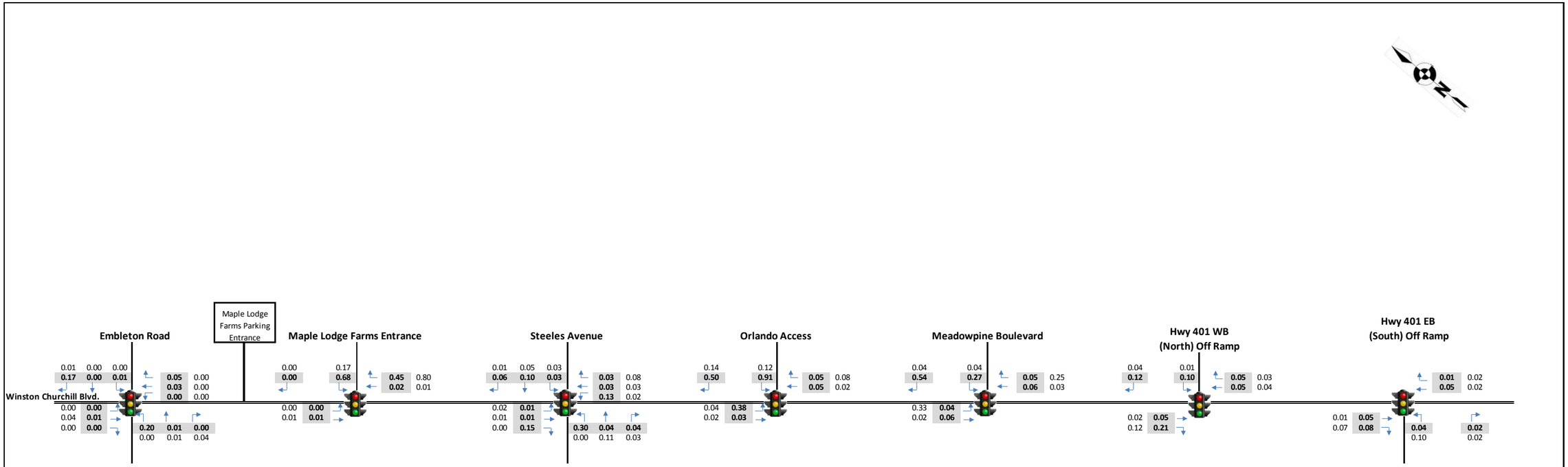


Figure 14 – 2014 Existing AM and PM Peak Hour Truck Percentages



Hatch Mott MacDonald

2014 Existing AM and PM Peak Hour Truck Percentages

LEGEND

PM Peak Hour
AM Peak Hour

Left Thru Right Turning Movements

STOP Unsignalized Intersection

Signalized Intersection

The v/c ratios shown in **Table H** are based on a lane capacity of 900 vehicles per hour per lane (veh/h/l) for an urban arterial roadway. The midblock sections north of the Highway 401 North Off-Ramp terminal to Steeles Avenue are operating at or slightly above the available capacity during both the afternoon and morning peak hours. The same is evident for the midblock section just north of the Maple Lodge Farms Entrance approximately 2 km south of Embleton Road to Embleton Road. These results indicate that there is an immediate need to widen Winston Churchill Boulevard from the Highway 401 North Off-Ramp terminal to Steeles Avenue from four lanes to six traffic lanes, and an immediate need to widen from 2 km south of Embleton Road to Embleton Road from two to four lanes of traffic.

3.8.2 2014 Existing Conditions – Intersection Analysis

Intersection operational analysis was completed for existing 2014 traffic conditions for the study area.

Table I summarizes the findings of the signalized intersection analyses under existing conditions. The table provides the v/c ratios and delays for the critical movements as well as the overall intersection for both the morning (AM) and afternoon (PM) peak hours. The LOS for the intersection and the critical movements are also reported. Only the movements with calculated v/c ratios in excess of 0.90 or locations with LOS E or F are bolded. The detailed Synchro reports are provided in **Appendix B**.

The Synchro analysis for the existing 2014 conditions was conducted using the existing signal timing plans and peak hour factors on the road network. Synchro parameters were calibrated to simulate existing conditions such that v/c ratios based on observed volumes are close to 1.00 (capacity).

Table I – 2014 Existing Conditions Intersection Analysis Results

Intersection	Movement	AM Peak Hour			PM Peak Hour		
		LOS	Delay(s)	V/C	LOS	Delay(s)	V/C
5 Side Road/ Embleton Road	*Overall*	*C*	*29.6*	*0.82*	*C*	*27.1*	*0.68*
	EBTLR	*D*	*39.8*	*0.95*	--	--	--
	WBTLR	--	--	--	***E***	*58.8*	*0.91*
Maple Lodge Farms Main Entrance	*Overall*	*A*	*6.1*	*0.48*	*A*	*6.5*	*0.49*
	WBL	***F***	*90.0*	*0.72*	***E***	*58.2*	*0.50*
Steeles Avenue	*Overall*	***E***	*58.1*	*1.01*	*D*	*47.8*	*0.93*
	EBL	--	--	--	**F**	102.9	0.83
	EBT	**E**	61.9	0.99	--	--	--
	WBL	**F**	87.5	0.99	**F**	86.0	0.99
	NBL	**E**	65.4	0.56	**E**	62.6	0.79
	NBT	--	--	--	**E**	71.1	0.98
	SBL	**E**	78.2	0.95	--	--	--
	SBT	**E**	73.7	0.95	--	--	--
Orlando Access	*Overall*	*A*	*3.9*	*0.64*	*A*	*7.7*	*0.68*
	WBL	*E*	*59.7*	*0.46*	***E***	*57.3*	*0.64*
Meadowpine Boulevard	*Overall*	*A*	*9.0*	*0.63*	*C*	*25.4*	*0.79*
Highway 401 North Off Ramp	*Overall*	*C*	*23.9*	*0.74*	*C*	*26.5*	*0.85*
Highway 401 South Off Ramp	*Overall*	*C*	*20.4*	*0.63*	*B*	*17.2*	*0.56*

The results in

Table I illustrate that all intersections are operating at acceptable levels of service D or better on an overall basis with one exception:

- The intersection of Winston Churchill Boulevard and Steeles Avenue is operating at an overall level of service (LOS) of E and D (AM and PM), with the westbound left turn operating at LOS F (AM and PM).

The remaining signalized intersections along Winston Churchill Boulevard are operating at an acceptable overall LOS during the AM and PM peak hours with only some movements experiencing high delays, in particular the intersection at Meadowpine Boulevard westbound left turn experiencing LOS of E in the AM and PM peak hours; the intersection at the Maple Lodge Farms Entrance westbound left turn experiencing LOS F and E in the AM and PM peak hours; and the intersection of 5 Side Road/ Embleton Road westbound movement operating at LOS E in the PM peak hour only. These movements could be improved by implementing a revised signal timing plan to redistribute the available green time more efficiently.

The intersection of Steeles Avenue with Winston Churchill Boulevard experiences an overall LOS of E in the morning and LOS of D in the afternoon peak hour. This intersection has critical movements that experience high delays that exceed capacity. An optimized timing plan can improve operations at the intersection however the operations of the Steeles Avenue approaches are failing due to the high volume of traffic for individual movements, in particular the eastbound through movement. A widening of Winston Churchill Boulevard from 4 to 6 lanes would improve operations as would widening of the east and west approaches on Steeles Avenue to include 3 through lanes in each direction. This widening on Steeles Avenue could be transitioned back to the existing 4 lane configuration away from the intersection.

It is noted that the volumes used for the analysis at Steeles Avenue are based on 2013 volumes that have been expanded to 2014 using a growth factor. Since the traffic counts are based on observed volumes the v/c ratios should not be greater than 1. This analysis indicates that these movements are operating at or close to capacity. These findings confirm the findings of the midblock capacity analysis that indicated there is an immediate need to widen Winston Churchill Boulevard and Steeles Avenue approaches at this intersection to 3 through lanes in each direction.

3.9 Traffic Safety

3.9.1 Collision Summary

Collision information for the study area was provided by the Region of Peel, Halton Region and the Ministry of Transportation for five intersection locations and four midblock locations for a six year period from 2008 to 2013. Locations along Winston Churchill Blvd that were studied include:

Intersections:

- Embleton Road and Winston Churchill Boulevard
- Steeles Avenue and Winston Churchill Boulevard
- Meadowpine Boulevard and Winston Churchill Boulevard
- Highway 401 WB Off-Ramp and Winston Churchill Boulevard
- Highway 401 EB Off-Ramp and Winston Churchill Boulevard

Midblock Sections:

- Between Embleton Road and Steeles Avenue
- Between Steeles Avenue and Meadowpine Boulevard
- Between Meadowpine Boulevard and Highway 401 WB Off-Ramp
- Between Highway 401 WB Off-Ramp and Highway 401 EB Off-Ramp

Within the study area of Winston Churchill Boulevard, there were a total of 163 collisions reported between 2008 and 2013: 124 intersection collisions and 39 midblock collisions. The intersection of Steeles Avenue and Winston Churchill Boulevard had the highest number of collisions recorded (90), followed by Embleton Road at Winston Churchill Boulevard (13) and Meadowpine Boulevard at Winston Churchill Boulevard (13). The midblock section between Embleton Road and Steeles Avenue had the highest number of collisions (30) followed by Steeles Avenue and Meadowpine Boulevard (9). There were no midblock collisions reported for the remaining two sections between Meadowpine Boulevard and the Hwy 401 WB Off-Ramp and the Hwy 401 WB Off-Ramp and Hwy 401 EB Off-Ramp. **Table J** is a summary of collisions by severity for both intersections and midblock locations. All intersections within the study area are signalized.

Table J – Intersection and Midblock Collisions by Severity

Location Along Winston Churchill	Fatal Collisions	Non-fatal Injury Collisions	Property Damage (PDO)	Non-Reportable	Total Collisions	Percentage of Total Collisions
Intersections						
Embleton Road	0	1	9	3	13	8%
Steeles Avenue	0	6	82	2	90	55%
Meadowpine Boulevard	0	0	12	1	13	8%
Highway 401 WB Off-Ramp	0	0	6	0	6	4%
Highway 401 EB Off-Ramp	0	0	2	0	2	1%
Subtotal:	**0**	**7**	**111**	**6**	**124**	**76%**
Midblock Sections						

Location Along Winston Churchill	Fatal Collisions	Non-fatal Injury Collisions	Property Damage (PDO)	Non-Reportable	Total Collisions	Percentage of Total Collisions
Embleton Road to Steeles Avenue	0	5	24	1	30	18%
Steeles Avenue to Meadowpine Boulevard	0	2	7	0	9	6%
Meadowpine Boulevard to Highway 401 WB Off-Ramp	0	0	0	0	0	0%
Highway 401 WB Off-Ramp to Highway 401 EB Off-Ramp	0	0	0	0	0	0%
Subtotal:	**0**	**7**	**31**	**1**	**39**	**24%**
Grand Total:	**0**	**14**	**142**	**7**	**163**	**100%**

As shown in **Table J**, there were no fatal collisions reported within the study area between 2008 and 2013. Fourteen collisions resulted in injury with the majority of collisions (142) involved property damage only, with the remaining collisions (7) being non-reportable. The rear-end collision type was the most predominant type with 84 collisions followed by side swipe (21) and turning movement (19) collisions. **Table K** is a summary of intersection and midblock collisions by type.

Table K – Intersection and Midblock Collisions by Type

Location Along Winston Churchill	Approaching (head on)	Angle (T-bone)	Rear end	Sideswipe	Turning movement	SMV - unattended vehicle	SMV - Other	Other
Intersections								
Embleton Road	0	3	10	0	0	0	0	0
Steeles Avenue	3	6	48	10	15	0	4	4
Meadowpine Boulevard	0	4	6	2	0	0	1	0
Highway 401 WB Off-Ramp	0	0	4	0	2	0	0	0
Highway 401 EB Off-Ramp	0	0	0	1	1	0	0	0
Subtotal:	**3**	**13**	**68**	**13**	**18**	**0**	**5**	**4**
Midblock Sections								
Embleton Road to Steeles Avenue	1	2	15	4	1	1	6	0
Steeles Avenue to Meadowpine Boulevard	1	0	1	4	0	1	2	0
Meadowpine Boulevard to Highway 401 WB Off-Ramp	0	0	0	0	0	0	0	0
Highway 401 WB Off-Ramp to Highway 401 EB Off-Ramp	0	0	0	0	0	0	0	0
Subtotal:	**2**	**2**	**16**	**8**	**1**	**2**	**8**	**0**
Grand Total:	**5**	**15**	**84**	**21**	**19**	**2**	**13**	**4**

3.9.2 Intersection Collision Analysis

The five intersections along Winston Churchill Blvd account for 124 collisions, which represents 76% of the total collisions within the study area between 2008 and 2013. During the six-year period, 111 collisions (90%) were reported as property damage only (PDO), 7 collisions (6%) involved non-fatal injuries and 6 collisions (5%) were non-reportable collisions. No collisions involving fatalities were reported.

Figure 15 illustrates that just over half (55%) of all intersection collisions are rear end collisions. Turning movement follows rear end collisions as second most predominant collision type (15%) with Angle T-Bone and Sideswipes following closely at 11% and 10%, respectively.

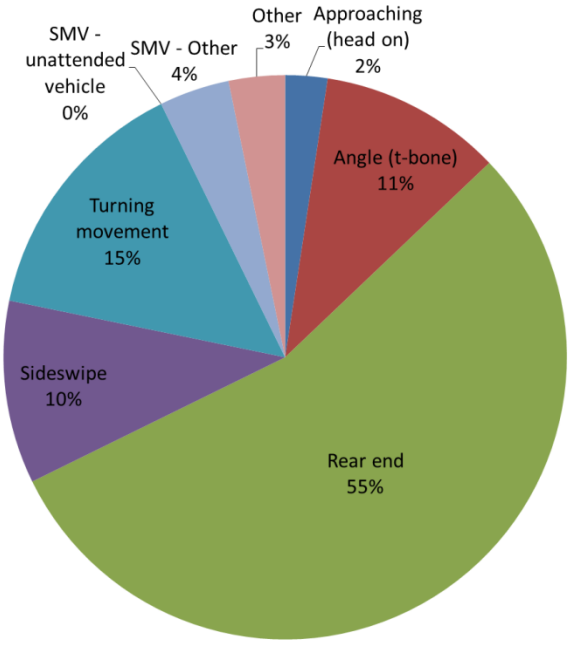


Figure 15 – Intersection Collisions by Impact Type

Figure 16 indicates that more than 75% of intersection collisions occurred during clear weather conditions. Nearly 20 % of collisions occurred during rainy or snowy conditions.

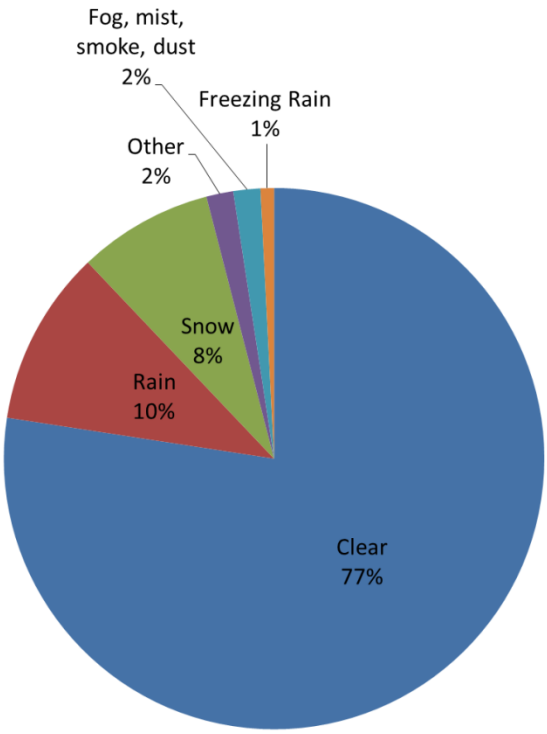


Figure 16 – Intersection Collisions by Environmental Conditions

Collision analysis by Time of Day indicated that there was almost an even split of collisions between the morning, midday and afternoon collisions. **Figure 17** illustrates the collisions by Time of Day.

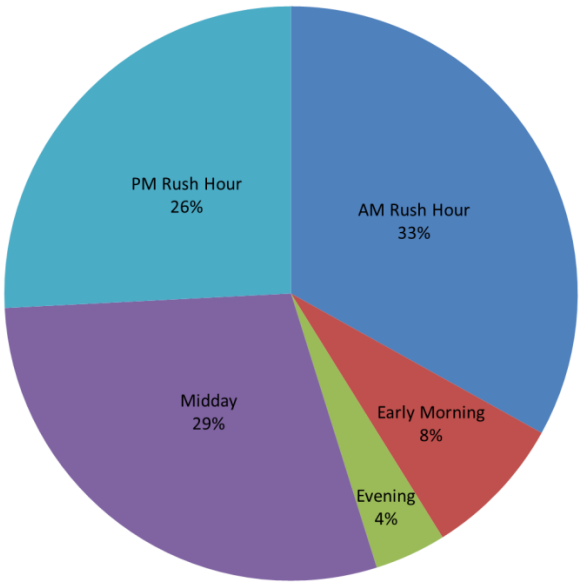


Figure 17 – Intersection Collisions by Time of Day

Collision analysis by light condition indicated that the majority of collisions (72 %) were reported to have occurred during daylight conditions. A further 13% of collisions occurred in dark lighting conditions and 5% occurring at dawn. **Figure 18** illustrates collisions by light conditions.

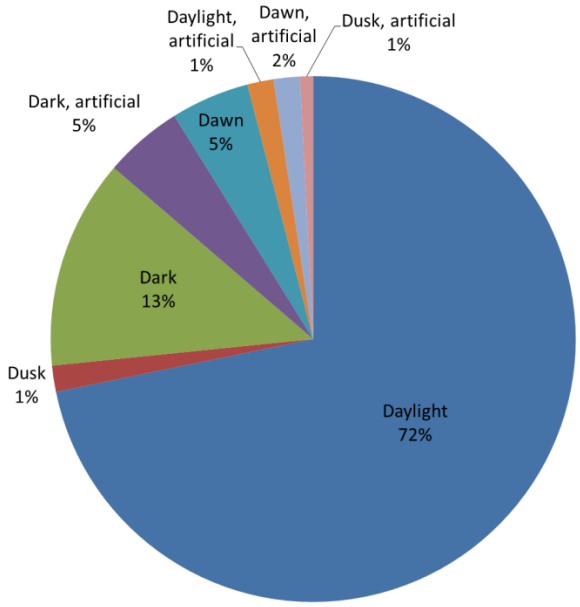


Figure 18 – Intersection Collisions by Light Condition

1. Embleton Road and Winston Churchill Boulevard

A total of 13 collisions were reported at the intersection of Embleton Road and Winston Churchill Boulevard between 2008 and 2013. Of those collisions, 10 were rear end collisions, while the remaining 3 were T-bone angle collisions. No fatal injury collisions were reported. 13 collisions resulted in non-fatal injury, while 9 resulted in property damage only. The remaining 3 were reported as non-reportable collisions. These are collisions that do not fit into the other collision types, as they are incidents where there has been a collision but it was unable to be reported.

Figure 19 illustrates a collision diagram of all reported collisions for the intersection of Winston Churchill Boulevard and Embleton Road. The most predominant collision type at this location was rear end collisions which accounts for 10 out of the 13 collisions. The remaining three collisions were reported as right angle collisions. The rear end collisions most frequently occurred on the south approach to the intersection.

Based on these patterns, the following road/driver action factors could have contributed to these collisions:

- Right Angle – Restricted sightlines, inconspicuous intersection, inappropriate gap acceptance, speeding, non-compliance with traffic control and improper turn.
- Rear End – Restricted sightlines, inconspicuous intersection, speeding, distracted driving, poor road surface friction, insufficient gap allowance, and signal timing.

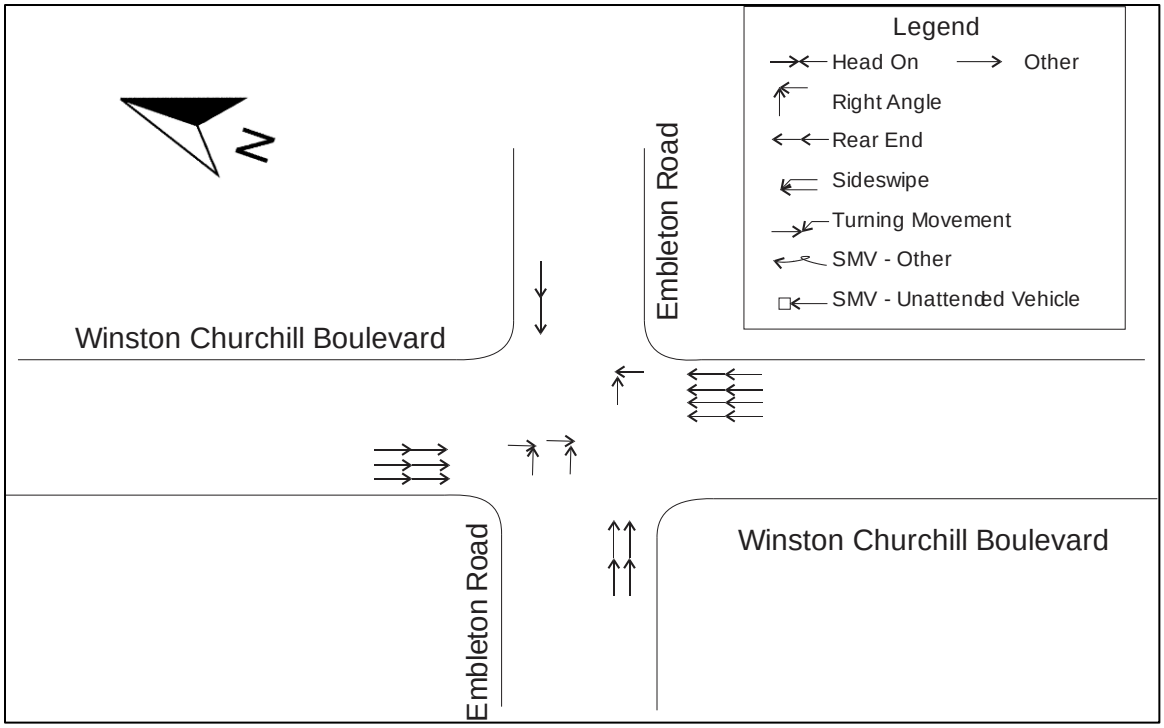


Figure 19 – Intersection Collision Diagram for Winston Churchill Boulevard and Embleton Road

2. Steeles Avenue and Winston Churchill Boulevard

Steeles Avenue at Winston Churchill Boulevard had the highest number of intersection collisions (90) for the study period. As indicated in **Table J**, the majority of the collisions at this intersection were reported as property damage only (82). There were also 6 non-fatal injury collisions along with 2 non-reportable collisions. The majority of collisions were rear end (48), followed by turning movement (15) and sideswipe (10).

Figure 20 below is a collision diagram for the intersection of Steeles Avenue at Winston Churchill Boulevard. Rear end collisions have predominantly taken place on the south and west approaches of the intersection.

Based on these patterns, the following road/driver action factors could have contributed to these collisions:

- Right Angle – Restricted sightlines, inconspicuous intersection, inappropriate gap acceptance, speeding, non-compliance with traffic control and improper turn.
- Rear End – Restricted sightlines, inconspicuous intersection, speeding, distracted driving, poor road surface friction, insufficient gap allowance, and signal timing.
- Turning Movement – insufficient clearance intervals, speeding, disobey traffic control, inconspicuous intersection, improper turn

- Single Motor Vehicle – poor road surface friction, poor delineation, shoulder width type, roadside design, speeding, distracted driving, evasive maneuvers
- Sideswipe – speeding, evasive maneuvers, poor road surface friction, poor delineation, insufficient gap allowance
- Approaching (Head On) – distracted driving, improper turn, restricted sightlines, speeding, inconspicuous intersection, and non-compliance with traffic control

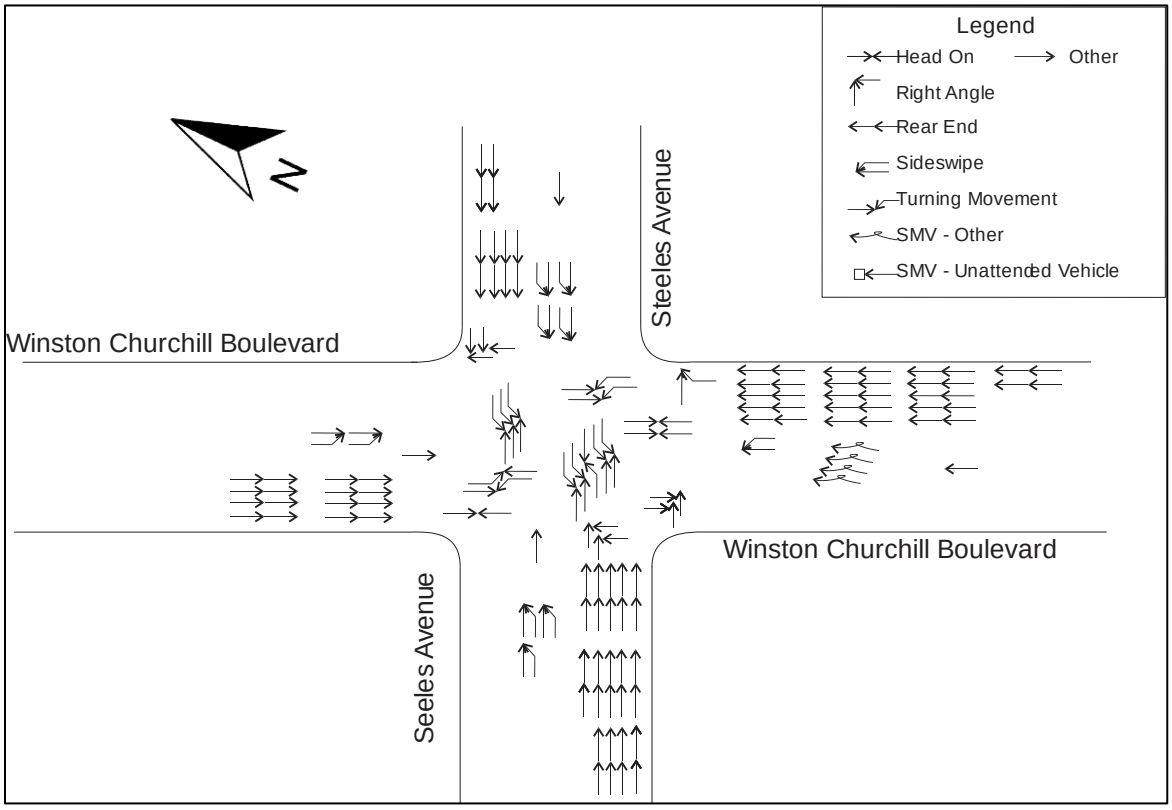


Figure 20 – Intersection Collision Diagram for Winston Churchill Boulevard and Steeles Avenue

3. Meadowpine Boulevard and Winston Churchill Boulevard

A total of 13 collisions were reported to have occurred at the intersection of Meadowpine Boulevard and Winston Churchill Boulevard. As indicated in **Table J** the majority of collisions were property damage only (12) with the remaining one collision being reported as non-reportable collision. There were no fatal collisions reported at this intersection. Of the 13 collisions, rear ends were the most predominant type (6), followed by right angle collisions (4). The remaining collisions were made up by sideswipes (2) and single motor vehicle (1) collisions.

Figure 21 below is a collision diagram for the intersection of Meadowpine Boulevard at Winston Churchill Boulevard. Rear end collisions occurred most frequently on the north

approach of the intersection, however the majority of collisions occurred on the south approach travelling northbound.

Based on these patterns, the following road/driver action factors could have contributed to these collisions:

- Right Angle – restricted sightlines, inconspicuous intersection, inappropriate gap acceptance, speeding, non-compliance with traffic control and improper turn.
- Rear End – restricted sightlines, inconspicuous intersection, speeding, distracted driving, poor road surface friction, insufficient gap allowance and signal timing.
- Single Motor Vehicle – poor road surface friction, poor delineation, shoulder width type, roadside design, speeding, distracted driving, evasive maneuvers
- Sideswipe – speeding, evasive maneuvers, poor road surface friction, poor delineation, insufficient gap allowance

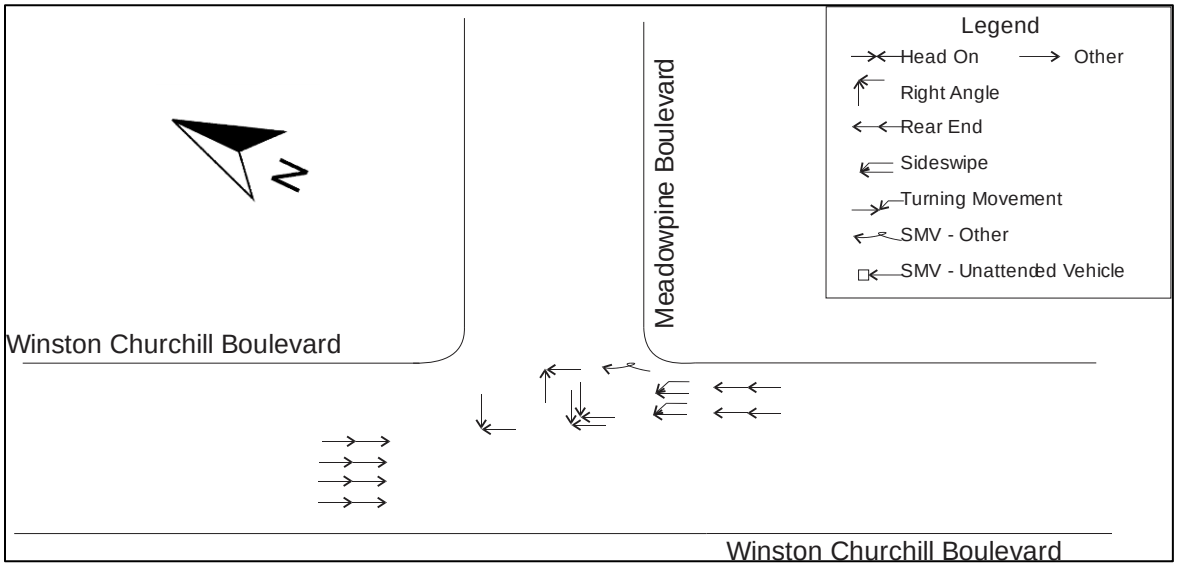


Figure 21 – Intersection Collision Diagram for Winston Churchill Boulevard and Meadowpine Boulevard

4. Highway 401 WB Off-Ramp and Winston Churchill Boulevard

A total of six collisions were reported at the intersection of Highway 401 WB Off-Ramp and Winston Churchill Boulevard. As previously indicated in **Table J**, all six collisions reported at this location resulted in property damage only. Of the six collisions, four were rear end collisions and the remaining two were turning movement collisions. No fatal or non-fatal injury collisions occurred at this intersection.

Figure 22 below is a collision diagram for the intersection of Highway 401 WB Off-Ramp and Winston Churchill Boulevard. The majority of collisions were rear end collisions and they all occurred on the highway off-ramp on the east approach of the intersection. The remaining turning movement collisions occurred within the intersection.

Based on these patterns, the following road/driver action factors could have contributed to these collisions:

- Rear End – restricted sightlines, inconspicuous intersection, speeding, distracted driving, poor road surface friction, insufficient gap allowance, and signal timing.
- Turning Movement – insufficient clearance intervals, speeding, non-compliance with traffic control, inconspicuous intersection, improper turn

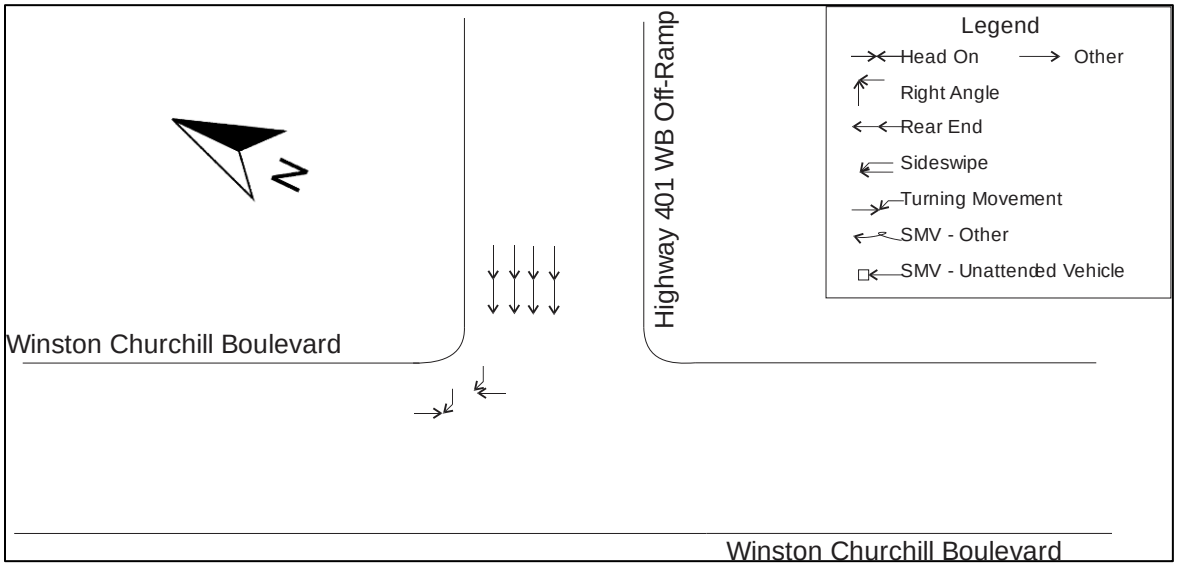


Figure 22 – Intersection Collision Diagram for Winston Churchill Boulevard and Highway 401 WB Off-Ramp

5. Highway 401 EB Off-Ramp and Winston Churchill Boulevard

A total of two collisions occurred at the intersection of Highway 401 EB Off-Ramp and Winston Churchill Boulevard. As indicated in **Table J**, both collisions resulted in property damage only. There were no fatal or non-fatal injury collisions at this intersection. There was one sideswipe collision and one turning movement collision.

Figure 23 below is a collision diagram for the intersection of Highway 401 EB Off-Ramp and Winston Churchill Boulevard. The sideswipe collision occurred on the eastbound off-ramp of the highway, on the west approach of the intersection. This collision occurred while the driver made an improper lane change approaching the traffic signal. The turning movement collision occurred as a result of the driver turning north from the ramp, disobeying traffic control, causing the driver to collide with a southbound travelling vehicle.

Based on these patterns, the following road/driver action factors could have contributed to these collisions:

- Turning Movement – insufficient clearance intervals, speeding, non-compliance with traffic control, inconspicuous intersection, improper turn
- Sideswipe – speeding, evasive maneuvers, poor road surface friction, poor delineation, insufficient gap allowance

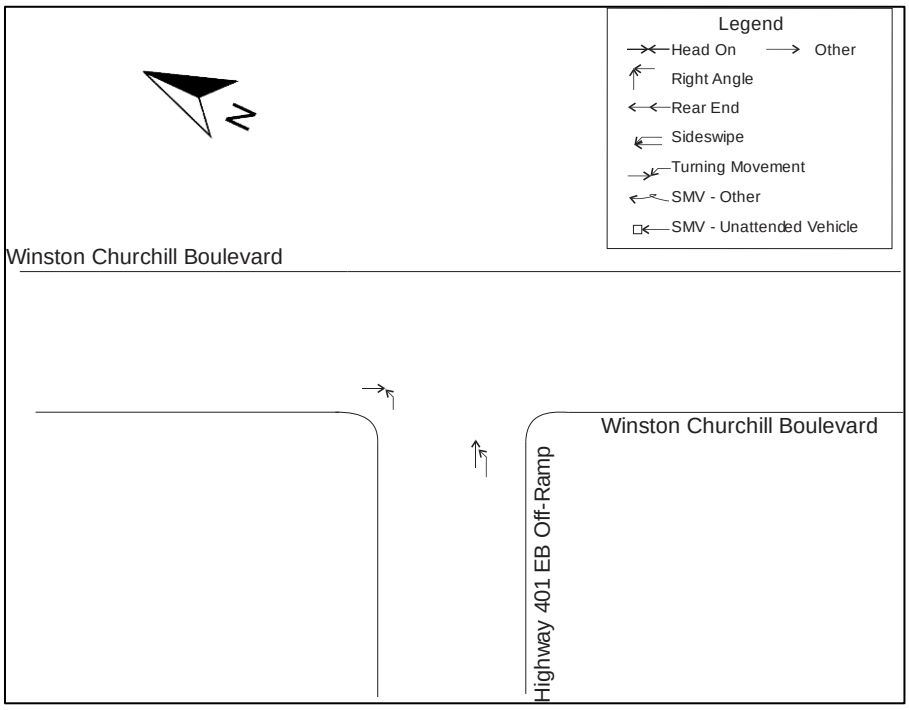


Figure 23 – Intersection Collision Diagram for Winston Churchill Boulevard and Highway 401 EB Off-Ramp

3.9.3 Midblock Collision Analysis

The four midblock sections along Winston Churchill Boulevard account for 39 (24%) of the total collisions (163) that were experienced within the study area between 2008 and 2013. During that time period there were no fatal collisions. Of the 39 midblock collisions, 31 (79%) were reported as property damage only (PDO), 7 collisions (6%) involved non-fatal injuries and 1 collision recorded as non-reportable.

Figure 24 shows that the majority of midblock collisions were rear end collisions (41%), followed by single motor vehicle collisions (21%) and sideswipe collisions (20%).

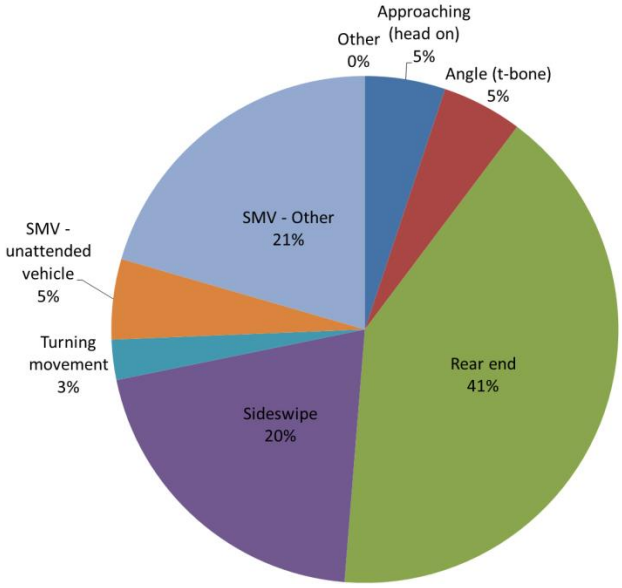


Figure 24 – Midblock Section Collisions by Impact Type

Figure 25 indicates that the majority of collisions (87%) occurred during clear weather conditions. The remaining (13%) occurred when snow was present. There were no collisions recorded in other weather conditions (rain, fog, mist, etc.).

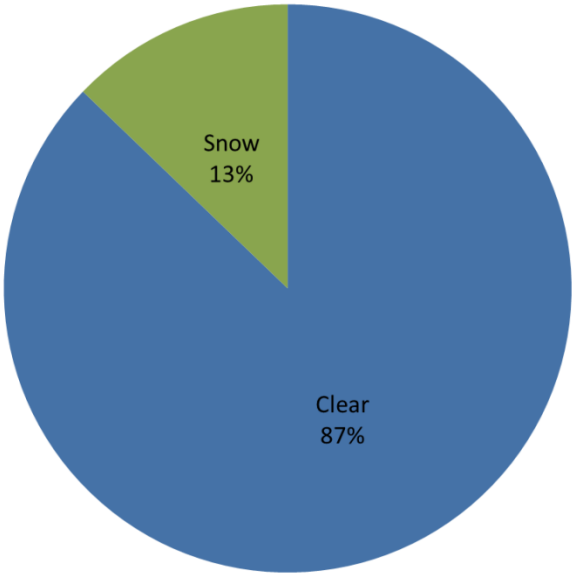


Figure 25 – Intersection Collisions by Environmental Conditions

Midblock collision analysis by time of day indicated that the collisions occurred in a near even split between morning, midday and afternoon peak period. **Figure 26** displays the collisions by time of day.

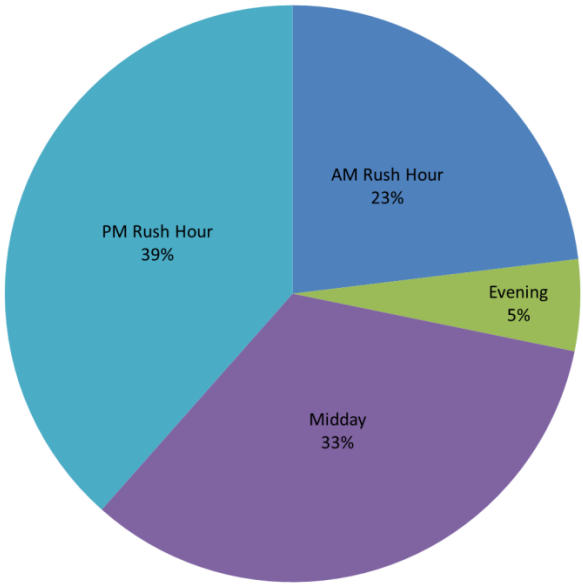


Figure 26 – Intersection Collisions by Time of Day

Nearly 80% of collisions were reported to have occurred during daylight conditions while the remaining 20% of collisions occurred during dusk or dark conditions. **Figure 27** shows collisions by light conditions.

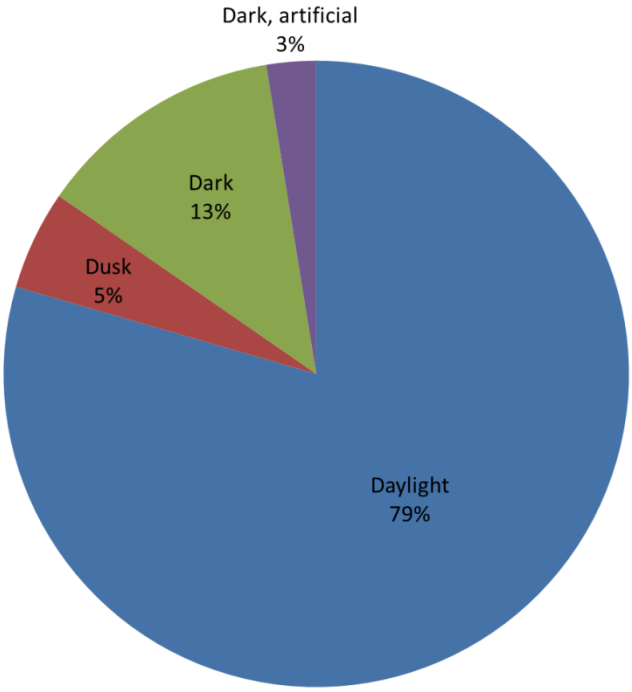


Figure 27 – Intersection Collisions by Light Condition

The following summarizes the two midblock sections based on number of collisions that occurred between 2008 and 2013. The midblock sections of Meadowpine to Highway 401 WB Off-Ramp and Highway 401 EB Off-Ramp had no reported collisions.

1. Embleton Road to Steeles Avenue

A total of 30 collisions occurred along Winston Churchill Boulevard between Embleton Road and Steeles Avenue. The majority of collisions (24) involved property damage only. Five collisions involved non-fatal injury and one collision was reported as non-reportable. Nearly 50% of reported collisions were rear end collisions followed by 20% single motor vehicle collisions and 4% sideswipe collisions. This pattern suggests poor road surface condition, shoulder width and type, roadside design and poor delineation. In addition, these collisions suggest driver actions to be evasive maneuvers, distracted driving, insufficient gap allowance and speeding.

2. Steeles Avenue to Meadowpine Boulevard

A total of nine collisions occurred along Winston Churchill Boulevard between Steeles Avenue and Meadowpine Boulevard. The majority of collisions (7) involved property damage only while the remaining two collisions were reported as non-fatal injury. Nearly half of the reported collisions were sideswipe collisions with three single motor vehicle collisions, one head-on collision and one rear end collision. This pattern suggests poor road surface condition, shoulder width and type, roadside design. Also these collisions suggest that driver actions may include speed, evasive maneuvers, and distracted driving.

3.9.4 Collision Analysis Summary

There were a total of 163 collisions within the study area of Winston Churchill Boulevard between Steeles Avenue and Highway 401 EB Off-Ramp between 2008 and 2013. The intersection of Steeles Avenue and Winston Churchill Boulevard had the highest number of collisions (90). Below is a list of the five intersections in order of collision frequency, from highest to lowest:

1. Steeles Avenue (90)
2. Embleton Road (13)
3. Meadowpine Boulevard (13)
4. Highway 401 WB Off-Ramp (6)
5. Highway 401 EB Off-Ramp (2)

Rear end collision type was the most predominant type with 84 collisions followed by side swipe (21) and turning movement (19) collisions. The majority of collisions (142) were reported as property damage only and 14 non-fatal injury collisions. Seven collisions were recorded as non-reportable. There were no fatal injuries.

Midblock sections accounted for 39 of the total collisions with the majority of collisions resulting in property damage only (31). There were a total of 7 non-fatal injuries that occurred within the midblock sections. No fatal collisions were recorded. The midblock sections along Winston Churchill Boulevard that experienced collisions are listed below in order of collision frequency, from highest to lowest:

1. Embleton Road to Steeles Avenue
2. Steeles Avenue to Meadowpine Boulevard

The majority of these midblock section collisions occurred during daylight and clear conditions. No collisions were reported between the segments of Meadowpine Boulevard and Highway 401 WB Off-Ramp and Highway 401WB Off-Ramp and Highway 401 EB Off-Ramp.

Appendix C contains tables that identify design and operational treatments that would be appropriate for various factors contributing to collisions at intersections and that could be considered during the design of improvements at intersections in the study area. The expected safety benefits are based on Crash Modification Factors (CMFs) available from the CMF Clearinghouse (CMFClearinghouse.org)[2]. Some treatments do not have CMFs

[2] A Crash Modification Factor (CMF) is a multiplicative factor used to compute the expected number of crashes after implementing a given countermeasure at a specific site. The lower the CMF, the greater the long-term expected safety benefit (e.g. CMF of 0.65 has a greater expected safety benefit than a CMF of 0.82). The CMF Clearinghouse builds upon the CMFs included in the Highway Safety Manual, 1st Edition. The website is funded by the U.S. Department of Transportation Federal Highway Administration and maintained by the University of North Carolina Highway Safety Research Center. (http://www.cmfclearinghouse.org)

available. The appropriateness and feasibility of the design and operational considerations are examined in detail in the Safety Assessment Investigation being completed for the section of Winston Churchill Boulevard within the Study Area (under separate cover).

Specific improvements and operational treatments have been reviewed in a separate safety assessment titled, "Safety Performance Report-Existing Condition", and is available as a standalone document that compliments this report.

4. Future Transportation Operations

4.1 Travel Characteristics and Growth

The background traffic growth rates for Winston Churchill Boulevard were calculated from the information provided by the Transportation Planning Group of Peel Region and historic Annual Average Daily Traffic (AADT) volumes from 2005 to 2012. In addition, Halton Region provided Automatic Traffic Recorder (ATR) counts for two sections of Winston Churchill Boulevard, north and south of Steeles Avenue, conducted between 2006 and 2013, mostly in the fall. The data was summarized and annual growth rates were calculated for various time periods (per year, over the last four years and over the last seven years). The results for Winston Churchill Boulevard and for other east-west routes including Embleton Road and Steeles Avenue are summarized in **Appendix D**.

Based on the information provided by Peel Region, the recommended background traffic growth rates for Winston Churchill Boulevard are 3% per annum for the section south of Steeles Avenue and 4% per annum for sections north of Steeles Avenue. As will be discussed further below, the rates are assumed to remain constant in the period from 2014 to 2021. However, during the period from 2021 to 2031, the rate for sections south of Steeles Avenue is assumed to grow at a reduced rate of 2% per annum, in view of capacity limitations that have been identified on these sections in this time frame as traffic volumes are expected to be diverted to other routes.

Traffic volumes on the crossing roadways have all been assumed to be growing at a rate of 2% per annum along the entire corridor for the horizon years of 2021 and 2031 with the exception of Steeles Avenue. Steeles Avenue is assumed to grow at 2.5% per annum until 2021. Beyond 2021 the growth rate is assumed to be only 0.5% per annum due to capacity limitations identified with the 6-lane cross section.

4.2 Traffic Forecast

Based on these traffic growth rates, a forecast of 2021 and 2031 weekday peak hour traffic volumes was made by applying the growth rates to the base year and projected 2021 traffic volumes. **Figure 28** and **Figure 29** summarize the resulting future 2021 and 2031 peak hourly volumes for the intersections and midblock sections of Winston Churchill Boulevard within the study limits.

Since the high northbound right turn movement from Winston Churchill Boulevard to Steeles Avenue eastbound was found to be operating at its effective capacity, the 2014 volume for this movement was maintained for the horizon year without adding further growth. Additionally, the westbound dual left turn movement was expanded to the 2021 horizon using the assumed growth rate. Since the projected 2021 movement was also found to be operating at its effective capacity, beyond 2021, no growth was applied for this movement to obtain 2031 volumes. For the purposes of this analysis, it has been assumed that once Winston Churchill Boulevard and Steeles Avenue are widened to 6 lanes, no further widening of the through lanes will be made. With capacity limitations in the Steeles Avenue corridor, a reduced growth rate of 0.5% per annum was applied to traffic volumes on Steeles Avenue for the period from 2021 to 2031.

4.3 Future Conditions – Midblock Capacity Analysis

Table L summarizes the midblock capacity analysis for road sections within the study area. As before, the analysis is based on a lane capacity of 900 veh/h/l and the growth rates shown in the right panel of the table.

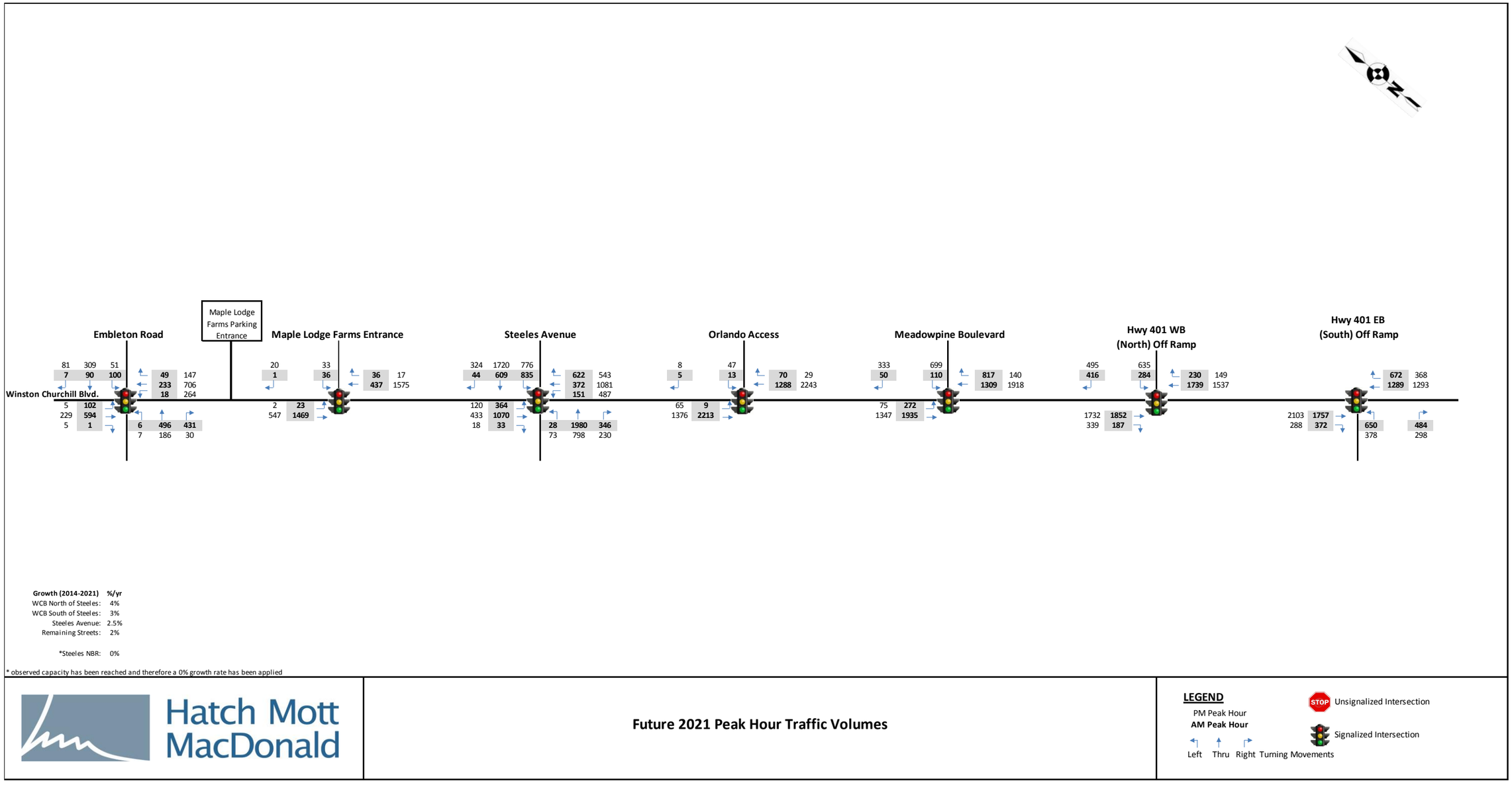
As noted in the upper panel of **Table L**, under existing 2014 conditions, the sections of Winston Churchill Boulevard between Steeles Avenue and Meadowpine Boulevard have reached the effective midblock lane capacity in both the southbound and northbound directions (AM and PM peak directions, respectively). In addition, the section from Meadowpine Boulevard to the North off-ramp terminal at Highway 401 is approaching its effective capacity in both the northbound and southbound directions (AM and PM peak directions, respectively). The segment from Embleton Road to 2 km south of Embleton Road is also exceeding and approaching capacity in the AM and PM peak hours, respectively.

In analyzing the midblock capacity for the 2021 horizon, it is assumed that Winston Churchill Boulevard is widened to a 6-lane cross section between the Highway 401 North Off-Ramp terminal and Steeles Avenue and to a 4-lane cross section from 2 km south of Embleton Road to Embleton Road. Under these conditions, as indicated in the middle panel of **Table L,** the sections of Winston Churchill Boulevard from Meadowpine Boulevard to Steeles Avenue appear to be operating within the capacity provided by a 6-lane cross section by 2021 however the capacity is approaching the higher end at 85%. On the basis of this finding, the growth rate used in projecting traffic volumes to the 2031 horizon was lowered from 3% to 2% for the sections of Winston Churchill Boulevard south of Steeles Avenue. A growth rate of 4% has been retained for the sections north of Winston Churchill Boulevard.

The lower panel of **Table L** indicates the capacity utilization by the 2031 horizon. In analyzing the midblock capacity for the 2031 horizon year, it is assumed that Winston Churchill Boulevard is widened to a 6-lane cross section between Steeles Avenue and 2 km south of Embleton Road. Widening beyond this point is not necessary. This analysis indicates that the section from Steeles Avenue to Meadowpine Boulevard will be operating at near capacity in both the AM and PM peak hours. Additionally, the sections

south of Meadowpine Boulevard to the Highway 401 South Off ramp terminal will also be approaching its effective capacity in either direction, but still within the capacity of the roadway.

Figure 28 – Future 2021 Peak Hour Traffic Volumes



Growth (2014-2021)	%/yr
WCB North of Steeles:	4%
WCB South of Steeles:	3%
Steeles Avenue:	2.5%
Remaining Streets:	2%
*Steeles NBR:	0%

* observed capacity has been reached and therefore a 0% growth rate has been applied

Hatch Mott MacDonald

Future 2021 Peak Hour Traffic Volumes

LEGEND

PM Peak Hour
AM Peak Hour

Left Thru Right Turning Movements

Unsignalized Intersection

Signalized Intersection

Figure 29 – Future 2031 Peak Hour Traffic Volumes

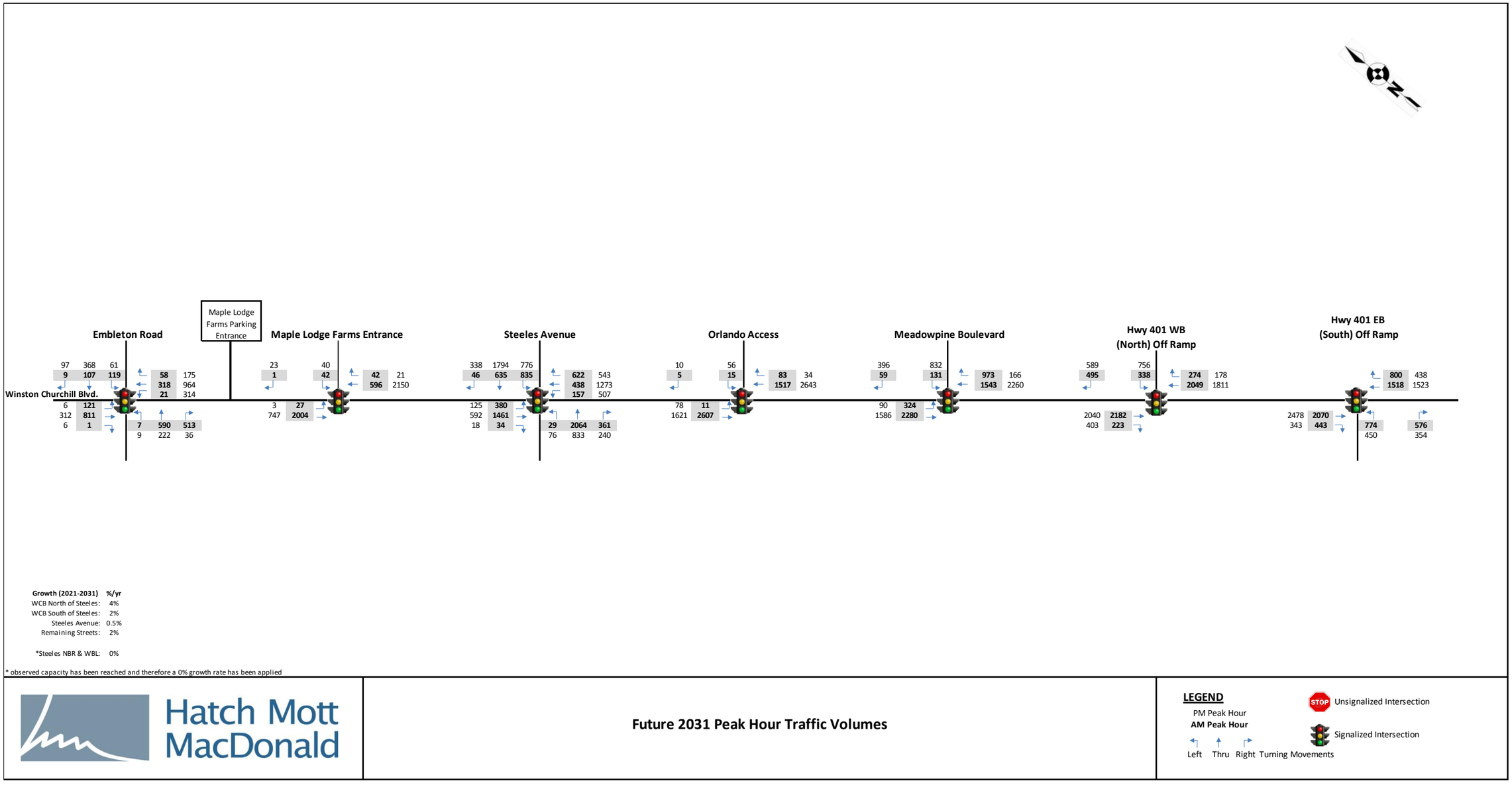


Table L – Future Conditions – Midblock Capacity Analysis 2021 and 2031

2014 Existing Traffic Volumes

Section		No Lanes	Capacity	AM Pk Hr		PM Pk Hr	
From	To			Volume	V/C	Volume	V/C
Embleton Rd	2 km South of Embleton Rd	1	900	914	1.02	894	0.99
2 km South of Embleton Rd	Maple Lodge Farms Entrance	2	1800	1136	0.63	1214	0.67
Maple Lodge Farms Entrance	Steeles Ave	2	1800	1147	0.64	1212	0.67
Steeles Ave	Orlando Access	2	1800	1807	1.00	1831	1.02
Orlando Access	Meadowpine Blvd	2	1800	1810	1.01	1849	1.03
Meadowpine Blvd	Hwy 401 E-NS (N off-ramp)	2	1800	1776	0.99	1703	0.95
Hwy 401 E-NS (N off-ramp)	Hwy 401 W-NS (S off-ramp)	3	2700	1753	0.65	1961	0.73

Lane Cap	900 veh/h/l

2021 Future Traffic Volumes

Section		No Lanes	Capacity	AM Pk Hr		PM Pk Hr	
From	To			Volume	V/C	Volume	V/C
Embleton Rd	2 km South of Embleton Rd	2	1800	1126	0.63	1117	0.62
2 km South of Embleton Rd	Maple Lodge Farms Entrance	2	1800	1492	0.83	1595	0.89
Maple Lodge Farms Entrance	Steeles Ave	2	1800	1504	0.84	1592	0.88
Steeles Ave	Orlando Access	3	2700	2251	0.83	2251	0.83
Orlando Access	Meadowpine Blvd	3	2700	2225	0.82	2272	0.84
Meadowpine Blvd	Hwy 401 E-NS (N off-ramp)	3	2700	2127	0.79	2071	0.77
Hwy 401 E-NS (N off-ramp)	Hwy 401 W-NS (S off-ramp)	3	2700	2136	0.79	2391	0.89

Growth	
N of Steeles	1.04
S of Steeles	1.03 % p.a.

2031 Future Traffic Volumes

Section		No Lanes	Capacity	AM Pk Hr		PM Pk Hr	
From	To			Volume	V/C	Volume	V/C
Embleton Rd	2 km South of Embleton Rd	2	1800	1444	0.80	1453	0.81
2 km South of Embleton Rd	Maple Lodge Farms Entrance	3	2700	2032	0.75	2173	0.80
Maple Lodge Farms Entrance	Steeles Ave	3	2700	2047	0.76	2170	0.80
Steeles Ave	Orlando Access	3	2700	2656	0.98	2652	0.98
Orlando Access	Meadowpine Blvd	3	2700	2622	0.97	2677	0.99
Meadowpine Blvd	Hwy 401 E-NS (N off-ramp)	3	2700	2544	0.94	2443	0.90
Hwy 401 E-NS (N off-ramp)	Hwy 401 W-NS (S off-ramp)	3	2700	2520	0.93	2679	0.99

Growth	
N of Steeles	1.04
S of Steeles	1.02 % p.a.

Since it is unlikely that Winston Churchill Boulevard would be widened beyond 6 basic traffic lanes, it is concluded that beyond 2021 the effective traffic growth rate will be less than that assumed in this study to the point that the sections of Winston Churchill Boulevard will be operating at their effective capacity. This implies that some of the longer distance traffic using this corridor may choose to use alternate north – south and east – west routes to avoid the congested conditions between Steeles Avenue and Highway 401. The proposed widening of Steeles Avenue east of Winston Churchill Boulevard would offer additional capacity to traffic travelling in a general southeasterly orientation to/from the GTA.

This analysis does not account for capacity enhancement that may result from the implementation of the higher-order transit improvements recommended in the LRTP, such as improved GO service on the Georgetown line, and improved transit between the Lisgar GO station and Argentia Road, Winston Churchill Boulevard and Steeles Avenue in the 2021 – 2031 time period. These improvements potentially will accommodate some or all of the excess vehicular demand identified in the Winston Churchill Boulevard corridor.

4.4 Future Conditions – Intersection Traffic Operations

As part of the future operations analysis the road improvements were analyzed based on the applied growth rates determined above for the horizon years of 2021 and 2031. The analysis focused on a 'Base' scenario for each horizon year that evaluates the operations of the road without any modifications to Winston Churchill Boulevard, but that takes into consideration planned capital roads improvements on the adjacent crossing road network. A subsequent analysis was then completed with recommendations and improvements to the road network, including any road improvements planned for the road network. This scenario is referred to in the following discussion as the 'Improved' scenario for its respective horizon year.

4.4.1 Future 2021 Intersection Operations

The following 2021 'Base' scenario was analyzed:

- Steeles Avenue widened to a 6-lane cross section east of Winston Churchill Boulevard. For purposes of this analysis the 6-lane cross section was extended to include 100 to 200 meters of the west approach of the intersection.

The analysis of the Base 2021 scenario under base conditions will determine whether any additional road improvements will be required to accommodate projected demand. These improvements, if required, are analyzed in a subsequent analysis.

4.4.1.1 Future 2021 'Base' Scenario Analysis

Table M shows the analysis results of the 2021 'Base' scenario condition. The signal timing plans were optimized and a peak hour factor of 1.00 was applied to all movements and a 1900 v/h/l saturation flow rate was used as per Peel Region guidelines. The table provides the LOS, v/c ratios and delays for the critical movements, as well as the overall intersection for both the AM and PM peak hours. Only movements with calculated v/c ratios in excess of 0.90 or locations with LOS E or F are included. The detailed Synchro reports can be found in **Appendix B,** showing the remaining movements with their respective results.

Table M – Future 2021 'Base' Scenario Intersection Analysis Results

Intersection	Movement	AM Peak Hour			PM Peak Hour		
		LOS	Delay(s)	V/C	LOS	Delay(s)	V/C
5 Side Road/ Embleton Road	*Overall*	*D*	*37.8*	*0.96*	*C*	*24.7*	*0.70*
	EBTLR	D	50.0	1.00	--	--	--
Maple Lodge Farms Main Entrance	*Overall*	*A*	*5.5*	*0.53*	*A*	*5.9*	*0.55*
	WBL	**F**	81.1	0.67	**E**	61.0	0.50
Steeles Avenue	*Overall*	***F***	*121.9*	*1.27*	***E***	*69.0*	*1.18*
	EBL	--	--	--	**F**	237.6	1.24
	EBT	**F**	156.4	1.24	--	--	--
	WBL	**F**	150.6	1.18	**F**	148.6	1.18
	NBL	**E**	66.9	0.61	**E**	79.5	0.93
	NBT	--	--	--	**F**	111.5	1.11
	SBL	**F**	121.0	1.09	--	--	--
	SBT	**F**	213.3	1.33	--	--	--
Orlando Access	*Overall*	*A*	*4.5*	*0.73*	*A*	*7.4*	*0.81*
	WBL	**E**	57.9	0.38	**E**	63.0	0.61
	SBL	--	--	--	**E**	68.4	0.83
Meadowpine Boulevard	*Overall*	*B*	*10.1*	*0.74*	*C*	*32.0*	*0.90*
	NBT	--	--	--	D	44.2	1.00
Highway 401 North Off Ramp	*Overall*	*C*	*35.0*	*0.81*	*C*	*26.6*	*0.84*
	NBT	C	25.5	0.94	--	--	--
	SBT	D	46.2	1.01	C	30.0	0.91
Highway 401 South Off Ramp	*Overall*	*C*	*21.4*	*0.68*	*B*	*18.1*	*0.64*

The analysis indicates that most of the movements at Steeles Avenue show operational deficiencies in both the AM and PM peak hours; particularly the southbound and northbound movements. The same is evident on the segment of Winston Churchill Boulevard south of Steeles Avenue and near the Highway 401 ramps, during the PM peak hour. The analysis also indicates that the eastbound approach to the intersection of 5 Side Road/ Embleton Road is approaching its capacity. The following improvements have been considered to address these capacity deficiencies:

Winston Churchill Boulevard:

- Winston Churchill Boulevard widened from 4 to 6 lanes south of Steeles Avenue to Highway 401.
- Winston Churchill Boulevard widened from 2 to 4 lanes from 2 km south of 5 Side Road/ Embleton Road to 5 Side Road/ Embleton Road.

For the purposes of this analysis, the northbound right turns at Orlando Access and Embleton Road have been converted into shared through right turns in conjunction with the lane widening.

5 Side Road/ Embleton Road:

- Eastbound right turn lane with a 50 metre storage length.
- Westbound left turn lane with a 50 metre storage length.

Steeles Avenue

- Phasing for the northbound right turn lane modified to include an overlap phasing with the westbound left turn movement. A separate receiving lane has also been recommended for improved operations and safety due to the large volumes of vehicles making a right turn.
- Phasing for the eastbound left turn lane has been modified to provide an additional permitted and protected phase during the PM peak hour to partially overlap with the westbound left turn movement. This phasing would only be active during PM peak hours, with the existing phasing plan maintained during the AM peak hour.

Orlando Access:

- Phasing for the southbound left turn lane modified to provide an additional permitted and protected phase. This phasing would be active for both the AM and PM peak hours.

The storage lengths are assumed to remain at 50 meters for this analysis. A detailed queuing analysis will confirm the recommended storage length capacities.

4.4.1.2 Future 2021 Analysis – With Improvements

Table N shows the analysis results of the 2021 Scenario with the anticipated improvements along Winston Churchill Boulevard, along with the additional improvements at 5 Side Road / Embleton Road, Steeles Avenue and the Orlando Access as outlined above. In addition, the signal timing plans were optimized to accommodate the new lane configurations and widening. **Figure 30** illustrates the recommended lane configurations for the 2021 scenario with improvements.

Figure 30 – Future 2021 Recommended Lane Configurations

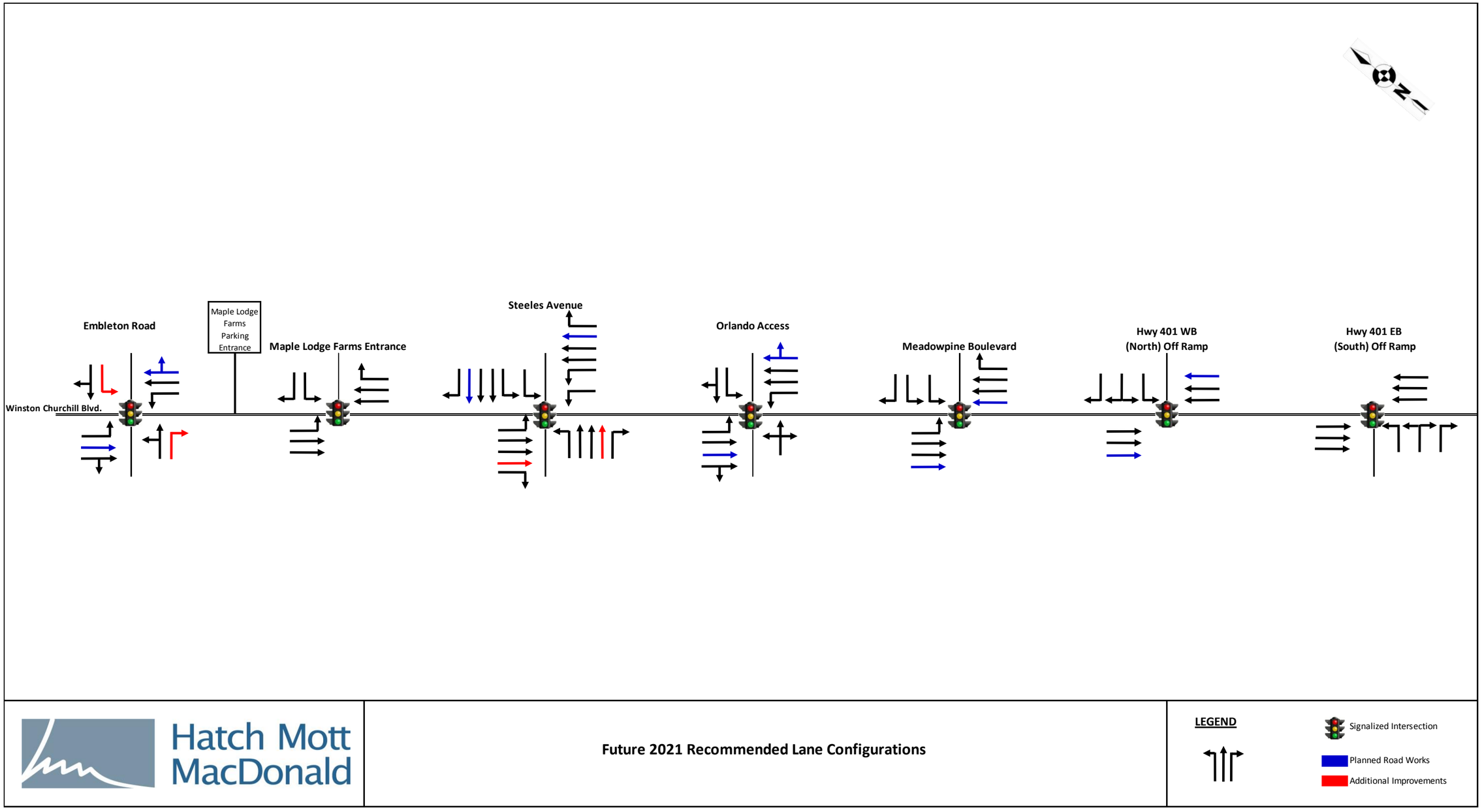


Table N – Future 2021 'Improved' Scenario Intersection Analysis Results

Intersection	Movement	AM Peak Hour			PM Peak Hour		
		LOS	Delay(s)	V/C	LOS	Delay(s)	V/C
5 Side Road/ Embleton Road	*Overall*	*B*	*17.3*	*0.53*	*B*	*15.8*	*0.53*
Maple Lodge Farms Main Entrance	*Overall*	*A*	*5.8*	*0.59*	*A*	*7.0*	*0.59*
Steeles Avenue	*Overall*	***E***	*63.1*	*1.04*	*D*	*37.1*	*0.83*
	EBT	**E**	65.0	1.00	--	--	--
	WBL	**F**	102.1	1.05	--	--	--
	NBL	**F**	97.3	0.85	--	--	--
	SBL	**F**	107.6	1.04	--	--	--
	SBT	**E**	66.2	0.91	--	--	--
Orlando Access	*Overall*	*A*	*3.3*	*0.54*	*A*	*6.9*	*0.62*
Meadowpine Boulevard	*Overall*	*A*	*8.6*	*0.53*	*B*	*17.8*	*0.72*
Highway 401 North Off Ramp	*Overall*	*B*	*16.6*	*0.62*	*C*	*20.1*	*0.67*
Highway 401 South Off Ramp	*Overall*	*B*	*19.2*	*0.68*	*B*	*14.2*	*0.64*

The analysis indicates that the additional lanes on Winston Churchill Boulevard and turning lanes at cross streets would improve operations at intersections south of Steeles Avenue and improve the operations of 5 Side Road/ Embleton Road. Each intersection is expected to operate at overall LOS C or better with the exception of the Steeles Avenue and Winston Churchill Boulevard intersection, which will still be operating at LOS E and D in the AM and PM peak hours respectively. This intersection is experiencing high volumes of traffic and further widening beyond 6 lanes is not anticipated or practical. As noted in the LRTP, additional transit improvements either in the GO system or by higher-order transit on the Argentia Road – Winston Churchill Boulevard – Steeles Avenue corridors are planned to accommodate some of the excess demand in the study area.

4.4.2 Future 2031 Intersection Operations

The recommendations and improvements resulting from the 2021 analysis (with improvements) have been carried forward in the analysis for 2031. The following additional improvements were assumed for the 2031 'Base' Scenario analysis:

2031 'Base' Scenario:

- Remainder of Steeles Avenue widened to a 6-lane cross section west of Winston Churchill Boulevard.

The analysis of the Base 2031 scenario will determine whether further improvement to Winston Churchill Boulevard is required to accommodate the traffic demand to the 2031 horizon year.

4.4.2.1 Future 2031 'Base' Scenario Analysis

Table O shows the analysis results of the 2031 'Base' Scenario condition. The signal timing plans were optimized and a peak hour factor of 1.00 was applied to all movements as per Peel Region guidelines, just as in the 2021 base analysis. The table provides the LOS, v/c ratios and delays for the critical movements, as well as the overall intersection for both the AM and PM peak hours. Only the movements with calculated v/c ratios in excess of 0.90 or locations with LOS E or F are bolded. Detailed Synchro reports are provided in **Appendix B,** showing the remaining movements with their respective results.

Table O – Future 2031 'Base' Scenario Intersection Analysis Results

Intersection	Movement	AM Peak Hour			PM Peak Hour		
		LOS	Delay(s)	V/C	LOS	Delay(s)	V/C
5 Side Road/ Embleton Road	*Overall*	*B*	*19.6*	*0.65*	*B*	*18.1*	*0.66*
Maple Lodge Farms Main Entrance	*Overall*	*A*	*8.1*	*0.80*	*B*	*10.8*	*0.81*
Steeles Avenue	*Overall*	***F***	*83.2*	*1.10*	*D*	*40.5*	*0.90*
	EBT	D	53.6	0.95	--	--	--
	WBL	**F**	102.1	1.05	**E**	68.0	0.97
	NBL	**F**	104.3	0.88	--	--	--
	SBL	**F**	132.1	1.12	--	--	--
	SBT	**F**	172.1	1.24	--	--	--
Orlando Access	*Overall*	*A*	*3.9*	*0.63*	*A*	*8.5*	*0.74*
Meadowpine Boulevard	*Overall*	*B*	*11.0*	*0.69*	*C*	*23.7*	*0.85*
	NBT	--	--	--	C	30.8	0.95
Highway 401 North Off Ramp	*Overall*	*B*	*18.5*	*0.74*	*C*	*23.1*	*0.80*
Highway 401 South Off Ramp	*Overall*	*C*	*22.9*	*0.81*	*B*	*15.6*	*0.75*

The analysis indicates that many of the turning movements at Steeles Avenue show operational deficiencies in the AM peak hour, including LOS F operation for both the eastbound and southbound through movements. In the AM peak hour the westbound, northbound and southbound left turn movements will be operating at LOS F and in the PM peak hour the westbound left turn movement will be operating poorly at LOS E. The remaining intersections on the segment of Winston Churchill Boulevard south of Steeles Avenue and towards the Highway 401 ramps are functioning well with the northbound through movement at Meadowpine Boulevard approaching capacity. All intersections were found to operate at LOS C or better on an overall basis, with the exception of Steeles Avenue. This intersection was found to be operating at LOS F and v/c of 1.10 in the AM peak hour and LOS D and v/c of 0.90 in the PM peak hour.

The following improvements have been identified as part of Winston Churchill Boulevards Capital Road Improvement Plan and have the capability to improve operations of these intersections:

Winston Churchill Boulevard:

- Widening from 5 to 7 lanes from Steeles Avenue to 2 km south of 5 Side Road / Embleton Road.
- Widening from 4 to 6 lanes from 2 km south of 5 Side Road / Embleton Road to 5 Side Road/ Embleton Road.

In reviewing the intersection operations of these roadways it does not appear that a lane widening is necessary to improve operations of the intersections north of Steeles Avenue as the intersections are functioning well with only 4 through lanes. As a result the midblock capacity analysis found in **Table L** was reviewed further to determine the effects of not widening Winston Churchill Boulevard to 6 lanes from Steeles Avenue to 2 km south of Embleton Road. The following table shows the results of that analysis:

Table P – 2031 Future Conditions Midblock Capacity Analysis with Two Through Lanes North of Steeles Avenue

Section	No. Lanes	Capacity	AM Pk Hr Volume	V/C	PM Pk Hr Volume	V/C
Embleton Rd to 2 km South of Embleton Road	2	1800	1444	0.80	1453	0.81
2 km South of Embleton Road to Maple Lodge Farms Entrance	2	1800	2032	1.13	2173	1.21
Maple Lodge Farms Entrance to Steeles Ave	2	1800	2047	1.14	2170	1.21

The midblock capacity analysis in **Table P** indicates that the capacity will be exceeded along these roadways north of Steeles Avenue with the exception of the section from Embleton Road to 2 km south of Embleton Road. As a result, the widening of Winston Churchill Boulevard is recommended to end at this point. The northbound right turn at the Maple Lodge Farms Entrance has been converted into a shared through right turn in conjunction with the lane widening.

4.4.2.2 Future 2031 Analysis – With Improvements

Table Q shows the analysis results of the 2031 Scenario with the lane widening improvements scheduled along Winston Churchill Boulevard as outlined above with the exception of lane widening from 4 to 6-lanes 2 km south of Embleton Road to Embleton Road. In addition, the signal timing plans were optimized to better allocate the signal timing and the additional lane widening. **Figure 31** shows the recommended lane configurations for the 2031 scenario with improvements.

Figure 31 – Future 2031 Recommended Lane Configurations

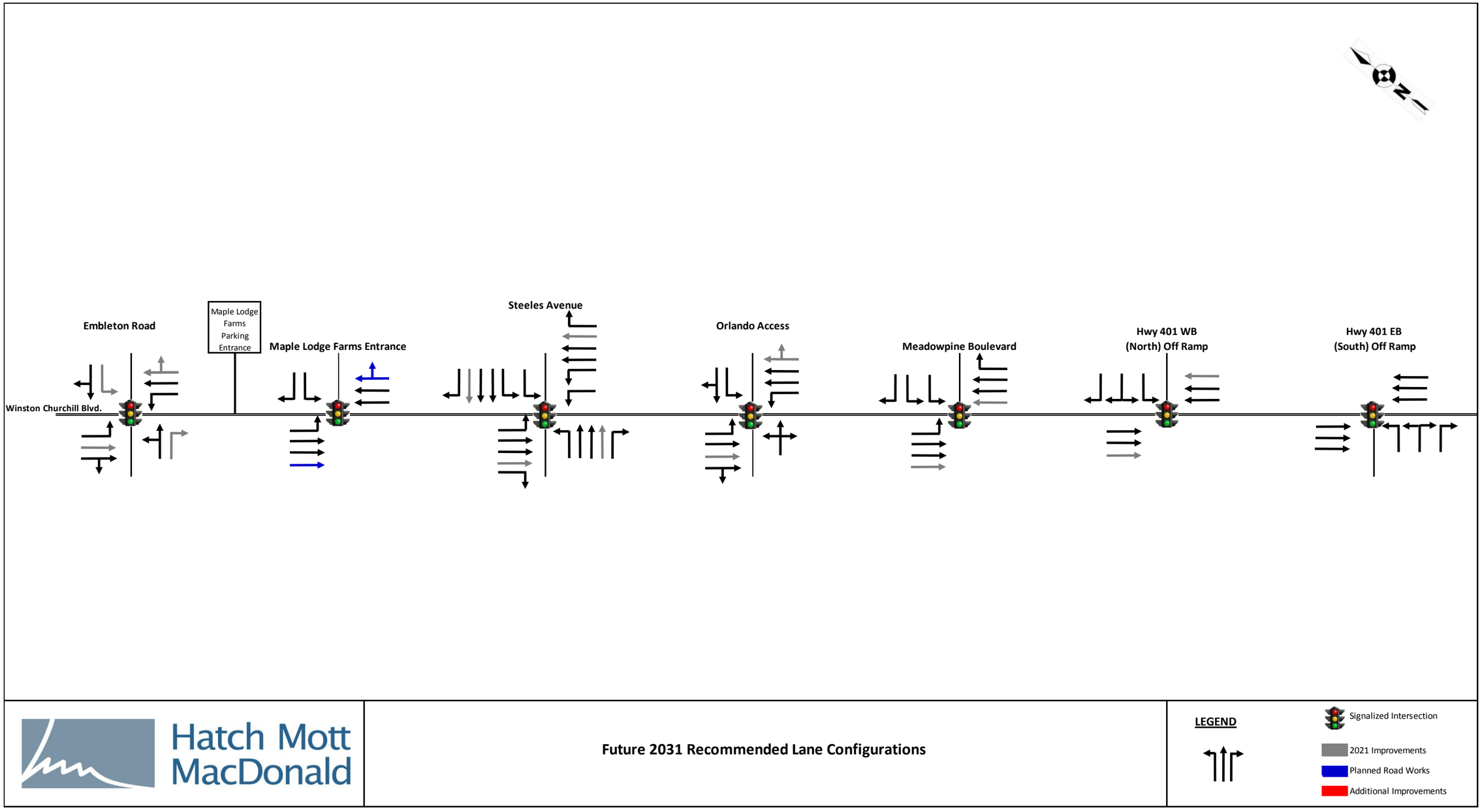


Table Q – Future 2031 'Improved' Scenario Intersection Analysis Results

Intersection	Movement	AM Peak Hour			PM Peak Hour		
		LOS	Delay(s)	V/C	LOS	Delay(s)	V/C
5 Side Road/ Embleton Road	*Overall*	*C*	*20.3*	*0.65*	*B*	*18.3*	*0.66*
Maple Lodge Farms Main Entrance	*Overall*	*A*	*5.6*	*0.57*	*A*	*6.7*	*0.58*
Steeles Avenue	*Overall*	***E***	*63.1*	*1.04*	*D*	*40.5*	*0.90*
	EBT	**E**	64.3	1.00	--	--	--
	WBL	**F**	114.7	1.08	**E**	68.0	0.97
	NBL	**F**	104.3	0.88	--	--	--
	SBL	**E**	62.5	0.90	--	--	--
	SBT	**E**	70.4	0.97	--	--	--
Orlando Access	*Overall*	*A*	*4.2*	*0.65*	*A*	*8.5*	*0.74*
Meadowpine Boulevard	*Overall*	*B*	*10.4*	*0.64*	*C*	*22.7*	*0.81*
Highway 401 North Off Ramp	*Overall*	*B*	*18.5*	*0.74*	*C*	*23.1*	*0.80*
Highway 401 South Off Ramp	*Overall*	*C*	*22.9*	*0.81*	*B*	*15.6*	*0.75*

The analysis results indicate that the intersection of Steeles Avenue continues to experience high delays for some turning movements however it was concluded that no additional signal modifications can improve the operations of these movements. Any further road modifications to Winston Churchill Boulevard and Steeles Avenue are constrained by the right-of-way limitations at each of the approaches to this intersection. It is expected that during peak hours of operation this intersection will approach and reach capacity due to the high volume of traffic on both the through and turning movements. Overall, Steeles Avenue will operate at an acceptable LOS D in the PM peak hour and LOS E in the AM peak hour. The remaining intersections operate at LOS C or better.

As noted in the midblock capacity analysis in **Table L**, this analysis does not account for planned transit improvements that will affect traffic demand in the Winston Churchill Boulevard and Steeles Avenue corridors. It is anticipated that with these improvements, operations in the Winston Churchill Boulevard corridor within the study area will be at or near capacity at the major intersections, particularly those in the section from Steeles Avenue to Highway 401.

It is noted that a widening of Winston Churchill Boulevard to 6 lanes in the vicinity of 5 Side Road / Embleton Road is not necessary by 2031 from an intersection analysis perspective and a capacity analysis perspective as shown in **Table P**. Within the vicinity of the Maple Lodge Farms Entrance widening the roadway to 6 lanes is required to 2 km south of 5 Side Road/ Embleton Road. It is recommended however, that the widening 6 lanes be continued to 5 Side Road / Embleton Road and transitioned to a 4-lane cross section north of this intersection to maintain cross section continuity and improve safety.

4.4.3 Queuing Assessment, Future Total Traffic Volumes

The queuing analyses was completed using SimTraffic 8 software for the 2021 and 2031 future total traffic conditions in order to estimate intersection turning lane storage requirements. Each simulation was seeded for 15 minutes and a total of five simulation runs of 60 minutes each were averaged to determine the turning lane requirements shown in **Table R**. The listed storage lengths for both 2021 and 2031 are the 95th percentile queue lengths. **Appendix E** contains the detailed SimTraffic summary sheets.

Table R – Summary of Queuing Analysis, Future Total Traffic with Improvements

Intersection	Movement	Approximate Available Storage (m)	2021 Future Total Traffic		2031 Future Total Traffic		Recommended Storage Length (m)
			AM (m)	PM (m)	AM (m)	PM (m)	
5 Side Road/ Embleton Road	EBR	*50	60.2	12.2	63.7	13.5	**65**
	WBL	*50	30.3	30.6	47.5	46.8	**50**
	NBL	50	11.1	51.2	14.2	65.6	**65**
	SBL	30	31.7	5.4	48.0	6.8	**50**
Maple Lodge Farms Main Entrance	SBL	60	52.8	2.6	24.9	3.7	**55**
Steeles Avenue	EBL	150	131.0	26.9	105.0	24.9	**130**
	EBR	150	232.0	8.4	220.7	14.0	**235**
	WBL	115	131.0	134.0	130.6	156.4	**155**
	WBR	115	--	68.5	--	94.4	**95**
	NBL	130[1]	49.6	143.8	57.3	109.5	**145**
	NBR	130	--	117.6	--	25.9	**120**
	SBL	130	145.1	37.7	165.8	37.8	**165**
	SBR	110	52.5	--	122.6	--	**125**
Orlando Access	SBL	80[1]	7.8	22.5	7.8	25.6	**25**
Meadowpine Boulevard	WBL	135	24.3	64.3	26.0	98.5	**100**
	NBR	110	84.4	32.8	123.3	86.6	**125**
	SBL	110	58.4	33.0	80.5	45.5	**80**
Highway 401 North Off Ramp	WBR	160	70.0	68.6	81.0	87.0	**90**
Highway 401 South Off Ramp	EBR	155	96.3	58.3	149.3	73.3	**195**

EBL= Eastbound Left, WBR= Westbound Right, * Assumed Storage Length

Notes1:

The Northbound left turn movement at Steeles Avenue and the Southbound left turn movement at the Orlando access are back-to-back movements as the intersections utilize the maximum distance between the two intersections to provide the maximum storage lengths possible. Based on the analysis, the storage for the NBL turn lane at Steeles needs to be greater than 145 m. This can be accommodated by shortening the SBL at the Orlando Access since this movement does not require 80 m of storage.

The queuing analysis results indicate that the assumed 50 metre storage length of the new turning movements at the intersection of 5 Side Road/ Embleton Road was appropriate

for the westbound left turn lane by 2031, however the eastbound right turn lane should have a length of at least 65 meters.

5. Needs Assessment

5.1 Short Term Needs – Existing (2014)

Midblock Capacity:

1. The midblock sections north of the Highway 401 north ramp terminal to Meadowpine Boulevard are approaching the available capacity during the AM and PM peak hours.

2. Midblock sections from Steeles Avenue to Meadowpine Boulevard are operating at or slightly over the available capacity during the AM and PM peak hours.

3. The midblock section from Embleton Road to 2 km south of Embleton is approaching or slightly over the available capacity during the AM and PM peak hours.

4. There is a need to widen Winston Churchill Boulevard from Steeles Avenue to Meadowpine Boulevard from 4 to 6 lanes and from 2 to 4 lanes for the segment from Embleton Road to 2 km south of Embleton Road.

Intersection Operations:

1. Poor operations were identified at the Steeles Avenue and Meadowpine Boulevard intersections with Winston Churchill Boulevard. These operations, as well as operations of other intersections on Winston Churchill Boulevard could be improved by:

    - Widening Winston Churchill Boulevard to 6 lanes from Steeles Avenue to Meadowpine Boulevard;

    - Widening the east and west approach of Steeles Avenue at Winston Churchill Boulevard to 3 through lanes in each direction; and

    - Optimizing the signal timing plans.

5.2 Medium Term Needs - 2021

1. This analysis has shown that projected traffic growth in the Winston Churchill Boulevard corridor for the 2014 – 2021 time frame warrants the following road improvements:

   Winston Churchill Boulevard:

   - Widen to 6 through lanes from Highway 401 to north of Steeles Avenue.
   - Widen to 4 through lanes from 2 km south of 5 Side Road/ Embleton Road to north of 5 Side Road/Embleton Road

2. The intersection of 5 Side Road/ Embleton Road requires an additional turning lane for both the eastbound right and westbound left turn movements. Currently the road has a single lane on the east and west approaches operating as a shared left-through-right movement. Turning lanes should incorporate the 2031 storage length requirements of 65 meters for the eastbound right turn and 50 meters for the westbound left turn movement. No additional signal modifications other than optimization are required.

3. The intersection of Steeles Avenue requires:

   - Phasing for the northbound right turn movement to be modified to provide an overlap phase with the westbound left turn. A separate receiving lane should be implemented to improve operations and safety due to the large volume of vehicles making this turn onto Steeles Avenue.
   - Phasing for the eastbound left turn lane to be modified to provide a permitted and protected phase to partially overlap with the westbound left turn movement. This phasing would only be required during PM peak hours. Permitted phasing would be adequate during AM peak hour.

4. The intersection with the Orlando Access should have the following improvements:

   - Phasing for the southbound left turn modified to provide an additional permitted and protected phase during both the AM and PM peak hours.

5.3 Long-Term Needs - 2031

1. This analysis has shown that projected traffic growth in the Winston Churchill Boulevard corridor for the 2021 – 2031 time frame warrants the following road improvements:

   Winston Churchill Boulevard:

   - Widen to 6 through lanes from Steeles Avenue to north of 5 Side Road/ Embleton Road.

APPENDICES

Appendix A

Existing Intersection Counts and Signal Timing Plans

MG8 ENG

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:15:00
To: 8:15:00

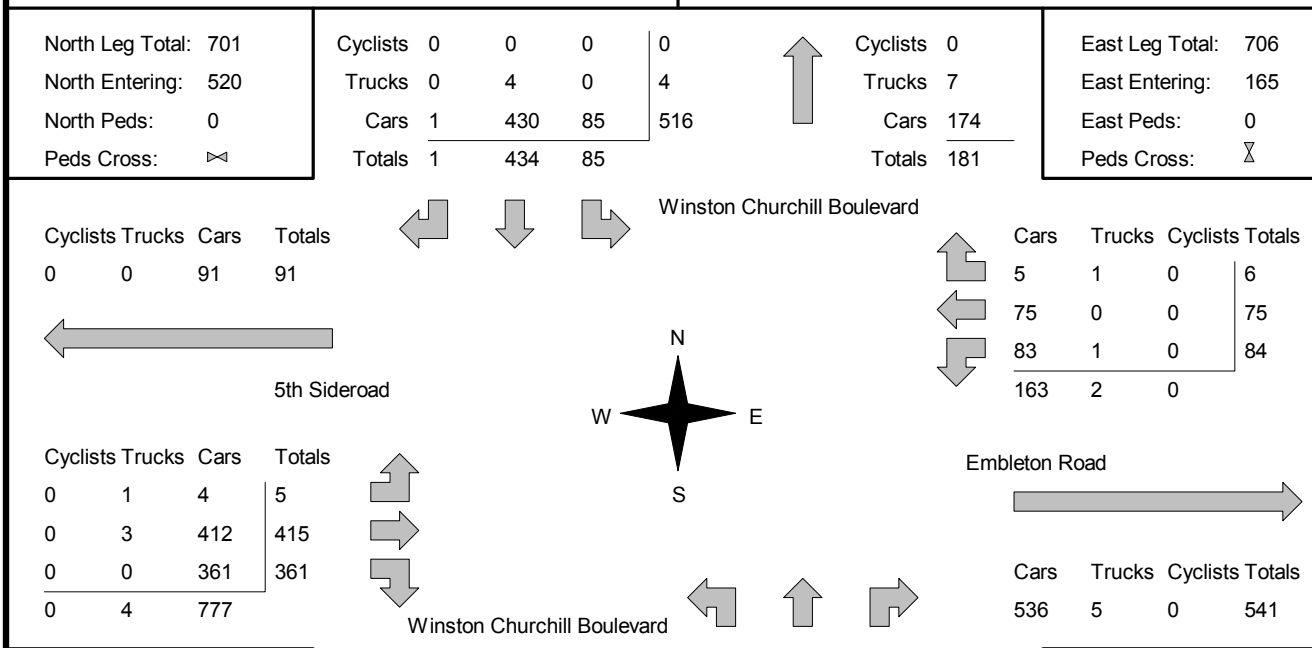
Municipality: Region of Peel
Site #: 0000608052
Intersection: Winston Churchill Blvd & Embleton
TFR File #: 8
Count date: 11-Apr-2013

Weather conditions:
Normal

Person(s) who counted:
NIKOLA

**** Signalized Intersection ****

Major Road: Winston Churchill Blvd runs N/S



Comments

MG8 ENG

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

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

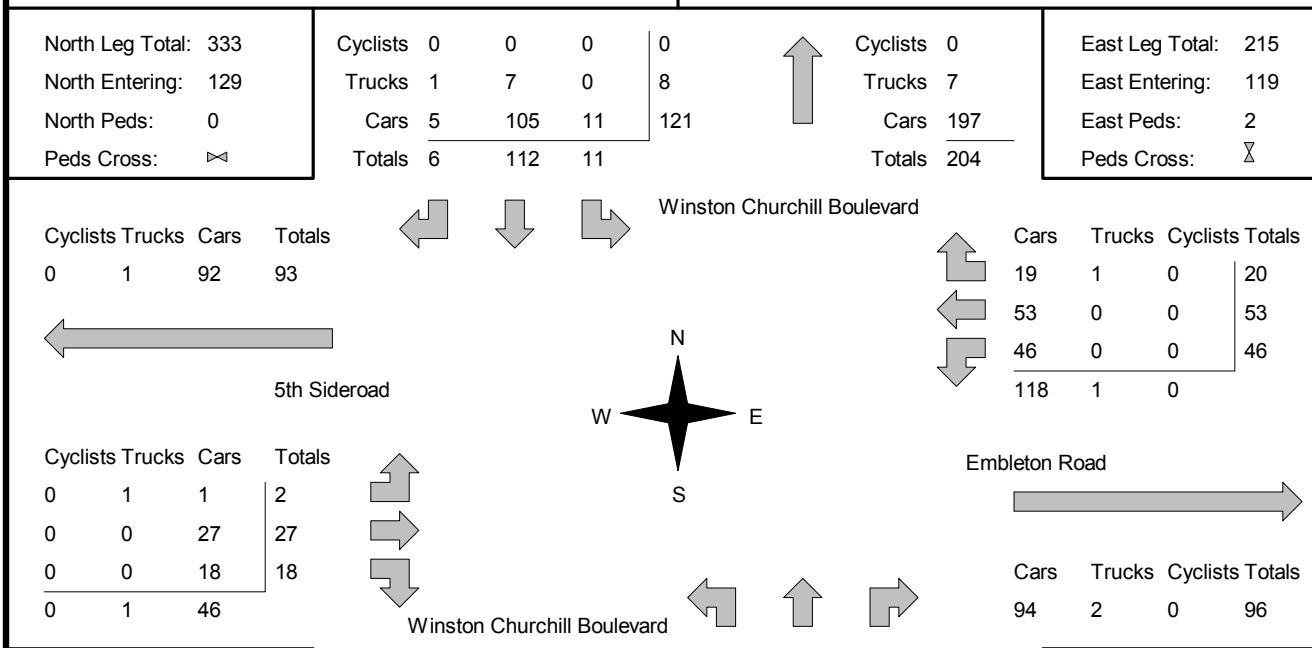
Municipality: Region of Peel
Site #: 0000608052
Intersection: Winston Churchill Blvd & Embleton
TFR File #: 8
Count date: 11-Apr-2013

Weather conditions:
Normal

Person(s) who counted:
NIKOLA

**** Signalized Intersection ****

Major Road: Winston Churchill Blvd runs N/S



Comments

MG8 ENG

Afternoon Peak Diagram

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

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

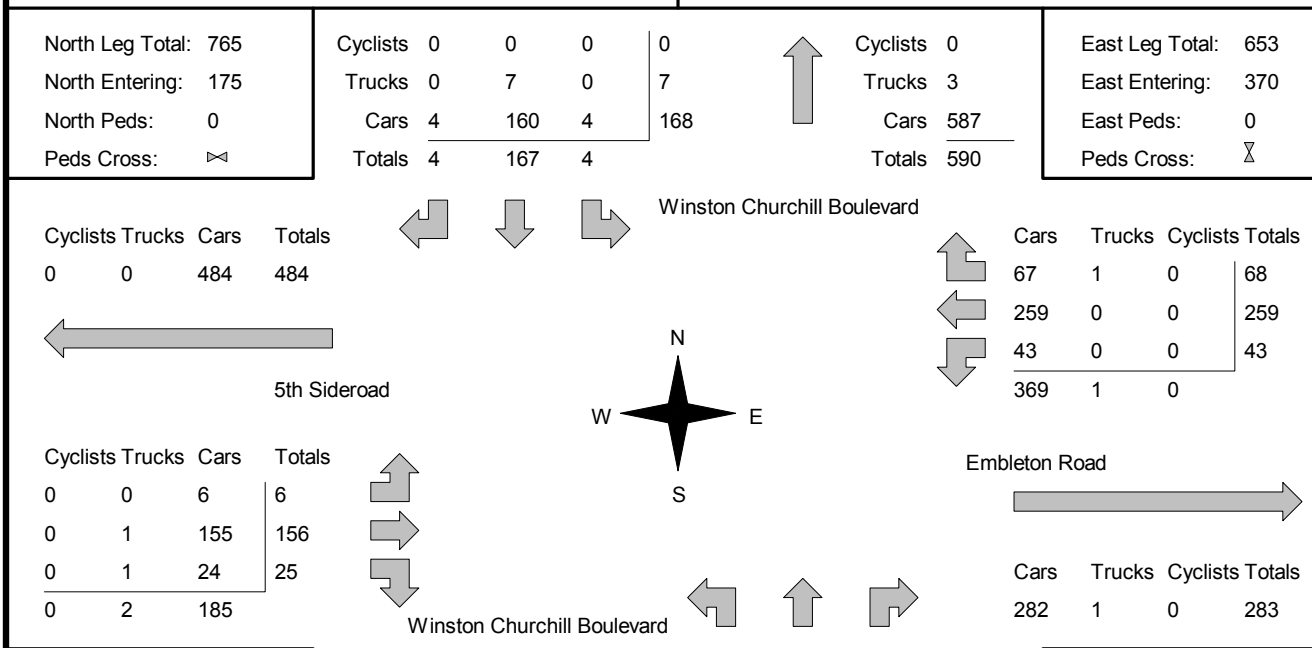
Municipality: Region of Peel
Site #: 0000608052
Intersection: Winston Churchill Blvd & Embleton
TFR File #: 8
Count date: 11-Apr-2013

Weather conditions:
Normal

Person(s) who counted:
NIKOLA

**** Signalized Intersection ****

Major Road: Winston Churchill Blvd runs N/S



Comments

MG8 ENG

Total Count Diagram

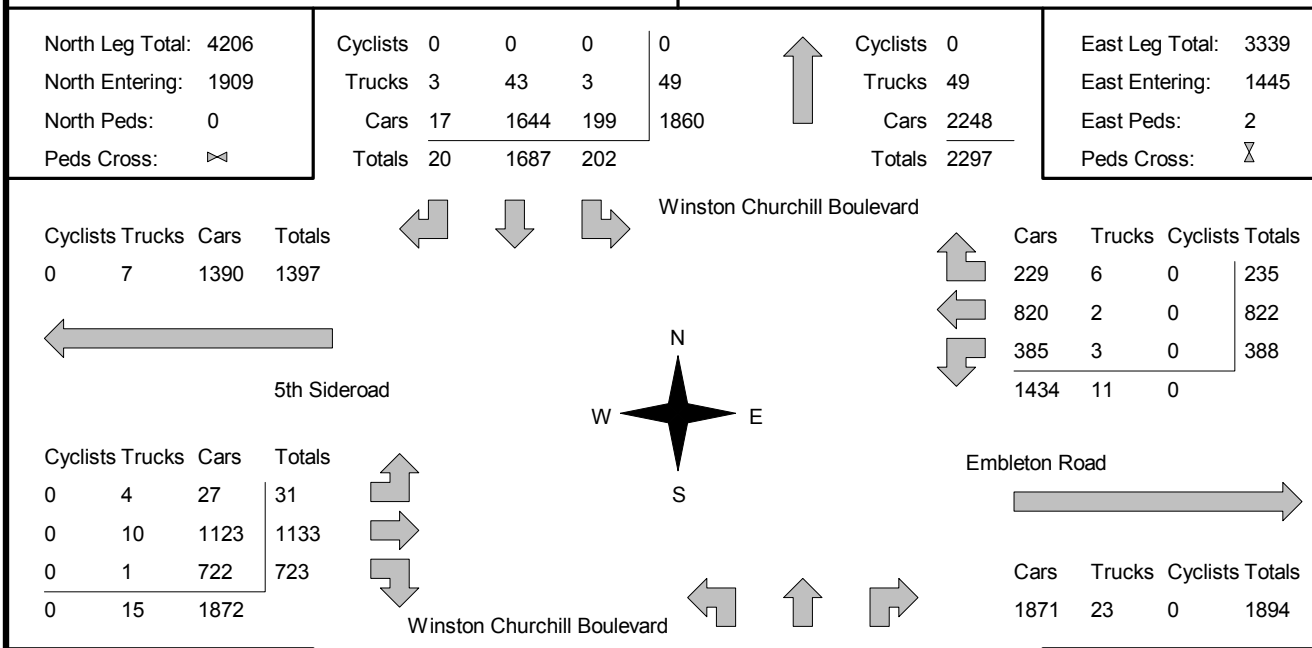
Municipality: Region of Peel
Site #: 0000608052
Intersection: Winston Churchill Blvd & Embleton
TFR File #: 8
Count date: 11-Apr-2013

Weather conditions:
Normal

Person(s) who counted:
NIKOLA

**** Signalized Intersection ****

Major Road: Winston Churchill Blvd runs N/S



Comments

MG8 ENG
Traffic Count Summary

Intersection: Winston Churchill Blvd & Embleton | **Count Date:** 11-Apr-2013 | **Municipality:** Region of Peel

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	75	389	1	465	0	687
9:00:00	71	388	2	461	0	653
11:00:00	0	2	0	2	0	4
12:00:00	10	131	2	143	0	310
13:00:00	12	130	1	143	0	412
14:00:00	11	112	6	129	0	403
15:00:00	0	1	0	1	0	4
16:00:00	8	168	3	179	0	740
17:00:00	12	198	2	212	0	940
18:00:00	3	168	3	174	0	901
Totals:	202	1687	20	1909	0	5054

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	12	168	42	222	0
9:00:00	12	148	32	192	0
11:00:00	1	0	1	2	0
12:00:00	17	132	18	167	0
13:00:00	26	163	80	269	0
14:00:00	34	182	58	274	0
15:00:00	0	1	2	3	0
16:00:00	106	347	108	561	0
17:00:00	168	455	105	728	0
18:00:00	179	435	113	727	0
Totals:	555	2031	559	3145	0

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	74	74	7	155	0	933
9:00:00	72	70	13	155	0	701
11:00:00	0	0	0	0	0	0
12:00:00	44	19	11	74	0	129
13:00:00	32	39	11	82	0	116
14:00:00	46	53	20	119	2	166
15:00:00	0	0	0	0	0	0
16:00:00	38	147	46	231	0	345
17:00:00	50	223	62	335	0	493
18:00:00	32	196	65	293	0	448
Totals:	388	821	235	1444	2	3331

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	8	431	339	778	0
9:00:00	3	271	272	546	0
11:00:00	0	0	0	0	0
12:00:00	2	35	18	55	0
13:00:00	2	22	10	34	0
14:00:00	2	27	18	47	0
15:00:00	0	0	0	0	0
16:00:00	4	89	21	114	0
17:00:00	2	135	21	158	0
18:00:00	8	123	24	155	0
Totals:	31	1133	723	1887	0

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00
Crossing Values:	513	346	81	73	101	189	275	236

MG8 ENG

Count Date: 11-Apr-2013 Site #: 0000608052

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Cyclists - 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
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	15	15	71	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	37	22	176	105	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
7:45:00	55	18	283	107	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
8:00:00	75	20	387	104	1	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0
8:15:00	100	25	501	114	1	0	0	0	4	2	0	0	0	0	0	0	0	0	0	0
8:30:00	119	19	603	102	2	1	0	0	7	3	0	0	0	0	0	0	0	0	0	0
8:45:00	136	17	688	85	2	0	0	0	8	1	0	0	0	0	0	0	0	0	0	0
9:00:00	146	10	768	80	3	1	0	0	9	1	0	0	0	0	0	0	0	0	0	0
9:00:11	146	0	770	2	3	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0
11:00:00	146	0	770	0	3	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0
11:15:00	147	1	801	31	4	1	0	0	13	4	0	0	0	0	0	0	0	0	0	0
11:30:00	150	3	832	31	4	0	1	1	15	2	0	0	0	0	0	0	0	0	0	0
11:45:00	153	3	861	29	4	0	1	0	16	1	1	1	0	0	0	0	0	0	0	0
12:00:00	155	2	892	31	4	0	1	0	18	2	1	0	0	0	0	0	0	0	0	0
12:15:00	159	4	929	37	4	0	2	1	22	4	2	1	0	0	0	0	0	0	0	0
12:30:00	161	2	961	32	4	0	2	0	24	2	2	0	0	0	0	0	0	0	0	0
12:45:00	164	3	994	33	4	0	3	1	24	0	2	0	0	0	0	0	0	0	0	0
13:00:00	165	1	1015	21	4	0	3	0	25	1	2	0	0	0	0	0	0	0	0	0
13:15:00	169	4	1038	23	4	0	3	0	26	1	2	0	0	0	0	0	0	0	0	0
13:30:00	172	3	1064	26	6	2	3	0	30	4	2	0	0	0	0	0	0	0	0	0
13:45:00	173	1	1089	25	7	1	3	0	30	0	3	1	0	0	0	0	0	0	0	0
14:00:00	176	3	1120	31	9	2	3	0	32	2	3	0	0	0	0	0	0	0	0	0
14:00:05	176	0	1121	1	9	0	3	0	32	0	3	0	0	0	0	0	0	0	0	0
15:00:00	176	0	1121	0	9	0	3	0	32	0	3	0	0	0	0	0	0	0	0	0
15:15:00	179	3	1159	38	10	1	3	0	32	0	3	0	0	0	0	0	0	0	0	0
15:30:00	183	4	1189	30	10	0	3	0	33	1	3	0	0	0	0	0	0	0	0	0
15:45:00	184	1	1245	56	11	1	3	0	33	0	3	0	0	0	0	0	0	0	0	0
16:00:00	184	0	1287	42	12	1	3	0	34	1	3	0	0	0	0	0	0	0	0	0
16:15:00	190	6	1345	58	12	0	3	0	35	1	3	0	0	0	0	0	0	0	0	0
16:30:00	194	4	1402	57	12	0	3	0	35	0	3	0	0	0	0	0	0	0	0	0
16:45:00	195	1	1429	27	14	2	3	0	38	3	3	0	0	0	0	0	0	0	0	0
17:00:00	196	1	1480	51	14	0	3	0	39	1	3	0	0	0	0	0	0	0	0	0
17:15:00	197	1	1523	43	15	1	3	0	42	3	3	0	0	0	0	0	0	0	0	0
17:30:00	198	1	1562	39	16	1	3	0	42	0	3	0	0	0	0	0	0	0	0	0
17:45:00	199	1	1605	43	17	1	3	0	43	1	3	0	0	0	0	0	0	0	0	0
18:00:00	199	0	1644	39	17	0	3	0	43	0	3	0	0	0	0	0	0	0	0	0
18:00:11	199	0	1644	0	17	0	3	0	43	0	3	0	0	0	0	0	0	0	0	0

MG8 ENG

Count Date: 11-Apr-2013 Site #: 0000608052

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Cyclists - 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
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	15	15	19	19	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	37	22	42	23	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	54	17	59	17	6	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	73	19	74	15	6	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0
8:15:00	98	25	94	20	8	2	1	0	0	0	1	0	0	0	0	0	0	0	0	0
8:30:00	112	14	110	16	10	2	1	0	0	0	1	0	0	0	0	0	0	0	0	0
8:45:00	132	20	126	16	15	5	1	0	0	0	2	1	0	0	0	0	0	0	0	0
9:00:00	145	13	144	18	18	3	1	0	0	0	2	0	0	0	0	0	0	0	0	0
9:00:11	145	0	144	0	18	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
11:00:00	145	0	144	0	18	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
11:15:00	151	6	144	0	23	5	1	0	0	0	2	0	0	0	0	0	0	0	0	0
11:30:00	162	11	153	9	27	4	1	0	0	0	2	0	0	0	0	0	0	0	0	0
11:45:00	177	15	158	5	27	0	2	1	0	0	2	0	0	0	0	0	0	0	0	0
12:00:00	188	11	163	5	29	2	2	0	0	0	2	0	0	0	0	0	0	0	0	0
12:15:00	200	12	169	6	29	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0
12:30:00	205	5	182	13	31	2	3	1	0	0	4	2	0	0	0	0	0	0	0	0
12:45:00	209	4	193	11	31	0	3	0	1	1	4	0	0	0	0	0	0	0	0	0
13:00:00	219	10	201	8	38	7	3	0	1	0	4	0	0	0	0	0	0	0	0	0
13:15:00	226	7	212	11	43	5	3	0	1	0	5	1	0	0	0	0	0	0	0	0
13:30:00	244	18	226	14	49	6	3	0	1	0	5	0	0	0	0	0	0	0	1	1
13:45:00	253	9	237	11	51	2	3	0	1	0	5	0	0	0	0	0	0	0	2	1
14:00:00	265	12	254	17	57	6	3	0	1	0	5	0	0	0	0	0	0	0	2	0
14:00:05	265	0	254	0	57	0	3	0	1	0	5	0	0	0	0	0	0	0	2	0
15:00:00	265	0	254	0	57	0	3	0	1	0	5	0	0	0	0	0	0	0	2	0
15:15:00	272	7	276	22	70	13	3	0	1	0	5	0	0	0	0	0	0	0	2	0
15:30:00	281	9	316	40	73	3	3	0	1	0	5	0	0	0	0	0	0	0	2	0
15:45:00	295	14	357	41	89	16	3	0	1	0	5	0	0	0	0	0	0	0	2	0
16:00:00	303	8	401	44	103	14	3	0	1	0	5	0	0	0	0	0	0	0	2	0
16:15:00	316	13	438	37	115	12	3	0	2	1	5	0	0	0	0	0	0	0	2	0
16:30:00	324	8	482	44	128	13	3	0	2	0	5	0	0	0	0	0	0	0	2	0
16:45:00	336	12	552	70	141	13	3	0	2	0	5	0	0	0	0	0	0	0	2	0
17:00:00	353	17	623	71	165	24	3	0	2	0	5	0	0	0	0	0	0	0	2	0
17:15:00	359	6	679	56	178	13	3	0	2	0	5	0	0	0	0	0	0	0	2	0
17:30:00	367	8	741	62	195	17	3	0	2	0	6	1	0	0	0	0	0	0	2	0
17:45:00	375	8	791	50	217	22	3	0	2	0	6	0	0	0	0	0	0	0	2	0
18:00:00	385	10	819	28	229	12	3	0	2	0	6	0	0	0	0	0	0	0	2	0
18:00:11	385	0	820	1	229	0	3	0	2	0	6	0	0	0	0	0	0	0	2	0

MG8 ENG

Count Date: 11-Apr-2013 Site #: 0000608052

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Cyclists - 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
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	1	1	40	40	6	6	0	0	1	1	0	0	0	0	0	0	0	0	0	0
7:30:00	6	5	73	33	15	9	0	0	1	0	0	0	0	0	0	0	0	0	0	0
7:45:00	8	2	117	44	29	14	0	0	3	2	0	0	0	0	0	0	0	0	0	0
8:00:00	12	4	163	46	40	11	0	0	5	2	2	2	0	0	0	0	0	0	0	0
8:15:00	16	4	205	42	45	5	0	0	6	1	2	0	0	0	0	0	0	0	0	0
8:30:00	18	2	233	28	53	8	0	0	8	2	2	0	0	0	0	0	0	0	0	0
8:45:00	23	5	261	28	64	11	0	0	12	4	3	1	0	0	0	0	0	0	0	0
9:00:00	24	1	303	42	71	7	0	0	13	1	3	0	0	0	0	0	0	0	0	0
9:00:11	25	1	303	0	71	0	0	0	13	0	3	0	0	0	0	0	0	0	0	0
11:00:00	25	0	303	0	72	1	0	0	13	0	3	0	0	0	0	0	0	0	0	0
11:15:00	27	2	332	29	76	4	0	0	15	2	3	0	0	0	0	0	0	0	0	0
11:30:00	32	5	357	25	78	2	0	0	19	4	5	2	0	0	0	0	0	0	0	0
11:45:00	37	5	391	34	81	3	0	0	21	2	5	0	0	0	0	0	0	0	0	0
12:00:00	42	5	425	34	88	7	0	0	23	2	5	0	0	0	0	0	0	0	0	0
12:15:00	46	4	453	28	106	18	0	0	23	0	5	0	0	0	0	0	0	0	0	0
12:30:00	51	5	496	43	122	16	1	1	24	1	6	1	0	0	0	0	0	0	0	0
12:45:00	60	9	537	41	148	26	1	0	25	1	6	0	0	0	0	0	0	0	0	0
13:00:00	67	7	585	48	166	18	1	0	26	1	7	1	0	0	0	0	0	0	0	0
13:15:00	76	9	625	40	173	7	1	0	27	1	9	2	0	0	0	0	0	0	0	0
13:30:00	86	10	664	39	186	13	1	0	29	2	9	0	0	0	0	0	0	0	0	0
13:45:00	94	8	705	41	199	13	1	0	31	2	9	0	0	0	0	0	0	0	0	0
14:00:00	101	7	762	57	222	23	1	0	31	0	9	0	0	0	0	0	0	0	0	0
14:00:05	101	0	762	0	223	1	1	0	31	0	9	0	0	0	0	0	0	0	0	0
15:00:00	101	0	763	1	224	1	1	0	31	0	9	0	0	0	0	0	0	0	0	0
15:15:00	123	22	841	78	251	27	1	0	34	3	9	0	0	0	0	0	0	0	0	0
15:30:00	149	26	938	97	276	25	1	0	34	0	10	1	0	0	0	0	0	0	0	0
15:45:00	178	29	1025	87	315	39	1	0	35	1	10	0	0	0	0	0	0	0	0	0
16:00:00	207	29	1104	79	331	16	1	0	37	2	10	0	0	0	0	0	0	0	0	0
16:15:00	238	31	1200	96	353	22	2	1	37	0	10	0	0	0	0	0	0	0	0	0
16:30:00	271	33	1311	111	378	25	2	0	37	0	10	0	0	0	0	0	0	0	0	0
16:45:00	331	60	1441	130	409	31	2	0	37	0	10	0	0	0	0	0	0	0	0	0
17:00:00	374	43	1559	118	436	27	2	0	37	0	10	0	0	0	0	0	0	0	0	0
17:15:00	421	47	1679	120	465	29	2	0	39	2	10	0	0	0	0	0	0	0	0	0
17:30:00	492	71	1825	146	501	36	2	0	39	0	10	0	0	0	0	0	0	0	0	0
17:45:00	535	43	1931	106	528	27	2	0	39	0	10	0	0	0	0	0	0	0	0	0
18:00:00	553	18	1992	61	549	21	2	0	39	0	10	0	0	0	0	0	0	0	0	0
18:00:11	553	0	1992	0	549	0	2	0	39	0	10	0	0	0	0	0	0	0	0	0

MG8 ENG

Count Date: 11-Apr-2013 Site #: 0000608052

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Cyclists - 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
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	3	3	104	104	67	67	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	5	2	208	104	160	93	0	0	1	1	0	0	0	0	0	0	0	0	0	0
7:45:00	5	0	324	116	244	84	0	0	3	2	0	0	0	0	0	0	0	0	0	0
8:00:00	7	2	428	104	339	95	1	1	3	0	0	0	0	0	0	0	0	0	0	0
8:15:00	7	0	516	88	428	89	1	0	3	0	0	0	0	0	0	0	0	0	0	0
8:30:00	7	0	596	80	520	92	2	1	4	1	0	0	0	0	0	0	0	0	0	0
8:45:00	9	2	661	65	577	57	2	0	4	0	0	0	0	0	0	0	0	0	0	0
9:00:00	9	0	697	36	611	34	2	0	5	1	0	0	0	0	0	0	0	0	0	0
9:00:11	9	0	697	0	611	0	2	0	5	0	0	0	0	0	0	0	0	0	0	0
11:00:00	9	0	697	0	611	0	2	0	5	0	0	0	0	0	0	0	0	0	0	0
11:15:00	10	1	706	9	614	3	3	1	6	1	0	0	0	0	0	0	0	0	0	0
11:30:00	10	0	716	10	623	9	3	0	6	0	0	0	0	0	0	0	0	0	0	0
11:45:00	10	0	719	3	626	3	3	0	6	0	0	0	0	0	0	0	0	0	0	0
12:00:00	10	0	730	11	629	3	3	0	7	1	0	0	0	0	0	0	0	0	0	0
12:15:00	10	0	736	6	631	2	3	0	7	0	0	0	0	0	0	0	0	0	0	0
12:30:00	11	1	738	2	634	3	3	0	7	0	0	0	0	0	0	0	0	0	0	0
12:45:00	12	1	748	10	638	4	3	0	7	0	0	0	0	0	0	0	0	0	0	0
13:00:00	12	0	752	4	639	1	3	0	7	0	0	0	0	0	0	0	0	0	0	0
13:15:00	12	0	755	3	644	5	4	1	7	0	0	0	0	0	0	0	0	0	0	0
13:30:00	12	0	765	10	645	1	4	0	7	0	0	0	0	0	0	0	0	0	0	0
13:45:00	13	1	770	5	649	4	4	0	7	0	0	0	0	0	0	0	0	0	0	0
14:00:00	13	0	779	9	657	8	4	0	7	0	0	0	0	0	0	0	0	0	0	0
14:00:05	13	0	779	0	657	0	4	0	7	0	0	0	0	0	0	0	0	0	0	0
15:00:00	13	0	779	0	657	0	4	0	7	0	0	0	0	0	0	0	0	0	0	0
15:15:00	13	0	789	10	666	9	4	0	7	0	0	0	0	0	0	0	0	0	0	0
15:30:00	14	1	808	19	667	1	4	0	7	0	0	0	0	0	0	0	0	0	0	0
15:45:00	16	2	828	20	671	4	4	0	7	0	0	0	0	0	0	0	0	0	0	0
16:00:00	17	1	867	39	678	7	4	0	8	1	0	0	0	0	0	0	0	0	0	0
16:15:00	17	0	895	28	684	6	4	0	8	0	0	0	0	0	0	0	0	0	0	0
16:30:00	17	0	933	38	689	5	4	0	9	1	0	0	0	0	0	0	0	0	0	0
16:45:00	18	1	960	27	693	4	4	0	9	0	0	0	0	0	0	0	0	0	0	0
17:00:00	19	1	1001	41	699	6	4	0	9	0	0	0	0	0	0	0	0	0	0	0
17:15:00	21	2	1030	29	705	6	4	0	9	0	0	0	0	0	0	0	0	0	0	0
17:30:00	23	2	1088	58	713	8	4	0	10	1	1	1	0	0	0	0	0	0	0	0
17:45:00	24	1	1108	20	716	3	4	0	10	0	1	0	0	0	0	0	0	0	0	0
18:00:00	27	3	1123	15	722	6	4	0	10	0	1	0	0	0	0	0	0	0	0	0
18:00:11	27	0	1123	0	722	0	4	0	10	0	1	0	0	0	0	0	0	0	0	0

Ontario Traffic Inc

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:30:00
To: 8:30:00

Municipality: Mississauga
Site #: 1427300004
Intersection: Winston Churchill Blvd & Maple Lod
TFR File #: 5
Count date: 18-Nov-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Winston Churchill Blvd runs N/S

North Leg Total: 1469
North Entering: 1136
North Peds: 0
Peds Cross: ⋈

Heavys	0	0	0
Trucks	7	0	7
Cars	1109	20	1129
Totals	1116	20	

Heavys	0
Trucks	6
Cars	327
Totals	333

East Leg Total: 83
East Entering: 32
East Peds: 0
Peds Cross: ⋈

Winston Churchill Blvd

Cars	Trucks	Heavys	Totals
1	0	0	1
10	21	0	31
11	21	0	

N
W E
S

Maple Lodge Farms Access

Cars	Trucks	Heavys	Totals
37	14	0	51

Winston Churchill Blvd

Cars	1119
Trucks	28
Heavys	0
Totals	1147

Cars	326	17	343
Trucks	6	14	20
Heavys	0	0	0
Totals	332	31	

Peds Cross: ⋈
South Peds: 0
South Entering: 363
South Leg Total: 1510

Comments

Ontario Traffic Inc

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

One Hour Peak
From: 11:45:00
To: 12:45:00

Municipality: Mississauga
Site #: 1427300004
Intersection: Winston Churchill Blvd & Maple Lod
TFR File #: 5
Count date: 18-Nov-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Winston Churchill Blvd runs N/S

North Leg Total: 655
North Entering: 329
North Peds: 0
Peds Cross: ⋈

Heavys	0	0	0
Trucks	11	0	11
Cars	315	3	318
Totals	326	3	

Heavys	0
Trucks	14
Cars	312
Totals	326

East Leg Total: 89
East Entering: 50
East Peds: 0
Peds Cross: ⋈

Winston Churchill Blvd

	Cars	Trucks	Heavys	Totals
	11	0	0	11
	31	8	0	39
	42	8	0	

N
W E
S

Maple Lodge Farms Access

Cars	Trucks	Heavys	Totals
27	12	0	39

Winston Churchill Blvd

Cars	346
Trucks	19
Heavys	0
Totals	365

Cars	301	24	325
Trucks	14	12	26
Heavys	0	0	0
Totals	315	36	

Peds Cross: ⋈
South Peds: 0
South Entering: 351
South Leg Total: 716

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: Mississauga
Site #: 1427300004
Intersection: Winston Churchill Blvd & Maple Lod
TFR File #: 5
Count date: 18-Nov-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

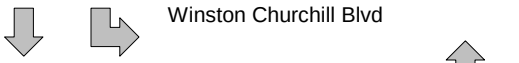
Major Road: Winston Churchill Blvd runs N/S

North Leg Total: 1632
North Entering: 418
North Peds: 0
Peds Cross: ⋈

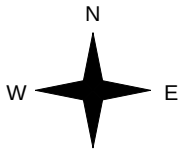
Heavys	0	0	0
Trucks	6	0	6
Cars	410	2	412
Totals	416	2	

Heavys	0
Trucks	10
Cars	1204
Totals	1214

East Leg Total: 63
East Entering: 46
East Peds: 0
Peds Cross: ⋈



	Cars	Trucks	Heavys	Totals
	17	0	0	17
	24	5	0	29
	41	5	0	



	Cars	Trucks	Heavys	Totals
	5	12	0	17

Cars	434		
Trucks	11		
Heavys	0		
Totals	445		

Cars	1187	3	1190
Trucks	10	12	22
Heavys	0	0	0
Totals	1197	15	

Peds Cross: ⋈
South Peds: 0
South Entering: 1212
South Leg Total: 1657

Comments

Ontario Traffic Inc

Total Count Diagram

Municipality: Mississauga
Site #: 1427300004
Intersection: Winston Churchill Blvd & Maple Lod
TFR File #: 5
Count date: 18-Nov-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Winston Churchill Blvd runs N/S

North Leg Total: 8705
North Entering: 4224
North Peds: 0
Peds Cross: ⋈

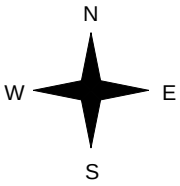
Heavys	0	0	0
Trucks	88	2	90
Cars	4086	48	4134
Totals	4174	50	

Heavys	0
Trucks	79
Cars	4402
Totals	4481

East Leg Total: 552
East Entering: 294
East Peds: 2
Peds Cross: ⋈

Winston Churchill Blvd

	Cars	Trucks	Heavys	Totals
	69	4	0	73
	143	78	0	221
	212	82	0	



Maple Lodge Farms Access

Cars	Trucks	Heavys	Totals
162	96	0	258

Winston Churchill Blvd

Cars	4229		
Trucks	166		
Heavys	0		
Totals	4395		

Cars	4333	114	4447
Trucks	75	94	169
Heavys	0	0	0
Totals	4408	208	

Peds Cross: ⋈
South Peds: 0
South Entering: 4616
South Leg Total: 9011

Comments

Ontario Traffic Inc
Traffic Count Summary

Intersection: Winston Churchill Blvd & Maple Lo | **Count Date:** 18-Nov-14 | **Municipality:** Mississauga

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
7:00:00	2	1	0	3	0	8
8:00:00	13	1070	0	1083	0	1414
9:00:00	15	1043	0	1058	0	1404
11:00:00	2	6	0	8	0	16
12:00:00	3	287	0	290	0	567
13:00:00	5	317	0	322	0	666
14:00:00	3	279	0	282	0	692
15:00:00	2	7	0	9	0	22
16:00:00	2	349	0	351	0	1026
17:00:00	0	426	0	426	0	1509
18:00:00	3	383	0	386	0	1510
Totals:	50	4168	0	4218	0	8834

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	1	4	5	0
8:00:00	0	309	22	331	0
9:00:00	0	306	40	346	0
11:00:00	0	5	3	8	0
12:00:00	0	251	26	277	0
13:00:00	0	310	34	344	0
14:00:00	0	388	22	410	0
15:00:00	0	10	3	13	0
16:00:00	0	654	21	675	0
17:00:00	0	1063	20	1083	0
18:00:00	0	1111	13	1124	0
Totals:	0	4408	208	4616	0

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
7:00:00	4	0	2	6	0	6
8:00:00	30	0	1	31	0	31
9:00:00	28	0	2	30	0	30
11:00:00	2	0	3	5	0	5
12:00:00	19	0	5	24	0	24
13:00:00	35	0	12	47	0	47
14:00:00	25	0	6	31	0	31
15:00:00	2	0	0	2	1	2
16:00:00	31	0	14	45	0	45
17:00:00	20	0	16	36	1	36
18:00:00	25	0	12	37	0	37
Totals:	221	0	73	294	2	294

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	0	0	0	0	0
9:00:00	0	0	0	0	0
11:00:00	0	0	0	0	0
12:00:00	0	0	0	0	0
13:00:00	0	0	0	0	0
14:00:00	0	0	0	0	0
15:00:00	0	0	0	0	0
16:00:00	0	0	0	0	0
17:00:00	0	0	0	0	0
18:00:00	0	0	0	0	0
Totals:	0	0	0	0	0

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00
Crossing Values:	30	28	19	35	25	31	20	25

Ontario Traffic Inc

Count Date: 18-Nov-14 Site #: 1427300004

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
7:00:00	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	3	1	246	245	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
7:30:00	7	4	514	268	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0
7:45:00	11	4	787	273	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0
8:00:00	15	4	1067	280	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0
8:15:00	20	5	1362	295	0	0	0	0	8	4	0	0	0	0	0	0	0	0	0	0
8:30:00	27	7	1623	261	0	0	0	0	10	2	0	0	0	0	0	0	0	0	0	0
8:45:00	28	1	1888	265	0	0	0	0	13	3	0	0	0	0	0	0	0	0	0	0
9:00:00	30	2	2097	209	0	0	0	0	17	4	0	0	0	0	0	0	0	0	0	0
9:00:05	30	0	2099	2	0	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0
11:00:00	31	1	2101	2	0	0	1	1	19	2	0	0	0	0	0	0	0	0	0	0
11:15:00	32	1	2159	58	0	0	1	0	21	2	0	0	0	0	0	0	0	0	0	0
11:30:00	32	0	2242	83	0	0	1	0	26	5	0	0	0	0	0	0	0	0	0	0
11:45:00	34	2	2298	56	0	0	1	0	30	4	0	0	0	0	0	0	0	0	0	0
12:00:00	34	0	2374	76	0	0	1	0	33	3	0	0	0	0	0	0	0	0	0	0
12:15:00	35	1	2438	64	0	0	1	0	35	2	0	0	0	0	0	0	0	0	0	0
12:30:00	35	0	2517	79	0	0	1	0	38	3	0	0	0	0	0	0	0	0	0	0
12:45:00	37	2	2613	96	0	0	1	0	41	3	0	0	0	0	0	0	0	0	0	0
13:00:00	39	2	2681	68	0	0	1	0	43	2	0	0	0	0	0	0	0	0	0	0
13:15:00	39	0	2745	64	0	0	2	1	46	3	0	0	0	0	0	0	0	0	0	0
13:30:00	40	1	2805	60	0	0	2	0	49	3	0	0	0	0	0	0	0	0	0	0
13:45:00	41	1	2878	73	0	0	2	0	54	5	0	0	0	0	0	0	0	0	0	0
14:00:00	41	0	2948	70	0	0	2	0	55	1	0	0	0	0	0	0	0	0	0	0
14:00:05	41	0	2948	0	0	0	2	0	55	0	0	0	0	0	0	0	0	0	0	0
14:45:00	41	0	2948	0	0	0	2	0	55	0	0	0	0	0	0	0	0	0	0	0
15:00:00	43	2	2955	7	0	0	2	0	55	0	0	0	0	0	0	0	0	0	0	0
15:15:00	43	0	3021	66	0	0	2	0	61	6	0	0	0	0	0	0	0	0	0	0
15:30:00	44	1	3102	81	0	0	2	0	65	4	0	0	0	0	0	0	0	0	0	0
15:45:00	44	0	3197	95	0	0	2	0	68	3	0	0	0	0	0	0	0	0	0	0
16:00:00	45	1	3285	88	0	0	2	0	74	6	0	0	0	0	0	0	0	0	0	0
16:15:00	45	0	3389	104	0	0	2	0	75	1	0	0	0	0	0	0	0	0	0	0
16:30:00	45	0	3488	99	0	0	2	0	80	5	0	0	0	0	0	0	0	0	0	0
16:45:00	45	0	3590	102	0	0	2	0	81	1	0	0	0	0	0	0	0	0	0	0
17:00:00	45	0	3702	112	0	0	2	0	83	2	0	0	0	0	0	0	0	0	0	0
17:15:00	45	0	3789	87	0	0	2	0	84	1	0	0	0	0	0	0	0	0	0	0
17:30:00	47	2	3898	109	0	0	2	0	86	2	0	0	0	0	0	0	0	0	0	0
17:45:00	48	1	3990	92	0	0	2	0	86	0	0	0	0	0	0	0	0	0	0	0
18:00:00	48	0	4080	90	0	0	2	0	88	2	0	0	0	0	0	0	0	0	0	0
18:15:00	48	0	4083	3	0	0	2	0	88	0	0	0	0	0	0	0	0	0	0	0
18:15:04	48	0	4086	3	0	0	2	0	88	0	0	0	0	0	0	0	0	0	0	0

Ontario Traffic Inc

Count Date: 18-Nov-14 Site #: 1427300004

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
7:00:00	1	1	0	0	2	2	3	3	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	5	4	0	0	2	0	6	3	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	8	3	0	0	2	0	7	1	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	10	2	0	0	3	1	15	8	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	11	1	0	0	3	0	23	8	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	12	1	0	0	3	0	24	1	0	0	0	0	0	0	0	0	0	0	0	0
8:30:00	18	6	0	0	3	0	28	4	0	0	0	0	0	0	0	0	0	0	0	0
8:45:00	22	4	0	0	3	0	30	2	0	0	0	0	0	0	0	0	0	0	0	0
9:00:00	26	4	0	0	4	1	36	6	0	0	1	1	0	0	0	0	0	0	0	0
9:00:05	26	0	0	0	4	0	36	0	0	0	1	0	0	0	0	0	0	0	0	0
11:00:00	27	1	0	0	6	2	37	1	0	0	2	1	0	0	0	0	0	0	0	0
11:15:00	29	2	0	0	8	2	39	2	0	0	2	0	0	0	0	0	0	0	0	0
11:30:00	30	1	0	0	8	0	40	1	0	0	2	0	0	0	0	0	0	0	0	0
11:45:00	35	5	0	0	9	1	42	2	0	0	2	0	0	0	0	0	0	0	0	0
12:00:00	40	5	0	0	11	2	43	1	0	0	2	0	0	0	0	0	0	0	0	0
12:15:00	46	6	0	0	12	1	47	4	0	0	2	0	0	0	0	0	0	0	0	0
12:30:00	52	6	0	0	12	0	48	1	0	0	2	0	0	0	0	0	0	0	0	0
12:45:00	66	14	0	0	20	8	50	2	0	0	2	0	0	0	0	0	0	0	0	0
13:00:00	68	2	0	0	22	2	50	0	0	0	3	1	0	0	0	0	0	0	0	0
13:15:00	72	4	0	0	23	1	50	0	0	0	3	0	0	0	0	0	0	0	0	0
13:30:00	76	4	0	0	23	0	54	4	0	0	4	1	0	0	0	0	0	0	0	0
13:45:00	82	6	0	0	27	4	58	4	0	0	4	0	0	0	0	0	0	0	0	0
14:00:00	83	1	0	0	27	0	60	2	0	0	4	0	0	0	0	0	0	0	0	0
14:00:05	83	0	0	0	27	0	60	0	0	0	4	0	0	0	0	0	0	0	0	0
14:45:00	83	0	0	0	27	0	60	0	0	0	4	0	0	0	0	0	0	0	1	1
15:00:00	84	1	0	0	27	0	61	1	0	0	4	0	0	0	0	0	0	0	1	0
15:15:00	87	3	0	0	31	4	64	3	0	0	4	0	0	0	0	0	0	0	1	0
15:30:00	92	5	0	0	33	2	67	3	0	0	4	0	0	0	0	0	0	0	1	0
15:45:00	99	7	0	0	38	5	69	2	0	0	4	0	0	0	0	0	0	0	1	0
16:00:00	106	7	0	0	41	3	70	1	0	0	4	0	0	0	0	0	0	0	1	0
16:15:00	109	3	0	0	45	4	71	1	0	0	4	0	0	0	0	0	0	0	2	1
16:30:00	112	3	0	0	49	4	72	1	0	0	4	0	0	0	0	0	0	0	2	0
16:45:00	118	6	0	0	52	3	73	1	0	0	4	0	0	0	0	0	0	0	2	0
17:00:00	123	5	0	0	57	5	73	0	0	0	4	0	0	0	0	0	0	0	2	0
17:15:00	132	9	0	0	63	6	75	2	0	0	4	0	0	0	0	0	0	0	2	0
17:30:00	136	4	0	0	66	3	77	2	0	0	4	0	0	0	0	0	0	0	2	0
17:45:00	140	4	0	0	67	1	78	1	0	0	4	0	0	0	0	0	0	0	2	0
18:00:00	143	3	0	0	69	2	78	0	0	0	4	0	0	0	0	0	0	0	2	0
18:15:00	143	0	0	0	69	0	78	0	0	0	4	0	0	0	0	0	0	0	2	0
18:15:04	143	0	0	0	69	0	78	0	0	0	4	0	0	0	0	0	0	0	2	0

Ontario Traffic Inc

Count Date: 18-Nov-14 Site #: 1427300004

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
7:00:00	0	0	1	1	2	2	0	0	0	0	2	2	0	0	0	0	0	0	0	0
7:15:00	0	0	59	58	3	1	0	0	2	2	3	1	0	0	0	0	0	0	0	0
7:30:00	0	0	133	74	8	5	0	0	6	4	6	3	0	0	0	0	0	0	0	0
7:45:00	0	0	213	80	11	3	0	0	8	2	10	4	0	0	0	0	0	0	0	0
8:00:00	0	0	301	88	15	4	0	0	9	1	11	1	0	0	0	0	0	0	0	0
8:15:00	0	0	388	87	20	5	0	0	11	2	13	2	0	0	0	0	0	0	0	0
8:30:00	0	0	459	71	25	5	0	0	12	1	20	7	0	0	0	0	0	0	0	0
8:45:00	0	0	525	66	30	5	0	0	14	2	27	7	0	0	0	0	0	0	0	0
9:00:00	0	0	600	75	38	8	0	0	16	2	28	1	0	0	0	0	0	0	0	0
9:00:05	0	0	600	0	38	0	0	0	16	0	28	0	0	0	0	0	0	0	0	0
11:00:00	0	0	603	3	40	2	0	0	18	2	29	1	0	0	0	0	0	0	0	0
11:15:00	0	0	641	38	44	4	0	0	19	1	31	2	0	0	0	0	0	0	0	0
11:30:00	0	0	705	64	47	3	0	0	20	1	36	5	0	0	0	0	0	0	0	0
11:45:00	0	0	764	59	48	1	0	0	20	0	38	2	0	0	0	0	0	0	0	0
12:00:00	0	0	845	81	54	6	0	0	27	7	41	3	0	0	0	0	0	0	0	0
12:15:00	0	0	939	94	58	4	0	0	30	3	46	5	0	0	0	0	0	0	0	0
12:30:00	0	0	1000	61	66	8	0	0	31	1	50	4	0	0	0	0	0	0	0	0
12:45:00	0	0	1065	65	72	6	0	0	34	3	50	0	0	0	0	0	0	0	0	0
13:00:00	0	0	1144	79	77	5	0	0	38	4	52	2	0	0	0	0	0	0	0	0
13:15:00	0	0	1213	69	79	2	0	0	39	1	55	3	0	0	0	0	0	0	0	0
13:30:00	0	0	1306	93	88	9	0	0	40	1	57	2	0	0	0	0	0	0	0	0
13:45:00	0	0	1418	112	90	2	0	0	42	2	58	1	0	0	0	0	0	0	0	0
14:00:00	0	0	1527	109	91	1	0	0	43	1	60	2	0	0	0	0	0	0	0	0
14:00:05	0	0	1529	2	91	0	0	0	43	0	60	0	0	0	0	0	0	0	0	0
14:45:00	0	0	1529	0	91	0	0	0	43	0	60	0	0	0	0	0	0	0	0	0
15:00:00	0	0	1534	5	93	2	0	0	46	3	61	1	0	0	0	0	0	0	0	0
15:15:00	0	0	1658	124	94	1	0	0	50	4	64	3	0	0	0	0	0	0	0	0
15:30:00	0	0	1811	153	97	3	0	0	55	5	67	3	0	0	0	0	0	0	0	0
15:45:00	0	0	1988	177	102	5	0	0	60	5	69	2	0	0	0	0	0	0	0	0
16:00:00	0	0	2174	186	103	1	0	0	60	0	72	3	0	0	0	0	0	0	0	0
16:15:00	0	0	2373	199	107	4	0	0	61	1	75	3	0	0	0	0	0	0	0	0
16:30:00	0	0	2644	271	109	2	0	0	62	1	76	1	0	0	0	0	0	0	0	0
16:45:00	0	0	2923	279	110	1	0	0	62	0	79	3	0	0	0	0	0	0	0	0
17:00:00	0	0	3232	309	112	2	0	0	65	3	83	4	0	0	0	0	0	0	0	0
17:15:00	0	0	3543	311	112	0	0	0	67	2	85	2	0	0	0	0	0	0	0	0
17:30:00	0	0	3831	288	112	0	0	0	72	5	88	3	0	0	0	0	0	0	0	0
17:45:00	0	0	4093	262	114	2	0	0	74	2	91	3	0	0	0	0	0	0	0	0
18:00:00	0	0	4333	240	114	0	0	0	75	1	94	3	0	0	0	0	0	0	0	0
18:15:00	0	0	4333	0	114	0	0	0	75	0	94	0	0	0	0	0	0	0	0	0
18:15:04	0	0	4333	0	114	0	0	0	75	0	94	0	0	0	0	0	0	0	0	0

Ontario Traffic Inc

Count Date: 18-Nov-14 Site #: 1427300004

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
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
9:00:05	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
14:00:05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45:00	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
18:15:04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MG8 ENG

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:30:00
To: 8:30:00

Municipality: Region of Peel
Site #: 0001519708
Intersection: Steeles Ave&Winston Churchill Bld
TFR File #: 7
Count date: 2-May-2013

Weather conditions:

Person(s) who counted:
THOMAS

**** Signalized Intersection ****

Major Road: Steeles Avenue runs W/E

North Leg Total:	2380
North Entering:	1974
North Peds:	0
Peds Cross:	⋈

Cyclists	0	3	0	3
Trucks	4	17	4	25
Cars	23	1221	702	1946
Totals	27	1241	706	

Cyclists	3
Trucks	20
Cars	383
Totals	406

East Leg Total:	5372
East Entering:	1603
East Peds:	0
Peds Cross:	⧖

Winston Churchill Boulevard

Cyclists	Trucks	Cars	Totals
2	71	574	647

Cars	Trucks	Cyclists	Totals
34	2	0	36
444	51	2	497
1036	34	0	1070
1514	87	2	

Steeles Avenue

N
W E
S

Cyclists	Trucks	Cars	Totals
0	7	16	23
8	71	1732	1811
0	18	397	415
8	96	2145	

Steeles Avenue

Cars	Trucks	Cyclists	Totals
3645	115	9	3769

Winston Churchill Boulevard

Peds Cross:	⧖
West Peds:	1
West Entering:	2249
West Leg Total:	2896

Cars	2654
Trucks	69
Cyclists	3
Totals	2726

Cars	107	333	1211	1651
Trucks	16	11	40	67
Cyclists	0	3	1	4
Totals	123	347	1252	

Peds Cross:	⋈
South Peds:	0
South Entering:	1722
South Leg Total:	4448

Comments

MG8 ENG

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

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

Municipality: Region of Peel
Site #: 0001519708
Intersection: Steeles Ave&Winston Churchill Bld
TFR File #: 7
Count date: 2-May-2013

Weather conditions:

Person(s) who counted:
THOMAS

**** Signalized Intersection ****

Major Road: Steeles Avenue runs W/E

North Leg Total:	899
North Entering:	426
North Peds:	0
Peds Cross:	⋈

Cyclists	0	0	0	0
Trucks	6	9	3	18
Cars	20	316	72	408
Totals	26	325	75	

Cyclists	2
Trucks	34
Cars	437
Totals	473

East Leg Total:	1308
East Entering:	624
East Peds:	0
Peds Cross:	⧖

Winston Churchill Boulevard

Cyclists	Trucks	Cars	Totals
0	78	340	418

Cars	Trucks	Cyclists	Totals
72	7	0	79
225	40	0	265
251	29	0	280
548	76	0	

Steeles Avenue

N
W E
S

Cyclists	Trucks	Cars	Totals
0	1	11	12
0	43	223	266
2	19	139	160
2	63	373	

Steeles Avenue

Cars	Trucks	Cyclists	Totals
572	112	0	684

Winston Churchill Boulevard

Peds Cross:	⧖
West Peds:	0
West Entering:	438
West Leg Total:	856

Cars	706
Trucks	57
Cyclists	2
Totals	765

Cars	95	354	277	726
Trucks	32	26	66	124
Cyclists	0	2	0	2
Totals	127	382	343	

Peds Cross:	⋈
South Peds:	0
South Entering:	852
South Leg Total:	1617

Comments

MG8 ENG

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: Region of Peel
Site #: 0001519708
Intersection: Steeles Ave&Winston Churchill Bld
TFR File #: 7
Count date: 2-May-2013

Weather conditions:

Person(s) who counted:
THOMAS

**** Signalized Intersection ****

Major Road: Steeles Avenue runs W/E

North Leg Total:	1883
North Entering:	669
North Peds:	0
Peds Cross:	⋈

Cyclists	0	5	0	5
Trucks	0	5	2	7
Cars	28	504	125	657
Totals	28	514	127	

Cyclists	8
Trucks	31
Cars	1175
Totals	1214

East Leg Total:	4283
East Entering:	2614
East Peds:	1
Peds Cross:	⧖

Winston Churchill Boulevard

Cyclists	Trucks	Cars	Totals
5	82	1957	2044

Cars	Trucks	Cyclists	Totals
184	2	1	187
1331	72	2	1405
983	35	4	1022
2498	109	7	

Steeles Avenue

N
W E
S

Cyclists	Trucks	Cars	Totals
0	0	40	40
1	69	582	652
1	6	180	187
2	75	802	

Steeles Avenue

Cars	Trucks	Cyclists	Totals
1525	142	2	1669

Winston Churchill Boulevard

Peds Cross:	⧖
West Peds:	2
West Entering:	879
West Leg Total:	2923

Cars	1667
Trucks	46
Cyclists	10
Totals	1723

Cars	598	951	818	2367
Trucks	10	29	71	110
Cyclists	3	7	1	11
Totals	611	987	890	

Peds Cross:	⋈
South Peds:	1
South Entering:	2488
South Leg Total:	4211

Comments

MG8 ENG

Total Count Diagram

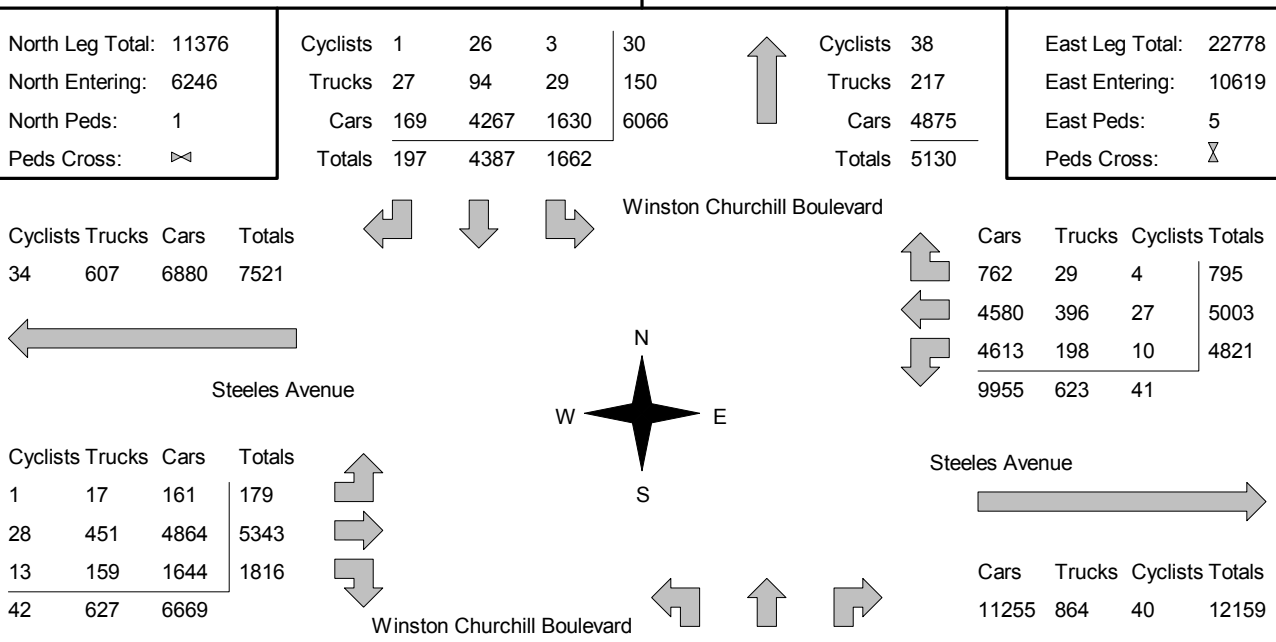
Municipality: Region of Peel
Site #: 0001519708
Intersection: Steeles Ave&Winston Churchill Bld
TFR File #: 7
Count date: 2-May-2013

Weather conditions:

Person(s) who counted:
THOMAS

**** Signalized Intersection ****

Major Road: Steeles Avenue runs W/E



Comments

MG8 ENG
Traffic Count Summary

Intersection: Steeles Av&Winston Churchi l l Bd | **Count Date:** 2-May-2013 | **Municipality:** Region of Peel

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	559	977	36	1572	0	3006
9:00:00	616	1253	21	1890	0	3442
11:00:00	2	0	1	3	0	6
12:00:00	33	194	12	239	0	934
13:00:00	75	325	26	426	0	1278
14:00:00	65	300	17	382	0	1187
15:00:00	3	11	2	16	0	35
16:00:00	95	351	21	467	1	2048
17:00:00	113	497	31	641	0	2819
18:00:00	98	472	30	600	0	3065
Totals:	1659	4380	197	6236	1	17820

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	93	353	988	1434	1
9:00:00	130	286	1136	1552	0
11:00:00	3	0	0	3	0
12:00:00	117	303	275	695	1
13:00:00	127	382	343	852	0
14:00:00	165	377	263	805	0
15:00:00	5	8	6	19	0
16:00:00	427	627	527	1581	0
17:00:00	560	905	713	2178	1
18:00:00	673	904	888	2465	1
Totals:	2300	4145	5139	11584	4

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	835	444	44	1323	2	3194
9:00:00	919	397	31	1347	1	3267
11:00:00	0	4	2	6	0	15
12:00:00	189	253	37	479	0	939
13:00:00	280	265	79	624	0	1062
14:00:00	219	268	85	572	0	1019
15:00:00	8	12	7	27	0	53
16:00:00	517	783	129	1429	1	2008
17:00:00	868	1237	174	2279	1	3069
18:00:00	986	1340	207	2533	0	3322
Totals:	4821	5003	795	10619	5	17948

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	20	1497	354	1871	1
9:00:00	26	1555	339	1920	0
11:00:00	0	5	4	9	0
12:00:00	7	327	126	460	0
13:00:00	12	266	160	438	0
14:00:00	15	242	190	447	0
15:00:00	3	11	12	26	0
16:00:00	16	333	230	579	1
17:00:00	43	534	213	790	3
18:00:00	37	573	179	789	1
Totals:	179	5343	1807	7329	6

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00
Crossing Values:	1632	2000	453	584	607	1151	1582	1676

MG8 ENG

Count Date: 2-May-2013 Site #: 0001519708

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Cyclists - 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
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	89	89	100	100	17	17	1	1	4	4	8	8	0	0	0	0	0	0	0	0
7:30:00	212	123	365	265	17	0	3	2	5	1	8	0	0	0	2	2	0	0	0	0
7:45:00	376	164	685	320	17	0	4	1	11	6	8	0	0	0	2	0	0	0	0	0
8:00:00	553	177	959	274	26	9	6	2	14	3	10	2	0	0	4	2	0	0	0	0
8:15:00	689	136	1235	276	38	12	6	0	19	5	11	1	0	0	5	1	0	0	0	0
8:30:00	914	225	1586	351	40	2	7	1	22	3	12	1	0	0	5	0	0	0	0	0
8:45:00	1090	176	2025	439	42	2	8	1	27	5	13	1	1	1	6	1	0	0	0	0
9:00:00	1165	75	2194	169	44	2	9	1	29	2	13	0	1	0	7	1	0	0	0	0
9:00:16	1167	2	2194	0	44	0	9	0	29	0	13	0	1	0	7	0	0	0	0	0
11:00:00	1167	0	2194	0	45	1	9	0	29	0	13	0	1	0	7	0	0	0	0	0
11:15:00	1170	3	2231	37	49	4	11	2	31	2	13	0	1	0	7	0	0	0	0	0
11:30:00	1174	4	2263	32	51	2	11	0	31	0	14	1	1	0	7	0	0	0	0	0
11:45:00	1185	11	2305	42	52	1	11	0	32	1	14	0	1	0	7	0	0	0	0	0
12:00:00	1198	13	2381	76	56	4	11	0	35	3	14	0	1	0	8	1	0	0	0	0
12:15:00	1221	23	2448	67	59	3	13	2	37	2	15	1	1	0	8	0	0	0	0	0
12:30:00	1233	12	2533	85	62	3	13	0	39	2	15	0	1	0	8	0	0	0	0	0
12:45:00	1253	20	2622	89	72	10	14	1	43	4	17	2	1	0	8	0	0	0	0	0
13:00:00	1270	17	2697	75	76	4	14	0	44	1	20	3	1	0	8	0	0	0	0	0
13:15:00	1285	15	2762	65	80	4	15	1	49	5	20	0	2	1	9	1	0	0	0	0
13:30:00	1303	18	2837	75	86	6	15	0	55	6	24	4	2	0	9	0	0	0	0	0
13:45:00	1310	7	2901	64	87	1	15	0	61	6	24	0	3	1	9	0	0	0	0	0
14:00:00	1331	21	2970	69	89	2	16	1	68	7	24	0	3	0	11	2	0	0	0	0
14:01:00	1331	0	2970	0	90	1	16	0	68	0	24	0	3	0	11	0	0	0	0	0
15:00:00	1334	3	2980	10	91	1	16	0	68	0	24	0	3	0	12	1	0	0	0	0
15:15:00	1355	21	3044	64	93	2	16	0	71	3	25	1	3	0	15	3	0	0	0	0
15:30:00	1372	17	3128	84	97	4	16	0	75	4	25	0	3	0	17	2	0	0	0	0
15:45:00	1396	24	3208	80	99	2	17	1	76	1	25	0	3	0	17	0	1	1	1	1
16:00:00	1423	27	3313	105	108	9	22	5	80	4	27	2	3	0	18	1	1	0	1	0
16:15:00	1447	24	3400	87	114	6	24	2	80	0	27	0	3	0	19	1	1	0	1	0
16:30:00	1470	23	3550	150	127	13	24	0	83	3	27	0	3	0	19	0	1	0	1	0
16:45:00	1490	20	3680	130	131	4	25	1	86	3	27	0	3	0	19	0	1	0	1	0
17:00:00	1533	43	3801	121	139	8	25	0	88	2	27	0	3	0	19	0	1	0	1	0
17:15:00	1562	29	3896	95	147	8	26	1	88	0	27	0	3	0	22	3	1	0	1	0
17:30:00	1595	33	4054	158	155	8	26	0	88	0	27	0	3	0	24	2	1	0	1	0
17:45:00	1604	9	4177	123	162	7	26	0	90	2	27	0	3	0	24	0	1	0	1	0
18:00:00	1627	23	4260	83	169	7	29	3	94	4	27	0	3	0	26	2	1	0	1	0
18:00:34	1630	3	4267	7	169	0	29	0	94	0	27	0	3	0	26	0	1	0	1	0

MG8 ENG

Count Date: 2-May-2013 Site #: 0001519708

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Cyclists - 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
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	94	94	58	58	9	9	3	3	10	10	0	0	0	0	1	1	0	0	0	0
7:30:00	322	228	152	94	18	9	5	2	25	15	2	2	0	0	3	2	0	0	2	2
7:45:00	599	277	285	133	31	13	8	3	42	17	3	1	0	0	3	0	0	0	2	0
8:00:00	817	218	381	96	41	10	18	10	58	16	3	0	0	0	5	2	0	0	2	0
8:15:00	1098	281	504	123	46	5	30	12	71	13	3	0	0	0	5	0	0	0	2	0
8:30:00	1358	260	596	92	52	6	39	9	76	5	4	1	0	0	5	0	0	0	2	0
8:45:00	1581	223	684	88	62	10	45	6	91	15	5	1	0	0	5	0	0	0	3	1
9:00:00	1702	121	729	45	69	7	52	7	106	15	6	1	0	0	6	1	0	0	3	0
9:00:16	1702	0	729	0	69	0	52	0	106	0	6	0	0	0	6	0	0	0	3	0
11:00:00	1702	0	733	4	71	2	52	0	106	0	6	0	0	0	6	0	0	0	3	0
11:15:00	1736	34	802	69	78	7	58	6	113	7	7	1	0	0	6	0	0	0	3	0
11:30:00	1765	29	854	52	85	7	64	6	121	8	7	0	0	0	7	1	0	0	3	0
11:45:00	1817	52	902	48	94	9	71	7	135	14	9	2	0	0	7	0	0	0	3	0
12:00:00	1867	50	945	43	105	11	76	5	146	11	9	0	0	0	7	0	0	0	3	0
12:15:00	1922	55	994	49	123	18	80	4	158	12	12	3	0	0	7	0	0	0	3	0
12:30:00	1992	70	1053	59	142	19	88	8	164	6	13	1	0	0	7	0	0	0	3	0
12:45:00	2048	56	1121	68	161	19	99	11	173	9	16	3	0	0	7	0	0	0	3	0
13:00:00	2118	70	1170	49	177	16	105	6	186	13	16	0	0	0	7	0	0	0	3	0
13:15:00	2152	34	1208	38	189	12	108	3	192	6	17	1	0	0	8	1	0	0	3	0
13:30:00	2213	61	1254	46	205	16	115	7	202	10	17	0	0	0	8	0	0	0	3	0
13:45:00	2268	55	1340	86	234	29	121	6	211	9	19	2	0	0	9	1	1	1	3	0
14:00:00	2316	48	1397	57	257	23	126	5	223	12	19	0	0	0	11	2	2	1	3	0
14:01:00	2317	1	1401	4	258	1	126	0	223	0	19	0	0	0	11	0	2	0	3	0
15:00:00	2324	7	1409	8	264	6	126	0	223	0	19	0	0	0	11	0	2	0	3	0
15:15:00	2401	77	1518	109	293	29	129	3	238	15	20	1	0	0	11	0	3	1	3	0
15:30:00	2504	103	1656	138	312	19	133	4	256	18	22	2	2	2	12	1	3	0	3	0
15:45:00	2666	162	1853	197	328	16	139	6	266	10	22	0	3	1	12	0	3	0	4	1
16:00:00	2816	150	2127	274	387	59	146	7	284	18	24	2	5	2	15	3	3	0	4	0
16:15:00	2990	174	2379	252	423	36	148	2	292	8	24	0	6	1	17	2	3	0	4	0
16:30:00	3192	202	2645	266	473	50	154	6	304	12	25	1	6	0	17	0	3	0	4	0
16:45:00	3406	214	2943	298	517	44	167	13	325	21	27	2	7	1	17	0	3	0	5	1
17:00:00	3651	245	3297	354	558	41	177	10	348	23	27	0	7	0	18	1	3	0	5	0
17:15:00	3921	270	3580	283	598	40	185	8	362	14	27	0	9	2	18	0	3	0	5	0
17:30:00	4175	254	3976	396	657	59	189	4	376	14	27	0	10	1	19	1	4	1	5	0
17:45:00	4452	277	4295	319	708	51	195	6	381	5	27	0	10	0	22	3	4	0	5	0
18:00:00	4613	161	4580	285	762	54	198	3	396	15	29	2	10	0	27	5	4	0	5	0
18:00:34	4613	0	4580	0	762	0	198	0	396	0	29	0	10	0	27	0	4	0	5	0

MG8 ENG

Count Date: 2-May-2013 Site #: 0001519708

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Cyclists - 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
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	14	14	71	71	146	146	3	3	4	4	9	9	0	0	0	0	0	0	0	0
7:30:00	38	24	140	69	377	231	6	3	9	5	24	15	0	0	0	0	1	1	1	1
7:45:00	59	21	206	66	668	291	7	1	12	3	28	4	0	0	1	1	1	0	1	0
8:00:00	84	25	337	131	951	283	9	2	14	2	36	8	0	0	2	1	1	0	1	0
8:15:00	114	30	395	58	1274	323	16	7	16	2	51	15	0	0	2	0	1	0	1	0
8:30:00	145	31	473	78	1588	314	22	6	20	4	64	13	0	0	3	1	2	1	1	0
8:45:00	175	30	566	93	1855	267	29	7	25	5	85	21	0	0	3	0	3	1	1	0
9:00:00	186	11	607	41	2020	165	37	8	29	4	100	15	0	0	3	0	4	1	1	0
9:00:16	187	1	607	0	2020	0	39	2	29	0	100	0	0	0	3	0	4	0	1	0
11:00:00	187	0	607	0	2020	0	39	0	29	0	100	0	0	0	3	0	4	0	1	0
11:15:00	209	22	654	47	2059	39	44	5	33	4	115	15	0	0	3	0	5	1	2	1
11:30:00	221	12	749	95	2138	79	55	11	39	6	131	16	0	0	3	0	5	0	2	0
11:45:00	239	18	808	59	2181	43	61	6	42	3	139	8	0	0	3	0	5	0	2	0
12:00:00	278	39	894	86	2238	57	65	4	44	2	156	17	0	0	4	1	5	0	2	0
12:15:00	298	20	980	86	2303	65	67	2	45	1	165	9	0	0	5	1	5	0	2	0
12:30:00	314	16	1068	88	2392	89	75	8	54	9	205	40	0	0	5	0	5	0	2	0
12:45:00	334	20	1163	95	2464	72	90	15	64	10	218	13	0	0	6	1	5	0	2	0
13:00:00	373	39	1248	85	2515	51	97	7	70	6	222	4	0	0	6	0	5	0	2	0
13:15:00	404	31	1334	86	2560	45	106	9	71	1	226	4	0	0	6	0	6	1	2	0
13:30:00	440	36	1422	88	2621	61	113	7	77	6	238	12	1	1	7	1	6	0	2	0
13:45:00	462	22	1506	84	2693	72	122	9	85	8	246	8	1	0	8	1	6	0	2	0
14:00:00	503	41	1604	98	2749	56	131	9	87	2	250	4	1	0	10	2	6	0	2	0
14:01:00	503	0	1604	0	2751	2	131	0	87	0	250	0	1	0	10	0	6	0	2	0
15:00:00	508	5	1612	8	2755	4	131	0	87	0	250	0	1	0	10	0	6	0	2	0
15:15:00	576	68	1714	102	2850	95	136	5	95	8	259	9	1	0	10	0	7	1	2	0
15:30:00	678	102	1837	123	2933	83	145	9	103	8	263	4	1	0	11	1	8	1	2	0
15:45:00	802	124	1994	157	3093	160	150	5	112	9	270	7	1	0	15	4	8	0	2	0
16:00:00	911	109	2194	200	3247	154	155	5	125	13	283	13	1	0	17	2	8	0	2	0
16:15:00	1023	112	2375	181	3403	156	159	4	128	3	290	7	1	0	21	4	8	0	3	1
16:30:00	1177	154	2576	201	3544	141	164	5	131	3	297	7	1	0	22	1	8	0	3	0
16:45:00	1316	139	2871	295	3717	173	169	5	148	17	309	12	3	2	25	3	8	0	3	0
17:00:00	1454	138	3064	193	3915	198	169	0	150	2	328	19	4	1	27	2	8	0	3	0
17:15:00	1637	183	3266	202	4108	193	171	2	154	4	352	24	4	0	28	1	9	1	3	0
17:30:00	1775	138	3527	261	4362	254	174	3	160	6	368	16	4	0	29	1	9	0	4	1
17:45:00	1964	189	3763	236	4525	163	176	2	166	6	377	9	4	0	32	3	9	0	4	0
18:00:00	2112	148	3942	179	4746	221	182	6	170	4	384	7	6	2	33	1	9	0	4	0
18:00:34	2131	19	3952	10	4761	15	184	2	171	1	384	0	6	0	33	0	9	0	4	0

MG8 ENG

Count Date: 2-May-2013 Site #: 0001519708

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Cyclists - 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
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	3	3	169	169	37	37	0	0	6	6	3	3	0	0	2	2	1	1	0	0
7:30:00	8	5	588	419	123	86	1	1	13	7	5	2	0	0	3	1	1	0	0	0
7:45:00	12	4	1019	431	216	93	4	3	29	16	7	2	0	0	7	4	1	0	0	0
8:00:00	14	2	1442	423	343	127	6	2	46	17	10	3	0	0	9	2	1	0	1	1
8:15:00	19	5	1888	446	432	89	7	1	63	17	18	8	0	0	9	0	1	0	1	0
8:30:00	24	5	2320	432	520	88	8	1	84	21	23	5	0	0	11	2	1	0	1	0
8:45:00	31	7	2684	364	601	81	8	0	102	18	30	7	0	0	12	1	1	0	1	0
9:00:00	38	7	2911	227	650	49	8	0	126	24	42	12	0	0	15	3	1	0	1	0
9:00:16	38	0	2912	1	650	0	8	0	126	0	42	0	0	0	15	0	1	0	1	0
11:00:00	38	0	2916	4	654	4	8	0	126	0	42	0	0	0	15	0	1	0	1	0
11:15:00	40	2	2977	61	679	25	10	2	140	14	43	1	0	0	17	2	1	0	1	0
11:30:00	40	0	3052	75	719	40	10	0	156	16	50	7	0	0	17	0	2	1	1	0
11:45:00	40	0	3134	82	730	11	10	0	183	27	53	3	0	0	17	0	2	0	1	0
12:00:00	43	3	3173	39	758	28	10	0	193	10	63	10	0	0	18	1	2	0	1	0
12:15:00	43	0	3207	34	791	33	10	0	203	10	70	7	0	0	18	0	2	0	1	0
12:30:00	47	4	3262	55	824	33	11	1	213	10	77	7	0	0	18	0	4	2	1	0
12:45:00	51	4	3346	84	863	39	11	0	227	14	79	2	0	0	18	0	4	0	1	0
13:00:00	54	3	3396	50	897	34	11	0	236	9	82	3	0	0	18	0	4	0	1	0
13:15:00	58	4	3440	44	937	40	11	0	249	13	89	7	0	0	19	1	5	1	1	0
13:30:00	59	1	3500	60	970	33	11	0	257	8	99	10	0	0	19	0	5	0	1	0
13:45:00	62	3	3541	41	1010	40	11	0	279	22	105	6	0	0	22	3	7	2	1	0
14:00:00	67	5	3577	36	1050	40	13	2	293	14	115	10	0	0	22	0	8	1	1	0
14:01:00	68	1	3582	5	1053	3	13	0	296	3	115	0	0	0	22	0	8	0	1	0
15:00:00	70	2	3585	3	1062	9	13	0	296	0	115	0	0	0	22	0	8	0	1	0
15:15:00	75	5	3638	53	1097	35	14	1	303	7	124	9	0	0	22	0	9	1	1	0
15:30:00	81	6	3712	74	1163	66	14	0	309	6	128	4	0	0	23	1	9	0	1	0
15:45:00	83	2	3769	57	1218	55	14	0	325	16	133	5	0	0	23	0	9	0	2	1
16:00:00	85	2	3869	100	1267	49	14	0	342	17	138	5	0	0	25	2	10	1	2	0
16:15:00	97	12	3953	84	1311	44	14	0	351	9	147	9	1	1	26	1	10	0	4	2
16:30:00	102	5	4039	86	1371	60	15	1	362	11	148	1	1	0	26	0	10	0	4	0
16:45:00	112	10	4188	149	1427	56	15	0	381	19	149	1	1	0	26	0	10	0	4	0
17:00:00	126	14	4344	156	1466	39	15	0	399	18	151	2	1	0	27	1	11	1	5	1
17:15:00	136	10	4504	160	1506	40	15	0	418	19	152	1	1	0	27	0	11	0	6	1
17:30:00	142	6	4621	117	1551	45	15	0	431	13	154	2	1	0	27	0	11	0	6	0
17:45:00	155	13	4759	138	1597	46	17	2	437	6	156	2	1	0	28	1	11	0	6	0
18:00:00	161	6	4864	105	1635	38	17	0	451	14	159	3	1	0	28	0	13	2	6	0
18:00:34	161	0	4864	0	1644	9	17	0	451	0	159	0	1	0	28	0	13	0	6	0

Ontario Traffic Inc

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:30:00
To: 8:30:00

Municipality: Mississauga
Site #: 1427300003
Intersection: Winston Churchill Blvd & Orlando D
TFR File #: 3
Count date: 18-Nov-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Winston Churchill Blvd runs N/S

North Leg Total: 2908
North Entering: 1857
North Peds: 0
Peds Cross: ⋈

Heavys	0	0	0
Trucks	63	3	66
Cars	1786	5	1791
Totals	1849	8	

Heavys	0
Trucks	51
Cars	1000
Totals	1051

East Leg Total: 84
East Entering: 15
East Peds: 0
Peds Cross: ⋈

Winston Churchill Blvd

	Cars	Trucks	Heavys	Totals
	2	2	0	4
	1	10	0	11
	3	12	0	

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Orlando Development Access

Cars	Trucks	Heavys	Totals
63	6	0	69

Winston Churchill Blvd

Cars	1787		
Trucks	73		
Heavys	0		
Totals	1860		

Cars	998	58	1056
Trucks	49	3	53
Heavys	0	0	0
Totals	1047	61	

Peds Cross: ⋈
South Peds: 1
South Entering: 1109
South Leg Total: 2969

Comments

Ontario Traffic Inc

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

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

Municipality: Mississauga
Site #: 1427300003
Intersection: Winston Churchill Blvd & Orlando D
TFR File #: 3
Count date: 18-Nov-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Winston Churchill Blvd runs N/S

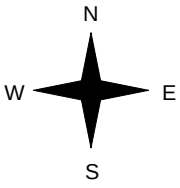
North Leg Total: 1456
North Entering: 717
North Peds: 0
Peds Cross: ⋈

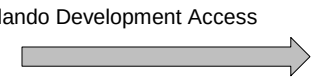
Heavys	0	0	0
Trucks	69	7	76
Cars	630	11	641
Totals	699	18	

Heavys	0
Trucks	65
Cars	674
Totals	739

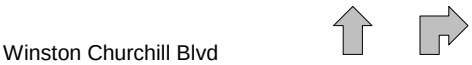
East Leg Total: 50
East Entering: 20
East Peds: 0
Peds Cross: ⋈

	Cars	Trucks	Heavys	Totals
	0	4	0	4
	6	10	0	16
	6	14	0	





Cars	Trucks	Heavys	Totals
17	13	0	30



Cars	636		
Trucks	79		
Heavys	0		
Totals	715		

Cars	674	6	680
Trucks	61	6	67
Heavys	0	0	0
Totals	735	12	

Peds Cross: ⋈
South Peds: 0
South Entering: 747
South Leg Total: 1462

Comments

Ontario Traffic Inc

Afternoon Peak Diagram

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

One Hour Peak
From: 17:00:00
To: 18:00:00

Municipality: Mississauga
Site #: 1427300003
Intersection: Winston Churchill Blvd & Orlando D
TFR File #: 3
Count date: 18-Nov-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Winston Churchill Blvd runs N/S

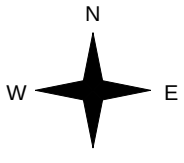
North Leg Total: 3307
North Entering: 1176
North Peds: 2
Peds Cross: ⋈

Heavys	0	0	0
Trucks	21	2	23
Cars	1098	55	1153
Totals	1119	57	

Heavys	0
Trucks	39
Cars	2092
Totals	2131

East Leg Total: 130
East Entering: 48
East Peds: 0
Peds Cross: ⋈

	Cars	Trucks	Heavys	Totals
	6	1	0	7
	36	5	0	41
	42	6	0	



Cars	Trucks	Heavys	Totals
78	4	0	82

Cars	1134	Cars	2086	23	2109
Trucks	26	Trucks	38	2	40
Heavys	0	Heavys	0	0	0
Totals	1160	Totals	2124	25	

Peds Cross: ⋈
South Peds: 0
South Entering: 2149
South Leg Total: 3309

Comments

Ontario Traffic Inc

Total Count Diagram

Municipality: Mississauga
Site #: 1427300003
Intersection: Winston Churchill Blvd & Orlando D
TFR File #: 3
Count date: 18-Nov-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Winston Churchill Blvd runs N/S

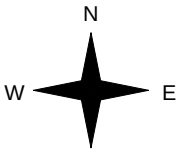
North Leg Total: 17455
North Entering: 8351
North Peds: 2
Peds Cross: ⋈

Heavys	0	0	0
Trucks	392	24	417
Cars	7836	98	7934
Totals	8228	122	

Heavys	0
Trucks	470
Cars	8634
Totals	9104

East Leg Total: 515
East Entering: 174
East Peds: 2
Peds Cross: ⋈

Cars	Trucks	Heavys	Totals
26	18	0	44
88	42	0	130
114	60	0	



Orlando Development Access

Cars	Trucks	Heavys	Totals
287	54	0	341

Winston Churchill Blvd

Cars	7924		
Trucks	434		
Heavys	0		
Totals	8358		

Cars	8608	189	8797
Trucks	452	30	485
Heavys	0	0	0
Totals	9060	219	

Peds Cross: ⋈
South Peds: 5
South Entering: 9282
South Leg Total: 17640

Comments

Ontario Traffic Inc
Traffic Count Summary

Intersection: Winston Churchill Blvd & Orlando D | **Count Date:** 18-Nov-14 | **Municipality:** Mississauga

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	19	1564	0	1583	0	2671
9:00:00	5	1721	0	1726	0	2754
11:00:00	0	0	0	0	0	0
12:00:00	10	606	1	617	0	1196
13:00:00	14	692	0	706	0	1444
14:00:00	10	680	0	690	0	1439
15:00:00	0	0	0	0	0	0
16:00:00	2	858	0	860	0	2022
17:00:00	5	984	0	989	0	2772
18:00:00	57	1119	0	1176	2	3325
Totals:	122	8224	1	8347	2	17623

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	1	1038	49	1088	0
9:00:00	1	927	100	1028	1
11:00:00	0	0	0	0	1
12:00:00	0	572	7	579	0
13:00:00	1	726	11	738	0
14:00:00	0	736	13	749	1
15:00:00	0	0	0	0	0
16:00:00	0	1156	6	1162	0
17:00:00	0	1775	8	1783	2
18:00:00	0	2124	25	2149	0
Totals:	3	9054	219	9276	5

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	15	0	3	18	0	18
9:00:00	14	0	5	19	1	19
11:00:00	0	0	0	0	0	0
12:00:00	8	0	9	17	0	17
13:00:00	10	0	5	15	0	15
14:00:00	19	0	5	24	1	24
15:00:00	0	0	0	0	0	0
16:00:00	16	0	6	22	0	22
17:00:00	7	0	4	11	0	11
18:00:00	41	0	7	48	0	48
Totals:	130	0	44	174	2	174

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	0	0	0	0	0
9:00:00	0	0	0	0	0
11:00:00	0	0	0	0	0
12:00:00	0	0	0	0	0
13:00:00	0	0	0	0	0
14:00:00	0	0	0	0	0
15:00:00	0	0	0	0	0
16:00:00	0	0	0	0	0
17:00:00	0	0	0	0	0
18:00:00	0	0	0	0	0
Totals:	0	0	0	0	0

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00
Crossing Values:	15	15	8	10	20	16	9	43

Ontario Traffic Inc

Count Date: 18-Nov-14 Site #: 1427300003

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
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	4	4	249	249	0	0	1	1	9	9	0	0	0	0	0	0	0	0	0	0
7:30:00	10	6	611	362	0	0	3	2	19	10	0	0	0	0	0	0	0	0	0	0
7:45:00	11	1	1056	445	0	0	3	0	39	20	0	0	0	0	0	0	0	0	0	0
8:00:00	14	3	1505	449	0	0	5	2	59	20	0	0	0	0	0	0	0	0	0	0
8:15:00	14	0	1995	490	0	0	5	0	67	8	0	0	0	0	0	0	0	0	0	0
8:30:00	15	1	2397	402	0	0	6	1	82	15	0	0	0	0	0	0	0	0	0	0
8:45:00	15	0	2787	390	0	0	7	1	97	15	0	0	0	0	0	0	0	0	0	0
9:00:00	17	2	3170	383	0	0	7	0	115	18	0	0	0	0	0	0	0	0	0	0
9:00:08	17	0	3170	0	0	0	7	0	115	0	0	0	0	0	0	0	0	0	0	0
11:00:00	17	0	3170	0	0	0	7	0	115	0	0	0	0	0	0	0	0	0	0	0
11:15:00	18	1	3291	121	0	0	8	1	132	17	0	0	0	0	0	0	0	0	0	0
11:30:00	20	2	3443	152	0	0	8	0	146	14	1	1	0	0	0	0	0	0	0	0
11:45:00	23	3	3556	113	0	0	9	1	160	14	1	0	0	0	0	0	0	0	0	0
12:00:00	24	1	3717	161	0	0	10	1	174	14	1	0	0	0	0	0	0	0	0	0
12:15:00	25	1	3863	146	0	0	10	0	184	10	1	0	0	0	0	0	0	0	0	0
12:30:00	26	1	4041	178	0	0	10	0	200	16	1	0	0	0	0	0	0	0	0	0
12:45:00	27	1	4203	162	0	0	12	2	208	8	1	0	0	0	0	0	0	0	0	0
13:00:00	32	5	4359	156	0	0	16	4	224	16	1	0	0	0	0	0	0	0	0	0
13:15:00	35	3	4503	144	0	0	18	2	240	16	1	0	0	0	0	0	0	0	0	0
13:30:00	37	2	4672	169	0	0	18	0	258	18	1	0	0	0	0	0	0	0	0	0
13:45:00	38	1	4833	161	0	0	19	1	277	19	1	0	0	0	0	0	0	0	0	0
14:00:00	38	0	4976	143	0	0	20	1	287	10	1	0	0	0	0	0	0	0	0	0
14:00:06	38	0	4976	0	0	0	20	0	287	0	1	0	0	0	0	0	0	0	0	0
15:00:00	38	0	4976	0	0	0	20	0	287	0	1	0	0	0	0	0	0	0	0	0
15:15:00	38	0	5120	144	0	0	20	0	297	10	1	0	0	0	0	0	0	0	0	0
15:30:00	39	1	5329	209	0	0	21	1	311	14	1	0	0	0	0	0	0	0	0	0
15:45:00	39	0	5547	218	0	0	21	0	318	7	1	0	0	0	0	0	0	0	0	0
16:00:00	39	0	5793	246	0	0	21	0	328	10	1	0	0	0	0	0	0	0	0	0
16:15:00	40	1	6014	221	0	0	21	0	335	7	1	0	0	0	0	0	0	0	0	0
16:30:00	40	0	6278	264	0	0	21	0	351	16	1	0	0	0	0	0	0	0	0	0
16:45:00	41	1	6502	224	0	0	21	0	356	5	1	0	0	0	0	0	0	0	0	0
17:00:00	43	2	6734	232	0	0	22	1	371	15	1	0	0	0	0	0	0	0	0	0
17:15:00	48	5	7050	316	0	0	22	0	379	8	1	0	0	0	0	0	0	0	0	0
17:30:00	63	15	7310	260	0	0	22	0	387	8	1	0	0	0	0	0	0	0	0	0
17:45:00	89	26	7634	324	0	0	24	2	392	5	1	0	0	0	0	0	0	0	0	0
18:00:00	98	9	7832	198	0	0	24	0	392	0	1	0	0	0	0	0	0	0	2	2
18:15:00	98	0	7834	2	0	0	24	0	392	0	1	0	0	0	0	0	0	0	2	0
18:15:31	98	0	7836	2	0	0	24	0	392	0	1	0	0	0	0	0	0	0	2	0

Ontario Traffic Inc

Count Date: 18-Nov-14 Site #: 1427300003

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
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	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	9	8	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	9	0	0	0	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	10	1	0	0	2	0	5	4	0	0	1	1	0	0	0	0	0	0	0	0
8:15:00	10	0	0	0	3	1	7	2	0	0	2	1	0	0	0	0	0	0	0	0
8:30:00	10	0	0	0	4	1	10	3	0	0	2	0	0	0	0	0	0	0	0	0
8:45:00	12	2	0	0	5	1	14	4	0	0	2	0	0	0	0	0	0	0	0	0
9:00:00	14	2	0	0	6	1	15	1	0	0	2	0	0	0	0	0	0	0	1	1
9:00:08	14	0	0	0	6	0	15	0	0	0	2	0	0	0	0	0	0	0	1	0
11:00:00	14	0	0	0	6	0	15	0	0	0	2	0	0	0	0	0	0	0	1	0
11:15:00	14	0	0	0	6	0	16	1	0	0	2	0	0	0	0	0	0	0	1	0
11:30:00	15	1	0	0	7	1	16	0	0	0	3	1	0	0	0	0	0	0	1	0
11:45:00	18	3	0	0	9	2	17	1	0	0	4	1	0	0	0	0	0	0	1	0
12:00:00	19	1	0	0	11	2	18	1	0	0	6	2	0	0	0	0	0	0	1	0
12:15:00	22	3	0	0	12	1	20	2	0	0	6	0	0	0	0	0	0	0	1	0
12:30:00	22	0	0	0	13	1	21	1	0	0	6	0	0	0	0	0	0	0	1	0
12:45:00	24	2	0	0	13	0	21	0	0	0	8	2	0	0	0	0	0	0	1	0
13:00:00	24	0	0	0	13	0	23	2	0	0	9	1	0	0	0	0	0	0	1	0
13:15:00	25	1	0	0	13	0	26	3	0	0	11	2	0	0	0	0	0	0	1	0
13:30:00	29	4	0	0	13	0	29	3	0	0	12	1	0	0	0	0	0	0	1	0
13:45:00	30	1	0	0	13	0	31	2	0	0	12	0	0	0	0	0	0	0	1	0
14:00:00	33	3	0	0	14	1	33	2	0	0	13	1	0	0	0	0	0	0	2	1
14:00:06	33	0	0	0	14	0	33	0	0	0	13	0	0	0	0	0	0	0	2	0
15:00:00	33	0	0	0	14	0	33	0	0	0	13	0	0	0	0	0	0	0	2	0
15:15:00	36	3	0	0	14	0	36	3	0	0	14	1	0	0	0	0	0	0	2	0
15:30:00	43	7	0	0	18	4	36	0	0	0	14	0	0	0	0	0	0	0	2	0
15:45:00	43	0	0	0	18	0	37	1	0	0	14	0	0	0	0	0	0	0	2	0
16:00:00	45	2	0	0	19	1	37	0	0	0	14	0	0	0	0	0	0	0	2	0
16:15:00	47	2	0	0	19	0	37	0	0	0	14	0	0	0	0	0	0	0	2	0
16:30:00	51	4	0	0	19	0	37	0	0	0	16	2	0	0	0	0	0	0	2	0
16:45:00	51	0	0	0	19	0	37	0	0	0	16	0	0	0	0	0	0	0	2	0
17:00:00	52	1	0	0	20	1	37	0	0	0	17	1	0	0	0	0	0	0	2	0
17:15:00	54	2	0	0	20	0	38	1	0	0	18	1	0	0	0	0	0	0	2	0
17:30:00	56	2	0	0	20	0	38	0	0	0	18	0	0	0	0	0	0	0	2	0
17:45:00	75	19	0	0	23	3	39	1	0	0	18	0	0	0	0	0	0	0	2	0
18:00:00	88	13	0	0	26	3	42	3	0	0	18	0	0	0	0	0	0	0	2	0
18:15:00	88	0	0	0	26	0	42	0	0	0	18	0	0	0	0	0	0	0	2	0
18:15:31	88	0	0	0	26	0	42	0	0	0	18	0	0	0	0	0	0	0	2	0

Ontario Traffic Inc

Count Date: 18-Nov-14 Site #: 1427300003

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
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	187	187	8	8	0	0	11	11	1	1	0	0	0	0	0	0	0	0
7:30:00	0	0	438	251	22	14	1	1	34	23	2	1	0	0	0	0	0	0	0	0
7:45:00	0	0	719	281	27	5	1	0	50	16	4	2	0	0	0	0	0	0	0	0
8:00:00	0	0	974	255	45	18	1	0	64	14	4	0	0	0	0	0	0	0	0	0
8:15:00	0	0	1216	242	58	13	1	0	68	4	4	0	0	0	0	0	0	0	1	1
8:30:00	0	0	1436	220	80	22	2	1	83	15	5	1	0	0	0	0	0	0	1	0
8:45:00	0	0	1649	213	102	22	2	0	96	13	6	1	0	0	0	0	0	0	1	0
9:00:00	0	0	1855	206	142	40	2	0	110	14	7	1	0	0	0	0	0	0	1	0
9:00:08	0	0	1855	0	142	0	2	0	110	0	7	0	0	0	0	0	0	0	1	0
11:00:00	0	0	1855	0	142	0	2	0	110	0	7	0	0	0	0	0	0	0	2	1
11:15:00	0	0	1973	118	142	0	2	0	124	14	7	0	0	0	0	0	0	0	2	0
11:30:00	0	0	2093	120	142	0	2	0	140	16	9	2	0	0	0	0	0	0	2	0
11:45:00	0	0	2210	117	144	2	2	0	151	11	11	2	0	0	0	0	0	0	2	0
12:00:00	0	0	2365	155	144	0	2	0	172	21	12	1	0	0	0	0	0	0	2	0
12:15:00	0	0	2535	170	147	3	3	1	186	14	13	1	0	0	0	0	0	0	2	0
12:30:00	0	0	2704	169	149	2	3	0	202	16	15	2	0	0	0	0	0	0	2	0
12:45:00	0	0	2843	139	149	0	3	0	222	20	15	0	0	0	0	0	0	0	2	0
13:00:00	0	0	3019	176	149	0	3	0	244	22	18	3	0	0	0	0	0	0	2	0
13:15:00	0	0	3175	156	150	1	3	0	253	9	19	1	0	0	0	0	0	0	2	0
13:30:00	0	0	3330	155	151	1	3	0	269	16	20	1	0	0	0	0	0	0	2	0
13:45:00	0	0	3517	187	155	4	3	0	283	14	21	1	0	0	0	0	0	0	2	0
14:00:00	0	0	3702	185	158	3	3	0	297	14	22	1	0	0	0	0	0	0	3	1
14:00:06	0	0	3702	0	158	0	3	0	297	0	22	0	0	0	0	0	0	0	3	0
15:00:00	0	0	3702	0	158	0	3	0	297	0	22	0	0	0	0	0	0	0	3	0
15:15:00	0	0	3904	202	158	0	3	0	314	17	23	1	0	0	0	0	0	0	3	0
15:30:00	0	0	4164	260	159	1	3	0	327	13	23	0	0	0	0	0	0	0	3	0
15:45:00	0	0	4480	316	161	2	3	0	338	11	23	0	0	0	0	0	0	0	3	0
16:00:00	0	0	4805	325	162	1	3	0	350	12	24	1	0	0	0	0	0	0	3	0
16:15:00	0	0	5147	342	163	1	3	0	365	15	24	0	0	0	0	0	0	0	4	1
16:30:00	0	0	5562	415	163	0	3	0	377	12	26	2	0	0	0	0	0	0	4	0
16:45:00	0	0	6053	491	164	1	3	0	399	22	26	0	0	0	0	0	0	0	4	0
17:00:00	0	0	6516	463	166	2	3	0	414	15	28	2	0	0	0	0	0	0	5	1
17:15:00	0	0	7070	554	168	2	3	0	422	8	29	1	0	0	0	0	0	0	5	0
17:30:00	0	0	7542	472	173	5	3	0	436	14	30	1	0	0	0	0	0	0	5	0
17:45:00	0	0	8050	508	183	10	3	0	443	7	30	0	0	0	0	0	0	0	5	0
18:00:00	0	0	8602	552	189	6	3	0	452	9	30	0	0	0	0	0	0	0	5	0
18:15:00	0	0	8605	3	189	0	3	0	452	0	30	0	0	0	0	0	0	0	5	0
18:15:31	0	0	8608	3	189	0	3	0	452	0	30	0	0	0	0	0	0	0	5	0

Ontario Traffic Inc

Count Date: 18-Nov-14 Site #: 1427300003

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
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
9:00:08	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
14:00:06	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
18:15:31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MG8 ENG

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

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

Municipality: Region of Peel
Site #: 0001918686
Intersection: Winston Churchill Bld & Meadowpine Blvd
TFR File #: 5
Count date: 5-Jun-2013

Weather conditions:

Person(s) who counted:
PREDO

**** Signalized Intersection ****

Major Road: Winston Churchill Bld runs N/S

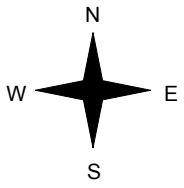
North Leg Total: 2551
North Entering: 1547
North Peds: 0
Peds Cross: ⋈

Cyclists	4	1	5
Trucks	75	10	85
Cars	1238	219	1457
Totals	1317	230	

Cyclists	0
Trucks	99
Cars	905
Totals	1004

East Leg Total: 1318
East Entering: 106
East Peds: 0
Peds Cross: ⋈

	Cars	Trucks	Cyclists	Totals
	6	7	0	13
	47	46	0	93
	53	53	0	



	Cars	Trucks	Cyclists	Totals
	1151	58	3	1212

Cars	1285		
Trucks	121		
Cyclists	4		
Totals	1410		

Cars	899	932	1831
Trucks	92	48	140
Cyclists	0	2	2
Totals	991	982	

Peds Cross: ⋈
South Peds: 0
South Entering: 1973
South Leg Total: 3383

Comments

MG8 ENG

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

One Hour Peak
From: 11:45:00
To: 12:45:00

Municipality: Region of Peel
Site #: 0001918686
Intersection: Winston Churchill Bld & Meadowpine Blvd
TFR File #: 5
Count date: 5-Jun-2013

Weather conditions:

Person(s) who counted:
PREDO

**** Signalized Intersection ****

Major Road: Winston Churchill Bld runs N/S

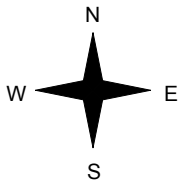
North Leg Total: 1467
North Entering: 766
North Peds: 0
Peds Cross: ⋈

Cyclists	2	0	2
Trucks	84	8	92
Cars	661	11	672
Totals	747	19	

Cyclists	6
Trucks	98
Cars	597
Totals	701

East Leg Total: 657
East Entering: 416
East Peds: 0
Peds Cross: ⋈

	Cars	Trucks	Cyclists	Totals
	11	4	0	15
	357	41	3	401
	368	45	3	



	Cars	Trucks	Cyclists	Totals
	191	47	3	241

Cars	1018		
Trucks	125		
Cyclists	5		
Totals	1148		

Cars	586	180	766
Trucks	94	39	133
Cyclists	6	3	9
Totals	686	222	

Peds Cross: ⋈
South Peds: 0
South Entering: 908
South Leg Total: 2056

Comments

MG8 ENG

Afternoon Peak Diagram

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

One Hour Peak
From: 16:45:00
To: 17:45:00

Municipality: Region of Peel
Site #: 0001918686
Intersection: Winston Churchill Bld & Meadowpine Blvd
TFR File #: 5
Count date: 5-Jun-2013

Weather conditions:

Person(s) who counted:
PREDO

**** Signalized Intersection ****

Major Road: Winston Churchill Bld runs N/S

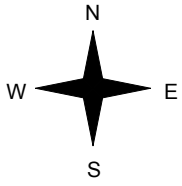
North Leg Total: 2794
North Entering: 1014
North Peds: 4
Peds Cross: ⋈

Cyclists	4	0	4
Trucks	24	5	29
Cars	971	10	981
Totals	999	15	

Cyclists	6
Trucks	69
Cars	1705
Totals	1780

East Leg Total: 1154
East Entering: 1021
East Peds: 0
Peds Cross: ⋈

Cars	177	7	0	184
	784	52	1	837
	961	59	1	



Cars	97	35	1	133

Cars	1755	Cars	1528	87	1615
Trucks	76	Trucks	62	30	92
Cyclists	5	Cyclists	6	1	7
Totals	1836	Totals	1596	118	

Peds Cross: ⋈
South Peds: 0
South Entering: 1714
South Leg Total: 3550

Comments

MG8 ENG

Total Count Diagram

Municipality: Region of Peel
Site #: 0001918686
Intersection: Winston Churchill Bld & Meadowpine Blvd
TFR File #: 5
Count date: 5-Jun-2013

Weather conditions:

Person(s) who counted:
PREDO

**** Signalized Intersection ****

Major Road: Winston Churchill Bld runs N/S

North Leg Total: 15899
North Entering: 7594
North Peds: 4
Peds Cross: ⋈

Cyclists	26	2	28
Trucks	515	43	558
Cars	6583	425	7008
Totals	7124	470	

Cyclists	29
Trucks	690
Cars	7586
Totals	8305

East Leg Total: 6244
East Entering: 3097
East Peds: 0
Peds Cross: ⋈

Winston Churchill Bld

Cars	Trucks	Cyclists	Totals
394	48	2	444
2339	305	9	2653
2733	353	11	

N
W E
S

Meadowpine Boulevard

Cars	Trucks	Cyclists	Totals
2744	379	24	3147

Winston Churchill Bld

Cars	8922		
Trucks	820		
Cyclists	35		
Totals	9777		

Cars	7192	2319	9511
Trucks	642	336	978
Cyclists	27	22	49
Totals	7861	2677	

Peds Cross: ⋈
South Peds: 0
South Entering: 10538
South Leg Total: 20315

Comments

MG8 ENG
Traffic Count Summary

Intersection: Winston Churchill Bld & Meadowpine Blvd | **Count Date:** 5-Jun-2013 | **Municipality:** Region of Peel

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
7:00:00	1	16	0	17	0	20
8:00:00	177	1142	0	1319	0	2849
9:00:00	198	1296	0	1494	0	3359
11:00:00	0	14	0	14	0	27
12:00:00	6	662	0	668	0	1438
13:00:00	23	710	0	733	0	1640
14:00:00	18	638	0	656	0	1720
15:00:00	0	3	0	3	0	6
16:00:00	22	787	0	809	0	2064
17:00:00	10	879	0	889	4	2368
18:00:00	15	977	0	992	0	2639
Totals:	470	7124	0	7594	4	18130

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	3	0	3	0
8:00:00	0	958	572	1530	0
9:00:00	0	912	953	1865	0
11:00:00	0	6	7	13	0
12:00:00	0	622	148	770	0
13:00:00	0	636	271	907	0
14:00:00	0	708	356	1064	0
15:00:00	0	0	3	3	0
16:00:00	0	1112	143	1255	0
17:00:00	0	1377	102	1479	0
18:00:00	0	1526	121	1647	0
Totals:	0	7860	2676	10536	0

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
7:00:00	1	0	0	1	0	1
8:00:00	80	0	7	87	0	87
9:00:00	94	0	14	108	0	108
11:00:00	1	0	0	1	0	1
12:00:00	192	0	12	204	0	204
13:00:00	385	0	16	401	0	401
14:00:00	203	0	30	233	0	233
15:00:00	3	0	1	4	0	4
16:00:00	272	0	49	321	0	321
17:00:00	630	0	155	785	0	785
18:00:00	780	0	159	939	0	939
Totals:	2641	0	443	3084	0	3084

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	0	0	0	0	0
9:00:00	0	0	0	0	0
11:00:00	0	0	0	0	0
12:00:00	0	0	0	0	0
13:00:00	0	0	0	0	0
14:00:00	0	0	0	0	0
15:00:00	0	0	0	0	0
16:00:00	0	0	0	0	0
17:00:00	0	0	0	0	0
18:00:00	0	0	0	0	0
Totals:	0	0	0	0	0

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00
Crossing Values:	80	94	192	385	203	272	634	780

MG8 ENG

Count Date: 5-Jun-2013 Site #: 0001918686

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Cyclists - 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
7:00:00	1	1	15	15	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
7:15:00	31	30	228	213	0	0	3	3	24	23	0	0	0	0	0	0	0	0	0	0
7:30:00	63	32	488	260	0	0	3	0	46	22	0	0	0	0	1	1	0	0	0	0
7:45:00	106	43	777	289	0	0	5	2	66	20	0	0	0	0	1	0	0	0	0	0
8:00:00	168	62	1068	291	0	0	9	4	86	20	0	0	1	1	4	3	0	0	0	0
8:15:00	222	54	1393	325	0	0	12	3	103	17	0	0	1	0	4	0	0	0	0	0
8:30:00	275	53	1697	304	0	0	14	2	119	16	0	0	1	0	4	0	0	0	0	0
8:45:00	325	50	2015	318	0	0	15	1	141	22	0	0	1	0	5	1	0	0	0	0
9:00:00	360	35	2282	267	0	0	15	0	166	25	0	0	1	0	6	1	0	0	0	0
9:00:20	360	0	2282	0	0	0	15	0	166	0	0	0	1	0	6	0	0	0	0	0
11:00:00	360	0	2296	14	0	0	15	0	166	0	0	0	1	0	6	0	0	0	0	0
11:15:00	361	1	2419	123	0	0	15	0	191	25	0	0	1	0	8	2	0	0	0	0
11:30:00	361	0	2549	130	0	0	15	0	209	18	0	0	1	0	9	1	0	0	0	0
11:45:00	361	0	2690	141	0	0	15	0	238	29	0	0	1	0	9	0	0	0	0	0
12:00:00	363	2	2861	171	0	0	18	3	260	22	0	0	1	0	9	0	0	0	0	0
12:15:00	365	2	3028	167	0	0	18	0	277	17	0	0	1	0	9	0	0	0	0	0
12:30:00	369	4	3210	182	0	0	19	1	294	17	0	0	1	0	10	1	0	0	0	0
12:45:00	372	3	3351	141	0	0	23	4	322	28	0	0	1	0	11	1	0	0	0	0
13:00:00	380	8	3489	138	0	0	24	1	340	18	0	0	1	0	11	0	0	0	0	0
13:15:00	381	1	3622	133	0	0	26	2	366	26	0	0	1	0	11	0	0	0	0	0
13:30:00	384	3	3753	131	0	0	28	2	381	15	0	0	1	0	11	0	0	0	0	0
13:45:00	390	6	3886	133	0	0	29	1	401	20	0	0	1	0	13	2	0	0	0	0
14:00:00	393	3	4046	160	0	0	29	0	416	15	0	0	1	0	16	3	0	0	0	0
14:00:15	393	0	4046	0	0	0	29	0	416	0	0	0	1	0	16	0	0	0	0	0
15:00:00	393	0	4048	2	0	0	29	0	417	1	0	0	1	0	16	0	0	0	0	0
15:15:00	396	3	4236	188	0	0	30	1	426	9	0	0	1	0	17	1	0	0	0	0
15:30:00	401	5	4423	187	0	0	32	2	442	16	0	0	1	0	17	0	0	0	0	0
15:45:00	402	1	4599	176	0	0	35	3	453	11	0	0	1	0	17	0	0	0	0	0
16:00:00	408	6	4790	191	0	0	35	0	461	8	0	0	2	1	17	0	0	0	0	0
16:15:00	409	1	5011	221	0	0	35	0	467	6	0	0	2	0	18	1	0	0	0	0
16:30:00	409	0	5222	211	0	0	36	1	478	11	0	0	2	0	20	2	0	0	0	0
16:45:00	413	4	5407	185	0	0	37	1	487	9	0	0	2	0	21	1	0	0	0	0
17:00:00	416	3	5631	224	0	0	37	0	492	5	0	0	2	0	24	3	0	0	4	4
17:15:00	420	4	5872	241	0	0	37	0	497	5	0	0	2	0	25	1	0	0	4	0
17:30:00	421	1	6139	267	0	0	39	2	506	9	0	0	2	0	25	0	0	0	4	0
17:45:00	423	2	6378	239	0	0	42	3	511	5	0	0	2	0	25	0	0	0	4	0
18:00:00	425	2	6583	205	0	0	43	1	515	4	0	0	2	0	26	1	0	0	4	0
18:00:19	425	0	6583	0	0	0	43	0	515	0	0	0	2	0	26	0	0	0	4	0

MG8 ENG

Count Date: 5-Jun-2013 Site #: 0001918686

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Cyclists - 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
7:00:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	14	13	0	0	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	36	22	0	0	3	1	6	4	0	0	2	2	0	0	0	0	0	0	0	0
7:45:00	47	11	0	0	3	0	14	8	0	0	2	0	0	0	0	0	0	0	0	0
8:00:00	58	11	0	0	5	2	23	9	0	0	2	0	0	0	0	0	0	0	0	0
8:15:00	69	11	0	0	5	0	33	10	0	0	3	1	0	0	0	0	0	0	0	0
8:30:00	78	9	0	0	8	3	50	17	0	0	6	3	0	0	0	0	0	0	0	0
8:45:00	94	16	0	0	9	1	60	10	0	0	9	3	0	0	0	0	0	0	0	0
9:00:00	108	14	0	0	10	1	67	7	0	0	11	2	0	0	0	0	0	0	0	0
9:00:20	109	1	0	0	10	0	67	0	0	0	11	0	0	0	0	0	0	0	0	0
11:00:00	109	0	0	0	10	0	67	0	0	0	11	0	0	0	0	0	0	0	0	0
11:15:00	129	20	0	0	12	2	72	5	0	0	11	0	0	0	0	0	0	0	0	0
11:30:00	157	28	0	0	14	2	88	16	0	0	11	0	0	0	0	0	0	0	0	0
11:45:00	200	43	0	0	16	2	98	10	0	0	13	2	0	0	0	0	0	0	0	0
12:00:00	257	57	0	0	17	1	109	11	0	0	16	3	2	2	0	0	0	0	0	0
12:15:00	381	124	0	0	21	4	117	8	0	0	16	0	2	0	0	0	0	0	0	0
12:30:00	474	93	0	0	26	5	130	13	0	0	17	1	2	0	0	0	0	0	0	0
12:45:00	557	83	0	0	27	1	139	9	0	0	17	0	3	1	0	0	0	0	0	0
13:00:00	599	42	0	0	31	4	151	12	0	0	18	1	3	0	0	0	0	0	0	0
13:15:00	661	62	0	0	40	9	162	11	0	0	19	1	3	0	0	0	0	0	0	0
13:30:00	693	32	0	0	42	2	169	7	0	0	21	2	3	0	0	0	0	0	0	0
13:45:00	728	35	0	0	48	6	180	11	0	0	25	4	3	0	0	0	0	0	0	0
14:00:00	764	36	0	0	53	5	189	9	0	0	26	1	3	0	0	0	0	0	0	0
14:00:15	764	0	0	0	53	0	189	0	0	0	26	0	3	0	0	0	0	0	0	0
15:00:00	767	3	0	0	53	0	189	0	0	0	27	1	3	0	0	0	0	0	0	0
15:15:00	833	66	0	0	65	12	194	5	0	0	28	1	3	0	0	0	0	0	0	0
15:30:00	884	51	0	0	75	10	204	10	0	0	31	3	3	0	0	0	0	0	0	0
15:45:00	956	72	0	0	81	6	217	13	0	0	33	2	4	1	0	0	1	1	0	0
16:00:00	1001	45	0	0	93	12	226	9	0	0	35	2	4	0	0	0	1	0	0	0
16:15:00	1140	139	0	0	112	19	232	6	0	0	36	1	4	0	0	0	1	0	0	0
16:30:00	1248	108	0	0	142	30	241	9	0	0	38	2	4	0	0	0	2	1	0	0
16:45:00	1446	198	0	0	198	56	246	5	0	0	40	2	7	3	0	0	2	0	0	0
17:00:00	1597	151	0	0	239	41	256	10	0	0	43	3	8	1	0	0	2	0	0	0
17:15:00	1852	255	0	0	295	56	286	30	0	0	45	2	8	0	0	0	2	0	0	0
17:30:00	2044	192	0	0	345	50	290	4	0	0	47	2	8	0	0	0	2	0	0	0
17:45:00	2230	186	0	0	375	30	298	8	0	0	47	0	8	0	0	0	2	0	0	0
18:00:00	2327	97	0	0	393	18	305	7	0	0	48	1	9	1	0	0	2	0	0	0
18:00:19	2339	12	0	0	394	1	305	0	0	0	48	0	9	0	0	0	2	0	0	0

MG8 ENG

Count Date: 5-Jun-2013 Site #: 0001918686

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Cyclists - 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
7:00:00	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	182	179	68	68	0	0	23	23	7	7	0	0	1	1	2	2	0	0
7:30:00	0	0	397	215	150	82	0	0	44	21	13	6	0	0	2	1	4	2	0	0
7:45:00	0	0	653	256	287	137	0	0	60	16	22	9	0	0	3	1	5	1	0	0
8:00:00	0	0	884	231	534	247	0	0	74	14	32	10	0	0	3	0	6	1	0	0
8:15:00	0	0	1118	234	751	217	0	0	91	17	51	19	0	0	3	0	6	0	0	0
8:30:00	0	0	1353	235	1006	255	0	0	118	27	60	9	0	0	3	0	7	1	0	0
8:45:00	0	0	1552	199	1219	213	0	0	152	34	70	10	0	0	3	0	7	0	0	0
9:00:00	0	0	1695	143	1432	213	0	0	173	21	86	16	0	0	5	2	7	0	0	0
9:00:20	0	0	1695	0	1439	7	0	0	173	0	86	0	0	0	5	0	7	0	0	0
11:00:00	0	0	1699	4	1439	0	0	0	175	2	86	0	0	0	5	0	7	0	0	0
11:15:00	0	0	1815	116	1461	22	0	0	199	24	96	10	0	0	6	1	7	0	0	0
11:30:00	0	0	1950	135	1491	30	0	0	226	27	110	14	0	0	6	0	8	1	0	0
11:45:00	0	0	2065	115	1514	23	0	0	250	24	121	11	0	0	6	0	9	1	0	0
12:00:00	0	0	2218	153	1539	25	0	0	276	26	132	11	0	0	7	1	9	0	0	0
12:15:00	0	0	2364	146	1576	37	0	0	306	30	139	7	0	0	9	2	10	1	0	0
12:30:00	0	0	2510	146	1629	53	0	0	326	20	151	12	0	0	10	1	11	1	0	0
12:45:00	0	0	2651	141	1694	65	0	0	344	18	160	9	0	0	12	2	12	1	0	0
13:00:00	0	0	2758	107	1770	76	0	0	367	23	169	9	0	0	12	0	12	0	0	0
13:15:00	0	0	2923	165	1865	95	0	0	389	22	178	9	0	0	12	0	14	2	0	0
13:30:00	0	0	3060	137	1931	66	0	0	409	20	192	14	0	0	12	0	14	0	0	0
13:45:00	0	0	3224	164	2013	82	0	0	433	24	208	16	0	0	12	0	14	0	0	0
14:00:00	0	0	3379	155	2074	61	0	0	451	18	219	11	0	0	15	3	14	0	0	0
14:00:15	0	0	3379	0	2076	2	0	0	451	0	219	0	0	0	15	0	14	0	0	0
15:00:00	0	0	3379	0	2076	0	0	0	451	0	220	1	0	0	15	0	14	0	0	0
15:15:00	0	0	3630	251	2102	26	0	0	466	15	232	12	0	0	15	0	16	2	0	0
15:30:00	0	0	3875	245	2130	28	0	0	482	16	243	11	0	0	15	0	17	1	0	0
15:45:00	0	0	4150	275	2152	22	0	0	497	15	256	13	0	0	17	2	19	2	0	0
16:00:00	0	0	4418	268	2167	15	0	0	522	25	266	10	0	0	17	0	20	1	0	0
16:15:00	0	0	4720	302	2183	16	0	0	538	16	276	10	0	0	19	2	21	1	0	0
16:30:00	0	0	5035	315	2200	17	0	0	557	19	284	8	0	0	20	1	21	0	0	0
16:45:00	0	0	5330	295	2210	10	0	0	575	18	294	10	0	0	20	0	21	0	0	0
17:00:00	0	0	5718	388	2235	25	0	0	596	21	299	5	0	0	20	0	21	0	0	0
17:15:00	0	0	6082	364	2264	29	0	0	607	11	305	6	0	0	21	1	21	0	0	0
17:30:00	0	0	6506	424	2278	14	0	0	621	14	317	12	0	0	22	1	21	0	0	0
17:45:00	0	0	6858	352	2297	19	0	0	637	16	324	7	0	0	26	4	22	1	0	0
18:00:00	0	0	7191	333	2319	22	0	0	642	5	335	11	0	0	27	1	22	0	0	0
18:00:19	0	0	7192	1	2319	0	0	0	642	0	336	1	0	0	27	0	22	0	0	0

MG8 ENG

Count Date: 5-Jun-2013 Site #: 0001918686

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Cyclists - 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
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
9:00:20	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
14:00:15	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
18:00:19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ontario Traffic Inc

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

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

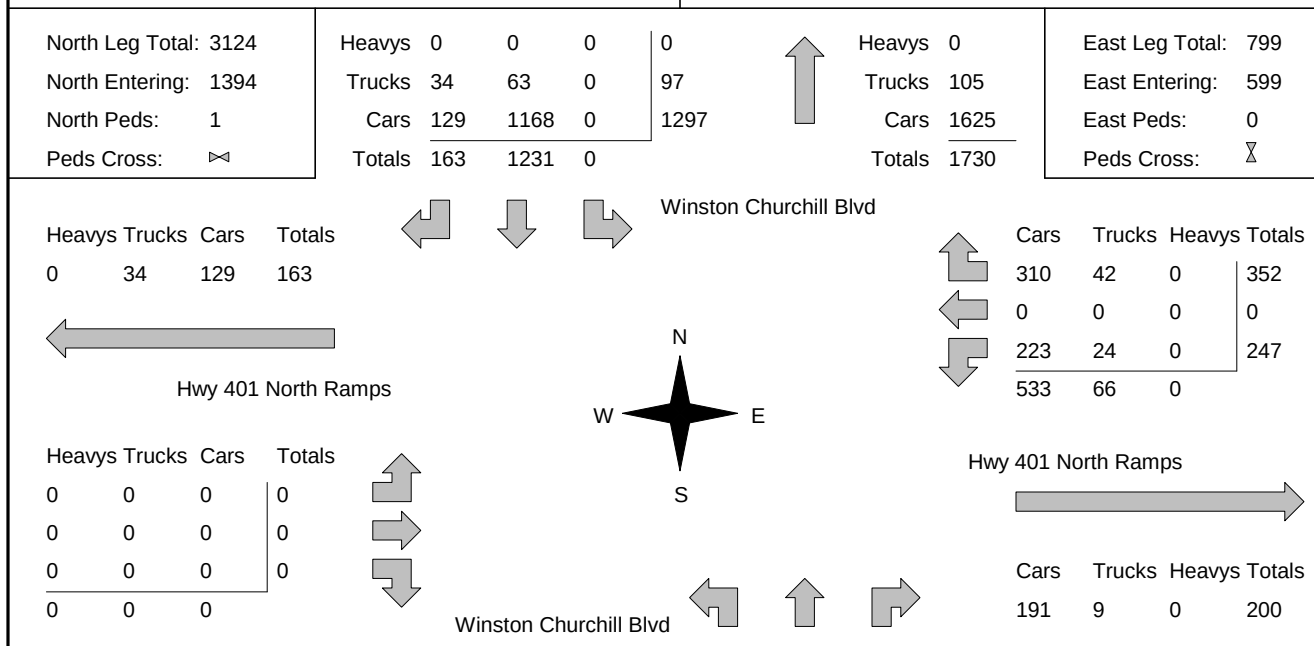
Municipality: Mississauga
Site #: 1427300002
Intersection: Winston Churchill Blvd & Hwy 401 N
TFR File #: 23
Count date: 18-Nov-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Winston Churchill Blvd runs N/S



Comments

Ontario Traffic Inc

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

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

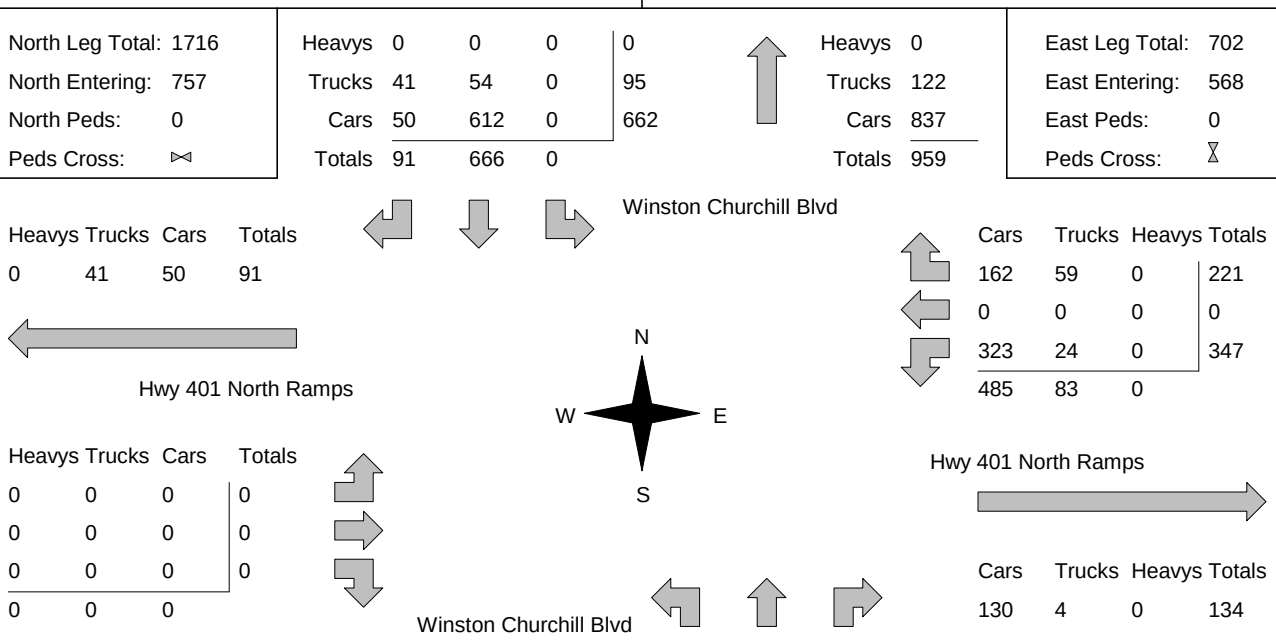
Municipality: Mississauga
Site #: 1427300002
Intersection: Winston Churchill Blvd & Hwy 401 N
TFR File #: 23
Count date: 18-Nov-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Winston Churchill Blvd runs N/S



Comments

Ontario Traffic Inc

Afternoon Peak Diagram

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

One Hour Peak
From: 17:00:00
To: 18:00:00

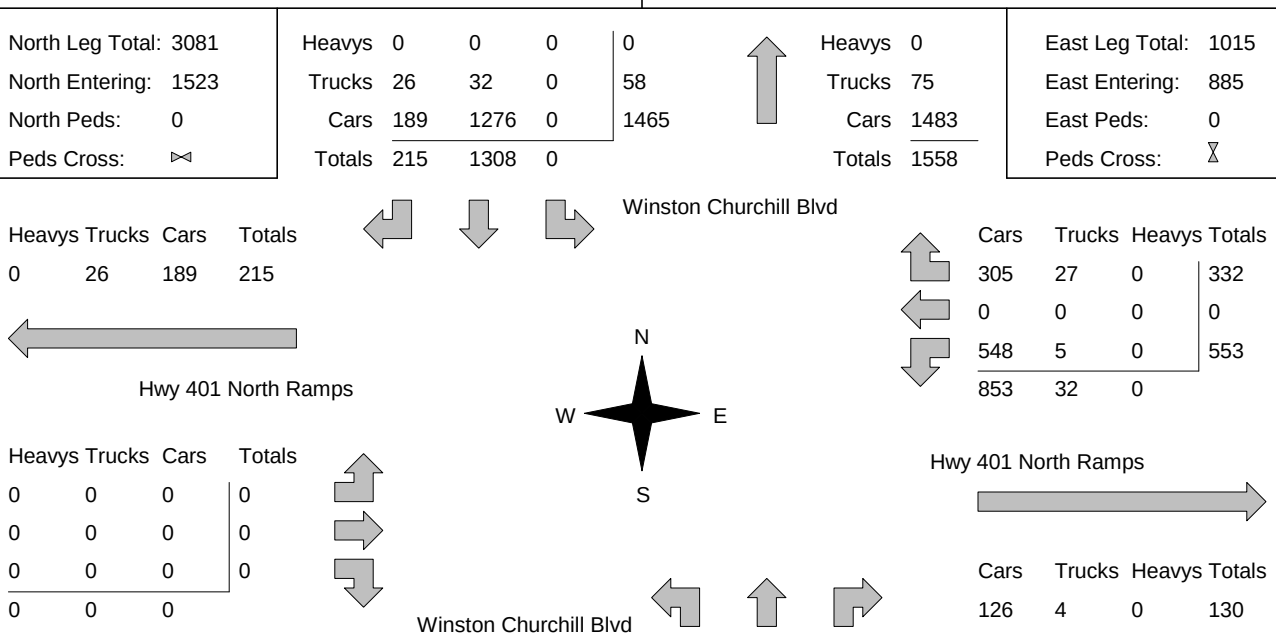
Municipality: Mississauga
Site #: 1427300002
Intersection: Winston Churchill Blvd & Hwy 401 N
TFR File #: 23
Count date: 18-Nov-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Winston Churchill Blvd runs N/S



Comments

Ontario Traffic Inc

Total Count Diagram

Municipality: Mississauga
Site #: 1427300002
Intersection: Winston Churchill Blvd & Hwy 401 N
TFR File #: 23
Count date: 18-Nov-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Winston Churchill Blvd runs N/S

North Leg Total:	18325			
North Entering:	8687			
North Peds:	1			
Peds Cross:	⋈			
Heavys	0	0	0	0
Trucks	291	401	0	692
Cars	794	7201	0	7995
Totals	1085	7602	0	
Heavys	0			
Trucks	813			
Cars	8825			
Totals	9638			
East Leg Total:	6239			
East Entering:	5117			
East Peds:	0			
Peds Cross:	⧖			

Winston Churchill Blvd

Heavys	Trucks	Cars	Totals
0	291	794	1085

Hwy 401 North Ramps

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

Cars	Trucks	Heavys	Totals
1969	335	0	2304
0	0	0	0
2680	133	0	2813
4649	468	0	

N
W E
S

Hwy 401 North Ramps

Cars	Trucks	Heavys	Totals
1074	48	0	1122

Winston Churchill Blvd

Peds Cross:	⧖			
West Peds:	0			
West Entering:	1			
West Leg Total:	1086			
Cars	9881			
Trucks	535			
Heavys	0			
Totals	10416			
Cars	0	6856	1074	7930
Trucks	0	478	48	526
Heavys	0	0	0	0
Totals	0	7334	1122	
Peds Cross:	⋈			
South Peds:	26			
South Entering:	8456			
South Leg Total:	18872			

Comments

Ontario Traffic Inc
Traffic Count Summary

Intersection: Winston Churchill Blvd & Hwy 401 I | **Count Date:** 18-Nov-14 | **Municipality:** Mississauga

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	0	1060	217	1277	0	2528
9:00:00	0	1231	141	1372	1	2948
11:00:00	0	3	0	3	0	30
12:00:00	0	632	128	760	0	1281
13:00:00	0	866	76	942	0	1682
14:00:00	0	625	91	716	0	1579
15:00:00	0	3	0	3	0	9
16:00:00	0	761	93	854	0	1732
17:00:00	0	1105	124	1229	0	2443
18:00:00	0	1308	215	1523	0	2879
Totals:	0	7594	1085	8679	1	17111

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	0	1107	144	1251	26
9:00:00	0	1360	216	1576	0
11:00:00	0	21	6	27	0
12:00:00	0	426	95	521	0
13:00:00	0	649	91	740	0
14:00:00	0	708	155	863	0
15:00:00	0	6	0	6	0
16:00:00	0	740	138	878	0
17:00:00	0	1067	147	1214	0
18:00:00	0	1226	130	1356	0
Totals:	0	7310	1122	8432	26

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	183	0	307	490	0	491
9:00:00	238	0	273	511	0	511
11:00:00	0	0	0	0	0	0
12:00:00	289	0	229	518	0	518
13:00:00	293	0	217	510	0	510
14:00:00	388	0	230	618	0	618
15:00:00	0	0	0	0	0	0
16:00:00	395	0	319	714	0	714
17:00:00	474	0	397	871	0	871
18:00:00	553	0	332	885	0	885
Totals:	2813	0	2304	5117	0	5118

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	0	0	1	1	0
9:00:00	0	0	0	0	0
11:00:00	0	0	0	0	0
12:00:00	0	0	0	0	0
13:00:00	0	0	0	0	0
14:00:00	0	0	0	0	0
15:00:00	0	0	0	0	0
16:00:00	0	0	0	0	0
17:00:00	0	0	0	0	0
18:00:00	0	0	0	0	0
Totals:	0	0	1	1	0

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00
Crossing Values:	209	239	289	293	388	395	474	553

Ontario Traffic Inc

Count Date: 18-Nov-14 Site #: 1427300002

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
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	223	223	28	28	0	0	9	9	3	3	0	0	0	0	0	0	0	0
7:30:00	0	0	479	256	68	40	0	0	13	4	16	13	0	0	0	0	0	0	0	0
7:45:00	0	0	754	275	120	52	0	0	24	11	42	26	0	0	0	0	0	0	0	0
8:00:00	0	0	1020	266	161	41	0	0	40	16	56	14	0	0	0	0	0	0	0	0
8:15:00	0	0	1351	331	189	28	0	0	47	7	61	5	0	0	0	0	0	0	0	0
8:30:00	0	0	1654	303	225	36	0	0	70	23	71	10	0	0	0	0	0	0	1	1
8:45:00	0	0	1922	268	249	24	0	0	87	17	76	5	0	0	0	0	0	0	1	0
9:00:00	0	0	2189	267	273	24	0	0	102	15	85	9	0	0	0	0	0	0	1	0
9:01:05	0	0	2192	3	273	0	0	0	102	0	85	0	0	0	0	0	0	0	1	0
9:01:08	0	0	2192	0	273	0	0	0	102	0	85	0	0	0	0	0	0	0	1	0
11:00:00	0	0	2192	0	273	0	0	0	102	0	85	0	0	0	0	0	0	0	1	0
11:15:00	0	0	2294	102	287	14	0	0	118	16	91	6	0	0	0	0	0	0	1	0
11:30:00	0	0	2451	157	309	22	0	0	136	18	104	13	0	0	0	0	0	0	1	0
11:45:00	0	0	2570	119	330	21	0	0	153	17	113	9	0	0	0	0	0	0	1	0
12:00:00	0	0	2759	189	354	24	0	0	167	14	132	19	0	0	0	0	0	0	1	0
12:15:00	0	0	2985	226	366	12	0	0	182	15	139	7	0	0	0	0	0	0	1	0
12:30:00	0	0	3204	219	376	10	0	0	202	20	145	6	0	0	0	0	0	0	1	0
12:45:00	0	0	3406	202	390	14	0	0	213	11	152	7	0	0	0	0	0	0	1	0
13:00:00	0	0	3570	164	400	10	0	0	222	9	162	10	0	0	0	0	0	0	1	0
13:15:00	0	0	3723	153	411	11	0	0	238	16	173	11	0	0	0	0	0	0	1	0
13:30:00	0	0	3862	139	431	20	0	0	253	15	185	12	0	0	0	0	0	0	1	0
13:45:00	0	0	4018	156	440	9	0	0	267	14	193	8	0	0	0	0	0	0	1	0
14:00:00	0	0	4135	117	448	8	0	0	282	15	205	12	0	0	0	0	0	0	1	0
14:01:59	0	0	4135	0	448	0	0	0	282	0	205	0	0	0	0	0	0	0	1	0
14:02:07	0	0	4135	0	448	0	0	0	282	0	205	0	0	0	0	0	0	0	1	0
15:00:00	0	0	4138	3	448	0	0	0	282	0	205	0	0	0	0	0	0	0	1	0
15:15:00	0	0	4277	139	461	13	0	0	297	15	216	11	0	0	0	0	0	0	1	0
15:30:00	0	0	4457	180	472	11	0	0	313	16	224	8	0	0	0	0	0	0	1	0
15:45:00	0	0	4642	185	497	25	0	0	324	11	228	4	0	0	0	0	0	0	1	0
16:00:00	0	0	4845	203	509	12	0	0	336	12	237	9	0	0	0	0	0	0	1	0
16:15:00	0	0	5095	250	530	21	0	0	344	8	244	7	0	0	0	0	0	0	1	0
16:30:00	0	0	5346	251	552	22	0	0	356	12	250	6	0	0	0	0	0	0	1	0
16:45:00	0	0	5621	275	581	29	0	0	359	3	256	6	0	0	0	0	0	0	1	0
17:00:00	0	0	5917	296	605	24	0	0	369	10	265	9	0	0	0	0	0	0	1	0
17:15:00	0	0	6273	356	629	24	0	0	379	10	271	6	0	0	0	0	0	0	1	0
17:30:00	0	0	6624	351	704	75	0	0	389	10	287	16	0	0	0	0	0	0	1	0
17:45:00	0	0	6906	282	752	48	0	0	393	4	290	3	0	0	0	0	0	0	1	0
18:00:00	0	0	7193	287	794	42	0	0	401	8	291	1	0	0	0	0	0	0	1	0
18:15:00	0	0	7201	8	794	0	0	0	401	0	291	0	0	0	0	0	0	0	1	0

Ontario Traffic Inc

Count Date: 18-Nov-14 Site #: 1427300002

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
18:15:51	0	0	7201	0	794	0	0	0	401	0	291	0	0	0	0	0	0	0	1	0

Ontario Traffic Inc

Count Date: 18-Nov-14 Site #: 1427300002

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
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	23	23	0	0	31	31	14	14	0	0	6	6	0	0	0	0	0	0	0	0
7:30:00	68	45	0	0	77	46	24	10	0	0	17	11	0	0	0	0	0	0	0	0
7:45:00	100	32	0	0	141	64	27	3	0	0	30	13	0	0	0	0	0	0	0	0
8:00:00	150	50	0	0	261	120	33	6	0	0	46	16	0	0	0	0	0	0	0	0
8:15:00	212	62	0	0	340	79	38	5	0	0	55	9	0	0	0	0	0	0	0	0
8:30:00	261	49	0	0	399	59	44	6	0	0	64	9	0	0	0	0	0	0	0	0
8:45:00	323	62	0	0	451	52	51	7	0	0	72	8	0	0	0	0	0	0	0	0
9:00:00	368	45	0	0	499	48	53	2	0	0	81	9	0	0	0	0	0	0	0	0
9:01:05	368	0	0	0	499	0	53	0	0	0	81	0	0	0	0	0	0	0	0	0
9:01:08	368	0	0	0	499	0	53	0	0	0	81	0	0	0	0	0	0	0	0	0
11:00:00	368	0	0	0	499	0	53	0	0	0	81	0	0	0	0	0	0	0	0	0
11:15:00	430	62	0	0	527	28	62	9	0	0	94	13	0	0	0	0	0	0	0	0
11:30:00	500	70	0	0	572	45	64	2	0	0	102	8	0	0	0	0	0	0	0	0
11:45:00	574	74	0	0	616	44	67	3	0	0	115	13	0	0	0	0	0	0	0	0
12:00:00	638	64	0	0	672	56	72	5	0	0	137	22	0	0	0	0	0	0	0	0
12:15:00	701	63	0	0	730	58	75	3	0	0	153	16	0	0	0	0	0	0	0	0
12:30:00	762	61	0	0	762	32	79	4	0	0	166	13	0	0	0	0	0	0	0	0
12:45:00	836	74	0	0	795	33	83	4	0	0	173	7	0	0	0	0	0	0	0	0
13:00:00	910	74	0	0	841	46	93	10	0	0	185	12	0	0	0	0	0	0	0	0
13:15:00	1002	92	0	0	874	33	98	5	0	0	201	16	0	0	0	0	0	0	0	0
13:30:00	1077	75	0	0	916	42	103	5	0	0	212	11	0	0	0	0	0	0	0	0
13:45:00	1159	82	0	0	957	41	107	4	0	0	232	20	0	0	0	0	0	0	0	0
14:00:00	1278	119	0	0	1017	60	113	6	0	0	239	7	0	0	0	0	0	0	0	0
14:01:59	1278	0	0	0	1017	0	113	0	0	0	239	0	0	0	0	0	0	0	0	0
14:02:07	1278	0	0	0	1017	0	113	0	0	0	239	0	0	0	0	0	0	0	0	0
15:00:00	1278	0	0	0	1017	0	113	0	0	0	239	0	0	0	0	0	0	0	0	0
15:15:00	1368	90	0	0	1063	46	115	2	0	0	244	5	0	0	0	0	0	0	0	0
15:30:00	1462	94	0	0	1127	64	118	3	0	0	254	10	0	0	0	0	0	0	0	0
15:45:00	1549	87	0	0	1205	78	121	3	0	0	265	11	0	0	0	0	0	0	0	0
16:00:00	1665	116	0	0	1301	96	121	0	0	0	274	9	0	0	0	0	0	0	0	0
16:15:00	1765	100	0	0	1381	80	123	2	0	0	279	5	0	0	0	0	0	0	0	0
16:30:00	1898	133	0	0	1490	109	124	1	0	0	286	7	0	0	0	0	0	0	0	0
16:45:00	2034	136	0	0	1579	89	127	3	0	0	299	13	0	0	0	0	0	0	0	0
17:00:00	2132	98	0	0	1664	85	128	1	0	0	308	9	0	0	0	0	0	0	0	0
17:15:00	2263	131	0	0	1739	75	129	1	0	0	315	7	0	0	0	0	0	0	0	0
17:30:00	2348	85	0	0	1817	78	129	0	0	0	326	11	0	0	0	0	0	0	0	0
17:45:00	2503	155	0	0	1872	55	130	1	0	0	328	2	0	0	0	0	0	0	0	0
18:00:00	2680	177	0	0	1969	97	133	3	0	0	335	7	0	0	0	0	0	0	0	0
18:15:00	2680	0	0	0	1969	0	133	0	0	0	335	0	0	0	0	0	0	0	0	0

Ontario Traffic Inc

Count Date: 18-Nov-14 Site #: 1427300002

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
18:15:51	2680	0	0	0	1969	0	133	0	0	0	335	0	0	0	0	0	0	0	0	0

Ontario Traffic Inc

Count Date: 18-Nov-14 Site #: 1427300002

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
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	174	174	28	28	0	0	11	11	1	1	0	0	0	0	0	0	0	0
7:30:00	0	0	446	272	62	34	0	0	26	15	1	0	0	0	0	0	0	0	0	0
7:45:00	0	0	738	292	110	48	0	0	36	10	4	3	0	0	0	0	0	0	16	16
8:00:00	0	0	1058	320	140	30	0	0	49	13	4	0	0	0	0	0	0	0	26	10
8:15:00	0	0	1384	326	202	62	0	0	54	5	8	4	0	0	0	0	0	0	26	0
8:30:00	0	0	1706	322	247	45	0	0	88	34	11	3	0	0	0	0	0	0	26	0
8:45:00	0	0	2053	347	301	54	0	0	99	11	13	2	0	0	0	0	0	0	26	0
9:00:00	0	0	2351	298	346	45	0	0	116	17	14	1	0	0	0	0	0	0	26	0
9:01:05	0	0	2351	0	346	0	0	0	116	0	14	0	0	0	0	0	0	0	26	0
9:01:08	0	0	2372	21	352	6	0	0	116	0	14	0	0	0	0	0	0	0	26	0
11:00:00	0	0	2372	0	352	0	0	0	116	0	14	0	0	0	0	0	0	0	26	0
11:15:00	0	0	2437	65	369	17	0	0	131	15	16	2	0	0	0	0	0	0	26	0
11:30:00	0	0	2528	91	393	24	0	0	145	14	18	2	0	0	0	0	0	0	26	0
11:45:00	0	0	2621	93	418	25	0	0	158	13	22	4	0	0	0	0	0	0	26	0
12:00:00	0	0	2738	117	436	18	0	0	176	18	25	3	0	0	0	0	0	0	26	0
12:15:00	0	0	2862	124	459	23	0	0	185	9	27	2	0	0	0	0	0	0	26	0
12:30:00	0	0	2992	130	477	18	0	0	204	19	30	3	0	0	0	0	0	0	26	0
12:45:00	0	0	3142	150	499	22	0	0	224	20	32	2	0	0	0	0	0	0	26	0
13:00:00	0	0	3322	180	518	19	0	0	241	17	34	2	0	0	0	0	0	0	26	0
13:15:00	0	0	3483	161	552	34	0	0	253	12	35	1	0	0	0	0	0	0	26	0
13:30:00	0	0	3647	164	589	37	0	0	274	21	36	1	0	0	0	0	0	0	26	0
13:45:00	0	0	3817	170	629	40	0	0	287	13	36	0	0	0	0	0	0	0	26	0
14:00:00	0	0	3966	149	669	40	0	0	305	18	38	2	0	0	0	0	0	0	26	0
14:01:59	0	0	3966	0	669	0	0	0	305	0	38	0	0	0	0	0	0	0	26	0
14:02:07	0	0	3971	5	669	0	0	0	305	0	38	0	0	0	0	0	0	0	26	0
15:00:00	0	0	3972	1	669	0	0	0	305	0	38	0	0	0	0	0	0	0	26	0
15:15:00	0	0	4095	123	694	25	0	0	318	13	39	1	0	0	0	0	0	0	26	0
15:30:00	0	0	4270	175	723	29	0	0	326	8	40	1	0	0	0	0	0	0	26	0
15:45:00	0	0	4463	193	756	33	0	0	338	12	40	0	0	0	0	0	0	0	26	0
16:00:00	0	0	4665	202	804	48	0	0	352	14	41	1	0	0	0	0	0	0	26	0
16:15:00	0	0	4868	203	856	52	0	0	373	21	41	0	0	0	0	0	0	0	26	0
16:30:00	0	0	5099	231	875	19	0	0	394	21	42	1	0	0	0	0	0	0	26	0
16:45:00	0	0	5385	286	907	32	0	0	415	21	43	1	0	0	0	0	0	0	26	0
17:00:00	0	0	5657	272	948	41	0	0	427	12	44	1	0	0	0	0	0	0	26	0
17:15:00	0	0	6000	343	992	44	0	0	432	5	45	1	0	0	0	0	0	0	26	0
17:30:00	0	0	6293	293	1016	24	0	0	444	12	46	1	0	0	0	0	0	0	26	0
17:45:00	0	0	6562	269	1051	35	0	0	456	12	46	0	0	0	0	0	0	0	26	0
18:00:00	0	0	6835	273	1074	23	0	0	475	19	48	2	0	0	0	0	0	0	26	0
18:15:00	0	0	6835	0	1074	0	0	0	475	0	48	0	0	0	0	0	0	0	26	0

Ontario Traffic Inc

Count Date: 18-Nov-14 Site #: 1427300002

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
18:15:51	0	0	6856	21	1074	0	0	0	478	3	48	0	0	0	0	0	0	0	26	0

Ontario Traffic Inc

Count Date: 18-Nov-14 Site #: 1427300002

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
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	1	1	0	0	0	0	0	0	0	0
7:30:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
7:45:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
8:00:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
8:15:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
8:30:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
8:45:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
9:00:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
9:01:05	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
9:01:08	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
11:00:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
11:15:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
11:30:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
11:45:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
12:00:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
12:15:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
12:30:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
12:45:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
13:00:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
13:15:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
13:30:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
13:45:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
14:00:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
14:01:59	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
14:02:07	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
15:00:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
15:15:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
15:30:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
15:45:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
16:00:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
16:15:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
16:30:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
16:45:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
17:00:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
17:15:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
17:30:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
17:45:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
18:00:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
18:15:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0

Ontario Traffic Inc

Count Date: 18-Nov-14 Site #: 1427300002

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
18:15:51	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0

Ontario Traffic Inc

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

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

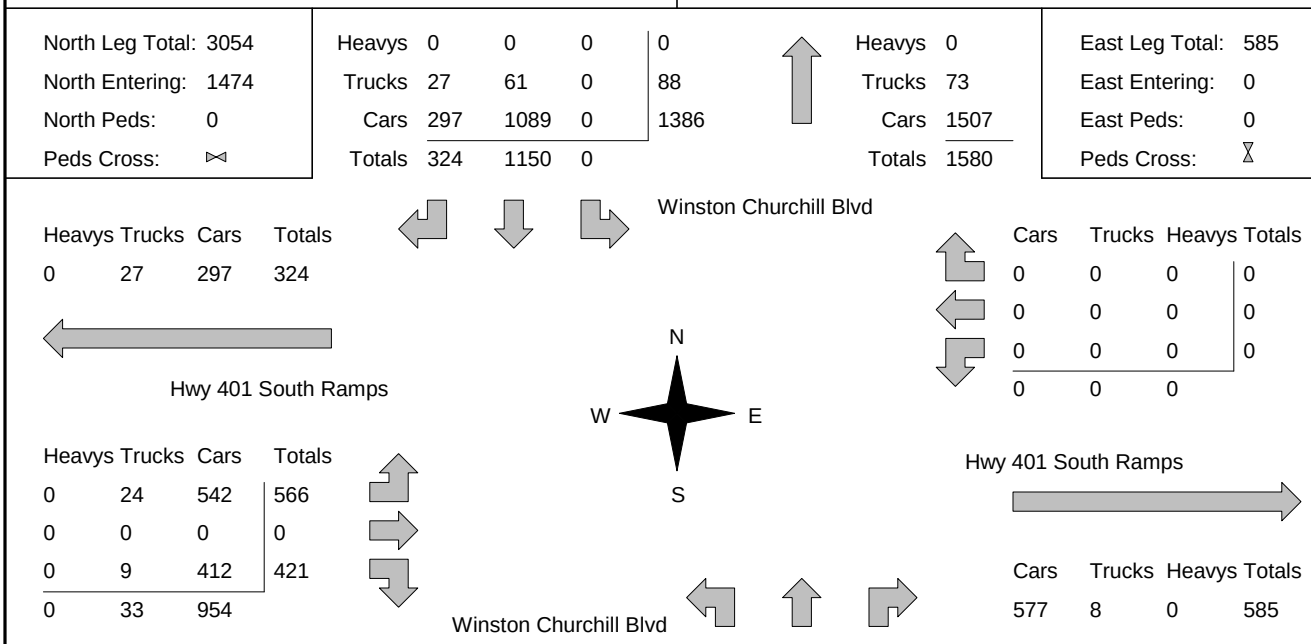
Municipality: Mississauga
Site #: 1427300001
Intersection: Winston Churchill Blvd & Hwy 401 S
TFR File #: 2
Count date: 18-Nov-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Winston Churchill Blvd runs N/S



Comments

Ontario Traffic Inc

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

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

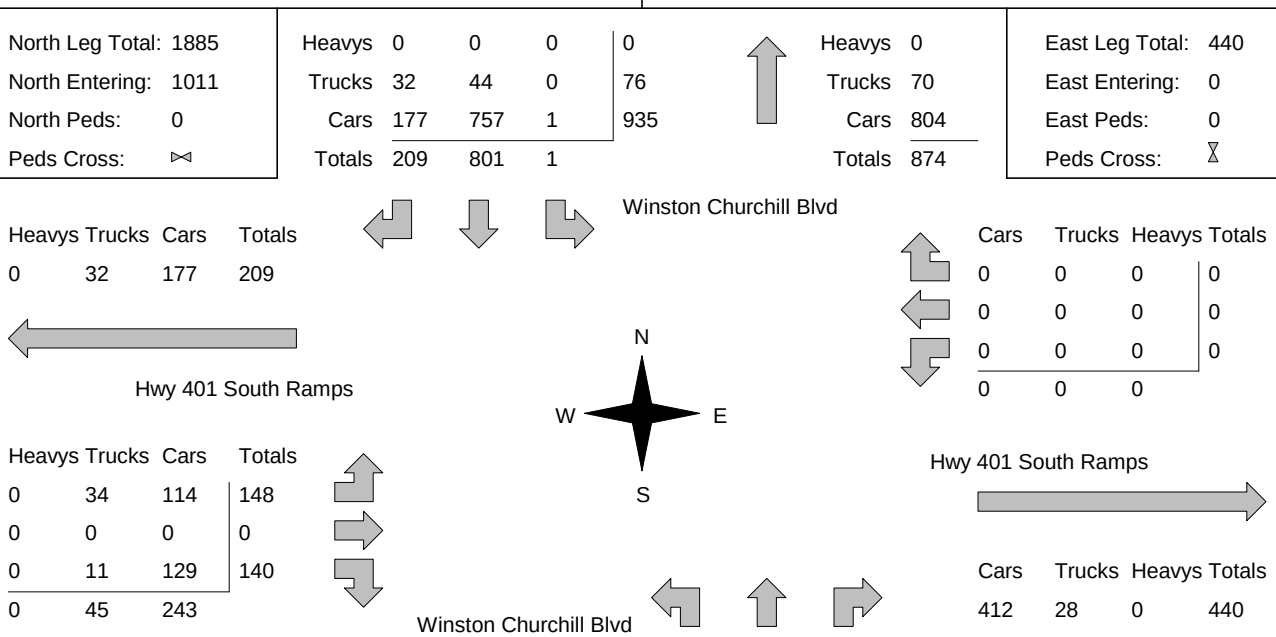
Municipality: Mississauga
Site #: 1427300001
Intersection: Winston Churchill Blvd & Hwy 401 S
TFR File #: 2
Count date: 18-Nov-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Winston Churchill Blvd runs N/S



Comments

Ontario Traffic Inc

Afternoon Peak Diagram

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

One Hour Peak
From: 17:00:00
To: 18:00:00

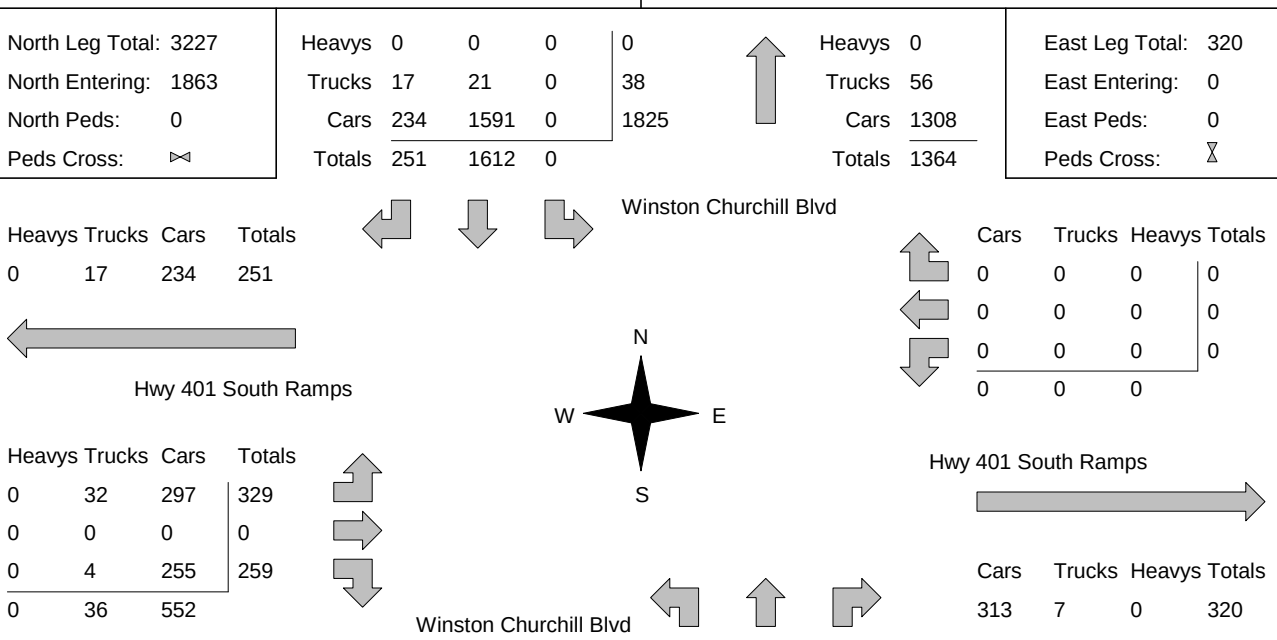
Municipality: Mississauga
Site #: 1427300001
Intersection: Winston Churchill Blvd & Hwy 401 S
TFR File #: 2
Count date: 18-Nov-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Winston Churchill Blvd runs N/S



Comments

Ontario Traffic Inc

Total Count Diagram

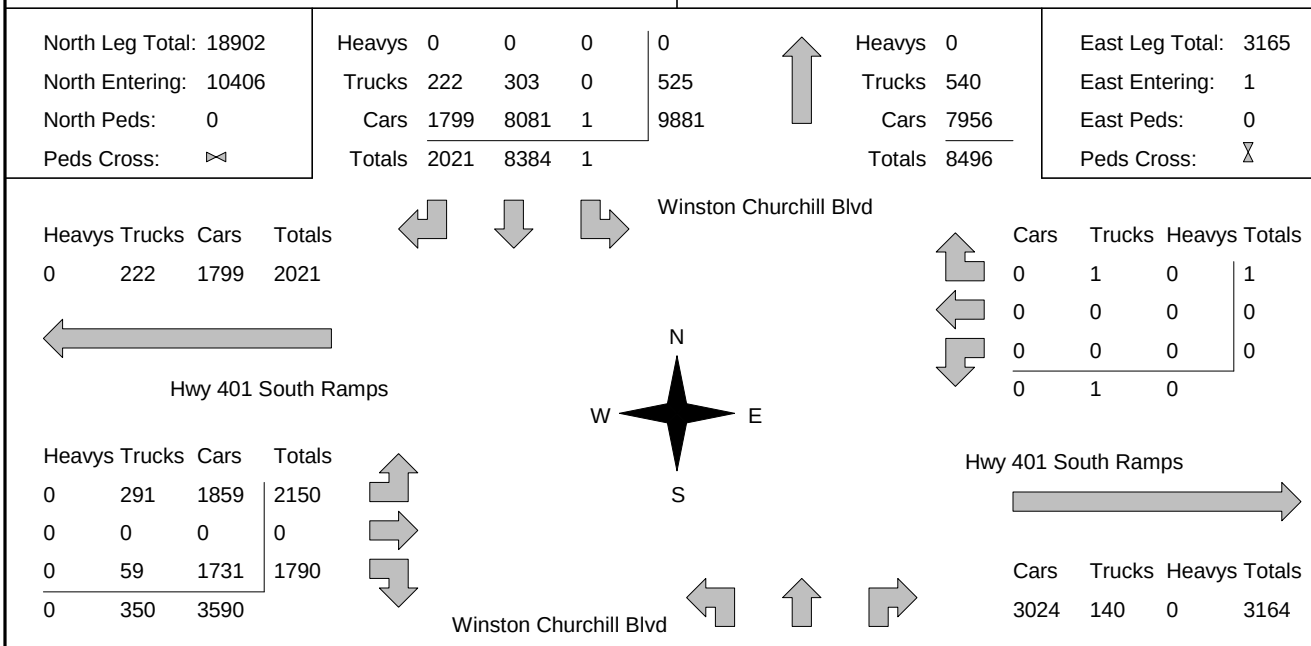
Municipality: Mississauga
Site #: 1427300001
Intersection: Winston Churchill Blvd & Hwy 401 S
TFR File #: 2
Count date: 18-Nov-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Winston Churchill Blvd runs N/S



Comments

Ontario Traffic Inc
Traffic Count Summary

Intersection: Winston Churchill Blvd & Hwy 401 S | **Count Date:** 18-Nov-14 | **Municipality:** Mississauga

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
7:00:00	0	0	0	0	0	5
8:00:00	0	892	344	1236	0	2593
9:00:00	0	1158	307	1465	0	2988
11:00:00	0	1	0	1	0	20
12:00:00	0	702	212	914	0	1712
13:00:00	0	941	213	1154	0	2191
14:00:00	1	803	206	1010	0	2136
15:00:00	0	5	1	6	0	25
16:00:00	0	940	212	1152	0	2165
17:00:00	0	1311	274	1585	0	2819
18:00:00	0	1612	251	1863	0	3218
Totals:	1	8365	2020	10386	0	19872

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	4	1	5	0
8:00:00	0	869	488	1357	0
9:00:00	0	995	528	1523	0
11:00:00	0	13	6	19	0
12:00:00	0	400	398	798	0
13:00:00	0	627	410	1037	0
14:00:00	0	708	418	1126	0
15:00:00	0	13	6	19	0
16:00:00	0	705	308	1013	0
17:00:00	0	957	277	1234	1
18:00:00	0	1035	320	1355	0
Totals:	0	6326	3160	9486	1

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	0	0	1	1	0	619
9:00:00	0	0	0	0	0	1044
11:00:00	0	0	0	0	0	11
12:00:00	0	0	0	0	0	248
13:00:00	0	0	0	0	0	260
14:00:00	0	0	0	0	0	308
15:00:00	0	0	0	0	0	4
16:00:00	0	0	0	0	0	344
17:00:00	0	0	0	0	0	508
18:00:00	0	0	0	0	0	588
Totals:	0	0	1	1	0	3934

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	382	0	236	618	0
9:00:00	585	0	459	1044	0
11:00:00	9	0	2	11	0
12:00:00	123	0	125	248	0
13:00:00	117	0	143	260	0
14:00:00	157	0	151	308	0
15:00:00	3	0	1	4	0
16:00:00	178	0	166	344	2
17:00:00	261	0	247	508	0
18:00:00	329	0	259	588	0
Totals:	2144	0	1789	3933	2

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00
Crossing Values:	382	585	123	117	157	178	262	329

Ontario Traffic Inc

Count Date: 18-Nov-14 Site #: 1427300001

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
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	162	162	82	82	0	0	16	16	4	4	0	0	0	0	0	0	0	0
7:30:00	0	0	367	205	179	97	0	0	26	10	5	1	0	0	0	0	0	0	0	0
7:45:00	0	0	598	231	255	76	0	0	35	9	10	5	0	0	0	0	0	0	0	0
8:00:00	0	0	839	241	329	74	0	0	53	18	15	5	0	0	0	0	0	0	0	0
8:15:00	0	0	1140	301	420	91	0	0	63	10	18	3	0	0	0	0	0	0	0	0
8:30:00	0	0	1414	274	496	76	0	0	81	18	27	9	0	0	0	0	0	0	0	0
8:45:00	0	0	1687	273	552	56	0	0	96	15	37	10	0	0	0	0	0	0	0	0
9:00:00	0	0	1945	258	606	54	0	0	105	9	45	8	0	0	0	0	0	0	0	0
9:00:17	0	0	1946	1	606	0	0	0	105	0	45	0	0	0	0	0	0	0	0	0
9:00:37	0	0	1946	0	606	0	0	0	105	0	45	0	0	0	0	0	0	0	0	0
11:00:00	0	0	1946	0	606	0	0	0	105	0	45	0	0	0	0	0	0	0	0	0
11:15:00	0	0	2083	137	633	27	0	0	116	11	56	11	0	0	0	0	0	0	0	0
11:30:00	0	0	2259	176	683	50	0	0	126	10	67	11	0	0	0	0	0	0	0	0
11:45:00	0	0	2410	151	724	41	0	0	133	7	79	12	0	0	0	0	0	0	0	0
12:00:00	0	0	2609	199	776	52	0	0	144	11	87	8	0	0	0	0	0	0	0	0
12:15:00	0	0	2860	251	813	37	0	0	151	7	98	11	0	0	0	0	0	0	0	0
12:30:00	0	0	3091	231	861	48	0	0	161	10	110	12	0	0	0	0	0	0	0	0
12:45:00	0	0	3319	228	909	48	0	0	165	4	119	9	0	0	0	0	0	0	0	0
13:00:00	0	0	3516	197	950	41	0	0	178	13	126	7	0	0	0	0	0	0	0	0
13:15:00	0	0	3718	202	992	42	0	0	189	11	135	9	0	0	0	0	0	0	0	0
13:30:00	0	0	3900	182	1025	33	0	0	198	9	145	10	0	0	0	0	0	0	0	0
13:45:00	1	1	4076	176	1086	61	0	0	209	11	151	6	0	0	0	0	0	0	0	0
14:00:00	1	0	4277	201	1120	34	0	0	220	11	162	11	0	0	0	0	0	0	0	0
14:00:17	1	0	4282	5	1121	1	0	0	220	0	162	0	0	0	0	0	0	0	0	0
14:00:29	1	0	4282	0	1121	0	0	0	220	0	162	0	0	0	0	0	0	0	0	0
15:00:00	1	0	4282	0	1121	0	0	0	220	0	162	0	0	0	0	0	0	0	0	0
15:15:00	1	0	4480	198	1152	31	0	0	228	8	170	8	0	0	0	0	0	0	0	0
15:30:00	1	0	4694	214	1211	59	0	0	243	15	174	4	0	0	0	0	0	0	0	0
15:45:00	1	0	4921	227	1257	46	0	0	250	7	179	5	0	0	0	0	0	0	0	0
16:00:00	1	0	5186	265	1311	54	0	0	256	6	184	5	0	0	0	0	0	0	0	0
16:15:00	1	0	5468	282	1379	68	0	0	261	5	189	5	0	0	0	0	0	0	0	0
16:30:00	1	0	5778	310	1453	74	0	0	269	8	196	7	0	0	0	0	0	0	0	0
16:45:00	1	0	6136	358	1506	53	0	0	275	6	199	3	0	0	0	0	0	0	0	0
17:00:00	1	0	6472	336	1564	58	0	0	281	6	205	6	0	0	0	0	0	0	0	0
17:15:00	1	0	6881	409	1642	78	0	0	286	5	211	6	0	0	0	0	0	0	0	0
17:30:00	1	0	7267	386	1694	52	0	0	290	4	218	7	0	0	0	0	0	0	0	0
17:45:00	1	0	7651	384	1746	52	0	0	293	3	220	2	0	0	0	0	0	0	0	0
18:00:00	1	0	8063	412	1798	52	0	0	302	9	222	2	0	0	0	0	0	0	0	0
18:15:00	1	0	8081	18	1799	1	0	0	303	1	222	0	0	0	0	0	0	0	0	0

Ontario Traffic Inc

Count Date: 18-Nov-14 Site #: 1427300001

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
18:15:52	1	0	8081	0	1799	0	0	0	303	0	222	0	0	0	0	0	0	0	0	0

Ontario Traffic Inc

Count Date: 18-Nov-14 Site #: 1427300001

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
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	1	1	0	0	0	0	0	0	0	0
8:00:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
8:15:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
8:30:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
8:45:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
9:00:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
9:00:17	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
9:00:37	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
11:00:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
11:15:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
11:30:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
11:45:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
12:00:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
12:15:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
12:30:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
12:45:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
13:00:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
13:15:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
13:30:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
13:45:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
14:00:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
14:00:17	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
14:00:29	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
15:00:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
15:15:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
15:30:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
15:45:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
16:00:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
16:15:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
16:30:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
16:45:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
17:00:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
17:15:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
17:30:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
17:45:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
18:00:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
18:15:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0

Ontario Traffic Inc

Count Date: 18-Nov-14 Site #: 1427300001

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
18:15:52	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0

Ontario Traffic Inc

Count Date: 18-Nov-14 Site #: 1427300001

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
7:00:00	0	0	4	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	149	145	89	88	0	0	4	4	3	3	0	0	0	0	0	0	0	0
7:30:00	0	0	371	222	212	123	0	0	11	7	4	1	0	0	0	0	0	0	0	0
7:45:00	0	0	599	228	332	120	0	0	17	6	6	2	0	0	0	0	0	0	0	0
8:00:00	0	0	851	252	482	150	0	0	22	5	7	1	0	0	0	0	0	0	0	0
8:15:00	0	0	1101	250	630	148	0	0	29	7	8	1	0	0	0	0	0	0	0	0
8:30:00	0	0	1339	238	773	143	0	0	52	23	10	2	0	0	0	0	0	0	0	0
8:45:00	0	0	1564	225	909	136	0	0	66	14	14	4	0	0	0	0	0	0	0	0
9:00:00	0	0	1797	233	1002	93	0	0	71	5	15	1	0	0	0	0	0	0	0	0
9:00:17	0	0	1797	0	1002	0	0	0	71	0	15	0	0	0	0	0	0	0	0	0
9:00:37	0	0	1808	11	1008	6	0	0	71	0	15	0	0	0	0	0	0	0	0	0
11:00:00	0	0	1810	2	1008	0	0	0	71	0	15	0	0	0	0	0	0	0	0	0
11:15:00	0	0	1879	69	1111	103	0	0	76	5	21	6	0	0	0	0	0	0	0	0
11:30:00	0	0	1975	96	1219	108	0	0	84	8	27	6	0	0	0	0	0	0	0	0
11:45:00	0	0	2073	98	1288	69	0	0	92	8	35	8	0	0	0	0	0	0	0	0
12:00:00	0	0	2180	107	1379	91	0	0	101	9	42	7	0	0	0	0	0	0	0	0
12:15:00	0	0	2317	137	1473	94	0	0	105	4	51	9	0	0	0	0	0	0	0	0
12:30:00	0	0	2447	130	1562	89	0	0	113	8	56	5	0	0	0	0	0	0	0	0
12:45:00	0	0	2601	154	1647	85	0	0	120	7	62	6	0	0	0	0	0	0	0	0
13:00:00	0	0	2776	175	1763	116	0	0	132	12	68	6	0	0	0	0	0	0	0	0
13:15:00	0	0	2949	173	1854	91	0	0	140	8	77	9	0	0	0	0	0	0	0	0
13:30:00	0	0	3122	173	1949	95	0	0	148	8	83	6	0	0	0	0	0	0	0	0
13:45:00	0	0	3291	169	2058	109	0	0	156	8	90	7	0	0	0	0	0	0	0	0
14:00:00	0	0	3450	159	2152	94	0	0	166	10	97	7	0	0	0	0	0	0	0	0
14:00:17	0	0	3450	0	2152	0	0	0	166	0	97	0	0	0	0	0	0	0	0	0
14:00:29	0	0	3460	10	2157	5	0	0	167	1	98	1	0	0	0	0	0	0	0	0
15:00:00	0	0	3462	2	2157	0	0	0	167	0	98	0	0	0	0	0	0	0	0	0
15:15:00	0	0	3584	122	2235	78	0	0	175	8	101	3	0	0	0	0	0	0	0	0
15:30:00	0	0	3750	166	2299	64	0	0	179	4	106	5	0	0	0	0	0	0	0	0
15:45:00	0	0	3927	177	2371	72	0	0	184	5	111	5	0	0	0	0	0	0	0	0
16:00:00	0	0	4141	214	2443	72	0	0	193	9	120	9	0	0	0	0	0	0	0	0
16:15:00	0	0	4356	215	2509	66	0	0	201	8	121	1	0	0	0	0	0	0	1	1
16:30:00	0	0	4557	201	2585	76	0	0	208	7	126	5	0	0	0	0	0	0	1	0
16:45:00	0	0	4816	259	2647	62	0	0	215	7	129	3	0	0	0	0	0	0	1	0
17:00:00	0	0	5067	251	2708	61	0	0	224	9	132	3	0	0	0	0	0	0	1	0
17:15:00	0	0	5380	313	2779	71	0	0	229	5	133	1	0	0	0	0	0	0	1	0
17:30:00	0	0	5627	247	2846	67	0	0	238	9	135	2	0	0	0	0	0	0	1	0
17:45:00	0	0	5864	237	2940	94	0	0	242	4	137	2	0	0	0	0	0	0	1	0
18:00:00	0	0	6078	214	3021	81	0	0	248	6	139	2	0	0	0	0	0	0	1	0
18:15:00	0	0	6078	0	3021	0	0	0	248	0	139	0	0	0	0	0	0	0	1	0

Ontario Traffic Inc

Count Date: 18-Nov-14 Site #: 1427300001

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
18:15:52	0	0	6097	19	3023	2	0	0	248	0	140	1	0	0	0	0	0	0	1	0

Ontario Traffic Inc

Count Date: 18-Nov-14 Site #: 1427300001

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
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	58	58	0	0	29	29	9	9	0	0	1	1	0	0	0	0	0	0	0	0
7:30:00	143	85	0	0	89	60	18	9	0	0	3	2	0	0	0	0	0	0	0	0
7:45:00	255	112	0	0	150	61	22	4	0	0	6	3	0	0	0	0	0	0	0	0
8:00:00	354	99	0	0	230	80	28	6	0	0	6	0	0	0	0	0	0	0	0	0
8:15:00	492	138	0	0	344	114	30	2	0	0	8	2	0	0	0	0	0	0	0	0
8:30:00	622	130	0	0	467	123	43	13	0	0	11	3	0	0	0	0	0	0	0	0
8:45:00	797	175	0	0	562	95	46	3	0	0	15	4	0	0	0	0	0	0	0	0
9:00:00	908	111	0	0	678	116	59	13	0	0	17	2	0	0	0	0	0	0	0	0
9:00:17	908	0	0	0	678	0	59	0	0	0	17	0	0	0	0	0	0	0	0	0
9:00:37	917	9	0	0	680	2	59	0	0	0	17	0	0	0	0	0	0	0	0	0
11:00:00	917	0	0	0	680	0	59	0	0	0	17	0	0	0	0	0	0	0	0	0
11:15:00	930	13	0	0	708	28	72	13	0	0	18	1	0	0	0	0	0	0	0	0
11:30:00	949	19	0	0	732	24	81	9	0	0	18	0	0	0	0	0	0	0	0	0
11:45:00	970	21	0	0	760	28	89	8	0	0	21	3	0	0	0	0	0	0	0	0
12:00:00	999	29	0	0	799	39	100	11	0	0	23	2	0	0	0	0	0	0	0	0
12:15:00	1011	12	0	0	829	30	108	8	0	0	24	1	0	0	0	0	0	0	0	0
12:30:00	1029	18	0	0	868	39	122	14	0	0	27	3	0	0	0	0	0	0	0	0
12:45:00	1047	18	0	0	905	37	137	15	0	0	30	3	0	0	0	0	0	0	0	0
13:00:00	1070	23	0	0	932	27	146	9	0	0	33	3	0	0	0	0	0	0	0	0
13:15:00	1092	22	0	0	966	34	150	4	0	0	37	4	0	0	0	0	0	0	0	0
13:30:00	1120	28	0	0	1000	34	164	14	0	0	39	2	0	0	0	0	0	0	0	0
13:45:00	1161	41	0	0	1034	34	171	7	0	0	41	2	0	0	0	0	0	0	0	0
14:00:00	1192	31	0	0	1073	39	181	10	0	0	43	2	0	0	0	0	0	0	0	0
14:00:17	1192	0	0	0	1073	0	181	0	0	0	43	0	0	0	0	0	0	0	0	0
14:00:29	1195	3	0	0	1074	1	181	0	0	0	43	0	0	0	0	0	0	0	0	0
15:00:00	1195	0	0	0	1074	0	181	0	0	0	43	0	0	0	0	0	0	0	0	0
15:15:00	1221	26	0	0	1107	33	187	6	0	0	44	1	0	0	0	0	0	0	0	0
15:30:00	1260	39	0	0	1143	36	193	6	0	0	47	3	0	0	0	0	0	0	0	0
15:45:00	1309	49	0	0	1183	40	202	9	0	0	49	2	0	0	0	0	0	0	0	0
16:00:00	1345	36	0	0	1233	50	209	7	0	0	50	1	0	0	0	0	0	0	2	2
16:15:00	1385	40	0	0	1288	55	223	14	0	0	52	2	0	0	0	0	0	0	2	0
16:30:00	1434	49	0	0	1353	65	238	15	0	0	53	1	0	0	0	0	0	0	2	0
16:45:00	1494	60	0	0	1408	55	254	16	0	0	53	0	0	0	0	0	0	0	2	0
17:00:00	1556	62	0	0	1475	67	259	5	0	0	55	2	0	0	0	0	0	0	2	0
17:15:00	1631	75	0	0	1524	49	263	4	0	0	56	1	0	0	0	0	0	0	2	0
17:30:00	1702	71	0	0	1606	82	268	5	0	0	57	1	0	0	0	0	0	0	2	0
17:45:00	1770	68	0	0	1676	70	277	9	0	0	59	2	0	0	0	0	0	0	2	0
18:00:00	1853	83	0	0	1730	54	291	14	0	0	59	0	0	0	0	0	0	0	2	0
18:15:00	1853	0	0	0	1730	0	291	0	0	0	59	0	0	0	0	0	0	0	2	0

Ontario Traffic Inc

Count Date: 18-Nov-14 Site #: 1427300001

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
18:15:52	1859	6	0	0	1731	1	291	0	0	0	59	0	0	0	0	0	0	0	2	0

REGIONAL MUNICIPALITY OF PEEL

Traffic Signal Timing Parameters

DATE:	April 21, 2012			Completed By:	MF
Database / Office rev		10		Check By:	MT
Timing Card / Field rev		-			

Location:	W.C.B. @ Embleton							TIME PERIOD (sec.) (Green+Amber+All Red)		
Phase #	Direction	Vehicle Minimum (sec.)	Pedestrian Walk (sec.)	Pedestrian FDW (sec.)	Amber (sec.)	All Red (sec.)		AM MAX	OFF MAX	PM MAX
1										
2	WCB - N/S	15.0	8.0	5.0	4.6	2.0		36.6	36.6	71.6
3										
4	Embleton - E/W	9.0	8.0	9.0	4.0	2.0		46.0	36.0	46.0

System Control	NO
Local Control	YES
Semi-Actuated Mode	YES

TIME	PEAK	CYCLE LENGTH (sec.)
06:30-09:00	AM	LOCAL
09:00-15:00	OFF	LOCAL
15:00-19:00	PM	LOCAL

REGIONAL MUNICIPALITY OF PEEL

Traffic Signal Timing Parameters

DATE:	January 11, 2012			Completed By:	MF
Database Rev		1		Checked By:	MT
Timing Card / Field rev		-			

Location:	W.C.B. @ Maple Lodge Farms Entrance							TIME PERIOD (sec.) (Green+Amber+All Red)		
Phase #	Direction	Vehicle Minimum (sec.)	Pedestrian Walk (sec.)	Pedestrian FDW (sec.)	Amber (sec.)	All Red (sec.)		AM SPLIT	OFF SPLIT	PM SPLIT
1	Not in use									
2	WCB - S/B	12.0	8.0	22.0	4.6	2.9		82.5	52.5	82.5
3	Not in use									
4	Maple Lodge Entr - W/B	8.0	8.0	17.0	4.0	3.4		32.4	32.4	32.4
5	WCB - S/B P.P. LT	5.0			3.0			10.0	10.0	10.0
6	WCB - N/B	12.0	8.0	22.0	4.6	2.9		82.5	52.5	82.5
7	Not in use									
8	Field Entr - E/B	8.0	8.0	17.0	4.0	3.4		32.4	32.4	32.4

System Control	NO
Local Control	YES
Semi-Actuated Mode	YES

TIME	PEAK	CYCLE LENGTH (sec.)	OFFSET (sec.)
06:30-09:30	AM	Local	Free
Other Time	OFF	Local	Free
15:30-18:30	PM	Local	Free

REGIONAL MUNICIPALITY OF PEEL

Traffic Signal Timing Parameters

DATE:	October 6, 2011			Completed By:	MF
Database Rev		21		Checked By:	MT
Timing Card / Field rev		-			

Location:	Steeles Ave @ Winston Churchill Blvd							TIME PERIOD (sec.) (Green+Amber+All Red)		
Phase #	Direction	Vehicle Minimum (sec.)	Pedestrian Walk (sec.)	Pedestrian FDW (sec.)	Amber (sec.)	All Red (sec.)		AM SPLIT	OFF SPLIT	PM SPLIT
1	Steeles - W/B Prot LT	8.0			3.0	2.0		28.0	25.0	25.0
2	Steeles - E/B	12.0	8.0	18.0	4.6	2.2		60.0	43.0	49.0
3	WCB - S/B P.P. LT	5.0			3.0			17.0	-	15.0
4	WCB - N/B	8.0	8.0	18.0	4.0	2.9		35.0	52.0	41.0
5	Not in use									
6	Steeles - W/B	12.0	8.0	18.0	4.6	2.2		88.0	68.0	74.0
7	WCB - N/B Prot LT	8.0			3.0	2.0		17.0	17.0	21.0
8	WCB - S/B	8.0	8.0	18.0	4.0	2.9		35.0	35.0	35.0

System Control	YES
Local Control	NO
Semi-Actuated Mode	YES

TIME	PEAK	CYCLE LENGTH (sec.)	OFFSET (sec.)
06:30-09:30	AM	140	72
Other Time	OFF	120	68
16:30-18:30	PM	130	68

REGIONAL MUNICIPALITY OF PEEL

Traffic Signal Timing Parameters

DATE:	May 8, 2014		Completed By:	MF	
Database / Office rev	1		Checked By:	MT	
Timing Card / Field rev					

Location:	WCB @ Orlando Access						TIME PERIOD (sec.) (Green+Amber+All Red)		
Phase #	Direction	Vehicle Minimum (sec.)	Pedestrian Walk (sec.)	Pedestrian FDW (sec.)	Amber (sec.)	All Red (sec.)	AM MAX	OFF MAX	PM MAX
1									
2	WCB - N/S	12.0	8.0	15.0	4.0	2.5	81.5	61.5	81.5
3									
4	Orlando Acc - E/W	8.0	8.0	20.0	4.0	2.8	34.8	34.8	34.8
5									
6	WCB - N/S	12.0	8.0	15.0	4.0	2.5	81.5	61.5	81.5
7									
8	Orlando Acc - E/W	8.0	8.0	20.0	4.0	2.8	34.8	34.8	34.8

System Control	NO
Local Control	YES
Semi-Actuated Mode	YES

TIME	PEAK	CYCLE LENGTH (sec.)
06:30-09:30	AM	LOCAL
09:30-15:30	OFF	LOCAL
15:30-19:30	PM	LOCAL

REGIONAL MUNICIPALITY OF PEEL

Traffic Signal Timing Parameters

DATE:	February 17, 2011		Completed By:	MF	
Database / Office rev	17		Checked By:	MT	
Timing Card / Field rev					
Location:	W.C.B. @ Meadowpine Blvd.				

Phase #	Direction	Vehicle Minimum (sec.)	Pedestrian Walk (sec.)	Pedestrian FDW (sec.)	Amber (sec.)	All Red (sec.)	TIME PERIOD (sec.) (Green+Amber+All Red) AM MAX	OFF MAX	PM MAX
1	S/B P.P. LT Arrow	5.0			3.0		15.0	10.0	10.0
2	WCB - N/S	8.0	8.0	22.0	4.0	2.5	56.5	46.5	56.5
3									
4	Meadowpine - E/W	8.0	8.0	17.0	4.0	2.8	31.8	31.8	46.8

System Control	NO
Local Control	YES
Semi-Actuated Mode	YES

TIME	PEAK	CYCLE LENGTH (sec.)
06:00-09:00	AM	LOCAL
09:00-15:00	OFF	LOCAL
15:00-19:00	PM	LOCAL

INT No.: **597**

LOCATION: **WCB @ 401 N.T.**

SCHEDULED DATA

Mode	Cycle Length	OFF No.	Split No.	Spec Func	DUP ISEC
LO	101	2	2	2	1023

PHASING DATA

PHASE	MIN	MAX	WALK	DON'T WALK	AMBER	ALL-RED
2. N/S WCB	50	N/A	38	12	5	2.5
4. WB 401 N.T.	8	40	-	-	4	2.5

* ALL VALUES IN SECONDS

INT No.: **596**

LOCATION: **WCB @ 401 S.T.**

SCHEDULED DATA

Mode	Cycle Length	OFF No.	Split No.	Spec Func	DUP ISEC
LO	101	2	2	2	1023

PHASING DATA

PHASE	MIN	MAX	WALK	DON'T WALK	AMBER	ALL-RED
2. N/S WCB	50	N/A	40	10	4	2.5
4. WB 401 N.T.	8	40	-	-	4	3.5

* ALL VALUES IN SECONDS

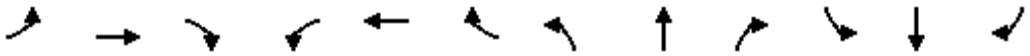
Appendix B

Synchro Summary Reports

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	432	375	87	78	6	16	177	43	88	451	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		6.6	6.6	6.6	6.6	6.6	
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Frt		0.94			1.00		1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00			0.98		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1789			1844		1825	1865	1555	1825	1902	
Flt Permitted		1.00			0.43		0.31	1.00	1.00	0.63	1.00	
Satd. Flow (perm)		1787			818		590	1865	1555	1211	1902	
Peak-hour factor, PHF	0.97	0.97	0.97	0.88	0.88	0.88	0.87	0.87	0.87	0.92	0.96	0.92
Adj. Flow (vph)	5	445	387	99	89	7	18	203	49	96	470	1
RTOR Reduction (vph)	0	39	0	0	2	0	0	0	31	0	0	0
Lane Group Flow (vph)	0	798	0	0	193	0	18	203	18	96	471	0
Heavy Vehicles (%)	20%	1%	0%	1%	0%	17%	0%	3%	5%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)		38.1			38.1		30.1	30.1	30.1	30.1	30.1	
Effective Green, g (s)		38.1			38.1		30.1	30.1	30.1	30.1	30.1	
Actuated g/C Ratio		0.47			0.47		0.37	0.37	0.37	0.37	0.37	
Clearance Time (s)		6.0			6.0		6.6	6.6	6.6	6.6	6.6	
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		842			385		219	694	579	451	708	
v/s Ratio Prot								0.11			c0.25	
v/s Ratio Perm		c0.45			0.24		0.03		0.01	0.08		
v/c Ratio		0.95			0.50		0.08	0.29	0.03	0.21	0.67	
Uniform Delay, d1		20.4			14.8		16.4	17.9	16.1	17.3	21.1	
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		19.3			1.0		0.7	1.1	0.1	1.1	4.9	
Delay (s)		39.8			15.8		17.1	18.9	16.2	18.4	26.0	
Level of Service		D			B		B	B	B	B	C	
Approach Delay (s)		39.8			15.8			18.3			24.7	
Approach LOS		D			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	29.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	80.8	Sum of lost time (s)	12.6
Intersection Capacity Utilization	112.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	31	0	1	0	332	31	20	1116	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.4	7.4			7.5	7.5	3.0	7.5	
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1086	1633			3579	1126	1825	3614	
Flt Permitted				0.76	1.00			1.00	1.00	0.53	1.00	
Satd. Flow (perm)				866	1633			3579	1126	1011	3614	
Peak-hour factor, PHF	0.92	0.92	0.92	0.73	0.73	0.73	0.96	0.96	0.96	0.87	0.87	0.87
Adj. Flow (vph)	0	0	0	42	0	1	0	346	32	23	1283	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	8	0	0	0
Lane Group Flow (vph)	0	0	0	42	0	0	0	346	24	23	1283	0
Heavy Vehicles (%)	0%	0%	0%	68%	0%	0%	0%	2%	45%	0%	1%	0%
Turn Type	Perm			Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		8			4			6		5	2	
Permitted Phases	8			4			6		6	2		
Actuated Green, G (s)				8.0	8.0			88.9	88.9	95.4	95.4	
Effective Green, g (s)				8.0	8.0			88.9	88.9	95.4	95.4	
Actuated g/C Ratio				0.07	0.07			0.75	0.75	0.81	0.81	
Clearance Time (s)				7.4	7.4			7.5	7.5	3.0	7.5	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				58	110			2689	846	839	2914	
v/s Ratio Prot					0.00			0.10		0.00	c0.36	
v/s Ratio Perm				c0.05					0.02	0.02		
v/c Ratio				0.72	0.00			0.13	0.03	0.03	0.44	
Uniform Delay, d1				54.1	51.4			4.0	3.7	2.3	3.4	
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2				35.9	0.0			0.1	0.1	0.0	0.5	
Delay (s)				90.0	51.4			4.1	3.8	2.3	3.9	
Level of Service				F	D			A	A	A	A	
Approach Delay (s)		0.0			89.1			4.1			3.9	
Approach LOS		A			F			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	118.3	Sum of lost time (s)	17.9
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	1665	291	702	512	37	127	302	622	306	813	28
Ideal Flow (vphpl)	1900	2150	1900	1950	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	3.8	6.8	2.0	6.8	6.8	5.0	6.9	3.0	3.0	4.9	6.9
Lane Util. Factor	1.00	*1.00	1.00	*1.00	0.95	1.00	0.97	0.95	1.00	1.00	*1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1404	4181	1570	3828	3318	1541	3133	3544	1865	1807	3804	1420
Flt Permitted	0.44	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)	648	4181	1570	3828	3318	1541	3133	3544	1865	851	3804	1420
Peak-hour factor, PHF	0.98	1.00	0.98	1.00	0.90	0.90	0.95	0.95	1.00	0.90	1.00	0.85
Adj. Flow (vph)	24	1665	297	702	569	41	134	318	622	340	813	33
RTOR Reduction (vph)	0	0	131	0	0	17	0	0	42	0	0	26
Lane Group Flow (vph)	24	1665	166	702	569	24	134	318	580	340	813	7
Heavy Vehicles (%)	30%	4%	4%	3%	10%	6%	13%	3%	3%	1%	1%	15%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	pm+pt	NA	Perm
Protected Phases		2		1	6		7	4	1	3	8	
Permitted Phases	2		2			6			4	8		8
Actuated Green, G (s)	53.2	53.2	53.2	23.0	81.2	81.2	10.7	28.1	51.1	43.4	29.4	29.4
Effective Green, g (s)	53.2	56.2	53.2	26.0	81.2	81.2	10.7	28.1	55.1	43.4	31.4	29.4
Actuated g/C Ratio	0.38	0.40	0.38	0.19	0.58	0.58	0.08	0.20	0.39	0.31	0.22	0.21
Clearance Time (s)	6.8	6.8	6.8	5.0	6.8	6.8	5.0	6.9	5.0	3.0	6.9	6.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	246	1678	596	710	1924	893	239	711	734	359	853	298
v/s Ratio Prot		c0.40		c0.18	0.17		0.04	0.09	0.14	c0.09	c0.21	
v/s Ratio Perm	0.04		0.11			0.02			0.17	0.20		0.00
v/c Ratio	0.10	0.99	0.28	0.99	0.30	0.03	0.56	0.45	0.79	0.95	0.95	0.02
Uniform Delay, d1	27.9	41.7	30.1	56.9	14.9	12.5	62.4	49.1	37.4	44.6	53.6	43.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	20.2	1.2	30.6	0.1	0.0	3.0	0.4	5.8	33.6	20.2	0.0
Delay (s)	28.7	61.9	31.2	87.5	15.0	12.6	65.4	49.6	43.2	78.2	73.7	43.9
Level of Service	C	E	C	F	B	B	E	D	D	E	E	D
Approach Delay (s)		56.9			53.7			47.8			74.2	
Approach LOS		E			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	58.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.7
Intersection Capacity Utilization	106.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	11	0	4	0	1047	61	8	1799	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.8	6.8			6.5	6.5	6.5	6.5	
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				956	1089			3476	1555	1323	3544	
Flt Permitted				1.00	1.00			1.00	1.00	0.24	1.00	
Satd. Flow (perm)				1006	1089			3476	1555	335	3544	
Peak-hour factor, PHF	0.92	0.92	0.92	0.63	0.63	0.63	0.91	0.91	0.91	0.93	0.93	0.93
Adj. Flow (vph)	0	0	0	17	0	6	0	1151	67	9	1934	0
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	8	0	0	0
Lane Group Flow (vph)	0	0	0	17	0	0	0	1151	59	9	1934	0
Heavy Vehicles (%)	2%	2%	2%	91%	0%	50%	0%	5%	5%	38%	3%	0%
Turn Type	Perm			Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)				4.0	4.0			90.6	90.6	90.6	90.6	
Effective Green, g (s)				4.0	4.0			90.6	90.6	90.6	90.6	
Actuated g/C Ratio				0.04	0.04			0.84	0.84	0.84	0.84	
Clearance Time (s)				6.8	6.8			6.5	6.5	6.5	6.5	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				37	40			2918	1305	281	2975	
v/s Ratio Prot					0.00			0.33			c0.55	
v/s Ratio Perm				c0.02					0.04	0.03		
v/c Ratio				0.46	0.01			0.39	0.05	0.03	0.65	
Uniform Delay, d1				50.9	50.0			2.1	1.4	1.4	3.1	
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2				8.8	0.1			0.4	0.1	0.2	1.1	
Delay (s)				59.7	50.1			2.5	1.5	1.6	4.2	
Level of Service				E	D			A	A	A	A	
Approach Delay (s)		0.0			57.2			2.4			4.2	
Approach LOS		A			E			A			A	

Intersection Summary			
HCM 2000 Control Delay	3.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	107.9	Sum of lost time (s)	13.3
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

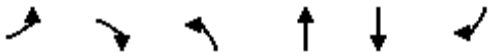
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	91	43	1065	711	237	1574
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	6.5	6.5	3.0	6.5
Lane Util. Factor	0.97	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	2788	1060	3444	1555	1755	3444
Flt Permitted	0.95	1.00	1.00	1.00	0.28	1.00
Satd. Flow (perm)	2788	1060	3444	1555	517	3444
Peak-hour factor, PHF	0.83	0.83	0.94	0.94	1.00	0.97
Adj. Flow (vph)	110	52	1133	756	237	1623
RTOR Reduction (vph)	0	48	0	278	0	0
Lane Group Flow (vph)	110	4	1133	478	237	1623
Heavy Vehicles (%)	27%	54%	6%	5%	4%	6%
Turn Type	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		2		1	6
Permitted Phases		4		2	6	
Actuated Green, G (s)	7.4	7.4	54.9	54.9	66.1	66.1
Effective Green, g (s)	7.4	7.4	54.9	54.9	66.1	66.1
Actuated g/C Ratio	0.09	0.09	0.63	0.63	0.76	0.76
Clearance Time (s)	6.8	6.8	6.5	6.5	3.0	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	237	90	2178	983	510	2622
v/s Ratio Prot	c0.04		0.33		0.04	c0.47
v/s Ratio Perm		0.00		0.31	0.31	
v/c Ratio	0.46	0.05	0.52	0.49	0.46	0.62
Uniform Delay, d1	37.8	36.5	8.7	8.5	2.9	4.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4	0.2	0.9	1.7	0.7	1.1
Delay (s)	39.3	36.7	9.6	10.2	3.5	5.8
Level of Service	D	D	A	B	A	A
Approach Delay (s)	38.4		9.9			5.5
Approach LOS	D		A			A

Intersection Summary			
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	86.8	Sum of lost time (s)	16.3
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	247	362	1414	0	0	1506
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	7.5			7.5
Lane Util. Factor	0.97	0.91	0.95			0.95
Frt	0.94	0.85	1.00			1.00
Flt Protected	0.97	1.00	1.00			1.00
Satd. Flow (prot)	3069	1327	3476			3476
Flt Permitted	0.97	1.00	1.00			1.00
Satd. Flow (perm)	3069	1327	3476			3476
Peak-hour factor, PHF	0.78	0.78	0.95	0.95	0.94	0.94
Adj. Flow (vph)	317	464	1488	0	0	1602
RTOR Reduction (vph)	16	16	0	0	0	0
Lane Group Flow (vph)	514	235	1488	0	0	1602
Heavy Vehicles (%)	10%	12%	5%	5%	0%	5%
Turn Type	NA	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	33.5	33.5	53.5			53.5
Effective Green, g (s)	33.5	33.5	53.5			53.5
Actuated g/C Ratio	0.33	0.33	0.53			0.53
Clearance Time (s)	6.5	6.5	7.5			7.5
Lane Grp Cap (vph)	1017	440	1841			1841
v/s Ratio Prot	0.17		0.43			c0.46
v/s Ratio Perm		c0.18				
v/c Ratio	0.51	0.53	0.81			0.87
Uniform Delay, d1	27.1	27.4	19.5			20.7
Progression Factor	1.00	1.00	0.73			1.00
Incremental Delay, d2	1.8	4.6	3.5			5.9
Delay (s)	28.9	32.0	17.8			26.7
Level of Service	C	C	B			C
Approach Delay (s)	29.9		17.8			26.7
Approach LOS	C		B			C

Intersection Summary			
HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	101.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	566	421	0	1048	1429	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.5		6.5	6.5	
Lane Util. Factor	0.97	0.91		0.91	0.91	
Frt	0.97	0.85		1.00	1.00	
Flt Protected	0.96	1.00		1.00	1.00	
Satd. Flow (prot)	3365	1457		4995	4995	
Flt Permitted	0.96	1.00		1.00	1.00	
Satd. Flow (perm)	3365	1457		4995	4995	
Peak-hour factor, PHF	0.89	0.89	0.98	0.98	0.91	0.91
Adj. Flow (vph)	636	473	0	1069	1570	0
RTOR Reduction (vph)	14	14	0	0	0	0
Lane Group Flow (vph)	750	331	0	1069	1570	0
Heavy Vehicles (%)	4%	2%	0%	5%	5%	0%
Turn Type	NA	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	32.5	32.5		54.5	54.5	
Effective Green, g (s)	32.5	32.5		54.5	54.5	
Actuated g/C Ratio	0.32	0.32		0.54	0.54	
Clearance Time (s)	7.5	7.5		6.5	6.5	
Lane Grp Cap (vph)	1082	468		2695	2695	
v/s Ratio Prot	0.22			0.21	c0.31	
v/s Ratio Perm		c0.23				
v/c Ratio	0.69	0.71		0.40	0.58	
Uniform Delay, d1	29.9	30.1		13.6	15.6	
Progression Factor	1.00	1.00		1.00	0.87	
Incremental Delay, d2	3.7	8.7		0.4	0.5	
Delay (s)	33.6	38.8		14.1	14.2	
Level of Service	C	D		B	B	
Approach Delay (s)	35.2			14.1	14.2	
Approach LOS	D			B	B	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	101.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	162	26	45	269	71	230	537	128	4	174	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		6.6	6.6	6.6	6.6	6.6	
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Frt		0.98			0.97		1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1858			1859		1825	1921	1633	1825	1842	
Flt Permitted		0.98			0.89		0.62	1.00	1.00	0.31	1.00	
Satd. Flow (perm)		1831			1657		1198	1921	1633	586	1842	
Peak-hour factor, PHF	0.67	0.67	0.67	0.83	0.83	0.83	0.85	0.85	0.85	0.83	0.83	0.83
Adj. Flow (vph)	9	242	39	54	324	86	271	632	151	5	210	5
RTOR Reduction (vph)	0	5	0	0	8	0	0	0	51	0	1	0
Lane Group Flow (vph)	0	285	0	0	456	0	271	632	100	5	214	0
Heavy Vehicles (%)	0%	1%	4%	0%	0%	1%	0%	0%	0%	0%	4%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)		33.6			33.6		65.2	65.2	65.2	65.2	65.2	
Effective Green, g (s)		33.6			33.6		65.2	65.2	65.2	65.2	65.2	
Actuated g/C Ratio		0.30			0.30		0.59	0.59	0.59	0.59	0.59	
Clearance Time (s)		6.0			6.0		6.6	6.6	6.6	6.6	6.6	
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		552			499		701	1124	955	342	1078	
v/s Ratio Prot								c0.33			0.12	
v/s Ratio Perm		0.16			c0.28		0.23		0.06	0.01		
v/c Ratio		0.52			0.91		0.39	0.56	0.10	0.01	0.20	
Uniform Delay, d1		32.2			37.5		12.4	14.3	10.2	9.7	10.8	
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.8			21.3		1.6	2.0	0.2	0.1	0.4	
Delay (s)		33.0			58.8		14.0	16.3	10.4	9.7	11.3	
Level of Service		C			E		B	B	B	A	B	
Approach Delay (s)		33.0			58.8			14.9			11.2	
Approach LOS		C			E			B			B	

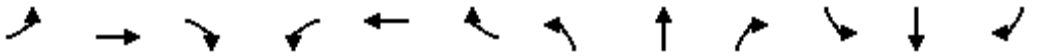
Intersection Summary			
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	111.4	Sum of lost time (s)	12.6
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	29	0	17	0	1197	15	2	416	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.4	7.4			7.5	7.5	3.0	7.5	
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1560	1633			3614	907	1825	3614	
Flt Permitted				0.76	1.00			1.00	1.00	0.17	1.00	
Satd. Flow (perm)				1243	1633			3614	907	329	3614	
Peak-hour factor, PHF	0.92	0.92	0.92	0.68	0.68	0.68	0.88	0.88	0.88	0.78	0.78	0.78
Adj. Flow (vph)	0	0	0	43	0	25	0	1360	17	3	533	0
RTOR Reduction (vph)	0	0	0	0	23	0	0	0	4	0	0	0
Lane Group Flow (vph)	0	0	0	43	2	0	0	1360	13	3	533	0
Heavy Vehicles (%)	0%	0%	0%	17%	0%	0%	0%	1%	80%	0%	1%	0%
Turn Type	Perm			Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		8			4			6		5	2	
Permitted Phases	8			4			6		6	2		
Actuated Green, G (s)				8.3	8.3			92.4	92.4	96.5	96.5	
Effective Green, g (s)				8.3	8.3			92.4	92.4	96.5	96.5	
Actuated g/C Ratio				0.07	0.07			0.77	0.77	0.81	0.81	
Clearance Time (s)				7.4	7.4			7.5	7.5	3.0	7.5	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				86	113			2789	700	278	2913	
v/s Ratio Prot					0.00			c0.38		0.00	c0.15	
v/s Ratio Perm				c0.03					0.01	0.01		
v/c Ratio				0.50	0.02			0.49	0.02	0.01	0.18	
Uniform Delay, d1				53.7	51.9			5.0	3.2	3.0	2.6	
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2				4.5	0.1			0.6	0.0	0.0	0.1	
Delay (s)				58.2	51.9			5.6	3.2	3.0	2.8	
Level of Service				E	D			A	A	A	A	
Approach Delay (s)		0.0			55.9			5.6			2.8	
Approach LOS		A			E			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	119.7	Sum of lost time (s)	17.9
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	61	672	194	653	1447	273	409	879	543	101	329	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8	6.8	6.8	2.0	6.8	6.8	3.0	6.9	3.0	3.0	6.9	6.9
Lane Util. Factor	1.00	0.95	1.00	*1.00	0.95	1.00	*1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3288	1585	3730	3476	1617	3767	3544	1512	1789	3614	1633
Flt Permitted	0.12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.14	1.00	1.00
Satd. Flow (perm)	235	3288	1585	3730	3476	1617	3767	3544	1512	266	3614	1633
Peak-hour factor, PHF	0.94	1.00	0.94	1.00	1.00	0.90	1.00	0.92	1.00	0.83	0.83	0.83
Adj. Flow (vph)	65	672	206	653	1447	303	409	955	543	122	396	18
RTOR Reduction (vph)	0	0	139	0	0	146	0	0	67	0	0	14
Lane Group Flow (vph)	65	672	67	653	1447	157	409	955	476	122	396	4
Heavy Vehicles (%)	0%	11%	3%	3%	5%	1%	2%	3%	8%	2%	1%	0%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	pm+pt	NA	Perm
Protected Phases		2		1	6		7	4	1	3	8	
Permitted Phases	2		2			6			4	8		8
Actuated Green, G (s)	42.2	42.2	42.2	20.0	67.2	67.2	15.8	35.7	55.7	38.7	28.3	28.3
Effective Green, g (s)	43.2	42.2	42.2	23.0	67.2	67.2	17.8	35.7	59.7	38.7	28.3	28.3
Actuated g/C Ratio	0.33	0.32	0.32	0.18	0.52	0.52	0.14	0.27	0.46	0.30	0.22	0.22
Clearance Time (s)	6.8	6.8	6.8	5.0	6.8	6.8	5.0	6.9	5.0	3.0	6.9	6.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	78	1067	514	659	1796	835	515	973	694	201	786	355
v/s Ratio Prot		0.20		c0.18	c0.42		c0.11	c0.27	0.12	0.05	0.11	
v/s Ratio Perm	0.28		0.04			0.10			0.20	0.13		0.00
v/c Ratio	0.83	0.63	0.13	0.99	0.81	0.19	0.79	0.98	0.69	0.61	0.50	0.01
Uniform Delay, d1	40.1	37.3	31.0	53.4	26.0	16.8	54.3	46.8	27.7	36.5	44.7	39.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	62.8	2.8	0.5	32.6	2.7	0.1	8.2	24.3	2.8	5.1	0.5	0.0
Delay (s)	102.9	40.1	31.5	86.0	28.7	16.9	62.6	71.1	30.6	41.6	45.2	39.9
Level of Service	F	D	C	F	C	B	E	E	C	D	D	D
Approach Delay (s)		42.5			42.8			57.7			44.2	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	47.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.7
Intersection Capacity Utilization	99.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	41	0	7	0	1824	25	57	1119	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.8	6.8			6.5	6.5	6.5	6.5	
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1630	1432			3579	1512	1755	3579	
Flt Permitted				0.76	1.00			1.00	1.00	0.08	1.00	
Satd. Flow (perm)				1299	1432			3579	1512	150	3579	
Peak-hour factor, PHF	0.92	0.92	0.92	0.52	0.52	0.52	0.95	0.95	0.95	0.85	0.82	0.82
Adj. Flow (vph)	0	0	0	79	0	13	0	1920	26	67	1365	0
RTOR Reduction (vph)	0	0	0	0	12	0	0	0	6	0	0	0
Lane Group Flow (vph)	0	0	0	79	1	0	0	1920	20	67	1365	0
Heavy Vehicles (%)	2%	2%	2%	12%	0%	14%	0%	2%	8%	4%	2%	0%
Turn Type	Perm			Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)				10.3	10.3			84.3	84.3	84.3	84.3	
Effective Green, g (s)				10.3	10.3			84.3	84.3	84.3	84.3	
Actuated g/C Ratio				0.10	0.10			0.78	0.78	0.78	0.78	
Clearance Time (s)				6.8	6.8			6.5	6.5	6.5	6.5	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				124	136			2796	1181	117	2796	
v/s Ratio Prot					0.00			c0.54			0.38	
v/s Ratio Perm				c0.06					0.01	0.45		
v/c Ratio				0.64	0.01			0.69	0.02	0.57	0.49	
Uniform Delay, d1				47.0	44.2			5.6	2.6	4.7	4.2	
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2				10.3	0.0			1.4	0.0	18.8	0.6	
Delay (s)				57.3	44.2			7.0	2.6	23.5	4.8	
Level of Service				E	D			A	A	C	A	
Approach Delay (s)		0.0			55.4			6.9			5.7	
Approach LOS		A			E			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	107.9	Sum of lost time (s)	13.3
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

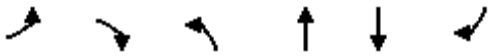
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	608	290	1560	122	65	1095
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	4.5	6.5	0.0	6.5
Lane Util. Factor	0.97	1.00	*1.00	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	3404	1570	3730	1306	1847	3579
Flt Permitted	0.95	1.00	1.00	1.00	0.10	1.00
Satd. Flow (perm)	3404	1570	3730	1306	185	3579
Peak-hour factor, PHF	0.74	0.74	1.00	0.92	1.00	0.91
Adj. Flow (vph)	822	392	1560	133	65	1203
RTOR Reduction (vph)	0	100	0	67	0	0
Lane Group Flow (vph)	822	292	1560	66	65	1203
Heavy Vehicles (%)	4%	4%	3%	25%	4%	2%
Turn Type	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		2		1	6
Permitted Phases		4		2	6	
Actuated Green, G (s)	31.6	31.6	52.5	52.5	60.8	60.8
Effective Green, g (s)	31.6	31.6	54.5	52.5	63.8	60.8
Actuated g/C Ratio	0.30	0.30	0.52	0.50	0.60	0.58
Clearance Time (s)	6.8	6.8	6.5	6.5	3.0	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1017	469	1923	648	242	2058
v/s Ratio Prot	c0.24		c0.42		0.02	c0.34
v/s Ratio Perm		0.19		0.05	0.14	
v/c Ratio	0.81	0.62	0.81	0.10	0.27	0.58
Uniform Delay, d1	34.2	31.9	21.3	14.1	8.6	14.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.8	2.6	3.8	0.3	0.6	1.2
Delay (s)	39.1	34.5	25.2	14.4	9.2	15.6
Level of Service	D	C	C	B	A	B
Approach Delay (s)	37.6		24.3			15.3
Approach LOS	D		C			B

Intersection Summary			
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	105.7	Sum of lost time (s)	13.3
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	553	431	1250	0	0	1408
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	7.5			7.5
Lane Util. Factor	0.97	0.91	0.95			0.95
Frt	0.97	0.85	1.00			1.00
Flt Protected	0.96	1.00	1.00			1.00
Satd. Flow (prot)	3429	1429	3510			3579
Flt Permitted	0.96	1.00	1.00			1.00
Satd. Flow (perm)	3429	1429	3510			3579
Peak-hour factor, PHF	0.78	0.78	0.86	0.86	0.84	0.84
Adj. Flow (vph)	709	553	1453	0	0	1676
RTOR Reduction (vph)	17	17	0	0	0	0
Lane Group Flow (vph)	852	376	1453	0	0	1676
Heavy Vehicles (%)	1%	4%	4%	3%	12%	2%
Turn Type	NA	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	33.5	33.5	53.5			53.5
Effective Green, g (s)	33.5	33.5	53.5			53.5
Actuated g/C Ratio	0.33	0.33	0.53			0.53
Clearance Time (s)	6.5	6.5	7.5			7.5
Lane Grp Cap (vph)	1137	473	1859			1895
v/s Ratio Prot	0.25		0.41			c0.47
v/s Ratio Perm		c0.26				
v/c Ratio	0.75	0.79	0.78			0.88
Uniform Delay, d1	30.0	30.6	19.1			21.0
Progression Factor	1.00	1.00	0.68			1.00
Incremental Delay, d2	4.5	12.9	3.1			6.5
Delay (s)	34.6	43.5	16.1			27.5
Level of Service	C	D	B			C
Approach Delay (s)	37.3		16.1			27.5
Approach LOS	D		B			C

Intersection Summary			
HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	101.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	329	259	0	1051	1710	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.5		6.5	6.5	
Lane Util. Factor	0.97	0.91		0.91	0.91	
Frt	0.97	0.85		1.00	1.00	
Flt Protected	0.96	1.00		1.00	1.00	
Satd. Flow (prot)	3208	1457		5142	5193	
Flt Permitted	0.96	1.00		1.00	1.00	
Satd. Flow (perm)	3208	1457		5142	5193	
Peak-hour factor, PHF	0.92	0.92	0.87	0.87	0.94	0.94
Adj. Flow (vph)	358	282	0	1208	1819	0
RTOR Reduction (vph)	7	7	0	0	0	0
Lane Group Flow (vph)	433	193	0	1208	1819	0
Heavy Vehicles (%)	10%	2%	2%	2%	1%	7%
Turn Type	NA	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	32.5	32.5		54.5	54.5	
Effective Green, g (s)	32.5	32.5		54.5	54.5	
Actuated g/C Ratio	0.32	0.32		0.54	0.54	
Clearance Time (s)	7.5	7.5		6.5	6.5	
Lane Grp Cap (vph)	1032	468		2774	2802	
v/s Ratio Prot	c0.13			0.23	c0.35	
v/s Ratio Perm		0.13				
v/c Ratio	0.42	0.41		0.44	0.65	
Uniform Delay, d1	26.9	26.8		14.0	16.5	
Progression Factor	1.00	1.00		1.00	0.87	
Incremental Delay, d2	1.3	2.7		0.5	0.6	
Delay (s)	28.1	29.4		14.5	14.9	
Level of Service	C	C		B	B	
Approach Delay (s)	28.5			14.5	14.9	
Approach LOS	C			B	B	

Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	101.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	496	431	100	90	7	18	233	49	102	594	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			6.0		6.6	6.6	6.6	6.6	6.6	
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Frt		0.94			1.00		1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00			0.98		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1789			1844		1825	1865	1555	1825	1902	
Flt Permitted		1.00			0.40		0.16	1.00	1.00	0.59	1.00	
Satd. Flow (perm)		1787			750		299	1865	1555	1131	1902	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	6	496	431	100	90	7	18	233	49	102	594	1
RTOR Reduction (vph)	0	37	0	0	2	0	0	0	31	0	0	0
Lane Group Flow (vph)	0	896	0	0	195	0	18	233	18	102	595	0
Heavy Vehicles (%)	20%	1%	0%	1%	0%	17%	0%	3%	5%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)		40.0			40.0		30.0	30.0	30.0	30.0	30.0	
Effective Green, g (s)		41.5			40.0		30.0	30.0	30.0	30.0	30.0	
Actuated g/C Ratio		0.50			0.48		0.36	0.36	0.36	0.36	0.36	
Clearance Time (s)		6.0			6.0		6.6	6.6	6.6	6.6	6.6	
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		897			363		108	677	564	410	690	
v/s Ratio Prot								0.12			c0.31	
v/s Ratio Perm		c0.50			0.26		0.06		0.01	0.09		
v/c Ratio		1.00			0.54		0.17	0.34	0.03	0.25	0.86	
Uniform Delay, d1		20.5			14.9		17.8	19.1	16.9	18.4	24.4	
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		29.5			1.5		3.3	1.4	0.1	1.4	13.4	
Delay (s)		50.0			16.4		21.1	20.5	17.0	19.9	37.8	
Level of Service		D			B		C	C	B	B	D	
Approach Delay (s)		50.0			16.4			20.0			35.2	
Approach LOS		D			B			B			D	

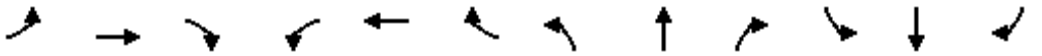
Intersection Summary			
HCM 2000 Control Delay	37.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	82.6	Sum of lost time (s)	12.6
Intersection Capacity Utilization	127.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	36	0	1	0	437	36	23	1469	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.4	7.4			7.5	7.5	3.0	7.5	
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1086	1633			3579	1126	1825	3614	
Flt Permitted				0.76	1.00			1.00	1.00	0.48	1.00	
Satd. Flow (perm)				866	1633			3579	1126	926	3614	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	36	0	1	0	437	36	23	1469	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	9	0	0	0
Lane Group Flow (vph)	0	0	0	36	0	0	0	437	27	23	1469	0
Heavy Vehicles (%)	0%	0%	0%	68%	0%	0%	0%	2%	45%	0%	1%	0%
Turn Type				Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		8			4			6		5	2	
Permitted Phases	8			4			6		6	2		
Actuated Green, G (s)				7.4	7.4			89.4	89.4	95.9	95.9	
Effective Green, g (s)				7.4	7.4			89.4	89.4	95.9	95.9	
Actuated g/C Ratio				0.06	0.06			0.76	0.76	0.81	0.81	
Clearance Time (s)				7.4	7.4			7.5	7.5	3.0	7.5	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				54	102			2706	851	777	2932	
v/s Ratio Prot					0.00			0.12		0.00	c0.41	
v/s Ratio Perm				c0.04					0.02	0.02		
v/c Ratio				0.67	0.00			0.16	0.03	0.03	0.50	
Uniform Delay, d1				54.2	51.9			4.0	3.6	2.2	3.5	
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2				26.9	0.0			0.1	0.1	0.0	0.6	
Delay (s)				81.1	51.9			4.1	3.7	2.2	4.2	
Level of Service				F	D			A	A	A	A	
Approach Delay (s)		0.0			80.3			4.1			4.1	
Approach LOS		A			F			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	118.2	Sum of lost time (s)	17.9
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	1980	346	835	609	44	151	372	622	364	1070	33
Ideal Flow (vphpl)	1900	2150	1900	1950	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	3.8	6.8	2.0	6.8	6.8	5.0	6.9	3.0	3.0	4.9	6.9
Lane Util. Factor	1.00	0.95	1.00	*1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1404	3972	1570	3828	3318	1541	3133	3544	1865	1807	3614	1420
Flt Permitted	0.42	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.39	1.00	1.00
Satd. Flow (perm)	623	3972	1570	3828	3318	1541	3133	3544	1865	740	3614	1420
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	28	1980	346	835	609	44	151	372	622	364	1070	33
RTOR Reduction (vph)	0	0	130	0	0	18	0	0	42	0	0	26
Lane Group Flow (vph)	28	1980	216	835	609	26	151	372	580	364	1070	7
Heavy Vehicles (%)	30%	4%	4%	3%	10%	6%	13%	3%	3%	1%	1%	15%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	pm+pt	NA	Perm
Protected Phases		2		1	6		7	4	1	3	8	
Permitted Phases	2		2			6			4	8		8
Actuated Green, G (s)	53.2	53.2	53.2	23.0	81.2	81.2	11.0	28.1	51.1	43.1	29.1	29.1
Effective Green, g (s)	53.2	56.2	53.2	26.0	81.2	81.2	11.0	28.1	55.1	43.1	31.1	29.1
Actuated g/C Ratio	0.38	0.40	0.38	0.19	0.58	0.58	0.08	0.20	0.39	0.31	0.22	0.21
Clearance Time (s)	6.8	6.8	6.8	5.0	6.8	6.8	5.0	6.9	5.0	3.0	6.9	6.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	236	1594	596	710	1924	893	246	711	734	334	802	295
v/s Ratio Prot		c0.50		c0.22	0.18		0.05	0.10	0.14	c0.11	c0.30	
v/s Ratio Perm	0.04		0.14			0.02			0.17	0.23		0.00
v/c Ratio	0.12	1.24	0.36	1.18	0.32	0.03	0.61	0.52	0.79	1.09	1.33	0.02
Uniform Delay, d1	28.2	41.9	31.2	57.0	15.1	12.6	62.4	50.0	37.4	45.6	54.5	44.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	114.5	1.7	93.6	0.1	0.0	4.5	0.7	5.8	75.4	158.9	0.0
Delay (s)	29.2	156.4	32.9	150.6	15.2	12.6	66.9	50.7	43.2	121.0	213.3	44.2
Level of Service	C	F	C	F	B	B	E	D	D	F	F	D
Approach Delay (s)		136.7			91.1			48.7			186.6	
Approach LOS		F			F			D			F	

Intersection Summary			
HCM 2000 Control Delay	121.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.27		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.7
Intersection Capacity Utilization	122.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	13	0	5	0	1288	70	9	2213	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.8	6.8			6.5	6.5	6.5	6.5	
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				956	1089			3476	1555	1323	3544	
Flt Permitted				1.00	1.00			1.00	1.00	0.21	1.00	
Satd. Flow (perm)				1006	1089			3476	1555	287	3544	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	13	0	5	0	1288	70	9	2213	0
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	7	0	0	0
Lane Group Flow (vph)	0	0	0	13	0	0	0	1288	63	9	2213	0
Heavy Vehicles (%)	2%	2%	2%	91%	0%	50%	0%	5%	5%	38%	3%	0%
Turn Type				Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)				3.7	3.7			90.6	90.6	90.6	90.6	
Effective Green, g (s)				3.7	3.7			90.6	90.6	90.6	90.6	
Actuated g/C Ratio				0.03	0.03			0.84	0.84	0.84	0.84	
Clearance Time (s)				6.8	6.8			6.5	6.5	6.5	6.5	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				34	37			2926	1309	241	2984	
v/s Ratio Prot					0.00			0.37			c0.62	
v/s Ratio Perm				c0.01					0.04	0.03		
v/c Ratio				0.38	0.00			0.44	0.05	0.04	0.74	
Uniform Delay, d1				50.8	50.2			2.1	1.4	1.4	3.6	
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2				7.0	0.0			0.5	0.1	0.3	1.7	
Delay (s)				57.9	50.2			2.6	1.5	1.7	5.3	
Level of Service				E	D			A	A	A	A	
Approach Delay (s)		0.0			55.7			2.6			5.3	
Approach LOS		A			E			A			A	

Intersection Summary			
HCM 2000 Control Delay	4.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	107.6	Sum of lost time (s)	13.3
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

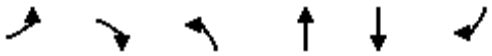
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	110	50	1309	817	272	1935
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	6.5	6.5	3.0	6.5
Lane Util. Factor	0.97	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	2788	1060	3444	1555	1755	3444
Flt Permitted	0.95	1.00	1.00	1.00	0.28	1.00
Satd. Flow (perm)	2788	1060	3444	1555	517	3444
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	110	50	1309	817	272	1935
RTOR Reduction (vph)	0	46	0	306	0	0
Lane Group Flow (vph)	110	4	1309	511	272	1935
Heavy Vehicles (%)	27%	54%	6%	5%	4%	6%
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		2		1	6
Permitted Phases		4		2	6	
Actuated Green, G (s)	7.3	7.3	54.0	54.0	65.7	65.7
Effective Green, g (s)	7.3	7.3	54.0	54.0	65.7	65.7
Actuated g/C Ratio	0.08	0.08	0.63	0.63	0.76	0.76
Clearance Time (s)	6.8	6.8	6.5	6.5	3.0	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	235	89	2154	973	518	2621
v/s Ratio Prot	c0.04		0.38		0.05	c0.56
v/s Ratio Perm		0.00		0.33	0.35	
v/c Ratio	0.47	0.05	0.61	0.53	0.53	0.74
Uniform Delay, d1	37.6	36.3	9.8	9.0	2.9	5.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	0.2	1.3	2.0	1.0	1.9
Delay (s)	39.1	36.5	11.0	11.0	3.9	7.5
Level of Service	D	D	B	B	A	A
Approach Delay (s)	38.3		11.0			7.1
Approach LOS	D		B			A

Intersection Summary			
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	86.3	Sum of lost time (s)	16.3
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	284	416	1739	0	0	1852
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	7.5			7.5
Lane Util. Factor	0.97	0.91	0.95			0.95
Frt	0.94	0.85	1.00			1.00
Flt Protected	0.97	1.00	1.00			1.00
Satd. Flow (prot)	3069	1327	3476			3476
Flt Permitted	0.97	1.00	1.00			1.00
Satd. Flow (perm)	3069	1327	3476			3476
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	284	416	1739	0	0	1852
RTOR Reduction (vph)	8	8	0	0	0	0
Lane Group Flow (vph)	467	217	1739	0	0	1852
Heavy Vehicles (%)	10%	12%	5%	0%	0%	5%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	33.5	33.5	53.5			53.5
Effective Green, g (s)	33.5	33.5	53.5			53.5
Actuated g/C Ratio	0.33	0.33	0.53			0.53
Clearance Time (s)	6.5	6.5	7.5			7.5
Lane Grp Cap (vph)	1017	440	1841			1841
v/s Ratio Prot	0.15		0.50			c0.53
v/s Ratio Perm		c0.16				
v/c Ratio	0.46	0.49	0.94			1.01
Uniform Delay, d1	26.6	27.0	22.4			23.8
Progression Factor	1.00	1.00	0.69			1.00
Incremental Delay, d2	1.5	3.9	10.0			22.4
Delay (s)	28.1	30.9	25.5			46.2
Level of Service	C	C	C			D
Approach Delay (s)	29.0		25.5			46.2
Approach LOS	C		C			D

Intersection Summary			
HCM 2000 Control Delay	35.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	101.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	650	484	0	1289	1757	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.5		6.5	6.5	
Lane Util. Factor	0.97	0.91		0.91	0.91	
Frt	0.97	0.85		1.00	1.00	
Flt Protected	0.96	1.00		1.00	1.00	
Satd. Flow (prot)	3365	1457		4995	4995	
Flt Permitted	0.96	1.00		1.00	1.00	
Satd. Flow (perm)	3365	1457		4995	4995	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	650	484	0	1289	1757	0
RTOR Reduction (vph)	9	9	0	0	0	0
Lane Group Flow (vph)	772	344	0	1289	1757	0
Heavy Vehicles (%)	4%	2%	0%	5%	5%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	32.5	32.5		54.5	54.5	
Effective Green, g (s)	32.5	32.5		54.5	54.5	
Actuated g/C Ratio	0.32	0.32		0.54	0.54	
Clearance Time (s)	7.5	7.5		6.5	6.5	
Lane Grp Cap (vph)	1082	468		2695	2695	
v/s Ratio Prot	0.23			0.26	c0.35	
v/s Ratio Perm		c0.24				
v/c Ratio	0.71	0.74		0.48	0.65	
Uniform Delay, d1	30.2	30.4		14.4	16.5	
Progression Factor	1.00	1.00		1.00	0.97	
Incremental Delay, d2	4.0	9.9		0.6	0.4	
Delay (s)	34.2	40.3		15.0	16.5	
Level of Service	C	D		B	B	
Approach Delay (s)	36.1			15.0	16.5	
Approach LOS	D			B	B	

Intersection Summary			
HCM 2000 Control Delay	21.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	101.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	186	30	51	309	81	264	706	147	5	229	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		6.6	6.6	6.6	6.6	6.6	
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Frt		0.98			0.98		1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1858			1859		1825	1921	1633	1825	1843	
Flt Permitted		0.99			0.92		0.61	1.00	1.00	0.27	1.00	
Satd. Flow (perm)		1834			1725		1177	1921	1633	511	1843	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	7	186	30	51	309	81	264	706	147	5	229	5
RTOR Reduction (vph)	0	5	0	0	7	0	0	0	43	0	0	0
Lane Group Flow (vph)	0	218	0	0	434	0	264	706	104	5	234	0
Heavy Vehicles (%)	0%	1%	4%	0%	0%	1%	0%	0%	0%	0%	4%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)		31.0			31.0		65.3	65.3	65.3	65.3	65.3	
Effective Green, g (s)		31.0			31.0		65.3	65.3	65.3	65.3	65.3	
Actuated g/C Ratio		0.28			0.28		0.60	0.60	0.60	0.60	0.60	
Clearance Time (s)		6.0			6.0		6.6	6.6	6.6	6.6	6.6	
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		522			491		705	1151	979	306	1105	
v/s Ratio Prot								c0.37			0.13	
v/s Ratio Perm		0.12			c0.25		0.22		0.06	0.01		
v/c Ratio		0.42			0.88		0.37	0.61	0.11	0.02	0.21	
Uniform Delay, d1		31.6			37.2		11.3	13.8	9.3	8.8	10.0	
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.5			17.0		1.5	2.4	0.2	0.1	0.4	
Delay (s)		32.2			54.2		12.8	16.3	9.5	8.9	10.4	
Level of Service		C			D		B	B	A	A	B	
Approach Delay (s)		32.2			54.2			14.5			10.4	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	24.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	108.9	Sum of lost time (s)	12.6
Intersection Capacity Utilization	106.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	33	0	20	0	1575	17	2	547	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.4	7.4			7.5	7.5	3.0	7.5	
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1772	1617			3544	1512	1789	3614	
Flt Permitted				0.76	1.00			1.00	1.00	0.13	1.00	
Satd. Flow (perm)				1412	1617			3544	1512	251	3614	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	33	0	20	0	1575	17	2	547	0
RTOR Reduction (vph)	0	0	0	0	19	0	0	0	4	0	0	0
Lane Group Flow (vph)	0	0	0	33	1	0	0	1575	13	2	547	0
Heavy Vehicles (%)	0%	0%	0%	3%	5%	1%	2%	3%	8%	2%	1%	0%
Turn Type				Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		8			4			6		5	2	
Permitted Phases	8			4			6		6	2		
Actuated Green, G (s)				5.6	5.6			94.0	94.0	98.1	98.1	
Effective Green, g (s)				5.6	5.6			94.0	94.0	98.1	98.1	
Actuated g/C Ratio				0.05	0.05			0.79	0.79	0.83	0.83	
Clearance Time (s)				7.4	7.4			7.5	7.5	3.0	7.5	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				66	76			2808	1198	221	2989	
v/s Ratio Prot					0.00			c0.44		0.00	c0.15	
v/s Ratio Perm				c0.02					0.01	0.01		
v/c Ratio				0.50	0.01			0.56	0.01	0.01	0.18	
Uniform Delay, d1				55.1	53.9			4.6	2.6	2.9	2.1	
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2				5.8	0.1			0.8	0.0	0.0	0.1	
Delay (s)				61.0	53.9			5.4	2.6	2.9	2.2	
Level of Service				E	D			A	A	A	A	
Approach Delay (s)		0.0			58.3			5.4			2.2	
Approach LOS		A			E			A			A	

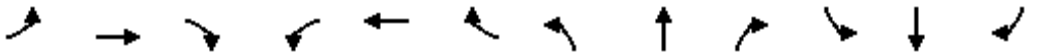
Intersection Summary			
HCM 2000 Control Delay	5.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	118.6	Sum of lost time (s)	17.9
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	73	798	230	776	1720	324	487	1081	543	120	433	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8	6.8	6.8	2.0	6.8	6.8	3.0	6.9	3.0	3.0	6.9	6.9
Lane Util. Factor	1.00	0.95	1.00	*1.00	0.95	1.00	*1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3288	1585	3730	3476	1617	3767	3544	1512	1789	3614	1633
Flt Permitted	0.09	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.14	1.00	1.00
Satd. Flow (perm)	178	3288	1585	3730	3476	1617	3767	3544	1512	268	3614	1633
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	73	798	230	776	1720	324	487	1081	543	120	433	18
RTOR Reduction (vph)	0	0	155	0	0	155	0	0	56	0	0	14
Lane Group Flow (vph)	73	798	75	776	1720	169	487	1081	487	120	433	4
Heavy Vehicles (%)	0%	11%	3%	3%	5%	1%	2%	3%	8%	2%	1%	0%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	pm+pt	NA	Perm
Protected Phases		2		1	6		7	4	1	3	8	
Permitted Phases	2		2			6			4	8		8
Actuated Green, G (s)	42.2	42.2	42.2	20.0	67.2	67.2	16.0	35.7	55.7	38.5	28.1	28.1
Effective Green, g (s)	43.2	42.2	42.2	23.0	67.2	67.2	18.0	35.7	59.7	38.5	28.1	28.1
Actuated g/C Ratio	0.33	0.32	0.32	0.18	0.52	0.52	0.14	0.27	0.46	0.30	0.22	0.22
Clearance Time (s)	6.8	6.8	6.8	5.0	6.8	6.8	5.0	6.9	5.0	3.0	6.9	6.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	59	1067	514	659	1796	835	521	973	694	201	781	352
v/s Ratio Prot		0.24		c0.21	0.49		c0.13	c0.31	0.12	0.05	0.12	
v/s Ratio Perm	c0.41		0.05			0.10			0.20	0.13		0.00
v/c Ratio	1.24	0.75	0.15	1.18	0.96	0.20	0.93	1.11	0.70	0.60	0.55	0.01
Uniform Delay, d1	43.4	39.2	31.1	53.5	30.0	16.9	55.4	47.1	28.1	36.9	45.4	40.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	194.2	4.8	0.6	95.1	12.6	0.1	24.1	64.3	3.2	4.7	0.9	0.0
Delay (s)	237.6	44.0	31.7	148.6	42.6	17.1	79.5	111.5	31.3	41.6	46.2	40.0
Level of Service	F	D	C	F	D	B	E	F	C	D	D	D
Approach Delay (s)		54.2			68.8			83.5			45.1	
Approach LOS		D			E			F			D	

Intersection Summary			
HCM 2000 Control Delay	69.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.7
Intersection Capacity Utilization	113.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	47	0	8	0	2243	29	65	1376	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.8	6.8			6.5	6.5	6.5	6.5	
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1630	1432			3579	1512	1755	3579	
Flt Permitted				0.76	1.00			1.00	1.00	0.05	1.00	
Satd. Flow (perm)				1299	1432			3579	1512	96	3579	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	47	0	8	0	2243	29	65	1376	0
RTOR Reduction (vph)	0	0	0	0	8	0	0	0	5	0	0	0
Lane Group Flow (vph)	0	0	0	47	0	0	0	2243	24	65	1376	0
Heavy Vehicles (%)	2%	2%	2%	12%	0%	14%	0%	2%	8%	4%	2%	0%
Turn Type				Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)				6.4	6.4			88.2	88.2	88.2	88.2	
Effective Green, g (s)				6.4	6.4			88.2	88.2	88.2	88.2	
Actuated g/C Ratio				0.06	0.06			0.82	0.82	0.82	0.82	
Clearance Time (s)				6.8	6.8			6.5	6.5	6.5	6.5	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				77	84			2925	1235	78	2925	
v/s Ratio Prot					0.00			0.63			0.38	
v/s Ratio Perm				c0.04					0.02	c0.67		
v/c Ratio				0.61	0.01			0.77	0.02	0.83	0.47	
Uniform Delay, d1				49.5	47.8			4.8	1.8	5.6	2.9	
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2				13.5	0.0			2.0	0.0	62.8	0.5	
Delay (s)				63.0	47.8			6.8	1.9	68.4	3.5	
Level of Service				E	D			A	A	E	A	
Approach Delay (s)		0.0			60.8			6.7			6.4	
Approach LOS		A			E			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	107.9	Sum of lost time (s)	13.3
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

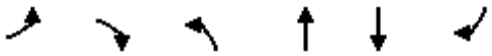
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	699	333	1918	140	75	1347
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	4.5	6.5	0.0	6.5
Lane Util. Factor	0.97	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	3404	1570	3544	1306	1444	3579
Flt Permitted	0.95	1.00	1.00	1.00	0.10	1.00
Satd. Flow (perm)	3404	1570	3544	1306	144	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	699	333	1918	140	75	1347
RTOR Reduction (vph)	0	101	0	59	0	0
Lane Group Flow (vph)	699	232	1918	81	75	1347
Heavy Vehicles (%)	4%	4%	3%	25%	33%	2%
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		2		1	6
Permitted Phases		4		2	6	
Actuated Green, G (s)	26.6	26.6	52.4	52.4	60.8	60.8
Effective Green, g (s)	26.6	26.6	54.4	52.4	63.8	60.8
Actuated g/C Ratio	0.26	0.26	0.54	0.52	0.63	0.60
Clearance Time (s)	6.8	6.8	6.5	6.5	3.0	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	899	414	1914	679	199	2160
v/s Ratio Prot	c0.21		c0.54		0.03	c0.38
v/s Ratio Perm		0.15		0.06	0.21	
v/c Ratio	0.78	0.56	1.00	0.12	0.38	0.62
Uniform Delay, d1	34.3	32.0	23.2	12.4	7.1	12.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.3	1.7	21.1	0.4	1.2	1.4
Delay (s)	38.6	33.7	44.2	12.7	8.3	14.0
Level of Service	D	C	D	B	A	B
Approach Delay (s)	37.0		42.1			13.7
Approach LOS	D		D			B

Intersection Summary			
HCM 2000 Control Delay	32.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	100.7	Sum of lost time (s)	13.3
Intersection Capacity Utilization	89.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

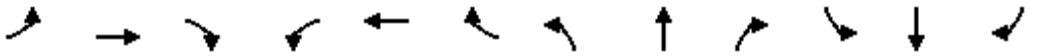
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	635	495	1537	0	0	1732
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	7.5			7.5
Lane Util. Factor	0.97	0.91	0.95			0.95
Frt	0.97	0.85	1.00			1.00
Flt Protected	0.96	1.00	1.00			1.00
Satd. Flow (prot)	3428	1429	3510			3579
Flt Permitted	0.96	1.00	1.00			1.00
Satd. Flow (perm)	3428	1429	3510			3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	635	495	1537	0	0	1732
RTOR Reduction (vph)	14	14	0	0	0	0
Lane Group Flow (vph)	765	337	1537	0	0	1732
Heavy Vehicles (%)	1%	4%	4%	3%	12%	2%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	33.5	33.5	53.5			53.5
Effective Green, g (s)	33.5	33.5	53.5			53.5
Actuated g/C Ratio	0.33	0.33	0.53			0.53
Clearance Time (s)	6.5	6.5	7.5			7.5
Lane Grp Cap (vph)	1137	473	1859			1895
v/s Ratio Prot	0.22		0.44			c0.48
v/s Ratio Perm		c0.24				
v/c Ratio	0.67	0.71	0.83			0.91
Uniform Delay, d1	29.0	29.5	19.9			21.7
Progression Factor	1.00	1.00	0.67			1.00
Incremental Delay, d2	3.2	8.8	4.0			8.3
Delay (s)	32.2	38.4	17.2			30.0
Level of Service	C	D	B			C
Approach Delay (s)	34.1		17.2			30.0
Approach LOS	C		B			C

Intersection Summary			
HCM 2000 Control Delay	26.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	101.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	378	298	0	1293	2103	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.5		6.5	6.5	
Lane Util. Factor	0.97	0.91		0.91	0.91	
Frt	0.97	0.85		1.00	1.00	
Flt Protected	0.96	1.00		1.00	1.00	
Satd. Flow (prot)	3208	1457		5142	5193	
Flt Permitted	0.96	1.00		1.00	1.00	
Satd. Flow (perm)	3208	1457		5142	5193	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	378	298	0	1293	2103	0
RTOR Reduction (vph)	3	3	0	0	0	0
Lane Group Flow (vph)	461	209	0	1293	2103	0
Heavy Vehicles (%)	10%	2%	2%	2%	1%	7%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	32.5	32.5		54.5	54.5	
Effective Green, g (s)	32.5	32.5		54.5	54.5	
Actuated g/C Ratio	0.32	0.32		0.54	0.54	
Clearance Time (s)	7.5	7.5		6.5	6.5	
Lane Grp Cap (vph)	1032	468		2774	2802	
v/s Ratio Prot	c0.14			0.25	c0.40	
v/s Ratio Perm		0.14				
v/c Ratio	0.45	0.45		0.47	0.75	
Uniform Delay, d1	27.1	27.1		14.3	18.0	
Progression Factor	1.00	1.00		1.00	0.87	
Incremental Delay, d2	1.4	3.1		0.6	1.0	
Delay (s)	28.5	30.2		14.9	16.6	
Level of Service	C	C		B	B	
Approach Delay (s)	29.0			14.9	16.6	
Approach LOS	C			B	B	

Intersection Summary			
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	101.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	496	431	100	90	7	18	33	49	102	594	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0		6.6	6.6		6.6	6.6	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85	1.00	0.99		1.00	0.91		1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1897	1633	1807	1877		1825	3189		1825	3613	
Flt Permitted		1.00	1.00	0.27	1.00		0.41	1.00		0.70	1.00	
Satd. Flow (perm)		1893	1633	512	1877		788	3189		1347	3613	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	6	496	431	100	90	7	18	33	49	102	594	1
RTOR Reduction (vph)	0	0	68	0	4	0	0	27	0	0	0	0
Lane Group Flow (vph)	0	502	363	100	93	0	18	55	0	102	595	0
Heavy Vehicles (%)	20%	1%	0%	1%	0%	17%	0%	3%	5%	0%	1%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		24.5	24.5	24.5	24.5		30.7	30.7		30.7	30.7	
Effective Green, g (s)		24.5	24.5	24.5	24.5		30.7	30.7		30.7	30.7	
Actuated g/C Ratio		0.36	0.36	0.36	0.36		0.45	0.45		0.45	0.45	
Clearance Time (s)		6.0	6.0	6.0	6.0		6.6	6.6		6.6	6.6	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		684	590	185	678		356	1443		609	1635	
v/s Ratio Prot					0.05			0.02			c0.16	
v/s Ratio Perm		c0.27	0.22	0.20			0.02			0.08		
v/c Ratio		0.73	0.62	0.54	0.14		0.05	0.04		0.17	0.36	
Uniform Delay, d1		18.8	17.8	17.2	14.5		10.4	10.3		11.0	12.2	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.1	1.9	3.2	0.1		0.3	0.0		0.6	0.6	
Delay (s)		22.9	19.7	20.4	14.6		10.7	10.4		11.6	12.8	
Level of Service		C	B	C	B		B	B		B	B	
Approach Delay (s)		21.4			17.6			10.4			12.6	
Approach LOS		C			B			B			B	

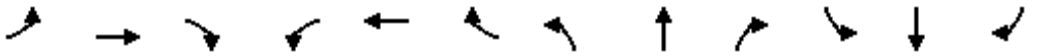
Intersection Summary			
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	67.8	Sum of lost time (s)	12.6
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	36	0	1	0	437	36	23	1469	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.4	7.4			7.5	7.5	3.0	7.5	
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1086	1633			3579	1126	1825	3614	
Flt Permitted				0.95	1.00			1.00	1.00	0.47	1.00	
Satd. Flow (perm)				1089	1633			3579	1126	900	3614	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	36	0	1	0	437	36	23	1469	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	12	0	0	0
Lane Group Flow (vph)	0	0	0	36	0	0	0	437	24	23	1469	0
Heavy Vehicles (%)	0%	0%	0%	68%	0%	0%	0%	2%	45%	0%	1%	0%
Turn Type				Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		8			4			6		5	2	
Permitted Phases	8			4			6		6	2		
Actuated Green, G (s)				4.2	4.2			47.0	47.0	52.3	52.3	
Effective Green, g (s)				4.2	4.2			47.0	47.0	52.3	52.3	
Actuated g/C Ratio				0.06	0.06			0.66	0.66	0.73	0.73	
Clearance Time (s)				7.4	7.4			7.5	7.5	3.0	7.5	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				64	96			2355	741	689	2647	
v/s Ratio Prot					0.00			0.12		0.00	c0.41	
v/s Ratio Perm				c0.03					0.02	0.02		
v/c Ratio				0.56	0.00			0.19	0.03	0.03	0.55	
Uniform Delay, d1				32.7	31.6			4.7	4.3	2.7	4.3	
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2				10.8	0.0			0.2	0.1	0.0	0.8	
Delay (s)				43.5	31.6			4.9	4.3	2.7	5.1	
Level of Service				D	C			A	A	A	A	
Approach Delay (s)		0.0			43.2			4.9			5.1	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	71.4	Sum of lost time (s)	17.9
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	1980	346	835	609	44	151	372	622	364	1070	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.3	6.8	2.0	6.8	6.8	5.0	6.9	3.0	1.5	5.9	6.9
Lane Util. Factor	1.00	0.91	1.00	*1.00	0.91	1.00	*1.00	0.91	1.00	1.00	*1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1404	5043	1570	3730	4768	1541	3230	5092	1865	1807	5706	1420
Flt Permitted	0.41	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.44	1.00	1.00
Satd. Flow (perm)	607	5043	1570	3730	4768	1541	3230	5092	1865	844	5706	1420
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	28	1980	346	835	609	44	151	372	622	364	1070	33
RTOR Reduction (vph)	0	0	87	0	0	17	0	0	40	0	0	26
Lane Group Flow (vph)	28	1980	259	835	609	27	151	372	582	364	1070	7
Heavy Vehicles (%)	30%	4%	4%	3%	10%	6%	13%	3%	3%	1%	1%	15%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	pm+pt	NA	Perm
Protected Phases		2		1	6		7	4	1	3	8	
Permitted Phases	2		2			6			4	8		8
Actuated Green, G (s)	56.3	56.3	56.3	28.0	89.3	89.3	8.0	26.0	54.0	42.0	29.0	29.0
Effective Green, g (s)	56.3	56.8	56.3	31.0	89.3	89.3	8.0	26.0	58.0	43.5	30.0	29.0
Actuated g/C Ratio	0.39	0.39	0.39	0.21	0.62	0.62	0.06	0.18	0.40	0.30	0.21	0.20
Clearance Time (s)	6.8	6.8	6.8	5.0	6.8	6.8	5.0	6.9	5.0	3.0	6.9	6.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	235	1975	609	797	2936	949	178	913	746	349	1180	284
v/s Ratio Prot		c0.39		c0.22	0.13		0.05	0.07	0.16	c0.10	c0.19	
v/s Ratio Perm	0.05		0.16			0.02			0.15	0.21		0.00
v/c Ratio	0.12	1.00	0.42	1.05	0.21	0.03	0.85	0.41	0.78	1.04	0.91	0.02
Uniform Delay, d1	28.4	44.1	32.5	57.0	12.3	10.9	67.9	52.7	38.0	47.8	56.1	46.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	20.9	2.2	45.1	0.0	0.0	29.4	0.3	5.3	59.8	10.1	0.0
Delay (s)	29.5	65.0	34.6	102.1	12.3	10.9	97.3	53.0	43.3	107.6	66.2	46.6
Level of Service	C	E	C	F	B	B	F	D	D	F	E	D
Approach Delay (s)		60.1			62.6			53.5			76.0	
Approach LOS		E			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	63.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	108.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	13	0	5	0	1288	70	9	2213	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.8	6.8			6.5		4.0	6.5	
Lane Util. Factor				1.00	1.00			0.91		1.00	0.91	
Frt				1.00	0.85			0.99		1.00	1.00	
Flt Protected				0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)				956	1089			4956		1323	5092	
Flt Permitted				1.00	1.00			1.00		0.18	1.00	
Satd. Flow (perm)				1006	1089			4956		244	5092	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	13	0	5	0	1288	70	9	2213	0
RTOR Reduction (vph)	0	0	0	0	5	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	0	0	13	0	0	0	1355	0	9	2213	0
Heavy Vehicles (%)	2%	2%	2%	91%	0%	50%	0%	5%	5%	38%	3%	0%
Turn Type				Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)				3.6	3.6			80.9		85.7	85.7	
Effective Green, g (s)				3.6	3.6			80.9		85.7	85.7	
Actuated g/C Ratio				0.04	0.04			0.79		0.84	0.84	
Clearance Time (s)				6.8	6.8			6.5		4.0	6.5	
Vehicle Extension (s)				3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)				35	38			3907		212	4253	
v/s Ratio Prot					0.00			0.27		0.00	c0.43	
v/s Ratio Perm				c0.01						0.04		
v/c Ratio				0.37	0.00			0.35		0.04	0.52	
Uniform Delay, d1				48.4	47.8			3.2		1.6	2.5	
Progression Factor				1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2				6.5	0.0			0.2		0.1	0.5	
Delay (s)				54.9	47.8			3.4		1.7	2.9	
Level of Service				D	D			A		A	A	
Approach Delay (s)		0.0			53.0			3.4			2.9	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	3.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	102.6	Sum of lost time (s)	17.3
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

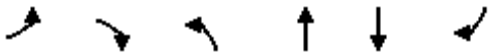
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	110	50	1309	817	272	1935
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	6.5	6.5	3.0	6.5
Lane Util. Factor	0.97	1.00	0.91	1.00	1.00	0.91
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	2788	1060	4948	1555	1755	4948
Flt Permitted	0.95	1.00	1.00	1.00	0.28	1.00
Satd. Flow (perm)	2788	1060	4948	1555	517	4948
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	110	50	1309	817	272	1935
RTOR Reduction (vph)	0	45	0	297	0	0
Lane Group Flow (vph)	110	5	1309	520	272	1935
Heavy Vehicles (%)	27%	54%	6%	5%	4%	6%
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		2		1	6
Permitted Phases		4		2	6	
Actuated Green, G (s)	9.3	9.3	59.5	59.5	71.6	71.6
Effective Green, g (s)	9.3	9.3	59.5	59.5	71.6	71.6
Actuated g/C Ratio	0.10	0.10	0.63	0.63	0.76	0.76
Clearance Time (s)	6.8	6.8	6.5	6.5	3.0	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	275	104	3125	982	512	3760
v/s Ratio Prot	c0.04		0.26		0.05	c0.39
v/s Ratio Perm		0.00		0.33	c0.35	
v/c Ratio	0.40	0.05	0.42	0.53	0.53	0.51
Uniform Delay, d1	39.8	38.4	8.7	9.6	3.2	4.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	0.2	0.4	2.0	1.1	0.5
Delay (s)	40.8	38.6	9.1	11.6	4.3	5.0
Level of Service	D	D	A	B	A	A
Approach Delay (s)	40.1		10.1			4.9
Approach LOS	D		B			A

Intersection Summary			
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	94.2	Sum of lost time (s)	16.3
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	284	416	1739	0	0	1852
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	7.5			7.5
Lane Util. Factor	0.97	0.91	0.91			0.91
Frt	0.94	0.85	1.00			1.00
Flt Protected	0.97	1.00	1.00			1.00
Satd. Flow (prot)	3069	1327	4995			4995
Flt Permitted	0.97	1.00	1.00			1.00
Satd. Flow (perm)	3069	1327	4995			4995
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	284	416	1739	0	0	1852
RTOR Reduction (vph)	11	11	0	0	0	0
Lane Group Flow (vph)	464	214	1739	0	0	1852
Heavy Vehicles (%)	10%	12%	5%	0%	0%	5%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	29.5	29.5	56.5			56.5
Effective Green, g (s)	29.5	29.5	56.5			56.5
Actuated g/C Ratio	0.29	0.29	0.56			0.56
Clearance Time (s)	6.5	6.5	7.5			7.5
Lane Grp Cap (vph)	905	391	2822			2822
v/s Ratio Prot	0.15		0.35			c0.37
v/s Ratio Perm		c0.16				
v/c Ratio	0.51	0.55	0.62			0.66
Uniform Delay, d1	29.3	29.6	14.5			15.0
Progression Factor	1.00	1.00	0.68			1.00
Incremental Delay, d2	2.1	5.4	0.9			1.2
Delay (s)	31.3	35.0	10.7			16.2
Level of Service	C	D	B			B
Approach Delay (s)	32.5		10.7			16.2
Approach LOS	C		B			B

Intersection Summary			
HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	650	484	0	1289	1757	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.5		6.5	6.5	
Lane Util. Factor	0.97	0.91		0.91	0.91	
Frt	0.97	0.85		1.00	1.00	
Flt Protected	0.96	1.00		1.00	1.00	
Satd. Flow (prot)	3365	1457		4995	4995	
Flt Permitted	0.96	1.00		1.00	1.00	
Satd. Flow (perm)	3365	1457		4995	4995	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	650	484	0	1289	1757	0
RTOR Reduction (vph)	7	7	0	0	0	0
Lane Group Flow (vph)	774	346	0	1289	1757	0
Heavy Vehicles (%)	4%	2%	0%	5%	5%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	33.5	33.5		52.5	52.5	
Effective Green, g (s)	33.5	33.5		52.5	52.5	
Actuated g/C Ratio	0.34	0.34		0.52	0.52	
Clearance Time (s)	7.5	7.5		6.5	6.5	
Lane Grp Cap (vph)	1127	488		2622	2622	
v/s Ratio Prot	0.23			0.26	c0.35	
v/s Ratio Perm		c0.24				
v/c Ratio	0.69	0.71		0.49	0.67	
Uniform Delay, d1	28.7	29.0		15.2	17.4	
Progression Factor	1.00	1.00		1.00	0.64	
Incremental Delay, d2	3.4	8.4		0.7	1.1	
Delay (s)	32.1	37.4		15.9	12.2	
Level of Service	C	D		B	B	
Approach Delay (s)	33.8			15.9	12.2	
Approach LOS	C			B	B	

Intersection Summary			
HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	186	30	51	309	81	264	706	147	5	229	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0		6.6	6.6		6.6	6.6	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85	1.00	0.97		1.00	0.97		1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1899	1570	1825	1857		1825	3556		1825	3501	
Flt Permitted		0.98	1.00	0.62	1.00		0.61	1.00		0.30	1.00	
Satd. Flow (perm)		1866	1570	1184	1857		1164	3556		571	3501	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	7	186	30	51	309	81	264	706	147	5	229	5
RTOR Reduction (vph)	0	0	22	0	12	0	0	16	0	0	1	0
Lane Group Flow (vph)	0	193	8	51	378	0	264	837	0	5	233	0
Heavy Vehicles (%)	0%	1%	4%	0%	0%	1%	0%	0%	0%	0%	4%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		20.6	20.6	20.6	20.6		42.7	42.7		42.7	42.7	
Effective Green, g (s)		20.6	20.6	20.6	20.6		42.7	42.7		42.7	42.7	
Actuated g/C Ratio		0.27	0.27	0.27	0.27		0.56	0.56		0.56	0.56	
Clearance Time (s)		6.0	6.0	6.0	6.0		6.6	6.6		6.6	6.6	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		506	426	321	504		654	2000		321	1969	
v/s Ratio Prot					c0.20			c0.24			0.07	
v/s Ratio Perm		0.10	0.01	0.04			0.23			0.01		
v/c Ratio		0.38	0.02	0.16	0.75		0.40	0.42		0.02	0.12	
Uniform Delay, d1		22.5	20.3	21.1	25.3		9.4	9.5		7.3	7.8	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.5	0.0	0.2	6.0		1.9	0.6		0.1	0.1	
Delay (s)		23.0	20.3	21.3	31.3		11.2	10.1		7.4	7.9	
Level of Service		C	C	C	C		B	B		A	A	
Approach Delay (s)		22.6			30.2			10.4			7.9	
Approach LOS		C			C			B			A	

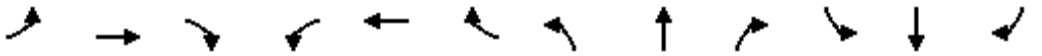
Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	75.9	Sum of lost time (s)	12.6
Intersection Capacity Utilization	89.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	33	0	20	0	1575	17	2	547	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.4	7.4			7.5	7.5	3.0	7.5	
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1560	1633			3614	907	1825	3614	
Flt Permitted				0.77	1.00			1.00	1.00	0.12	1.00	
Satd. Flow (perm)				1263	1633			3614	907	229	3614	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	33	0	20	0	1575	17	2	547	0
RTOR Reduction (vph)	0	0	0	0	19	0	0	0	5	0	0	0
Lane Group Flow (vph)	0	0	0	33	1	0	0	1575	12	2	547	0
Heavy Vehicles (%)	0%	0%	0%	17%	0%	0%	0%	1%	80%	0%	1%	0%
Turn Type				Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		8			4			6		5	2	
Permitted Phases	8			4			6		6	2		
Actuated Green, G (s)				5.2	5.2			59.7	59.7	63.9	63.9	
Effective Green, g (s)				5.2	5.2			59.7	59.7	63.9	63.9	
Actuated g/C Ratio				0.06	0.06			0.71	0.71	0.76	0.76	
Clearance Time (s)				7.4	7.4			7.5	7.5	3.0	7.5	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				78	101			2568	644	197	2749	
v/s Ratio Prot					0.00			c0.44		0.00	c0.15	
v/s Ratio Perm				c0.03					0.01	0.01		
v/c Ratio				0.42	0.01			0.61	0.02	0.01	0.20	
Uniform Delay, d1				38.0	37.0			6.2	3.6	4.0	2.8	
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2				3.7	0.0			1.1	0.1	0.0	0.2	
Delay (s)				41.6	37.0			7.3	3.6	4.0	3.0	
Level of Service				D	D			A	A	A	A	
Approach Delay (s)		0.0			39.9			7.3			3.0	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	84.0	Sum of lost time (s)	17.9
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	73	798	230	776	1720	324	487	1081	543	120	433	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	6.8	6.8	3.0	6.8	6.8	3.0	6.9	3.0	3.0	6.9	6.9
Lane Util. Factor	1.00	0.91	1.00	*1.00	*1.00	1.00	*1.00	0.91	1.00	1.00	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	4725	1585	3730	5489	1617	3767	5092	1779	1789	5193	1633
Flt Permitted	0.15	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.18	1.00	1.00
Satd. Flow (perm)	281	4725	1585	3730	5489	1617	3767	5092	1779	344	5193	1633
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	73	798	230	776	1720	324	487	1081	543	120	433	18
RTOR Reduction (vph)	0	0	177	0	0	186	0	0	74	0	0	15
Lane Group Flow (vph)	73	798	53	776	1720	138	487	1081	469	120	433	3
Heavy Vehicles (%)	0%	11%	3%	3%	5%	1%	2%	3%	8%	2%	1%	0%
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4	1	3	8	
Permitted Phases	2		2			6			4	8		8
Actuated Green, G (s)	31.2	26.3	26.3	25.6	49.0	49.0	17.5	31.2	56.8	32.1	21.9	21.9
Effective Green, g (s)	33.2	26.3	26.3	27.6	49.0	49.0	19.5	31.2	60.8	32.1	21.9	21.9
Actuated g/C Ratio	0.29	0.23	0.23	0.24	0.43	0.43	0.17	0.27	0.53	0.28	0.19	0.19
Clearance Time (s)	3.0	6.8	6.8	5.0	6.8	6.8	5.0	6.9	5.0	3.0	6.9	6.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	160	1080	362	895	2338	688	638	1381	940	224	988	310
v/s Ratio Prot	0.02	0.17		c0.21	c0.31		c0.13	c0.21	0.12	0.05	0.08	
v/s Ratio Perm	0.11		0.03			0.09			0.14	0.10		0.00
v/c Ratio	0.46	0.74	0.15	0.87	0.74	0.20	0.76	0.78	0.50	0.54	0.44	0.01
Uniform Delay, d1	30.3	41.2	35.4	41.9	27.6	20.7	45.5	38.8	17.3	32.3	41.1	37.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	4.5	0.8	8.9	1.2	0.1	5.4	3.0	0.4	2.5	0.3	0.0
Delay (s)	32.4	45.7	36.2	50.8	28.8	20.9	51.0	41.7	17.8	34.8	41.4	37.8
Level of Service	C	D	D	D	C	C	D	D	B	C	D	D
Approach Delay (s)		42.8			34.0			37.7			39.9	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	37.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	19.7
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	47	0	8	0	2243	29	65	1376	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.8	6.8			6.5		4.0	6.5	
Lane Util. Factor				1.00	1.00			0.91		1.00	0.91	
Frt				1.00	0.85			1.00		1.00	1.00	
Flt Protected				0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)				1630	1432			5128		1755	5142	
Flt Permitted				0.76	1.00			1.00		0.06	1.00	
Satd. Flow (perm)				1299	1432			5128		117	5142	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	47	0	8	0	2243	29	65	1376	0
RTOR Reduction (vph)	0	0	0	0	7	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	0	0	47	1	0	0	2271	0	65	1376	0
Heavy Vehicles (%)	2%	2%	2%	12%	0%	14%	0%	2%	8%	4%	2%	0%
Turn Type				Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)				5.9	5.9			59.1		66.3	66.3	
Effective Green, g (s)				5.9	5.9			59.1		66.3	66.3	
Actuated g/C Ratio				0.07	0.07			0.69		0.78	0.78	
Clearance Time (s)				6.8	6.8			6.5		4.0	6.5	
Vehicle Extension (s)				3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)				89	98			3544		152	3987	
v/s Ratio Prot					0.00			c0.44		0.02	c0.27	
v/s Ratio Perm				c0.04						0.32		
v/c Ratio				0.53	0.01			0.64		0.43	0.35	
Uniform Delay, d1				38.5	37.1			7.3		6.1	2.9	
Progression Factor				1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2				5.6	0.0			0.9		1.9	0.2	
Delay (s)				44.0	37.1			8.2		8.0	3.2	
Level of Service				D	D			A		A	A	
Approach Delay (s)		0.0			43.0			8.2			3.4	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	85.5	Sum of lost time (s)	17.3
Intersection Capacity Utilization	68.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

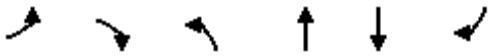
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	699	333	1918	140	75	1347
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.8	6.8	4.5	6.5	1.0	6.5
Lane Util. Factor	0.97	1.00	0.91	1.00	1.00	0.91
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3404	1570	5092	1306	1372	5142
Flt Permitted	0.95	1.00	1.00	1.00	0.28	1.00
Satd. Flow (perm)	3404	1570	5092	1306	404	5142
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	699	333	1918	140	75	1347
RTOR Reduction (vph)	0	124	0	77	0	0
Lane Group Flow (vph)	699	209	1918	63	75	1347
Heavy Vehicles (%)	4%	4%	3%	25%	33%	2%
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		2		1	6
Permitted Phases		4		2	6	
Actuated Green, G (s)	21.0	21.0	34.8	34.8	42.5	42.5
Effective Green, g (s)	23.0	21.0	36.8	34.8	44.5	42.5
Actuated g/C Ratio	0.30	0.27	0.48	0.45	0.58	0.55
Clearance Time (s)	6.8	6.8	6.5	6.5	3.0	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1019	429	2439	591	318	2845
v/s Ratio Prot	c0.21		c0.38		0.02	c0.26
v/s Ratio Perm		0.13		0.05	0.12	
v/c Ratio	0.69	0.49	0.79	0.11	0.24	0.47
Uniform Delay, d1	23.7	23.4	16.7	12.1	7.2	10.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	0.9	2.6	0.4	0.4	0.6
Delay (s)	25.6	24.3	19.4	12.4	7.6	10.9
Level of Service	C	C	B	B	A	B
Approach Delay (s)	25.2		18.9			10.8
Approach LOS	C		B			B

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	76.8	Sum of lost time (s)	11.3
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	635	495	1537	0	0	1732
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	7.5			7.5
Lane Util. Factor	0.97	0.91	0.91			0.91
Frt	0.97	0.85	1.00			1.00
Flt Protected	0.96	1.00	1.00			1.00
Satd. Flow (prot)	3428	1429	5043			5142
Flt Permitted	0.96	1.00	1.00			1.00
Satd. Flow (perm)	3428	1429	5043			5142
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	635	495	1537	0	0	1732
RTOR Reduction (vph)	12	12	0	0	0	0
Lane Group Flow (vph)	767	339	1537	0	0	1732
Heavy Vehicles (%)	1%	4%	4%	3%	12%	2%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	34.5	34.5	51.5			51.5
Effective Green, g (s)	34.5	34.5	51.5			51.5
Actuated g/C Ratio	0.34	0.34	0.52			0.52
Clearance Time (s)	6.5	6.5	7.5			7.5
Lane Grp Cap (vph)	1182	493	2597			2648
v/s Ratio Prot	0.22		0.30			c0.34
v/s Ratio Perm		c0.24				
v/c Ratio	0.65	0.69	0.59			0.65
Uniform Delay, d1	27.6	28.1	16.9			17.7
Progression Factor	1.00	1.00	0.69			1.00
Incremental Delay, d2	2.8	7.6	0.9			1.3
Delay (s)	30.4	35.7	12.6			19.0
Level of Service	C	D	B			B
Approach Delay (s)	32.0		12.6			19.0
Approach LOS	C		B			B

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	76.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	378	298	0	1293	2103	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.5		6.5	6.5	
Lane Util. Factor	0.97	0.91		0.91	0.91	
Frt	0.97	0.85		1.00	1.00	
Flt Protected	0.96	1.00		1.00	1.00	
Satd. Flow (prot)	3208	1457		5142	5193	
Flt Permitted	0.96	1.00		1.00	1.00	
Satd. Flow (perm)	3208	1457		5142	5193	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	378	298	0	1293	2103	0
RTOR Reduction (vph)	6	6	0	0	0	0
Lane Group Flow (vph)	458	206	0	1293	2103	0
Heavy Vehicles (%)	10%	2%	2%	2%	1%	7%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	27.5	27.5		58.5	58.5	
Effective Green, g (s)	27.5	27.5		58.5	58.5	
Actuated g/C Ratio	0.28	0.28		0.58	0.58	
Clearance Time (s)	7.5	7.5		6.5	6.5	
Lane Grp Cap (vph)	882	400		3008	3037	
v/s Ratio Prot	c0.14			0.25	c0.40	
v/s Ratio Perm		0.14				
v/c Ratio	0.52	0.52		0.43	0.69	
Uniform Delay, d1	30.7	30.6		11.5	14.5	
Progression Factor	1.00	1.00		1.00	0.57	
Incremental Delay, d2	2.2	4.7		0.5	1.0	
Delay (s)	32.8	35.3		12.0	9.3	
Level of Service	C	D		B	A	
Approach Delay (s)	33.6			12.0	9.3	
Approach LOS	C			B	A	

Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	76.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	590	513	119	107	9	21	318	58	121	811	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0		6.6	6.6		6.6	6.6	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85	1.00	0.99		1.00	0.98		1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1897	1633	1807	1874		1825	3451		1825	3613	
Flt Permitted		1.00	1.00	0.21	1.00		0.27	1.00		0.53	1.00	
Satd. Flow (perm)		1893	1633	408	1874		517	3451		1015	3613	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	7	590	513	119	107	9	21	318	58	121	811	1
RTOR Reduction (vph)	0	0	26	0	4	0	0	15	0	0	0	0
Lane Group Flow (vph)	0	597	487	119	112	0	21	361	0	121	812	0
Heavy Vehicles (%)	20%	1%	0%	1%	0%	17%	0%	3%	5%	0%	1%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		30.5	30.5	30.5	30.5		30.9	30.9		30.9	30.9	
Effective Green, g (s)		30.5	30.5	30.5	30.5		30.9	30.9		30.9	30.9	
Actuated g/C Ratio		0.41	0.41	0.41	0.41		0.42	0.42		0.42	0.42	
Clearance Time (s)		6.0	6.0	6.0	6.0		6.6	6.6		6.6	6.6	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		780	673	168	772		215	1441		423	1508	
v/s Ratio Prot					0.06			0.10			c0.22	
v/s Ratio Perm		c0.32	0.30	0.29			0.04			0.12		
v/c Ratio		0.77	0.72	0.71	0.14		0.10	0.25		0.29	0.54	
Uniform Delay, d1		18.7	18.2	18.1	13.6		13.1	14.0		14.3	16.2	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.5	3.9	12.8	0.1		0.9	0.4		1.7	1.4	
Delay (s)		23.2	22.1	30.9	13.7		14.0	14.4		15.9	17.6	
Level of Service		C	C	C	B		B	B		B	B	
Approach Delay (s)		22.7			22.4			14.4			17.4	
Approach LOS		C			C			B			B	

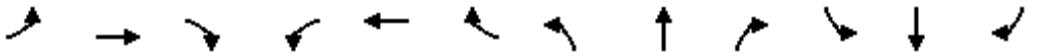
Intersection Summary			
HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	74.0	Sum of lost time (s)	12.6
Intersection Capacity Utilization	94.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	42	0	1	0	596	42	27	2004	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.4	7.4			7.5	7.5	3.0	7.5	
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1086	1633			3579	1126	1825	3614	
Flt Permitted				0.91	1.00			1.00	1.00	0.40	1.00	
Satd. Flow (perm)				1040	1633			3579	1126	770	3614	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	42	0	1	0	596	42	27	2004	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	15	0	0	0
Lane Group Flow (vph)	0	0	0	42	0	0	0	596	27	27	2004	0
Heavy Vehicles (%)	0%	0%	0%	68%	0%	0%	0%	2%	45%	0%	1%	0%
Turn Type				Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		8			4			6		5	2	
Permitted Phases	8			4			6		6	2		
Actuated Green, G (s)				4.4	4.4			46.4	46.4	51.7	51.7	
Effective Green, g (s)				4.4	4.4			46.4	46.4	51.7	51.7	
Actuated g/C Ratio				0.06	0.06			0.65	0.65	0.73	0.73	
Clearance Time (s)				7.4	7.4			7.5	7.5	3.0	7.5	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				64	101			2338	735	594	2631	
v/s Ratio Prot					0.00			0.17		0.00	c0.55	
v/s Ratio Perm				c0.04					0.02	0.03		
v/c Ratio				0.66	0.00			0.25	0.04	0.05	0.76	
Uniform Delay, d1				32.6	31.2			5.1	4.4	2.7	5.9	
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2				21.7	0.0			0.3	0.1	0.0	2.1	
Delay (s)				54.2	31.2			5.4	4.5	2.8	8.0	
Level of Service				D	C			A	A	A	A	
Approach Delay (s)		0.0			53.7			5.3			8.0	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	71.0	Sum of lost time (s)	17.9
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	2064	361	835	635	46	157	438	622	380	1461	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.3	6.8	2.0	6.8	6.8	5.0	6.9	3.0	1.5	5.9	6.9
Lane Util. Factor	1.00	*1.00	1.00	*1.00	*1.00	1.00	*1.00	*1.00	1.00	1.00	*1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1404	5542	1570	3730	5239	1541	3230	5595	1865	1807	5706	1420
Flt Permitted	0.42	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.42	1.00	1.00
Satd. Flow (perm)	626	5542	1570	3730	5239	1541	3230	5595	1865	797	5706	1420
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	29	2064	361	835	635	46	157	438	622	380	1461	34
RTOR Reduction (vph)	0	0	87	0	0	18	0	0	40	0	0	27
Lane Group Flow (vph)	29	2064	274	835	635	28	157	438	582	380	1461	7
Heavy Vehicles (%)	30%	4%	4%	3%	10%	6%	13%	3%	3%	1%	1%	15%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	pm+pt	NA	Perm
Protected Phases		2		1	6		7	4	1	3	8	
Permitted Phases	2		2			6			4	8		8
Actuated Green, G (s)	56.3	56.3	56.3	28.0	89.3	89.3	8.0	26.0	54.0	42.0	29.0	29.0
Effective Green, g (s)	56.3	56.8	56.3	31.0	89.3	89.3	8.0	26.0	58.0	43.5	30.0	29.0
Actuated g/C Ratio	0.39	0.39	0.39	0.21	0.62	0.62	0.06	0.18	0.40	0.30	0.21	0.20
Clearance Time (s)	6.8	6.8	6.8	5.0	6.8	6.8	5.0	6.9	5.0	3.0	6.9	6.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	243	2170	609	797	3226	949	178	1003	746	340	1180	284
v/s Ratio Prot		c0.37		c0.22	0.12		0.05	0.08	0.16	c0.11	c0.26	
v/s Ratio Perm	0.05		0.17			0.02			0.15	0.22		0.00
v/c Ratio	0.12	0.95	0.45	1.05	0.20	0.03	0.88	0.44	0.78	1.12	1.24	0.02
Uniform Delay, d1	28.4	42.8	32.9	57.0	12.2	10.9	68.0	53.0	38.0	47.6	57.5	46.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	10.8	2.4	45.1	0.0	0.0	36.3	0.3	5.3	84.5	114.6	0.0
Delay (s)	29.4	53.6	35.2	102.1	12.2	10.9	104.3	53.3	43.3	132.1	172.1	46.7
Level of Service	C	D	D	F	B	B	F	D	D	F	F	D
Approach Delay (s)		50.6			61.7			54.7			161.7	
Approach LOS		D			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	83.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	116.3%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	15	0	5	0	1517	83	11	2607	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.8	6.8			6.5		4.0	6.5	
Lane Util. Factor				1.00	1.00			0.91		1.00	0.91	
Frt				1.00	0.85			0.99		1.00	1.00	
Flt Protected				0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)				956	1089			4956		1323	5092	
Flt Permitted				1.00	1.00			1.00		0.13	1.00	
Satd. Flow (perm)				1006	1089			4956		184	5092	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	15	0	5	0	1517	83	11	2607	0
RTOR Reduction (vph)	0	0	0	0	5	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	0	0	15	0	0	0	1597	0	11	2607	0
Heavy Vehicles (%)	2%	2%	2%	91%	0%	50%	0%	5%	5%	38%	3%	0%
Turn Type				Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)				3.7	3.7			80.4		85.2	85.2	
Effective Green, g (s)				3.7	3.7			80.4		85.2	85.2	
Actuated g/C Ratio				0.04	0.04			0.79		0.83	0.83	
Clearance Time (s)				6.8	6.8			6.5		4.0	6.5	
Vehicle Extension (s)				3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)				36	39			3898		162	4244	
v/s Ratio Prot					0.00			0.32		0.00	c0.51	
v/s Ratio Perm				c0.01						0.06		
v/c Ratio				0.42	0.00			0.41		0.07	0.61	
Uniform Delay, d1				48.2	47.5			3.4		1.8	2.9	
Progression Factor				1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2				7.6	0.0			0.3		0.2	0.7	
Delay (s)				55.8	47.5			3.8		1.9	3.6	
Level of Service				E	D			A		A	A	
Approach Delay (s)		0.0			53.8			3.8			3.6	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	3.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	102.2	Sum of lost time (s)	17.3
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

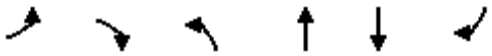
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	131	59	1543	973	324	2280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	6.5	6.5	3.0	6.5
Lane Util. Factor	0.97	1.00	*1.00	1.00	*1.00	0.91
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	2788	1060	5489	1555	1738	4334
Flt Permitted	0.95	1.00	1.00	1.00	0.28	1.00
Satd. Flow (perm)	2788	1060	5489	1555	512	4334
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	131	59	1543	973	324	2280
RTOR Reduction (vph)	0	53	0	300	0	0
Lane Group Flow (vph)	131	6	1543	673	324	2280
Heavy Vehicles (%)	27%	54%	5%	5%	5%	21%
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		2		1	6
Permitted Phases		4		2	6	
Actuated Green, G (s)	10.0	10.0	58.4	58.4	71.6	71.6
Effective Green, g (s)	10.0	10.0	58.4	58.4	71.6	71.6
Actuated g/C Ratio	0.11	0.11	0.62	0.62	0.75	0.75
Clearance Time (s)	6.8	6.8	6.5	6.5	3.0	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	293	111	3377	956	518	3269
v/s Ratio Prot	c0.05		0.28		0.07	c0.53
v/s Ratio Perm		0.01		0.43	0.40	
v/c Ratio	0.45	0.06	0.46	0.70	0.63	0.70
Uniform Delay, d1	39.9	38.2	9.8	12.4	3.5	6.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1	0.2	0.4	4.3	2.4	1.3
Delay (s)	40.9	38.4	10.2	16.7	5.9	7.3
Level of Service	D	D	B	B	A	A
Approach Delay (s)	40.2		12.7			7.1
Approach LOS	D		B			A

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	94.9	Sum of lost time (s)	16.3
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	338	495	2049	0	0	2182
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	7.5			7.5
Lane Util. Factor	0.97	0.91	0.91			0.91
Frt	0.94	0.85	1.00			1.00
Flt Protected	0.97	1.00	1.00			1.00
Satd. Flow (prot)	3069	1327	4995			4995
Flt Permitted	0.97	1.00	1.00			1.00
Satd. Flow (perm)	3069	1327	4995			4995
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	338	495	2049	0	0	2182
RTOR Reduction (vph)	5	5	0	0	0	0
Lane Group Flow (vph)	561	262	2049	0	0	2182
Heavy Vehicles (%)	10%	12%	5%	0%	0%	5%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	29.5	29.5	56.5			56.5
Effective Green, g (s)	29.5	29.5	56.5			56.5
Actuated g/C Ratio	0.29	0.29	0.56			0.56
Clearance Time (s)	6.5	6.5	7.5			7.5
Lane Grp Cap (vph)	905	391	2822			2822
v/s Ratio Prot	0.18		0.41			c0.44
v/s Ratio Perm		c0.20				
v/c Ratio	0.62	0.67	0.73			0.77
Uniform Delay, d1	30.4	31.0	16.0			16.8
Progression Factor	1.00	1.00	0.62			1.00
Incremental Delay, d2	3.2	8.8	1.2			2.1
Delay (s)	33.6	39.8	11.2			18.9
Level of Service	C	D	B			B
Approach Delay (s)	35.6		11.2			18.9
Approach LOS	D		B			B

Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	81.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



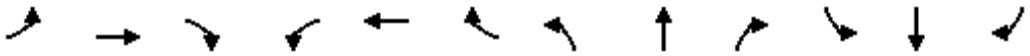
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	774	576	0	1518	2070	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.5		6.5	6.5	
Lane Util. Factor	0.97	0.91		0.91	0.91	
Frt	0.97	0.85		1.00	1.00	
Flt Protected	0.96	1.00		1.00	1.00	
Satd. Flow (prot)	3365	1457		4995	4995	
Flt Permitted	0.96	1.00		1.00	1.00	
Satd. Flow (perm)	3365	1457		4995	4995	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	774	576	0	1518	2070	0
RTOR Reduction (vph)	3	3	0	0	0	0
Lane Group Flow (vph)	927	417	0	1518	2070	0
Heavy Vehicles (%)	4%	2%	0%	5%	5%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	33.5	33.5		52.5	52.5	
Effective Green, g (s)	33.5	33.5		52.5	52.5	
Actuated g/C Ratio	0.34	0.34		0.52	0.52	
Clearance Time (s)	7.5	7.5		6.5	6.5	
Lane Grp Cap (vph)	1127	488		2622	2622	
v/s Ratio Prot	0.28			0.30	c0.41	
v/s Ratio Perm		c0.29				
v/c Ratio	0.82	0.85		0.58	0.79	
Uniform Delay, d1	30.5	31.0		16.2	19.3	
Progression Factor	1.00	1.00		1.00	0.72	
Incremental Delay, d2	6.8	17.1		0.9	1.6	
Delay (s)	37.3	48.1		17.1	15.5	
Level of Service	D	D		B	B	
Approach Delay (s)	40.7			17.1	15.5	
Approach LOS	D			B	B	

Intersection Summary			
HCM 2000 Control Delay	22.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	81.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	222	36	61	368	97	314	964	175	6	312	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0		6.6	6.6		6.6	6.6	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85	1.00	0.97		1.00	0.98		1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1899	1570	1825	1857		1825	3566		1825	3502	
Flt Permitted		0.92	1.00	0.56	1.00		0.56	1.00		0.18	1.00	
Satd. Flow (perm)		1760	1570	1077	1857		1074	3566		345	3502	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	9	222	36	61	368	97	314	964	175	6	312	6
RTOR Reduction (vph)	0	0	25	0	12	0	0	14	0	0	1	0
Lane Group Flow (vph)	0	231	11	61	453	0	314	1125	0	6	317	0
Heavy Vehicles (%)	0%	1%	4%	0%	0%	1%	0%	0%	0%	0%	4%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		24.5	24.5	24.5	24.5		42.7	42.7		42.7	42.7	
Effective Green, g (s)		24.5	24.5	24.5	24.5		42.7	42.7		42.7	42.7	
Actuated g/C Ratio		0.31	0.31	0.31	0.31		0.54	0.54		0.54	0.54	
Clearance Time (s)		6.0	6.0	6.0	6.0		6.6	6.6		6.6	6.6	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		540	482	330	570		574	1908		184	1873	
v/s Ratio Prot					c0.24			c0.32			0.09	
v/s Ratio Perm		0.13	0.01	0.06			0.29			0.02		
v/c Ratio		0.43	0.02	0.18	0.80		0.55	0.59		0.03	0.17	
Uniform Delay, d1		22.1	19.3	20.3	25.3		12.2	12.6		8.8	9.5	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.5	0.0	0.3	7.5		3.7	1.3		0.3	0.2	
Delay (s)		22.6	19.3	20.6	32.9		15.9	13.9		9.1	9.7	
Level of Service		C	B	C	C		B	B		A	A	
Approach Delay (s)		22.2			31.5			14.4			9.7	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	79.8	Sum of lost time (s)	12.6
Intersection Capacity Utilization	103.2%	ICU Level of Service	G
Analysis Period (min)	15		

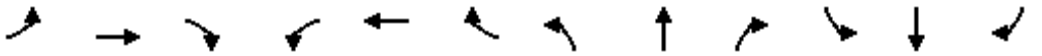
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	40	0	23	0	2150	21	3	747	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.4	7.4			7.5	7.5	3.0	7.5	
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1560	1633			3614	907	1825	3614	
Flt Permitted				0.76	1.00			1.00	1.00	0.06	1.00	
Satd. Flow (perm)				1243	1633			3614	907	124	3614	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	40	0	23	0	2150	21	3	747	0
RTOR Reduction (vph)	0	0	0	0	21	0	0	0	6	0	0	0
Lane Group Flow (vph)	0	0	0	40	2	0	0	2150	15	3	747	0
Heavy Vehicles (%)	0%	0%	0%	17%	0%	0%	0%	1%	80%	0%	1%	0%
Turn Type				Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		8			4			6		5	2	
Permitted Phases	8			4			6		6	2		
Actuated Green, G (s)				5.5	5.5			59.0	59.0	63.2	63.2	
Effective Green, g (s)				5.5	5.5			59.0	59.0	63.2	63.2	
Actuated g/C Ratio				0.07	0.07			0.71	0.71	0.76	0.76	
Clearance Time (s)				7.4	7.4			7.5	7.5	3.0	7.5	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				81	107			2550	640	118	2732	
v/s Ratio Prot					0.00			c0.59		0.00	c0.21	
v/s Ratio Perm				c0.03					0.02	0.02		
v/c Ratio				0.49	0.01			0.84	0.02	0.03	0.27	
Uniform Delay, d1				37.7	36.5			8.9	3.7	10.8	3.1	
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2				4.7	0.1			3.6	0.1	0.1	0.2	
Delay (s)				42.4	36.6			12.5	3.7	10.9	3.4	
Level of Service				D	D			B	A	B	A	
Approach Delay (s)		0.0			40.3			12.5			3.4	
Approach LOS		A			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	83.6	Sum of lost time (s)	17.9
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	76	833	240	776	1794	338	507	1273	543	125	592	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	6.8	6.8	3.0	6.8	6.8	3.0	6.9	3.0	3.0	6.9	6.9
Lane Util. Factor	1.00	0.91	1.00	*1.00	*1.00	1.00	*1.00	0.91	1.00	1.00	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	4725	1585	3730	5489	1617	3767	5092	1779	1789	5193	1633
Flt Permitted	0.15	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.16	1.00	1.00
Satd. Flow (perm)	281	4725	1585	3730	5489	1617	3767	5092	1779	306	5193	1633
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	76	833	240	776	1794	338	507	1273	543	125	592	18
RTOR Reduction (vph)	0	0	185	0	0	201	0	0	69	0	0	14
Lane Group Flow (vph)	76	833	55	776	1794	137	507	1273	474	125	592	4
Heavy Vehicles (%)	0%	11%	3%	3%	5%	1%	2%	3%	8%	2%	1%	0%
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4	1	3	8	
Permitted Phases	2		2			6			4	8		8
Actuated Green, G (s)	30.7	26.3	26.3	22.8	46.7	46.7	17.6	34.0	56.8	34.8	24.6	24.6
Effective Green, g (s)	32.7	26.3	26.3	24.8	46.7	46.7	19.6	34.0	60.8	34.8	24.6	24.6
Actuated g/C Ratio	0.28	0.23	0.23	0.22	0.41	0.41	0.17	0.30	0.53	0.30	0.21	0.21
Clearance Time (s)	3.0	6.8	6.8	5.0	6.8	6.8	5.0	6.9	5.0	3.0	6.9	6.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	152	1080	362	804	2229	656	642	1505	940	224	1110	349
v/s Ratio Prot	0.02	0.18		c0.21	c0.33		c0.13	c0.25	0.11	0.05	0.11	
v/s Ratio Perm	0.12		0.03			0.08			0.16	0.12		0.00
v/c Ratio	0.50	0.77	0.15	0.97	0.80	0.21	0.79	0.85	0.50	0.56	0.53	0.01
Uniform Delay, d1	31.0	41.5	35.4	44.7	30.1	22.2	45.7	38.0	17.4	30.9	40.1	35.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	5.3	0.9	23.3	2.2	0.2	6.4	4.6	0.4	3.0	0.5	0.0
Delay (s)	33.6	46.9	36.3	68.0	32.3	22.3	52.2	42.6	17.8	33.9	40.6	35.6
Level of Service	C	D	D	E	C	C	D	D	B	C	D	D
Approach Delay (s)		43.8			40.7			38.9			39.3	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	40.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	19.7
Intersection Capacity Utilization	88.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	56	0	10	0	2643	34	78	1621	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.8	6.8			6.5		4.0	6.5	
Lane Util. Factor				1.00	1.00			0.91		1.00	0.91	
Frt				1.00	0.85			1.00		1.00	1.00	
Flt Protected				0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)				1630	1432			5128		1755	5142	
Flt Permitted				0.76	1.00			1.00		0.06	1.00	
Satd. Flow (perm)				1299	1432			5128		118	5142	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	56	0	10	0	2643	34	78	1621	0
RTOR Reduction (vph)	0	0	0	0	9	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	0	0	56	1	0	0	2676	0	78	1621	0
Heavy Vehicles (%)	2%	2%	2%	12%	0%	14%	0%	2%	8%	4%	2%	0%
Turn Type				Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)				6.3	6.3			58.5		65.7	65.7	
Effective Green, g (s)				6.3	6.3			58.5		65.7	65.7	
Actuated g/C Ratio				0.07	0.07			0.69		0.77	0.77	
Clearance Time (s)				6.8	6.8			6.5		4.0	6.5	
Vehicle Extension (s)				3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)				95	105			3516		152	3960	
v/s Ratio Prot					0.00			c0.52		0.02	c0.32	
v/s Ratio Perm				c0.04						0.37		
v/c Ratio				0.59	0.01			0.76		0.51	0.41	
Uniform Delay, d1				38.2	36.6			8.8		10.2	3.3	
Progression Factor				1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2				9.0	0.0			1.6		2.9	0.3	
Delay (s)				47.3	36.6			10.4		13.1	3.6	
Level of Service				D	D			B		B	A	
Approach Delay (s)		0.0			45.7			10.4			4.0	
Approach LOS		A			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	85.3	Sum of lost time (s)	17.3
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

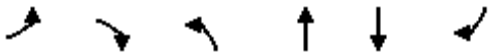
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	832	396	2260	166	90	1586
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.8	6.8	4.5	6.5	1.0	6.5
Lane Util. Factor	0.97	1.00	0.91	1.00	1.00	0.91
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3404	1570	5092	1306	1372	5142
Flt Permitted	0.95	1.00	1.00	1.00	0.28	1.00
Satd. Flow (perm)	3404	1570	5092	1306	404	5142
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	832	396	2260	166	90	1586
RTOR Reduction (vph)	0	120	0	93	0	0
Lane Group Flow (vph)	832	276	2260	73	90	1586
Heavy Vehicles (%)	4%	4%	3%	25%	33%	2%
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		2		1	6
Permitted Phases		4		2	6	
Actuated Green, G (s)	23.2	23.2	34.7	34.7	42.4	42.4
Effective Green, g (s)	25.2	23.2	36.7	34.7	44.4	42.4
Actuated g/C Ratio	0.32	0.29	0.47	0.44	0.56	0.54
Clearance Time (s)	6.8	6.8	6.5	6.5	3.0	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1087	461	2368	574	309	2763
v/s Ratio Prot	c0.24		c0.44		0.02	c0.31
v/s Ratio Perm		0.18		0.06	0.14	
v/c Ratio	0.77	0.60	0.95	0.13	0.29	0.57
Uniform Delay, d1	24.2	23.9	20.3	13.1	8.1	12.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.3	2.1	10.5	0.5	0.5	0.9
Delay (s)	27.5	26.0	30.8	13.6	8.6	13.1
Level of Service	C	C	C	B	A	B
Approach Delay (s)	27.0		29.6			12.8
Approach LOS	C		C			B

Intersection Summary			
HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	78.9	Sum of lost time (s)	11.3
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

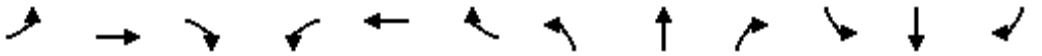
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	756	589	1811	0	0	2040
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	7.5			7.5
Lane Util. Factor	0.97	0.91	0.91			0.91
Frt	0.97	0.85	1.00			1.00
Flt Protected	0.96	1.00	1.00			1.00
Satd. Flow (prot)	3431	1429	5043			5142
Flt Permitted	0.96	1.00	1.00			1.00
Satd. Flow (perm)	3431	1429	5043			5142
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	756	589	1811	0	0	2040
RTOR Reduction (vph)	6	6	0	0	0	0
Lane Group Flow (vph)	915	418	1811	0	0	2040
Heavy Vehicles (%)	1%	4%	4%	3%	12%	2%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	34.5	34.5	51.5			51.5
Effective Green, g (s)	34.5	34.5	51.5			51.5
Actuated g/C Ratio	0.34	0.34	0.52			0.52
Clearance Time (s)	6.5	6.5	7.5			7.5
Lane Grp Cap (vph)	1183	493	2597			2648
v/s Ratio Prot	0.27		0.36			c0.40
v/s Ratio Perm		c0.29				
v/c Ratio	0.77	0.85	0.70			0.77
Uniform Delay, d1	29.3	30.3	18.4			19.5
Progression Factor	1.00	1.00	0.65			1.00
Incremental Delay, d2	5.0	16.4	1.4			2.2
Delay (s)	34.2	46.8	13.4			21.7
Level of Service	C	D	B			C
Approach Delay (s)	38.2		13.4			21.7
Approach LOS	D		B			C

Intersection Summary			
HCM 2000 Control Delay	23.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	450	354	0	1523	2478	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.5		6.5	6.5	
Lane Util. Factor	0.97	0.91		0.91	0.91	
Frt	0.97	0.85		1.00	1.00	
Flt Protected	0.96	1.00		1.00	1.00	
Satd. Flow (prot)	3208	1457		5142	5193	
Flt Permitted	0.96	1.00		1.00	1.00	
Satd. Flow (perm)	3208	1457		5142	5193	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	450	354	0	1523	2478	0
RTOR Reduction (vph)	2	2	0	0	0	0
Lane Group Flow (vph)	551	249	0	1523	2478	0
Heavy Vehicles (%)	10%	2%	2%	2%	1%	7%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	27.5	27.5		58.5	58.5	
Effective Green, g (s)	27.5	27.5		58.5	58.5	
Actuated g/C Ratio	0.28	0.28		0.58	0.58	
Clearance Time (s)	7.5	7.5		6.5	6.5	
Lane Grp Cap (vph)	882	400		3008	3037	
v/s Ratio Prot	c0.17			0.30	c0.48	
v/s Ratio Perm		0.17				
v/c Ratio	0.62	0.62		0.51	0.82	
Uniform Delay, d1	31.7	31.7		12.2	16.5	
Progression Factor	1.00	1.00		1.00	0.55	
Incremental Delay, d2	3.3	7.1		0.6	1.6	
Delay (s)	35.1	38.8		12.8	10.6	
Level of Service	D	D		B	B	
Approach Delay (s)	36.2			12.8	10.6	
Approach LOS	D			B	B	

Intersection Summary			
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	590	513	119	107	9	21	318	58	121	811	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0		6.6	6.6		6.6	6.6	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85	1.00	0.99		1.00	0.98		1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1897	1633	1807	1874		1825	3451		1825	3613	
Flt Permitted		1.00	1.00	0.21	1.00		0.27	1.00		0.53	1.00	
Satd. Flow (perm)		1893	1633	391	1874		522	3451		1015	3613	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	7	590	513	119	107	9	21	318	58	121	811	1
RTOR Reduction (vph)	0	0	31	0	4	0	0	15	0	0	0	0
Lane Group Flow (vph)	0	597	482	119	112	0	21	361	0	121	812	0
Heavy Vehicles (%)	20%	1%	0%	1%	0%	17%	0%	3%	5%	0%	1%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		31.1	31.1	31.1	31.1		32.8	32.8		32.8	32.8	
Effective Green, g (s)		31.1	31.1	31.1	31.1		32.8	32.8		32.8	32.8	
Actuated g/C Ratio		0.41	0.41	0.41	0.41		0.43	0.43		0.43	0.43	
Clearance Time (s)		6.0	6.0	6.0	6.0		6.6	6.6		6.6	6.6	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		769	663	158	761		223	1479		435	1549	
v/s Ratio Prot					0.06			0.10			c0.22	
v/s Ratio Perm		c0.32	0.29	0.30			0.04			0.12		
v/c Ratio		0.78	0.73	0.75	0.15		0.09	0.24		0.28	0.52	
Uniform Delay, d1		19.7	19.1	19.4	14.3		13.0	13.9		14.2	16.1	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.9	4.0	18.2	0.1		0.8	0.4		1.6	1.3	
Delay (s)		24.6	23.1	37.6	14.4		13.8	14.3		15.8	17.4	
Level of Service		C	C	D	B		B	B		B	B	
Approach Delay (s)		23.9			26.2			14.3			17.2	
Approach LOS		C			C			B			B	

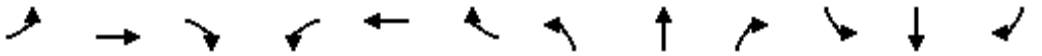
Intersection Summary			
HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	76.5	Sum of lost time (s)	12.6
Intersection Capacity Utilization	94.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	42	0	1	0	596	42	27	2004	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.4	7.4			7.5		3.0	7.5	
Lane Util. Factor				1.00	1.00			0.91		1.00	0.91	
Frt				1.00	0.85			0.99		1.00	1.00	
Flt Protected				0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)				1086	1633			4954		1825	5193	
Flt Permitted				0.91	1.00			1.00		0.37	1.00	
Satd. Flow (perm)				1040	1633			4954		719	5193	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	42	0	1	0	596	42	27	2004	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	0	0	42	0	0	0	632	0	27	2004	0
Heavy Vehicles (%)	0%	0%	0%	68%	0%	0%	0%	2%	45%	0%	1%	0%
Turn Type				Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		8			4			6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)				4.4	4.4			46.4		51.7	51.7	
Effective Green, g (s)				4.4	4.4			46.4		51.7	51.7	
Actuated g/C Ratio				0.06	0.06			0.65		0.73	0.73	
Clearance Time (s)				7.4	7.4			7.5		3.0	7.5	
Vehicle Extension (s)				3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)				64	101			3237		559	3781	
v/s Ratio Prot					0.00			0.13		0.00	c0.39	
v/s Ratio Perm				c0.04						0.03		
v/c Ratio				0.66	0.00			0.20		0.05	0.53	
Uniform Delay, d1				32.6	31.2			4.9		2.7	4.3	
Progression Factor				1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2				21.7	0.0			0.1		0.0	0.5	
Delay (s)				54.2	31.2			5.0		2.8	4.8	
Level of Service				D	C			A		A	A	
Approach Delay (s)		0.0			53.7			5.0			4.8	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	71.0	Sum of lost time (s)	17.9
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	2064	361	835	635	46	157	438	622	380	1461	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	3.8	6.8	2.0	6.8	6.8	5.0	6.9	3.0	0.5	3.9	6.9
Lane Util. Factor	1.00	*1.00	1.00	*1.00	*1.00	1.00	*1.00	*1.00	1.00	1.00	*1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1404	5542	1570	3730	5239	1541	3230	5595	1865	1807	5706	1420
Flt Permitted	0.42	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)	626	5542	1570	3730	5239	1541	3230	5595	1865	848	5706	1420
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	29	2064	361	835	635	46	157	438	622	380	1461	34
RTOR Reduction (vph)	0	0	85	0	0	20	0	0	52	0	0	26
Lane Group Flow (vph)	29	2064	276	835	635	26	157	438	570	380	1461	8
Heavy Vehicles (%)	30%	4%	4%	3%	10%	6%	13%	3%	3%	1%	1%	15%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	pm+pt	NA	Perm
Protected Phases		2		1	6		7	4	1	3	8	
Permitted Phases	2		2			6			4	8		8
Actuated Green, G (s)	51.2	51.2	51.2	27.0	83.2	83.2	8.0	28.5	55.5	48.1	35.1	35.1
Effective Green, g (s)	51.2	54.2	51.2	30.0	83.2	83.2	8.0	28.5	59.5	50.6	38.1	35.1
Actuated g/C Ratio	0.35	0.37	0.35	0.21	0.57	0.57	0.06	0.20	0.41	0.35	0.26	0.24
Clearance Time (s)	6.8	6.8	6.8	5.0	6.8	6.8	5.0	6.9	5.0	3.0	6.9	6.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	221	2071	554	771	3006	884	178	1099	765	422	1499	343
v/s Ratio Prot		c0.37		c0.22	0.12		0.05	0.08	0.15	c0.12	c0.26	
v/s Ratio Perm	0.05		0.18			0.02			0.16	0.20		0.01
v/c Ratio	0.13	1.00	0.50	1.08	0.21	0.03	0.88	0.40	0.74	0.90	0.97	0.02
Uniform Delay, d1	31.8	45.3	36.8	57.5	15.0	13.4	68.0	50.8	36.3	40.7	53.0	41.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	19.0	3.2	57.2	0.0	0.0	36.3	0.2	4.0	21.8	17.4	0.0
Delay (s)	33.0	64.3	40.0	114.7	15.0	13.4	104.3	51.0	40.2	62.5	70.4	41.9
Level of Service	C	E	D	F	B	B	F	D	D	E	E	D
Approach Delay (s)		60.4			69.9			52.4			68.3	
Approach LOS		E			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	63.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	15.7
Intersection Capacity Utilization	112.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	15	0	5	0	1517	83	11	2607	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.8	6.8			6.5		4.0	6.5	
Lane Util. Factor				1.00	1.00			0.91		1.00	0.91	
Frt				1.00	0.85			0.99		1.00	1.00	
Flt Protected				0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)				956	1089			4956		1323	5092	
Flt Permitted				1.00	1.00			1.00		0.13	1.00	
Satd. Flow (perm)				1006	1089			4956		181	5092	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	15	0	5	0	1517	83	11	2607	0
RTOR Reduction (vph)	0	0	0	0	5	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	0	0	15	0	0	0	1597	0	11	2607	0
Heavy Vehicles (%)	2%	2%	2%	91%	0%	50%	0%	5%	5%	38%	3%	0%
Turn Type				Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)				3.6	3.6			70.4		75.2	75.2	
Effective Green, g (s)				3.6	3.6			70.4		75.2	75.2	
Actuated g/C Ratio				0.04	0.04			0.76		0.82	0.82	
Clearance Time (s)				6.8	6.8			6.5		4.0	6.5	
Vehicle Extension (s)				3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)				39	42			3788		157	4157	
v/s Ratio Prot					0.00			0.32		0.00	c0.51	
v/s Ratio Perm				c0.01						0.06		
v/c Ratio				0.38	0.00			0.42		0.07	0.63	
Uniform Delay, d1				43.2	42.5			3.8		1.9	3.2	
Progression Factor				1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2				6.2	0.0			0.3		0.2	0.7	
Delay (s)				49.4	42.6			4.1		2.1	3.9	
Level of Service				D	D			A		A	A	
Approach Delay (s)		0.0			47.7			4.1			3.9	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	4.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	92.1	Sum of lost time (s)	17.3
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

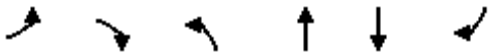
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	131	59	1543	973	324	2280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	6.5	6.5	3.0	6.5
Lane Util. Factor	0.97	1.00	*1.00	1.00	*1.00	0.91
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	2788	1060	5437	1555	1755	4948
Flt Permitted	0.95	1.00	1.00	1.00	0.28	1.00
Satd. Flow (perm)	2788	1060	5437	1555	517	4948
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	131	59	1543	973	324	2280
RTOR Reduction (vph)	0	52	0	350	0	0
Lane Group Flow (vph)	131	7	1543	623	324	2280
Heavy Vehicles (%)	27%	54%	6%	5%	4%	6%
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		2		1	6
Permitted Phases		4		2	6	
Actuated Green, G (s)	9.6	9.6	50.0	50.0	61.7	61.7
Effective Green, g (s)	9.6	9.6	50.0	50.0	61.7	61.7
Actuated g/C Ratio	0.11	0.11	0.59	0.59	0.73	0.73
Clearance Time (s)	6.8	6.8	6.5	6.5	3.0	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	316	120	3213	919	504	3608
v/s Ratio Prot	c0.05		0.28		0.07	c0.46
v/s Ratio Perm		0.01		c0.40	0.40	
v/c Ratio	0.41	0.06	0.48	0.68	0.64	0.63
Uniform Delay, d1	34.9	33.5	9.9	11.8	3.8	5.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	0.2	0.5	4.0	2.8	0.9
Delay (s)	35.8	33.7	10.4	15.8	6.6	6.6
Level of Service	D	C	B	B	A	A
Approach Delay (s)	35.1		12.5			6.6
Approach LOS	D		B			A

Intersection Summary			
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	84.6	Sum of lost time (s)	16.3
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	338	495	2049	0	0	2182
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	7.5			7.5
Lane Util. Factor	0.97	0.91	0.91			0.91
Frt	0.94	0.85	1.00			1.00
Flt Protected	0.97	1.00	1.00			1.00
Satd. Flow (prot)	3069	1327	4995			4995
Flt Permitted	0.97	1.00	1.00			1.00
Satd. Flow (perm)	3069	1327	4995			4995
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	338	495	2049	0	0	2182
RTOR Reduction (vph)	5	5	0	0	0	0
Lane Group Flow (vph)	561	262	2049	0	0	2182
Heavy Vehicles (%)	10%	12%	5%	0%	0%	5%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	29.5	29.5	56.5			56.5
Effective Green, g (s)	29.5	29.5	56.5			56.5
Actuated g/C Ratio	0.29	0.29	0.56			0.56
Clearance Time (s)	6.5	6.5	7.5			7.5
Lane Grp Cap (vph)	905	391	2822			2822
v/s Ratio Prot	0.18		0.41			c0.44
v/s Ratio Perm		c0.20				
v/c Ratio	0.62	0.67	0.73			0.77
Uniform Delay, d1	30.4	31.0	16.0			16.8
Progression Factor	1.00	1.00	0.62			1.00
Incremental Delay, d2	3.2	8.8	1.2			2.1
Delay (s)	33.6	39.8	11.2			18.9
Level of Service	C	D	B			B
Approach Delay (s)	35.6		11.2			18.9
Approach LOS	D		B			B

Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	81.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	774	576	0	1518	2070	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.5		6.5	6.5	
Lane Util. Factor	0.97	0.91		0.91	0.91	
Frt	0.97	0.85		1.00	1.00	
Flt Protected	0.96	1.00		1.00	1.00	
Satd. Flow (prot)	3365	1457		4995	4995	
Flt Permitted	0.96	1.00		1.00	1.00	
Satd. Flow (perm)	3365	1457		4995	4995	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	774	576	0	1518	2070	0
RTOR Reduction (vph)	3	3	0	0	0	0
Lane Group Flow (vph)	927	417	0	1518	2070	0
Heavy Vehicles (%)	4%	2%	0%	5%	5%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	33.5	33.5		52.5	52.5	
Effective Green, g (s)	33.5	33.5		52.5	52.5	
Actuated g/C Ratio	0.34	0.34		0.52	0.52	
Clearance Time (s)	7.5	7.5		6.5	6.5	
Lane Grp Cap (vph)	1127	488		2622	2622	
v/s Ratio Prot	0.28			0.30	c0.41	
v/s Ratio Perm		c0.29				
v/c Ratio	0.82	0.85		0.58	0.79	
Uniform Delay, d1	30.5	31.0		16.2	19.3	
Progression Factor	1.00	1.00		1.00	0.72	
Incremental Delay, d2	6.8	17.1		0.9	1.6	
Delay (s)	37.3	48.1		17.1	15.5	
Level of Service	D	D		B	B	
Approach Delay (s)	40.7			17.1	15.5	
Approach LOS	D			B	B	

Intersection Summary			
HCM 2000 Control Delay	22.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	81.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	222	36	61	368	97	314	964	175	6	312	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0		6.6	6.6		6.6	6.6	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85	1.00	0.97		1.00	0.98		1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1899	1570	1825	1857		1825	3566		1825	3502	
Flt Permitted		0.91	1.00	0.56	1.00		0.56	1.00		0.18	1.00	
Satd. Flow (perm)		1736	1570	1071	1857		1074	3566		348	3502	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	9	222	36	61	368	97	314	964	175	6	312	6
RTOR Reduction (vph)	0	0	25	0	12	0	0	15	0	0	1	0
Lane Group Flow (vph)	0	231	11	61	453	0	314	1124	0	6	317	0
Heavy Vehicles (%)	0%	1%	4%	0%	0%	1%	0%	0%	0%	0%	4%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		24.6	24.6	24.6	24.6		43.7	43.7		43.7	43.7	
Effective Green, g (s)		24.6	24.6	24.6	24.6		43.7	43.7		43.7	43.7	
Actuated g/C Ratio		0.30	0.30	0.30	0.30		0.54	0.54		0.54	0.54	
Clearance Time (s)		6.0	6.0	6.0	6.0		6.6	6.6		6.6	6.6	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		527	477	325	564		580	1926		187	1891	
v/s Ratio Prot					c0.24			c0.32			0.09	
v/s Ratio Perm		0.13	0.01	0.06			0.29			0.02		
v/c Ratio		0.44	0.02	0.19	0.80		0.54	0.58		0.03	0.17	
Uniform Delay, d1		22.6	19.7	20.8	25.9		12.1	12.5		8.7	9.4	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.6	0.0	0.3	8.1		3.6	1.3		0.3	0.2	
Delay (s)		23.2	19.7	21.1	34.1		15.7	13.8		9.0	9.6	
Level of Service		C	B	C	C		B	B		A	A	
Approach Delay (s)		22.7			32.5			14.2			9.6	
Approach LOS		C			C			B			A	

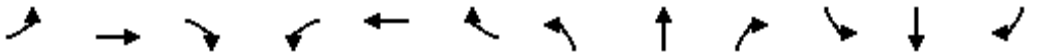
Intersection Summary			
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	80.9	Sum of lost time (s)	12.6
Intersection Capacity Utilization	103.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	40	0	23	0	2150	21	3	747	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.4	7.4			7.5		3.0	7.5	
Lane Util. Factor				1.00	1.00			0.91		1.00	0.91	
Frt				1.00	0.85			1.00		1.00	1.00	
Flt Protected				0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)				1560	1633			5146		1825	5193	
Flt Permitted				0.76	1.00			1.00		0.06	1.00	
Satd. Flow (perm)				1243	1633			5146		124	5193	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	40	0	23	0	2150	21	3	747	0
RTOR Reduction (vph)	0	0	0	0	21	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	0	0	40	2	0	0	2170	0	3	747	0
Heavy Vehicles (%)	0%	0%	0%	17%	0%	0%	0%	1%	80%	0%	1%	0%
Turn Type				Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		8			4			6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)				5.5	5.5			59.0		63.2	63.2	
Effective Green, g (s)				5.5	5.5			59.0		63.2	63.2	
Actuated g/C Ratio				0.07	0.07			0.71		0.76	0.76	
Clearance Time (s)				7.4	7.4			7.5		3.0	7.5	
Vehicle Extension (s)				3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)				81	107			3631		118	3925	
v/s Ratio Prot					0.00			c0.42		0.00	c0.14	
v/s Ratio Perm				c0.03						0.02		
v/c Ratio				0.49	0.01			0.60		0.03	0.19	
Uniform Delay, d1				37.7	36.5			6.3		3.9	2.9	
Progression Factor				1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2				4.7	0.1			0.7		0.1	0.1	
Delay (s)				42.4	36.6			7.0		3.9	3.0	
Level of Service				D	D			A		A	A	
Approach Delay (s)		0.0			40.3			7.0			3.0	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	83.6	Sum of lost time (s)	17.9
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	76	833	240	776	1794	338	507	1273	543	125	592	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	6.8	6.8	3.0	6.8	6.8	3.0	6.9	3.0	3.0	6.9	6.9
Lane Util. Factor	1.00	0.91	1.00	*1.00	*1.00	1.00	*1.00	0.91	1.00	1.00	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	4725	1585	3730	5489	1617	3767	5092	1779	1789	5193	1633
Flt Permitted	0.15	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.16	1.00	1.00
Satd. Flow (perm)	281	4725	1585	3730	5489	1617	3767	5092	1779	306	5193	1633
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	76	833	240	776	1794	338	507	1273	543	125	592	18
RTOR Reduction (vph)	0	0	185	0	0	201	0	0	69	0	0	14
Lane Group Flow (vph)	76	833	55	776	1794	137	507	1273	474	125	592	4
Heavy Vehicles (%)	0%	11%	3%	3%	5%	1%	2%	3%	8%	2%	1%	0%
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4	1	3	8	
Permitted Phases	2		2			6			4	8		8
Actuated Green, G (s)	30.7	26.3	26.3	22.8	46.7	46.7	17.6	34.0	56.8	34.8	24.6	24.6
Effective Green, g (s)	32.7	26.3	26.3	24.8	46.7	46.7	19.6	34.0	60.8	34.8	24.6	24.6
Actuated g/C Ratio	0.28	0.23	0.23	0.22	0.41	0.41	0.17	0.30	0.53	0.30	0.21	0.21
Clearance Time (s)	3.0	6.8	6.8	5.0	6.8	6.8	5.0	6.9	5.0	3.0	6.9	6.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	152	1080	362	804	2229	656	642	1505	940	224	1110	349
v/s Ratio Prot	0.02	0.18		c0.21	c0.33		c0.13	c0.25	0.11	0.05	0.11	
v/s Ratio Perm	0.12		0.03			0.08			0.16	0.12		0.00
v/c Ratio	0.50	0.77	0.15	0.97	0.80	0.21	0.79	0.85	0.50	0.56	0.53	0.01
Uniform Delay, d1	31.0	41.5	35.4	44.7	30.1	22.2	45.7	38.0	17.4	30.9	40.1	35.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	5.3	0.9	23.3	2.2	0.2	6.4	4.6	0.4	3.0	0.5	0.0
Delay (s)	33.6	46.9	36.3	68.0	32.3	22.3	52.2	42.6	17.8	33.9	40.6	35.6
Level of Service	C	D	D	E	C	C	D	D	B	C	D	D
Approach Delay (s)		43.8			40.7			38.9			39.3	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	40.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	19.7
Intersection Capacity Utilization	88.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	56	0	10	0	2643	34	78	1621	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.8	6.8			6.5		4.0	6.5	
Lane Util. Factor				1.00	1.00			0.91		1.00	0.91	
Frt				1.00	0.85			1.00		1.00	1.00	
Flt Protected				0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)				1630	1432			5128		1755	5142	
Flt Permitted				0.76	1.00			1.00		0.06	1.00	
Satd. Flow (perm)				1299	1432			5128		118	5142	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	56	0	10	0	2643	34	78	1621	0
RTOR Reduction (vph)	0	0	0	0	9	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	0	0	56	1	0	0	2676	0	78	1621	0
Heavy Vehicles (%)	2%	2%	2%	12%	0%	14%	0%	2%	8%	4%	2%	0%
Turn Type				Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)				6.3	6.3			58.5		65.7	65.7	
Effective Green, g (s)				6.3	6.3			58.5		65.7	65.7	
Actuated g/C Ratio				0.07	0.07			0.69		0.77	0.77	
Clearance Time (s)				6.8	6.8			6.5		4.0	6.5	
Vehicle Extension (s)				3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)				95	105			3516		152	3960	
v/s Ratio Prot					0.00			c0.52		0.02	c0.32	
v/s Ratio Perm				c0.04						0.37		
v/c Ratio				0.59	0.01			0.76		0.51	0.41	
Uniform Delay, d1				38.2	36.6			8.8		10.2	3.3	
Progression Factor				1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2				9.0	0.0			1.6		2.9	0.3	
Delay (s)				47.3	36.6			10.4		13.1	3.6	
Level of Service				D	D			B		B	A	
Approach Delay (s)		0.0			45.7			10.4			4.0	
Approach LOS		A			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	85.3	Sum of lost time (s)	17.3
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

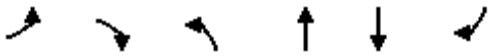
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	832	396	2260	166	90	1586
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.8	6.8	4.5	6.5	1.0	6.5
Lane Util. Factor	0.97	1.00	0.91	1.00	*1.00	0.91
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3404	1570	5092	1306	1372	5142
Flt Permitted	0.95	1.00	1.00	1.00	0.28	1.00
Satd. Flow (perm)	3404	1570	5092	1306	404	5142
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	832	396	2260	166	90	1586
RTOR Reduction (vph)	0	87	0	80	0	0
Lane Group Flow (vph)	832	309	2260	86	90	1586
Heavy Vehicles (%)	4%	4%	3%	25%	33%	2%
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		2		1	6
Permitted Phases		4		2	6	
Actuated Green, G (s)	27.1	27.1	51.4	51.4	59.1	59.1
Effective Green, g (s)	29.1	27.1	53.4	51.4	61.1	59.1
Actuated g/C Ratio	0.29	0.27	0.54	0.52	0.61	0.59
Clearance Time (s)	6.8	6.8	6.5	6.5	3.0	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	995	427	2732	674	313	3054
v/s Ratio Prot	c0.24		c0.44		0.02	c0.31
v/s Ratio Perm		0.20		0.07	0.16	
v/c Ratio	0.84	0.72	0.83	0.13	0.29	0.52
Uniform Delay, d1	33.0	32.8	19.2	12.4	7.9	11.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.2	6.0	3.0	0.4	0.5	0.6
Delay (s)	39.2	38.8	22.2	12.8	8.4	12.5
Level of Service	D	D	C	B	A	B
Approach Delay (s)	39.0		21.6			12.3
Approach LOS	D		C			B

Intersection Summary			
HCM 2000 Control Delay	22.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	99.5	Sum of lost time (s)	11.3
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	756	589	1811	0	0	2040
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	7.5			7.5
Lane Util. Factor	0.97	0.91	0.91			0.91
Frt	0.97	0.85	1.00			1.00
Flt Protected	0.96	1.00	1.00			1.00
Satd. Flow (prot)	3431	1429	5043			5142
Flt Permitted	0.96	1.00	1.00			1.00
Satd. Flow (perm)	3431	1429	5043			5142
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	756	589	1811	0	0	2040
RTOR Reduction (vph)	6	6	0	0	0	0
Lane Group Flow (vph)	915	418	1811	0	0	2040
Heavy Vehicles (%)	1%	4%	4%	3%	12%	2%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	34.5	34.5	51.5			51.5
Effective Green, g (s)	34.5	34.5	51.5			51.5
Actuated g/C Ratio	0.34	0.34	0.52			0.52
Clearance Time (s)	6.5	6.5	7.5			7.5
Lane Grp Cap (vph)	1183	493	2597			2648
v/s Ratio Prot	0.27		0.36			c0.40
v/s Ratio Perm		c0.29				
v/c Ratio	0.77	0.85	0.70			0.77
Uniform Delay, d1	29.3	30.3	18.4			19.5
Progression Factor	1.00	1.00	0.65			1.00
Incremental Delay, d2	5.0	16.4	1.4			2.2
Delay (s)	34.2	46.8	13.4			21.7
Level of Service	C	D	B			C
Approach Delay (s)	38.2		13.4			21.7
Approach LOS	D		B			C

Intersection Summary			
HCM 2000 Control Delay	23.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	450	354	0	1523	2478	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.5		6.5	6.5	
Lane Util. Factor	0.97	0.91		0.91	0.91	
Frt	0.97	0.85		1.00	1.00	
Flt Protected	0.96	1.00		1.00	1.00	
Satd. Flow (prot)	3208	1457		5142	5193	
Flt Permitted	0.96	1.00		1.00	1.00	
Satd. Flow (perm)	3208	1457		5142	5193	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	450	354	0	1523	2478	0
RTOR Reduction (vph)	2	2	0	0	0	0
Lane Group Flow (vph)	551	249	0	1523	2478	0
Heavy Vehicles (%)	10%	2%	2%	2%	1%	7%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	27.5	27.5		58.5	58.5	
Effective Green, g (s)	27.5	27.5		58.5	58.5	
Actuated g/C Ratio	0.28	0.28		0.58	0.58	
Clearance Time (s)	7.5	7.5		6.5	6.5	
Lane Grp Cap (vph)	882	400		3008	3037	
v/s Ratio Prot	c0.17			0.30	c0.48	
v/s Ratio Perm		0.17				
v/c Ratio	0.62	0.62		0.51	0.82	
Uniform Delay, d1	31.7	31.7		12.2	16.5	
Progression Factor	1.00	1.00		1.00	0.55	
Incremental Delay, d2	3.3	7.1		0.6	1.6	
Delay (s)	35.1	38.8		12.8	10.6	
Level of Service	D	D		B	B	
Approach Delay (s)	36.2			12.8	10.6	
Approach LOS	D			B	B	

Intersection Summary			
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Appendix C

Collisions Factors – Design and Operational Guidelines

Table 1 – Guidelines on Design and Operational Considerations for Collisions at Un-signalized Intersections

Potential Contributing Factor	Related Design and/or Operational Considerations	Expected Safety Benefit
Right Angle Collisions		
Restricted Sightlines to Crossing Road	Increase triangle sight distance	CMF = 0.53 for Injury CMF = 0.89 for Property Damage Only
Inconspicuous Intersection	Provide intersection illumination	CMF = 0.62 for Nighttime Injury
	Install flashing beacons at stop controlled intersections (rural)	CMF = 0.84 for Angle
	Install larger street name signs for Minor Road at the intersection of Major Road	Positive Guidance is generally accepted as a way to reduce collision risk. Refer to OTM Book 1b. No CMF available.
	Install advance street name signs for intersection.	CMF = 0.984 for All CMF = 0.897 for Sideswipe
Inappropriate Gap Acceptance	Install intersection conflict warning system, to assist drivers in accepting appropriate gaps	Activated systems are available, or a static system using signs can assist drivers in better judging the gap. No CMF available.
	Convert stop-controlled intersection into single-lane roundabout (rural)	CMF = 0.42 for All
	Convert minor-road stop control to all-way stop control (rural)	CMF = 0.52 for All
	Install traffic signals (if warranted)	CMF = 0.56 for All CMF = 0.23 for Angle
Speeding Disobey Traffic Control Improper Turn	Address driver error through education and enforcement	Work with Peel Regional Police to educate/enforce. No CMF available.
Turning Movement Collisions		
Restricted Sightlines to Crossing Road	Increase triangle sight distance	CMF = 0.53 for Injury CMF = 0.89 for Property Damage Only
Inconspicuous Intersection	Same considerations as Right Angle Collisions	See above.
Inappropriate Gap Acceptance	Same considerations as Right Angle Collisions	See above.
Speeding Improper Turn	Address driver error through education and enforcement	Work with Peel Regional Police to educate/enforce. No CMF available.
Sideswipe Collisions		
Poor Road Surface Friction	Resurface pavement	CMF = 1.01 for All CMF = 0.95 for Fatal & Serious Injury
Poor Delineation	Install wider markings and both edgeline and centerline rumble strips with resurfacing (rural)	CMF = 0.62 for Fatal & Injury
	Install wider markings and edgeline rumble strips with resurfacing (urban/rural)	CMF = 0.86 for Fatal & Injury (urban) CMF = 0.75 for Fatal & Injury (rural)

Table 1 – Guidelines on Design and Operational Considerations for Collisions at Un-signalized Intersections

Potential Contributing Factor	Related Design and/or Operational Considerations	Expected Safety Benefit
	Install wider markings and shoulder rumble strips with resurfacing (urban/rural)	CMF = 0.80 for Fatal & Injury (urban) CMF = 0.74 for Fatal & Injury (rural)
	Install wider markings with resurfacing (urban/rural)	CMF = 0.92 for Fatal & Injury (urban) CMF = 0.75 for Fatal & Injury (rural)
	Install wider markings without resurfacing (rural)	CMF = 0.78 for Fatal & Injury
Inappropriate Gap Acceptance	Install intersection conflict warning system, to assist drivers in accepting appropriate gaps	Activated systems are available, or a static system using signs can assist drivers in judging the gap. No CMF available.
Speeding Evasive Manoeuvres	Address driver error through education and enforcement	Work with Peel Regional Police to educate/enforce. No CMF available.

Table 2 – Guidelines on Design and Operational Considerations for Collisions at Signalized Intersections

Potential Contributing Factor	Related Design and/or Operational Considerations	Expected Safety Benefit[Error! Bookmark not defined.]
Rear End Collisions		
Inconspicuous Intersection	Provide intersection illumination	CMF = 0.62 for Nighttime Injury
	Replace 8-inch red signal heads with 12-inch	CMF = 0.58 for Angle CMF = 0.97 for All
	Install larger street name signs for Minor Road at the intersection of Major Road	Positive Guidance is generally accepted as a way to reduce collision risk. Refer to OTM Book 1b. No CMF available.
	Install advance street name signs for intersection.	CMF = 0.984 for All CMF = 0.897 for Sideswipe
Poor Road Surface Friction	Resurface pavement	CMF = 1.01 for All CMF = 0.95 for Fatal & Serious Injury
Speeding Distracted Driving	Address driver error through education and enforcement	Work with Peel Regional Police to educate/enforce. No CMF available.
Right Angle Collisions		
Restricted Sightlines to Signal Heads	Review and confirm signal head placement	No CMF available.
Inconspicuous Intersection	Same considerations as Rear-End Collisions	See above.
Inadequate Clearance Interval	Modify change plus clearance interval to ITE 1985 Proposed Recommended Practice	CMF = 0.96 for Angle CMF = 0.92 for All
	Convert signalized intersection to modern roundabout (urban,suburban/rural)	CMF = 0.735 for All (urban/suburban) CMF = 0.625 for All (rural)
Speeding Disobey Traffic Control Improper Turn	Address driver error through education and enforcement	Work with Peel Regional Police to educate/enforce. No CMF available.
Turning Movement Collisions		
Inconspicuous Intersection	Same considerations as Rear-End Collisions	See above.
Inadequate Clearance Interval	Same considerations as Right Angle Collisions	See above.
Speeding Disobey Traffic Control Improper Turn	Address driver error through education and enforcement	Work with Peel Regional Police to educate/enforce. No CMF available.
Single Motor Vehicle Collisions		
Poor Road Surface Friction	Resurface pavement	CMF = 1.01 for All CMF = 0.95 for Fatal & Serious Injury
Poor Delineation	Install wider markings and both edgeline and centerline rumble strips with resurfacing (rural)	CMF = 0.62 for Fatal & Injury
	Install wider markings and edgeline rumble strips with resurfacing (urban/rural)	CMF = 0.86 for Fatal & Injury (urban) CMF = 0.75 for Fatal & Injury (rural)
	Install wider markings and shoulder rumble strips with resurfacing (urban/rural)	CMF = 0.80 for Fatal & Injury (urban) CMF = 0.74 for Fatal & Injury (rural)

Table 2 – Guidelines on Design and Operational Considerations for Collisions at Signalized Intersections

Potential Contributing Factor	Related Design and/or Operational Considerations	Expected Safety Benefit[Error! Bookmark not defined.]
	Install wider markings with resurfacing (urban/rural)	CMF = 0.92 for Fatal & Injury (urban) CMF = 0.75 for Fatal & Injury (rural)
	Install wider markings without resurfacing (rural)	CMF = 0.78 for Fatal & Injury
Shoulder Width and Type	Improve shoulder width and type	Magnitude of safety benefit depends on amount of width increase, in combination with shoulder type.
Roadside Design	Flatten slopes, increase clear zone	Magnitude of safety benefit depends on before/after conditions.
Speeding Distracted Driving Evasive Manoeuvres	Address driver error through education and enforcement	Work with Peel Regional Police to educate/enforce. No CMF available.
Sideswipe Collisions		
Poor Road Surface Friction	Resurface pavement	CMF = 1.01 for All CMF = 0.95 for Fatal & Serious Injury
Poor Delineation	Same considerations as Single motor Vehicle Collisions	See above.
Inappropriate Gap Acceptance	Install intersection conflict warning system, to assist drivers in accepting appropriate gaps	Activated systems are available, or a static system using signs can assist drivers in judging the gap. No CMF available.
Speeding Evasive Manoeuvres	Address driver error through education and enforcement	Work with Peel Regional Police to educate/enforce. No CMF available.
Approaching Collisions		
Restricted Sightlines to Signal Heads	Review and confirm signal head placement	No CMF available.
Inconspicuous Intersection	Same considerations as Rear-End Collisions	See above.
Speeding Distracted Driving Disobey Traffic Control Improper Turn	Address driver error through education and enforcement	Work with Peel Regional Police to educate/enforce. No CMF available.

Appendix D

Background Traffic Growth Rates – Technical Memorandum

Hatch Mott MacDonald

MEMO

To **P. Gino Dela Cruz, P.Eng.**
Project Manager, Infrastructure Programming and Studies
Transportation Division, Public Works, Region of Peel

From Gene Chartier, P.Eng.
Associate and Senior Project Manager
Hatch Mott MacDonald

Date October 10, 2014

Project # 336921

Page 1 of 7

CC Juan P. Perez, P.Eng., HMM

Subject **Winston Churchill Boulevard Class Environmental Assessment Study**
Highway 401 to Embleton Road/5 Side Road
Background Traffic Growth Rates

The purpose of this technical memorandum is to describe the assumptions and methodology used to estimate background traffic growth rates for the Winston Churchill Boulevard Class Environmental Assessment (EA) Study, from Highway 401 to Embleton Road/5 Side Road. Through this memo, we wish to confirm the growth rates to be used in calculating intersection and midblock traffic volumes to horizon years 2021 and 2031.

For the purpose of this analysis, Winston Churchill Boulevard is assumed to be a north-south roadway and the intersecting roads and ramp terminals are assumed to travel east-west.

We note that information from the Peel Regional Travel Demand Forecasting Model was not available at the time of preparing this memorandum and should be reviewed prior to developing the traffic volume forecasts to validate the recommended growth rates.

Projected Background Growth for Winston Churchill Boulevard

The background traffic growth rates for Winston Churchill Boulevard were calculated from information provided by the Transportation Planning Group of the Region of Peel and historic Annual Average Daily Traffic (AADT) volumes from 2005 to 2012. In addition, the Region of Halton provided Automatic Traffic Recorder (ATR) counts for two sections of Winston Churchill Boulevard, north and south of Steeles Avenue, conducted between 2006 and 2013 mostly in the fall.

Tables 1, 2 and 3 below show the historic AADTs along various sections of Winston Churchill Boulevard within the Study Area based on the Peel Region data sets. The calculated annual growth rates for different time periods (per year, over the last four years and over the last seven years) are also provided.

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Table 1 – Winston Churchill Boulevard, 0.6 km South of Steeles Avenue (RR 15)

Year	NB	SB	AADT	Annual Growth Rate				
				Yearly NB	Yearly SB	Yearly NB + SB	4-Year Avg.	7-Year Avg.
2005	9,889	9,831	19,720					
2006	11,892	10,818	22,710	20.3%	10.0%	15.2%		
2007	11,519	11,149	22,668	-3.1%	3.1%	-0.2%		
2008	11,389	11,023	22,412	-1.1%	-1.1%	-1.1%		
2009	12,177	11,511	23,688	6.9%	4.4%	5.7%	4.7%	
2010	10,400	9,977	20,377	-14.6%	-13.3%	-14.0%	-2.7%	
2011	10,620	10,526	21,146	2.1%	5.5%	3.8%	-1.7%	
2012	13,699	12,209	25,908	29.0%	16.0%	22.5%	3.7%	4.0%

Table 2 – Winston Churchill Boulevard, 1.6 km North of Steeles Avenue (RR 15)

Year	NB	SB	AADT	Annual Growth Rate				
				Yearly NB	Yearly SB	Yearly NB + SB	4-Year Avg.	7-Year Avg.
2005	5,199	4,257	9,456					
2006	4,433	5,534	9,967	-14.7%	30.0%	5.4%		
2007	5,227	4,612	9,839	17.9%	-16.7%	-1.3%		
2008	5,168	4,560	9,728	-1.1%	-1.1%	-1.1%		
2009	5,589	4,751	10,340	8.1%	4.2%	6.3%	2.3%	
2010	5,558	5,123	10,681	-0.6%	7.8%	3.3%	1.7%	
2011	5,997	5,096	11,093	7.9%	-0.5%	3.9%	3.0%	
2012	5,213	4,606	9,819	-13.1%	-9.6%	***-11.5%***	0.2%	0.5%

NOTE: Numbers in ***italics*** indicate unusual decrease in volume, likely due to construction.

Table 3 – Winston Churchill Boulevard, 1.7 km North of Embleton Road (RR 6)

Year	NB	SB	AADT	Annual Growth Rate				
				Yearly NB	Yearly SB	Yearly NB + SB	4-Year Avg.	7-Year Avg.
2005	4,406	3,845	8,251					
2006	4,727	3,690	8,417	7.3%	-4.0%	2.0%		
2007	4,613	3,691	8,304	-2.4%	0.0%	-1.3%		
2008	4,561	3,649	8,210	-1.1%	-1.1%	-1.1%		
2009	4,708	3,763	8,471	3.2%	3.1%	3.2%	0.7%	
2010	4,729	3,826	8,555	0.4%	1.7%	1.0%	0.4%	
2011	3,787	2,834	6,621	-19.9%	-25.9%	***-22.6%***	-5.5%	
2012	4,052	3,049	7,101	7.0%	7.6%	7.2%	-3.6%	-2.1%

NOTE: Numbers in ***italics*** indicate unusual decrease in volume, likely due to construction.

For comparison purposes, **Tables 4 and 5** below summarize the historic ATR count information provided by Halton Region. The calculated annual growth rates for different time periods are also provided.

Table 4 – Winston Churchill Boulevard, 200 m South of Steeles Avenue (RR 15) (Site 101906)

Year	ADT	Count Date	Annual Growth Rate		
			Yearly NB + SB	4-Year Avg.	7-Year Avg.
2006	20,194	21-Nov-06			
2007	20,471	15-Nov-07	1.4%		
2008	22,177	04-Dec-08	8.3%		
2009	21,500	14-Oct-09	-3.1%		
2010	24,660	4-Jun-10	14.7%	5.1%	
2011	24,758	20-Oct-11	0.4%	4.9%	
2012	27,881	8-Nov-12	12.6%	5.9%	5.5%
2013	23,961	24-Apr-13	***-14.1%***	2.7%	2.5%

NOTE: Numbers in ***italics*** indicate unusual decrease in volume, likely due to construction.

Table 5 – Winston Churchill Boulevard, North of Steeles Avenue (RR 15) (Site 101907)

Year	ADT	Count Date	Annual Growth Rate		
			Yearly NB + SB	4-Year Avg.	7-Year Avg.
2006	9,411	21-Nov-06			
2007	11,738	15-Nov-07	24.7%		
2008	11,328	04-Dec-08	-3.5%		
2009	11,418	14-Oct-09	0.8%		
2010	13,817	4-Jun-10	21.0%	10.1%	
2011	8,001	20-Oct-11	***-42.1%***	-9.1%	
2012	12,625	8-Nov-12	57.8%	2.7%	
2013	14,029	17-Sep-13	11.1%	5.3%	5.9%

NOTE: Numbers in ***italics*** indicate unusual decrease in volume, likely due to construction.

Although the Halton Region counts are not true AADTs, the ADTs provided suggest significant background growth along Winston Churchill Boulevard over the past eight years, both north and south of Steeles Avenue.

Recommended Growth Rates

Based on the information provided by Peel Region, the recommended background traffic growth rates for Winston Churchill Boulevard are **3.0 per cent** per annum south of Steeles Avenue and **4.0 per cent** per annum north of Steeles Avenue. Both rates are assumed to be constant over the 2014 to 2031 planning period.

More substantial traffic growth is projected for the segment north of Steeles Avenue due to the magnitude of planned development in northwest Brampton, including build-out of the designated employment lands adjacent to the roadway corridor. This growth rate is also consistent with the segment south of Steeles Avenue, which has experienced considerable traffic volume increases over the last seven years. Future development north of Steeles Avenue is expected to be similar to the patterns observed to the south, suggesting growth rates should be of similar magnitude. Although some of the traffic generated within the Heritage Heights area (which includes Secondary Plan Areas 52 and 53 – Huttonville North and Mount Pleasant West, respectively) may ultimately use the proposed GTA West/North-South Transportation Corridor (NSTC) or the proposed Bram West Parkway, a considerable increase in demand can still be expected in the Winston Churchill Boulevard corridor.

Projected Background Growth for Intersecting Roads

The background traffic growth rates for roads crossing Winston Churchill Boulevard were calculated from information provided by the Transportation Planning Group of the Region of Peel and historic AADT volumes from 2005 to 2012. **Tables 6 and 7** below summarize the AADTs for the two main roads crossing Winston Churchill Boulevard within the Study Area, being Embleton Road/5 Side Road and Steeles Avenue. The calculated annual growth rates for different time periods are also provided.

Table 6 – Embleton Road, 0.4 km West of Mississauga Road

Year	EB	WB	AADT	Annual Growth Rate				
				Yearly EB	Yearly WB	Yearly EB + WB	4-Year Avg.	7-Year Avg.
2005	2,924	2,500	5,424					
2006	3,376	3,005	6,381	15.5%	20.2%	17.6%		
2007	3,366	2,918	6,284	-0.3%	-2.9%	-1.5%		
2008	3,328	2,884	6,212	-1.1%	-1.2%	-1.1%		
2009	2,989	2,825	5,814	-10.2%	-2.0%	-6.4%	1.8%	
2010	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
2011	3,240	2,636	5,876	n/a	n/a	n/a	-1.7%	
2012	3,335	2,775	6,110	2.9%	5.3%	4.0%	-0.4%	1.7%

Table 7 – Steeles Avenue, 1.1 km West of Mississauga Road

Year	EB	WB	AADT	Annual Growth Rate				
				Yearly EB	Yearly WB	Yearly EB + WB	4-Year Avg.	7-Year Avg.
2005	9,494	9,382	18,876					
2006	9,813	9,585	19,398	3.4%	2.2%	2.8%		
2007	10,693	10,324	21,017	9.0%	7.7%	8.3%		
2008	10,843	10,468	21,311	1.4%	1.4%	1.4%		
2009	8,899	8,868	17,767	-17.9%	-15.3%	-16.6%	-1.5%	
2010	9,168	9,186	18,354	3.0%	3.6%	3.3%	-1.4%	
2011	9,107	8,874	17,981	-0.7%	-3.4%	-2.0%	-3.8%	
2012	11,217	11,090	22,307	23.2%	25.0%	24.1%	1.1%	2.4%

HMM also reviewed the forecasted turning movement volumes for the Winston Churchill Boulevard and Steeles Avenue intersection developed for the Steeles Avenue Class EA Study, Chinguacousy Road/Mavis Road to Winston Churchill Boulevard. **Table 8** below shows the annual growth rates calculated for the intersection through movements to horizon years 2021 and 2031, for both the AM and PM (in brackets) peak hours.

Table 8 – Future Annual Growth Rates for the Intersection of Winston Churchill Boulevard and Steeles Avenue

Years	SB	NB	EB	WB
2011 – 2021	6.0% (9.6%)	9.4% (2.9%)	3.1% (2.6%)	13.4% (4.9%)
2021 – 2031	3.7% (4.6%)	4.8% (0.7%)	2.8% (7.2%)	1.1% (0.2%)

Reference: Appendix B Final Traffic Study, Paradigm Transportation Solutions, September 2013

We note that the rates shown in Table 8 were calculated from total forecasted traffic volumes, which include both background growth and new development trips. The other growth rates cited in this memorandum reflect only background growth.

Recommended Growth Rates

Based on the information provided by Peel Region, the recommended annual growth rates for the intersecting roads within the Study Area are:

- **2.5 per cent** per annum for Steeles Avenue
- **2.0 per cent** per annum for Embleton Road/5 Side Road

In the absence of historic AADT and/or ATR count information for the City of Brampton roads and Highway 401 ramp terminals within the Study Area, a **2.0 per cent** per annum growth rate is recommended for the following intersecting roads and ramps:

- Highway 401 South Off Ramp Terminal
- Highway 401 North Off Ramp Terminal
- Meadowpine Boulevard
- Orlando Access
- Maple Lodge Farms Entrance

All growth rates are assumed to be constant over the 2014 to 2031 planning period.

Next Steps

In order to prepare the intersection and midblock traffic forecasts for the Winston Churchill Boulevard Class EA study, we require:

- Confirmation that the recommended growth rates stated in this memorandum are acceptable to Peel Region;
- Information on planned development in the vicinity of the Study Area; and
- Plots from the Region's Travel Demand Forecasting Model.

In calculating the growth rates, we have assumed that the proposed GTA West/NSTC will not be open for traffic by 2031. Similarly, we have not assumed any reassignment of traffic to the proposed Bram West Parkway within this timeframe. Further information will be required regarding timing, configuration and travel demand to estimate potential traffic diversion to these new facilities (if any) within the planning horizon.

Appendix E

SimTraffic Queuing Summary Sheets

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:45	6:45	6:45	6:45	6:45	6:45
End Time	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	9213	9334	9243	9260	9200	9250
Vehs Exited	8676	8869	8777	8864	8742	8787
Starting Vehs	694	632	661	707	591	654
Ending Vehs	1231	1097	1127	1103	1049	1121
Travel Distance (km)	24513	25036	24502	24801	24504	24671
Travel Time (hr)	1074.9	987.3	999.6	997.1	877.9	987.4
Total Delay (hr)	708.2	612.6	631.9	624.6	509.7	617.4
Total Stops	18753	18204	18478	18970	16166	18112
Fuel Used (l)	2384.1	2345.3	2328.6	2342.3	2230.1	2326.1

Interval #0 Information Seeding

Start Time	6:45
End Time	7:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	9213	9334	9243	9260	9200	9250
Vehs Exited	8676	8869	8777	8864	8742	8787
Starting Vehs	694	632	661	707	591	654
Ending Vehs	1231	1097	1127	1103	1049	1121
Travel Distance (km)	24513	25036	24502	24801	24504	24671
Travel Time (hr)	1074.9	987.3	999.6	997.1	877.9	987.4
Total Delay (hr)	708.2	612.6	631.9	624.6	509.7	617.4
Total Stops	18753	18204	18478	18970	16166	18112
Fuel Used (l)	2384.1	2345.3	2328.6	2342.3	2230.1	2326.1

1: Winston Churchill Blvd. & 5th Side Rd/Embleton Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.2	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.0	3.3	1.6	0.9	0.3	0.0	0.1	0.3	0.1	0.5	2.8	0.0

1: Winston Churchill Blvd. & 5th Side Rd/Embleton Rd Performance by movement

Movement	All
Denied Delay (hr)	0.7
Total Delay (hr)	10.0

2: Winston Churchill Blvd. & Maple Lodge F. Main Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.5	18.7	19.2
Total Delay (hr)	0.3	0.0	1.0	0.1	0.2	19.1	20.6

3: Winston Churchill Blvd. & Steeles Ave/Steeles Ave. Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.9	81.9	8.0	33.6	1.9	0.0	3.9	6.5	1.3	26.8	24.4	0.0

3: Winston Churchill Blvd. & Steeles Ave/Steeles Ave. Performance by movement

Movement	All
Denied Delay (hr)	0.0
Total Delay (hr)	189.3

4: Winston Churchill Blvd. & Orlando Access Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.1	0.0	2.4	0.1	0.0	4.0	6.7

5: Winston Churchill Blvd. & Meadowpine Blvd Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.3	0.2	3.6	2.6	1.7	3.2	12.6

6: Winston Churchill Blvd. & Hwy 401 N. Off Ramp Performance by movement

Movement	WBL	WBR	NBT	SBT	All
Denied Delay (hr)	0.0	0.2	0.0	0.0	0.2
Total Delay (hr)	2.2	3.4	12.0	6.1	23.6

7: Winston Churchill Blvd. & Hwy 401 S. Off Ramp Performance by movement

Movement	EBL	EBR	NBT	SBT	All
Denied Delay (hr)	0.1	0.1	0.0	0.0	0.1
Total Delay (hr)	6.8	3.8	5.1	6.2	21.9

8: Winston Churchill Blvd. & Maple Lodge F. Employees Performance by movement

Movement	WBL	NBT	NBR	SBT	All
Denied Delay (hr)	6.3	0.0	0.0	0.4	6.7
Total Delay (hr)	7.4	0.2	0.1	8.4	16.0

Total Network Performance

Denied Delay (hr)	62.1
Total Delay (hr)	555.3

Intersection: 1: Winston Churchill Blvd. & 5th Side Rd/Embleton Rd

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	B27
Directions Served	LT	R	L	TR	L	T	TR	L	T	TR	T
Maximum Queue (m)	119.8	52.5	35.0	24.4	15.6	19.0	17.6	41.1	61.0	53.2	4.7
Average Queue (m)	52.0	34.2	16.8	9.9	3.5	4.2	5.4	14.5	31.3	29.5	0.2
95th Queue (m)	92.1	60.2	30.3	20.3	11.1	12.7	14.0	31.7	51.1	48.4	2.4
Link Distance (m)	382.1			391.0		1698.4	1698.4		56.3	56.3	285.2
Upstream Blk Time (%)									0	0	
Queuing Penalty (veh)									0	0	
Storage Bay Dist (m)		50.0	50.0		50.0			30.0			
Storage Blk Time (%)	5	1	0					0	6		
Queuing Penalty (veh)	20	4	0					1	7		

Intersection: 2: Winston Churchill Blvd. & Maple Lodge F. Main

Movement	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	T	TR	L	T	T
Maximum Queue (m)	39.9	3.3	41.5	52.9	74.9	173.7	176.2
Average Queue (m)	12.3	0.1	8.4	14.3	11.5	85.8	86.0
95th Queue (m)	28.4	1.7	27.3	40.7	52.8	207.1	207.7
Link Distance (m)	130.6	130.6	827.9	827.9		166.4	166.4
Upstream Blk Time (%)						18	18
Queuing Penalty (veh)						116	118
Storage Bay Dist (m)					60.0		
Storage Blk Time (%)			3			40	
Queuing Penalty (veh)			0			9	

Intersection: 3: Winston Churchill Blvd. & Steeles Ave/Steeles Ave.

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	B25	B25
Directions Served	L	T	T	T	R	L	L	T	T	T	T	T
Maximum Queue (m)	164.9	420.0	429.1	437.8	165.0	122.5	130.0	177.4	45.5	52.4	889.8	887.4
Average Queue (m)	33.9	274.9	284.7	294.5	129.5	121.5	129.5	170.5	21.6	28.1	713.7	698.9
95th Queue (m)	131.0	436.8	447.5	466.4	232.0	125.5	131.0	174.8	41.6	50.4	1075.2	1087.2
Link Distance (m)		1971.7	1971.7	1971.7				154.3	154.3	154.3	874.4	874.4
Upstream Blk Time (%)								62			46	26
Queuing Penalty (veh)								0			0	0
Storage Bay Dist (m)	150.0				150.0	115.0	115.0					
Storage Blk Time (%)	0	44		46	0	27	64					
Queuing Penalty (veh)	0	12		160	0	56	129					

Intersection: 3: Winston Churchill Blvd. & Steeles Ave/Steeles Ave.

Movement	B25	NB	NB	NB	NB	NB	SB	SB	SB	SB	SB	B24
Directions Served	T	L	L	T	T	T	L	T	T	T	R	T
Maximum Queue (m)	880.5	49.8	55.8	72.3	79.3	60.9	145.0	201.9	189.8	185.9	74.9	835.2
Average Queue (m)	540.2	24.3	30.5	37.2	43.3	18.0	144.9	195.2	101.4	100.1	6.6	574.1
95th Queue (m)	1057.2	44.5	49.6	58.7	65.8	45.2	145.1	199.0	192.1	179.5	52.5	1060.4
Link Distance (m)	874.4			225.0	225.0	225.0		179.6	179.6	179.6		827.9
Upstream Blk Time (%)	2							95	2	0		17
Queuing Penalty (veh)	0							479	12	2		127
Storage Bay Dist (m)		130.0	130.0				130.0				110.0	
Storage Blk Time (%)							99	3		15		
Queuing Penalty (veh)							351	10		5		

Intersection: 3: Winston Churchill Blvd. & Steeles Ave/Steeles Ave.

Movement	B24
Directions Served	T
Maximum Queue (m)	836.1
Average Queue (m)	566.7
95th Queue (m)	1071.8
Link Distance (m)	827.9
Upstream Blk Time (%)	16
Queuing Penalty (veh)	121
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: Winston Churchill Blvd. & Orlando Access

Movement	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	T	T	TR	L	T	T	TR
Maximum Queue (m)	30.0	18.4	35.2	31.6	75.8	13.8	47.1	119.6	163.8
Average Queue (m)	6.3	2.4	5.8	6.4	16.9	1.4	8.2	11.6	19.4
95th Queue (m)	21.3	11.3	21.1	22.0	54.7	7.8	32.2	59.5	90.9
Link Distance (m)	191.4	191.4	365.6	365.6	365.6		225.0	225.0	225.0
Upstream Blk Time (%)								0	1
Queuing Penalty (veh)								0	4
Storage Bay Dist (m)						80.0			
Storage Blk Time (%)			0						
Queuing Penalty (veh)			0						

Intersection: 5: Winston Churchill Blvd. & Meadowpine Blvd

Movement	WB	WB	WB	NB	NB	NB	NB	B30	SB	SB	SB	SB
Directions Served	L	L	R	T	T	T	R	T	L	T	T	T
Maximum Queue (m)	34.2	41.8	27.6	50.0	65.4	80.1	90.4	1.6	68.7	54.7	61.9	68.0
Average Queue (m)	10.7	17.7	9.2	22.0	29.7	43.3	47.3	0.1	33.8	20.8	24.7	30.4
95th Queue (m)	24.3	33.7	21.4	43.9	56.5	71.6	84.4	1.1	58.4	47.4	56.4	62.3
Link Distance (m)		1072.7	1072.7	147.1	147.1	147.1		129.3		365.6	365.6	365.6
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	135.0						110.0		110.0			
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 6: Winston Churchill Blvd. & Hwy 401 N. Off Ramp

Movement	WB	WB	WB	NB	NB	NB	B23	B23	B23	B26	B26	B26
Directions Served	L	LR	R	T	T	T	T	T	T	T	T	T
Maximum Queue (m)	57.8	68.1	79.1	107.6	135.4	153.7	26.5	49.9	71.4	9.1	33.3	42.6
Average Queue (m)	32.9	40.2	42.4	37.3	74.8	121.0	2.1	10.0	20.4	0.3	4.1	7.3
95th Queue (m)	52.0	64.8	70.0	82.5	140.5	173.2	20.8	47.2	72.2	6.4	34.2	50.5
Link Distance (m)	471.6	471.6		131.6	131.6	131.6	71.1	71.1	71.1	131.0	131.0	131.0
Upstream Blk Time (%)				0	0	18	0	0	5		0	0
Queuing Penalty (veh)				0	2	117	0	1	34		0	1
Storage Bay Dist (m)			160.0									
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 6: Winston Churchill Blvd. & Hwy 401 N. Off Ramp

Movement	SB	SB	SB
Directions Served	T	T	T
Maximum Queue (m)	102.9	113.9	112.2
Average Queue (m)	43.8	51.0	55.1
95th Queue (m)	85.4	95.1	97.9
Link Distance (m)	129.3	129.3	129.3
Upstream Blk Time (%)		0	0
Queuing Penalty (veh)		0	0
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: Winston Churchill Blvd. & Hwy 401 S. Off Ramp

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	LR	R	T	T	T	T	T	T
Maximum Queue (m)	102.7	125.7	106.8	59.6	73.8	86.9	80.1	93.7	82.4
Average Queue (m)	60.9	81.7	64.5	37.7	40.9	51.8	42.0	49.6	45.1
95th Queue (m)	92.1	110.1	96.3	55.8	63.0	78.0	69.2	77.9	72.6
Link Distance (m)	451.1	451.1		103.4	103.4	103.4	131.0	131.0	131.0
Upstream Blk Time (%)						0			
Queuing Penalty (veh)						0			
Storage Bay Dist (m)			155.0						
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 8: Winston Churchill Blvd. & Maple Lodge F. Employees

Movement	WB	SB	SB	B28	B28
Directions Served	LR	LT	T	T	T
Maximum Queue (m)	135.8	136.1	134.1	139.1	145.4
Average Queue (m)	58.4	38.7	38.3	31.1	31.2
95th Queue (m)	150.5	130.0	130.2	176.4	177.1
Link Distance (m)	138.6	128.2	128.2	1698.4	1698.4
Upstream Blk Time (%)	27	13	13		
Queuing Penalty (veh)	0	75	74		
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 25: Bend

Movement	EB	EB
Directions Served	T	T
Maximum Queue (m)	30.4	29.5
Average Queue (m)	1.1	1.0
95th Queue (m)	21.6	20.8
Link Distance (m)	154.3	154.3
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 2046

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	4:45	4:45	4:45	4:45	4:45	4:45
End Time	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	10778	11123	11045	11089	10753	10958
Vehs Exited	10704	11001	10947	10840	10643	10827
Starting Vehs	649	602	658	626	646	637
Ending Vehs	723	724	756	875	756	765
Travel Distance (km)	25033	26202	25602	25738	24789	25473
Travel Time (hr)	806.2	685.2	703.4	740.0	744.1	735.8
Total Delay (hr)	424.0	287.1	313.6	348.0	365.6	347.7
Total Stops	17208	16716	17628	19215	17035	17560
Fuel Used (l)	2266.1	2211.9	2198.0	2235.7	2187.4	2219.8

Interval #0 Information Seeding

Start Time	4:45
End Time	5:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	5:00
End Time	6:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	10778	11123	11045	11089	10753	10958
Vehs Exited	10704	11001	10947	10840	10643	10827
Starting Vehs	649	602	658	626	646	637
Ending Vehs	723	724	756	875	756	765
Travel Distance (km)	25033	26202	25602	25738	24789	25473
Travel Time (hr)	806.2	685.2	703.4	740.0	744.1	735.8
Total Delay (hr)	424.0	287.1	313.6	348.0	365.6	347.7
Total Stops	17208	16716	17628	19215	17035	17560
Fuel Used (l)	2266.1	2211.9	2198.0	2235.7	2187.4	2219.8

1: Winston Churchill Blvd. & 5th Side Rd/Embleton Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.1	1.2	0.0	0.4	2.1	0.4	1.7	3.1	0.5	0.0	0.6	0.0

1: Winston Churchill Blvd. & 5th Side Rd/Embleton Rd Performance by movement

Movement	All
Denied Delay (hr)	0.2
Total Delay (hr)	10.2

2: Winston Churchill Blvd. & Maple Lodge F. Main Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.2	0.1	5.1	0.1	0.0	0.6	6.0

3: Winston Churchill Blvd. & Steeles Ave/Steeles Ave. Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.8	10.1	0.5	33.8	15.1	0.5	9.6	26.3	1.7	1.3	4.2	0.0

3: Winston Churchill Blvd. & Steeles Ave/Steeles Ave. Performance by movement

Movement	All
Denied Delay (hr)	0.0
Total Delay (hr)	103.8

4: Winston Churchill Blvd. & Orlando Access Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.4	0.0	10.1	0.1	0.4	2.1	13.2

5: Winston Churchill Blvd. & Meadowpine Blvd Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay (hr)	5.6	2.0	12.1	0.2	0.5	4.3	24.7

6: Winston Churchill Blvd. & Hwy 401 N. Off Ramp Performance by movement

Movement	WBL	WBR	NBT	SBT	All
Denied Delay (hr)	0.0	0.1	0.0	0.0	0.1
Total Delay (hr)	5.2	2.9	5.2	7.3	20.6

7: Winston Churchill Blvd. & Hwy 401 S. Off Ramp Performance by movement

Movement	EBL	EBR	NBT	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	3.2	2.0	3.8	5.3	14.3

8: Winston Churchill Blvd. & Maple Lodge F. Employees Performance by movement

Movement	WBL	NBT	NBR	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.1
Total Delay (hr)	0.7	0.7	0.1	0.3	1.8

Total Network Performance

Denied Delay (hr)	30.6
Total Delay (hr)	317.0

Intersection: 1: Winston Churchill Blvd. & 5th Side Rd/Embleton Rd

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	41.5	15.7	47.3	76.8	58.3	65.8	72.5	9.2	32.8	17.7
Average Queue (m)	23.0	4.4	11.6	43.2	29.4	30.2	37.5	1.0	14.1	4.1
95th Queue (m)	38.1	12.2	30.6	67.5	51.2	51.3	59.4	5.4	27.2	12.1
Link Distance (m)	382.1			391.0		1738.0	1738.0		351.9	351.9
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)		50.0	50.0		50.0			30.0		
Storage Blk Time (%)	0		0	4	1	1			1	
Queuing Penalty (veh)	0		0	2	4	1			0	

Intersection: 2: Winston Churchill Blvd. & Maple Lodge F. Main

Movement	WB	WB	NB	NB	B25	B25	B25	SB	SB	SB
Directions Served	L	TR	T	TR	T	T		L	T	T
Maximum Queue (m)	28.0	13.1	73.2	79.0	178.2	193.1	71.0	6.1	28.9	25.0
Average Queue (m)	8.4	4.7	29.2	37.2	17.9	22.3	4.8	0.3	10.1	7.5
95th Queue (m)	21.3	12.1	63.2	76.2	103.9	119.2	53.2	2.6	24.0	19.6
Link Distance (m)	130.6	130.6	829.8	829.8	177.9	177.9	177.9		166.4	166.4
Upstream Blk Time (%)					0	0	0			
Queuing Penalty (veh)					0	1	1			
Storage Bay Dist (m)								60.0		
Storage Blk Time (%)			9							
Queuing Penalty (veh)			0							

Intersection: 3: Winston Churchill Blvd. & Steeles Ave/Steeles Ave.

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	B24
Directions Served	L	T	T	T	R	L	L	T	T	T	R	T
Maximum Queue (m)	34.3	74.6	80.3	85.2	16.6	122.5	130.0	171.1	144.0	140.3	113.0	887.6
Average Queue (m)	13.1	47.2	51.2	50.9	0.6	121.9	129.4	159.9	86.4	90.4	11.9	567.3
95th Queue (m)	26.9	66.0	71.8	74.1	8.4	126.6	134.0	182.2	128.6	125.9	68.5	1081.7
Link Distance (m)		1971.7	1971.7	1971.7				146.1	146.1	146.1		882.9
Upstream Blk Time (%)								60	0	0		25
Queuing Penalty (veh)								0	0	0		0
Storage Bay Dist (m)	150.0				150.0	115.0	115.0				115.0	
Storage Blk Time (%)						37	65	0		2		
Queuing Penalty (veh)						214	374	2		5		

Intersection: 3: Winston Churchill Blvd. & Steeles Ave/Steeles Ave.

Movement	B24	B24	NB	NB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	T	T	L	L	T	T	T	R	L	T	T	T
Maximum Queue (m)	878.7	858.2	102.9	139.2	206.4	205.6	198.1	116.0	43.0	40.3	41.6	38.0
Average Queue (m)	553.0	480.5	55.9	76.9	118.9	124.2	105.5	26.0	21.1	24.1	24.2	20.5
95th Queue (m)	1083.0	1065.8	89.8	143.8	207.8	208.5	199.4	117.6	37.7	36.5	36.7	35.0
Link Distance (m)	882.9	882.9			225.0	225.0	225.0			177.9	177.9	177.9
Upstream Blk Time (%)	14	2			2	1	1					
Queuing Penalty (veh)	0	0			15	10	9					
Storage Bay Dist (m)			130.0	130.0				130.0	130.0			
Storage Blk Time (%)				0	11		7					
Queuing Penalty (veh)				0	53		37					

Intersection: 4: Winston Churchill Blvd. & Orlando Access

Movement	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	T	T	TR	L	T	T	TR
Maximum Queue (m)	32.6	15.4	100.8	140.7	147.4	28.4	36.3	38.7	78.4
Average Queue (m)	11.2	2.3	41.2	44.3	47.8	10.4	9.3	12.5	16.8
95th Queue (m)	24.5	10.4	91.0	113.6	120.4	22.5	26.9	33.5	52.8
Link Distance (m)	191.4	191.4	365.6	365.6	365.6		225.0	225.0	225.0
Upstream Blk Time (%)				0	0				0
Queuing Penalty (veh)				0	0				0
Storage Bay Dist (m)						80.0			
Storage Blk Time (%)			11						
Queuing Penalty (veh)			0						

Intersection: 5: Winston Churchill Blvd. & Meadowpine Blvd

Movement	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	L	R	T	T	T	R	L	T	T	T
Maximum Queue (m)	70.5	74.7	82.0	112.3	111.1	116.1	52.9	38.6	54.9	63.6	65.0
Average Queue (m)	41.5	44.8	34.6	65.3	68.8	77.1	13.5	17.2	27.4	34.7	36.6
95th Queue (m)	64.3	66.3	62.6	104.5	106.5	116.0	32.8	33.0	51.9	59.1	61.5
Link Distance (m)		1072.7	1072.7	147.1	147.1	147.1			365.6	365.6	365.6
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (m)	135.0						110.0	110.0			
Storage Blk Time (%)						1	0				
Queuing Penalty (veh)						1	0				

Intersection: 6: Winston Churchill Blvd. & Hwy 401 N. Off Ramp

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	LR	R	T	T	T	T	T	T
Maximum Queue (m)	87.9	86.0	75.7	64.9	62.0	66.8	80.4	84.9	89.6
Average Queue (m)	55.4	56.6	40.2	40.4	39.7	38.5	46.1	51.7	56.0
95th Queue (m)	78.1	78.3	68.6	58.6	58.5	60.3	72.5	79.2	83.9
Link Distance (m)	471.6	471.6		131.6	131.6	131.6	129.3	129.3	129.3
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)			160.0						
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 7: Winston Churchill Blvd. & Hwy 401 S. Off Ramp

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	LR	R	T	T	T	T	T	T
Maximum Queue (m)	68.1	76.8	63.3	64.9	58.4	48.1	64.5	73.9	68.4
Average Queue (m)	39.2	48.1	29.1	45.0	37.0	27.2	36.9	45.3	41.0
95th Queue (m)	60.8	69.1	58.3	63.5	55.7	46.6	55.0	66.2	61.4
Link Distance (m)	451.1	451.1		103.4	103.4	103.4	131.0	131.0	131.0
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)			155.0						
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 8: Winston Churchill Blvd. & Maple Lodge F. Employees

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	40.9	3.6
Average Queue (m)	17.0	0.3
95th Queue (m)	32.0	2.9
Link Distance (m)	138.6	88.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 11: Bend

Movement	WB
Directions Served	T
Maximum Queue (m)	396.1
Average Queue (m)	13.2
95th Queue (m)	279.1
Link Distance (m)	1971.7
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 24: Bend

Movement	EB	EB	EB
Directions Served	T	T	
Maximum Queue (m)	82.7	120.5	30.0
Average Queue (m)	5.3	5.8	1.0
95th Queue (m)	48.5	53.2	21.2
Link Distance (m)	146.1	146.1	146.1
Upstream Blk Time (%)	0	0	0
Queuing Penalty (veh)	0	0	0
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 31: Bend

Movement	SB
Directions Served	T
Maximum Queue (m)	5.0
Average Queue (m)	0.2
95th Queue (m)	3.5
Link Distance (m)	103.4
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 731

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:45	6:45	6:45	6:45	6:45	6:45
End Time	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	11182	11187	11092	11142	11168	11156
Vehs Exited	10323	10275	10318	10306	10201	10285
Starting Vehs	879	832	843	892	812	848
Ending Vehs	1738	1744	1617	1728	1779	1720
Travel Distance (km)	27847	27708	27686	27651	27621	27703
Travel Time (hr)	1475.3	1417.7	1300.5	1450.8	1438.1	1416.5
Total Delay (hr)	1052.3	998.3	880.9	1031.1	1018.8	996.3
Total Stops	29328	27314	25850	27806	27211	27503
Fuel Used (l)	2936.3	2865.6	2762.8	2889.6	2870.8	2865.0

Interval #0 Information Seeding

Start Time	6:45
End Time	7:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	11182	11187	11092	11142	11168	11156
Vehs Exited	10323	10275	10318	10306	10201	10285
Starting Vehs	879	832	843	892	812	848
Ending Vehs	1738	1744	1617	1728	1779	1720
Travel Distance (km)	27847	27708	27686	27651	27621	27703
Travel Time (hr)	1475.3	1417.7	1300.5	1450.8	1438.1	1416.5
Total Delay (hr)	1052.3	998.3	880.9	1031.1	1018.8	996.3
Total Stops	29328	27314	25850	27806	27211	27503
Fuel Used (l)	2936.3	2865.6	2762.8	2889.6	2870.8	2865.0

1: Winston Churchill Blvd. & 5th Side Rd/Embleton Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.4	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (hr)	0.1	7.3	4.9	2.1	0.5	0.0	0.2	1.9	0.3	1.2	5.2	0.0

1: Winston Churchill Blvd. & 5th Side Rd/Embleton Rd Performance by movement

Movement	All
Denied Delay (hr)	1.2
Total Delay (hr)	23.6

2: Winston Churchill Blvd. & Maple Lodge F. Main Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	1.4	1.4
Total Delay (hr)	0.3	0.0	1.1	0.1	0.1	6.5	8.1

3: Winston Churchill Blvd. & Steeles Ave/Steeles Ave. Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.6	77.0	5.3	34.2	2.5	0.0	4.8	6.5	1.3	19.0	67.2	0.5

3: Winston Churchill Blvd. & Steeles Ave/Steeles Ave. Performance by movement

Movement	All
Denied Delay (hr)	0.0
Total Delay (hr)	218.9

4: Winston Churchill Blvd. & Orlando Access Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.1	0.0	3.2	0.2	0.0	5.8	9.3

5: Winston Churchill Blvd. & Meadowpine Blvd Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.3	0.2	5.0	4.8	3.2	4.8	19.4

6: Winston Churchill Blvd. & Hwy 401 N. Off Ramp Performance by movement

Movement	WBL	WBR	NBT	SBT	All
Denied Delay (hr)	0.0	0.2	0.0	0.0	0.2
Total Delay (hr)	2.8	4.4	19.9	7.4	34.5

7: Winston Churchill Blvd. & Hwy 401 S. Off Ramp Performance by movement

Movement	EBL	EBR	NBT	SBT	All
Denied Delay (hr)	0.1	0.1	0.0	0.0	0.2
Total Delay (hr)	12.1	6.2	21.7	8.4	48.5

8: Winston Churchill Blvd. & Maple Lodge F. Employees Performance by movement

Movement	WBL	NBT	NBR	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.9	0.2	0.1	0.1	1.3

Total Network Performance

Denied Delay (hr)	69.3
Total Delay (hr)	926.9

Intersection: 1: Winston Churchill Blvd. & 5th Side Rd/Embleton Rd

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	251.3	52.5	49.1	51.2	21.0	42.9	51.0	44.8	82.2	81.7
Average Queue (m)	121.3	48.6	25.6	14.1	4.7	19.1	25.5	24.1	51.1	43.9
95th Queue (m)	235.6	63.7	47.5	43.2	14.2	36.4	45.2	48.0	75.5	69.2
Link Distance (m)	382.1			391.0		1752.1	1752.1		351.9	351.9
Upstream Blk Time (%)	1									
Queuing Penalty (veh)	0									
Storage Bay Dist (m)		50.0	50.0		50.0			30.0		
Storage Blk Time (%)	17	6	3	1		0		2	26	
Queuing Penalty (veh)	88	37	3	2		0		9	32	

Intersection: 2: Winston Churchill Blvd. & Maple Lodge F. Main

Movement	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	T	T	TR	L	T	T	T
Maximum Queue (m)	46.4	8.9	36.0	39.4	52.7	51.0	121.1	117.5	113.6
Average Queue (m)	15.7	0.6	9.6	10.4	10.4	4.6	39.0	32.8	29.4
95th Queue (m)	34.9	4.1	26.8	31.1	34.1	24.9	93.9	87.7	83.6
Link Distance (m)	126.9	126.9	827.9	827.9	827.9		166.2	166.2	166.2
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)						60.0			
Storage Blk Time (%)			3				10		
Queuing Penalty (veh)			0				3		

Intersection: 3: Winston Churchill Blvd. & Steeles Ave/Steeles Ave.

Movement	EB	EB	EB	EB	EB	B27	B27	B27	WB	WB	WB	WB
Directions Served	L	T	T	T	R	T	T	T	L	L	T	T
Maximum Queue (m)	164.8	246.3	242.8	245.1	165.0	1131.6	1140.8	1136.6	122.5	130.0	183.5	59.2
Average Queue (m)	23.9	235.4	235.1	235.5	149.5	611.4	624.0	631.8	121.4	129.5	172.1	27.5
95th Queue (m)	105.0	241.6	240.2	241.2	220.7	1134.5	1144.9	1149.4	125.7	130.6	177.0	49.2
Link Distance (m)		217.9	217.9	217.9		1743.3	1743.3	1743.3			155.9	155.9
Upstream Blk Time (%)		63	66	64							65	
Queuing Penalty (veh)		0	0	0							0	
Storage Bay Dist (m)	150.0				150.0				115.0	115.0		
Storage Blk Time (%)	0	63		65	0				26	67	0	
Queuing Penalty (veh)	0	18		233	0				54	141	0	

Intersection: 3: Winston Churchill Blvd. & Steeles Ave/Steeles Ave.

Movement	WB	B25	B25	B25	NB	NB	NB	NB	NB	SB	SB	SB
Directions Served	T	T	T	T	L	L	T	T	T	L	T	T
Maximum Queue (m)	62.9	889.2	886.8	878.3	64.0	62.6	50.2	53.4	59.4	145.0	202.4	204.7
Average Queue (m)	32.4	753.7	742.0	602.4	27.8	32.8	29.0	32.7	33.8	141.4	195.4	196.0
95th Queue (m)	53.9	1070.0	1074.8	1094.4	54.5	57.3	45.2	48.4	52.4	165.8	198.9	200.6
Link Distance (m)	155.9	872.8	872.8	872.8			224.8	224.8	224.8		179.5	179.5
Upstream Blk Time (%)		53	33	2							75	68
Queuing Penalty (veh)		0	0	0							514	461
Storage Bay Dist (m)					130.0	130.0				130.0		
Storage Blk Time (%)										49	51	
Queuing Penalty (veh)										240	195	

Intersection: 3: Winston Churchill Blvd. & Steeles Ave/Steeles Ave.

Movement	SB	SB	B24	B24	B24
Directions Served	T	R	T	T	T
Maximum Queue (m)	205.6	125.0	824.6	827.5	825.8
Average Queue (m)	196.0	32.6	500.8	496.7	492.0
95th Queue (m)	201.1	122.6	918.1	915.7	910.6
Link Distance (m)	179.5		827.9	827.9	827.9
Upstream Blk Time (%)	73		4	4	3
Queuing Penalty (veh)	499		28	25	22
Storage Bay Dist (m)		110.0			
Storage Blk Time (%)	75	0			
Queuing Penalty (veh)	25	0			

Intersection: 4: Winston Churchill Blvd. & Orlando Access

Movement	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	T	T	TR	L	T	T	TR
Maximum Queue (m)	29.2	20.2	36.0	46.9	81.9	14.7	67.2	131.8	102.8
Average Queue (m)	7.4	2.0	7.0	8.5	21.4	1.5	13.3	18.4	20.6
95th Queue (m)	23.2	10.5	24.8	29.7	64.4	7.8	46.0	72.7	76.3
Link Distance (m)	191.4	191.4	365.6	365.6	365.6		224.8	224.8	224.8
Upstream Blk Time (%)								0	1
Queuing Penalty (veh)								0	6
Storage Bay Dist (m)						80.0			
Storage Blk Time (%)			0				0		
Queuing Penalty (veh)			0				0		

Intersection: 5: Winston Churchill Blvd. & Meadowpine Blvd

Movement	WB	WB	WB	NB	NB	NB	NB	B30	SB	SB	SB	SB
Directions Served	L	L	R	T	T	T	R	T	L	T	T	T
Maximum Queue (m)	31.7	42.4	34.5	74.3	81.2	145.1	120.8	2.6	91.1	69.5	72.8	77.4
Average Queue (m)	11.5	18.7	10.6	32.6	39.1	57.3	75.5	0.1	46.5	28.6	34.2	39.9
95th Queue (m)	26.0	34.3	26.4	61.8	68.6	109.5	123.3	1.8	80.5	58.5	67.8	74.3
Link Distance (m)		1072.7	1072.7	147.1	147.1	147.1		129.3		365.6	365.6	365.6
Upstream Blk Time (%)						0						
Queuing Penalty (veh)						3						
Storage Bay Dist (m)	135.0						110.0		110.0			
Storage Blk Time (%)							2		0			
Queuing Penalty (veh)							11		1			

Intersection: 6: Winston Churchill Blvd. & Hwy 401 N. Off Ramp

Movement	WB	WB	WB	NB	NB	NB	B23	B23	B23	B26	B26	B26
Directions Served	L	LR	R	T	T	T	T	T	T	T	T	T
Maximum Queue (m)	76.1	81.8	93.9	135.3	148.3	159.9	70.3	89.8	99.2	147.6	148.9	144.4
Average Queue (m)	41.3	49.2	50.7	83.9	122.7	148.6	19.6	66.3	87.8	69.4	115.2	124.2
95th Queue (m)	64.6	74.1	81.0	145.6	168.1	156.2	65.1	104.6	105.8	167.9	184.4	178.4
Link Distance (m)	471.6	471.6		131.6	131.6	131.6	71.1	71.1	71.1	131.0	131.0	131.0
Upstream Blk Time (%)				0	8	58	0	8	70	1	9	23
Queuing Penalty (veh)				2	58	440	0	60	534	6	70	178
Storage Bay Dist (m)			160.0									
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 6: Winston Churchill Blvd. & Hwy 401 N. Off Ramp

Movement	SB	SB	SB	B30	B30
Directions Served	T	T	T	T	T
Maximum Queue (m)	122.3	126.8	131.2	28.3	1.6
Average Queue (m)	51.4	59.3	63.8	0.9	0.1
95th Queue (m)	99.5	109.0	113.7	17.7	1.1
Link Distance (m)	129.3	129.3	129.3	147.1	147.1
Upstream Blk Time (%)	0	0	0		
Queuing Penalty (veh)	1	1	2		
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 7: Winston Churchill Blvd. & Hwy 401 S. Off Ramp

Movement	EB	EB	EB	NB	NB	NB	B31	B31	B31	SB	SB	SB
Directions Served	L	LR	R	T	T	T	T	T	T	T	T	T
Maximum Queue (m)	142.6	167.6	147.2	120.0	121.3	129.8	93.5	109.8	119.6	98.9	111.9	104.0
Average Queue (m)	87.2	108.7	92.1	79.0	90.1	103.8	39.4	54.1	64.0	53.3	62.4	56.7
95th Queue (m)	144.0	167.8	149.3	128.6	135.8	147.4	140.8	159.3	169.5	86.7	100.3	94.0
Link Distance (m)	451.1	451.1		103.4	103.4	103.4	144.9	144.9	144.9	131.0	131.0	131.0
Upstream Blk Time (%)				8	13	50	4	16	23	0	0	1
Queuing Penalty (veh)				0	0	0	0	0	0	2	3	4
Storage Bay Dist (m)			155.0									
Storage Blk Time (%)		3	0									
Queuing Penalty (veh)		9	2									

Intersection: 7: Winston Churchill Blvd. & Hwy 401 S. Off Ramp

Movement	B26	B26	B26
Directions Served	T	T	T
Maximum Queue (m)	9.2	9.4	10.3
Average Queue (m)	0.3	0.3	0.3
95th Queue (m)	6.5	6.6	7.2
Link Distance (m)	71.1	71.1	71.1
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 8: Winston Churchill Blvd. & Maple Lodge F. Employees

Movement	WB	NB
Directions Served	LR	TR
Maximum Queue (m)	49.0	3.4
Average Queue (m)	21.5	0.1
95th Queue (m)	37.7	2.4
Link Distance (m)	138.5	166.2
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 25: Bend

Movement	EB	EB
Directions Served	T	T
Maximum Queue (m)	33.0	31.5
Average Queue (m)	1.1	1.0
95th Queue (m)	23.3	22.2
Link Distance (m)	155.9	155.9
Upstream Blk Time (%)	0	0
Queuing Penalty (veh)	0	0
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 4024

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	4:45	4:45	4:45	4:45	4:45	4:45
End Time	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	75	75	75	75	75	75
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	2	2	2	2	2	2
Vehs Entered	15976	16151	16064	16095	16170	16095
Vehs Exited	15156	15283	15146	15159	15324	15216
Starting Vehs	0	0	0	0	0	0
Ending Vehs	820	868	918	936	846	878
Travel Distance (km)	34952	35491	35290	35397	35554	35337
Travel Time (hr)	992.1	926.7	959.3	927.0	997.6	960.5
Total Delay (hr)	454.8	381.5	417.3	383.4	450.3	417.4
Total Stops	23284	22270	24280	23357	23669	23372
Fuel Used (l)	3038.2	2996.4	3016.0	2986.1	3067.1	3020.7

Interval #0 Information Seeding

Start Time	4:45
End Time	5:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	3173	3144	3155	3193	3294	3189
Vehs Exited	2430	2445	2401	2464	2576	2462
Starting Vehs	0	0	0	0	0	0
Ending Vehs	743	699	754	729	718	727
Travel Distance (km)	6181	6197	6198	6339	6426	6268
Travel Time (hr)	144.5	145.1	146.9	149.2	148.6	146.9
Total Delay (hr)	49.6	50.0	52.1	52.0	50.1	50.8
Total Stops	3585	3395	3566	3662	3534	3547
Fuel Used (l)	501.5	503.1	500.2	513.1	519.6	507.5

Interval #1 Information

Start Time	5:00
End Time	6:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	12803	13007	12909	12902	12876	12898
Vehs Exited	12726	12838	12745	12695	12748	12750
Starting Vehs	743	699	754	729	718	727
Ending Vehs	820	868	918	936	846	878
Travel Distance (km)	28772	29294	29092	29058	29129	29069
Travel Time (hr)	847.6	781.6	812.4	777.8	849.0	813.7
Total Delay (hr)	405.2	331.5	365.1	331.4	400.2	366.7
Total Stops	19699	18875	20714	19695	20135	19822
Fuel Used (l)	2536.6	2493.3	2515.8	2472.9	2547.5	2513.2

1: Winston Churchill Blvd. & 5th Side Rd/Embleton Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Total Delay (hr)	0.1	1.8	0.1	0.7	3.6	0.7	3.3	6.7	1.1	0.1	1.2	0.0

1: Winston Churchill Blvd. & 5th Side Rd/Embleton Rd Performance by movement

Movement	All
Denied Delay (hr)	0.4
Total Delay (hr)	19.4

2: Winston Churchill Blvd. & Maple Lodge F. Main Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.3	0.1	7.1	0.1	0.0	0.9	8.5

3: Winston Churchill Blvd. & Steeles Ave/Steeles Ave. Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.0	13.3	0.6	37.8	21.9	0.9	14.2	19.1	1.6	1.5	7.7	0.0

3: Winston Churchill Blvd. & Steeles Ave/Steeles Ave. Performance by movement

Movement	All
Denied Delay (hr)	0.0
Total Delay (hr)	119.7

4: Winston Churchill Blvd. & Orlando Access Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.7	0.1	13.6	0.2	0.6	3.6	18.9

5: Winston Churchill Blvd. & Meadowpine Blvd Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay (hr)	13.2	5.3	20.4	0.4	1.1	6.9	47.3

6: Winston Churchill Blvd. & Hwy 401 N. Off Ramp Performance by movement

Movement	WBL	WBR	NBT	SBT	All
Denied Delay (hr)	0.1	0.1	0.0	0.0	0.2
Total Delay (hr)	9.2	5.6	9.2	10.1	34.1

7: Winston Churchill Blvd. & Hwy 401 S. Off Ramp Performance by movement

Movement	EBL	EBR	NBT	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.1
Total Delay (hr)	5.1	3.5	6.1	9.2	23.9

8: Winston Churchill Blvd. & Maple Lodge F. Employees Performance by movement

Movement	WBL	NBT	NBR	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.9	1.0	0.1	0.4	2.4

Total Network Performance

Denied Delay (hr)	12.6
Total Delay (hr)	404.8

Intersection: 1: Winston Churchill Blvd. & 5th Side Rd/Embleton Rd

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	53.4	20.8	52.3	112.6	64.8	98.1	91.8	10.5	39.4	30.1
Average Queue (m)	26.0	4.4	18.1	56.9	39.1	44.9	52.2	1.6	19.2	7.7
95th Queue (m)	45.7	13.5	46.8	92.2	65.6	78.1	82.3	6.8	33.7	19.5
Link Distance (m)	382.1			391.0		1751.2	1751.2		351.9	351.9
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)		50.0	50.0		50.0			30.0		
Storage Blk Time (%)	0	0	0	10	5	3			1	
Queuing Penalty (veh)	0	0	0	6	22	10			0	

Intersection: 2: Winston Churchill Blvd. & Maple Lodge F. Main

Movement	WB	WB	NB	NB	NB	B25	B25	SB	SB	SB	SB
Directions Served	L	TR	T	T	TR	T	T	L	T	T	T
Maximum Queue (m)	25.4	13.0	61.3	66.6	81.3	105.5	153.8	7.6	31.3	28.8	20.4
Average Queue (m)	9.0	4.5	25.6	27.8	30.9	3.8	8.2	0.5	11.9	8.1	4.2
95th Queue (m)	21.3	11.9	53.4	61.3	68.4	46.1	71.3	3.7	26.4	19.6	13.5
Link Distance (m)	126.9	126.9	829.8	829.8	829.8	177.9	177.9		166.2	166.2	166.2
Upstream Blk Time (%)						0	0				
Queuing Penalty (veh)						0	2				
Storage Bay Dist (m)								60.0			
Storage Blk Time (%)			8								
Queuing Penalty (veh)			0								

Intersection: 3: Winston Churchill Blvd. & Steeles Ave/Steeles Ave.

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	B24
Directions Served	L	T	T	T	R	L	L	T	T	T	R	T
Maximum Queue (m)	31.5	75.8	89.0	89.2	30.9	122.5	130.0	169.8	156.5	164.4	130.0	894.2
Average Queue (m)	12.8	47.8	53.2	51.8	1.6	114.4	122.5	146.0	92.9	96.5	25.1	435.5
95th Queue (m)	24.9	72.7	80.7	81.3	14.0	149.5	156.4	211.9	144.7	147.3	94.4	992.2
Link Distance (m)		1971.7	1971.7	1971.7				146.1	146.1	146.1		882.9
Upstream Blk Time (%)								50	1	2		13
Queuing Penalty (veh)								0	0	0		0
Storage Bay Dist (m)	150.0				150.0	115.0	115.0				115.0	
Storage Blk Time (%)						30	53	1		4		
Queuing Penalty (veh)						182	320	10		15		

Intersection: 3: Winston Churchill Blvd. & Steeles Ave/Steeles Ave.

Movement	B24	B24	NB	NB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	T	T	L	L	T	T	T	R	L	T	T	T
Maximum Queue (m)	889.7	883.5	111.9	113.2	118.0	121.9	112.8	28.6	44.4	52.4	58.4	57.5
Average Queue (m)	422.5	355.3	62.6	65.6	67.7	70.1	72.5	1.5	20.7	32.0	32.9	31.1
95th Queue (m)	986.5	944.6	104.1	109.5	108.1	105.8	106.1	25.9	37.8	48.4	49.9	49.8
Link Distance (m)	882.9	882.9			225.0	225.0	225.0			177.9	177.9	177.9
Upstream Blk Time (%)	6	1										
Queuing Penalty (veh)	0	0										
Storage Bay Dist (m)			130.0	130.0				130.0	130.0			
Storage Blk Time (%)			0	0	0		0	0				
Queuing Penalty (veh)			1	2	1		1	0				

Intersection: 4: Winston Churchill Blvd. & Orlando Access

Movement	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	T	T	TR	L	T	T	TR
Maximum Queue (m)	34.4	16.7	92.3	101.9	128.3	34.3	43.9	117.8	191.8
Average Queue (m)	13.5	2.6	38.8	41.2	57.4	12.7	13.9	19.4	25.3
95th Queue (m)	27.3	10.4	79.8	82.4	105.8	25.6	35.1	62.0	86.8
Link Distance (m)	191.4	191.4	365.6	365.6	365.6		225.0	225.0	225.0
Upstream Blk Time (%)								0	0
Queuing Penalty (veh)								0	1
Storage Bay Dist (m)						80.0			
Storage Blk Time (%)			7						
Queuing Penalty (veh)			0						

Intersection: 5: Winston Churchill Blvd. & Meadowpine Blvd

Movement	WB	WB	WB	NB	NB	NB	NB	B30	B30	SB	SB	SB
Directions Served	L	L	R	T	T	T	R	T	T	L	T	T
Maximum Queue (m)	110.2	110.0	118.2	127.6	133.1	146.8	105.3	1.5	8.6	58.3	90.8	97.5
Average Queue (m)	65.6	69.7	61.2	78.3	85.4	94.7	27.7	0.0	0.2	22.3	34.9	42.5
95th Queue (m)	98.5	100.9	105.5	124.9	134.6	143.5	86.6	1.0	3.7	45.5	70.6	79.0
Link Distance (m)		1072.7	1072.7	147.1	147.1	147.1		129.3	129.3		365.6	365.6
Upstream Blk Time (%)				0	0	1						
Queuing Penalty (veh)				0	0	4						
Storage Bay Dist (m)	135.0						110.0			110.0		
Storage Blk Time (%)	0					6	0					
Queuing Penalty (veh)	0					10	0					

Intersection: 5: Winston Churchill Blvd. & Meadowpine Blvd

Movement	SB
Directions Served	T
Maximum Queue (m)	94.6
Average Queue (m)	42.9
95th Queue (m)	80.3
Link Distance (m)	365.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Winston Churchill Blvd. & Hwy 401 N. Off Ramp

Movement	WB	WB	WB	NB	NB	NB	B26	SB	SB	SB	B30
Directions Served	L	LR	R	T	T	T	T	T	T	T	T
Maximum Queue (m)	107.5	110.3	94.4	77.0	80.8	84.5	2.2	87.2	91.5	99.0	3.9
Average Queue (m)	70.3	72.6	56.5	48.8	52.1	48.0	0.1	47.2	55.3	57.6	0.1
95th Queue (m)	99.7	101.5	87.0	68.0	74.5	74.3	1.4	78.9	87.2	92.5	1.9
Link Distance (m)	471.6	471.6		131.6	131.6	131.6	131.0	129.3	129.3	129.3	147.1
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (m)			160.0								
Storage Blk Time (%)											
Queuing Penalty (veh)											

Intersection: 7: Winston Churchill Blvd. & Hwy 401 S. Off Ramp

Movement	EB	EB	EB	NB	NB	NB	B31	SB	SB	SB	B26	B23
Directions Served	L	LR	R	T	T	T	T	T	T	T	T	T
Maximum Queue (m)	90.8	94.4	82.7	89.1	72.8	60.6	4.3	83.4	94.3	92.0	3.4	25.9
Average Queue (m)	46.5	56.6	41.3	51.6	44.0	33.3	0.1	44.6	54.0	49.1	0.1	0.7
95th Queue (m)	70.9	82.4	73.3	75.2	64.4	55.6	2.7	71.8	83.0	80.1	2.1	16.4
Link Distance (m)	451.1	451.1		103.4	103.4	103.4	144.9	131.0	131.0	131.0	71.1	131.6
Upstream Blk Time (%)				0								
Queuing Penalty (veh)				0								
Storage Bay Dist (m)			155.0									
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 8: Winston Churchill Blvd. & Maple Lodge F. Employees

Movement	WB	NB	SB
Directions Served	LR	T	LT
Maximum Queue (m)	44.5	1.3	7.3
Average Queue (m)	19.0	0.0	0.2
95th Queue (m)	33.7	0.8	2.4
Link Distance (m)	138.6	166.2	75.8
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 11: Bend

Movement	WB
Directions Served	T
Maximum Queue (m)	368.6
Average Queue (m)	10.0
95th Queue (m)	232.9
Link Distance (m)	1971.7
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 24: Bend

Movement	EB	EB	EB
Directions Served	T	T	T
Maximum Queue (m)	52.8	88.6	87.4
Average Queue (m)	1.4	3.2	3.1
95th Queue (m)	24.0	38.4	37.8
Link Distance (m)	146.1	146.1	146.1
Upstream Blk Time (%)		0	0
Queuing Penalty (veh)		0	0
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 31: Bend

Movement	SB
Directions Served	T
Maximum Queue (m)	4.8
Average Queue (m)	0.1
95th Queue (m)	3.0
Link Distance (m)	103.4
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 587

Region of Peel
Working for you

Hatch Mott MacDonald

Class Environmental Assessment Study

Winston Churchill Boulevard (P.R. 19)

from Hwy 401 to Embleton Road / 5 Side Road

Safety Performance Report – Existing Conditions – Environmental Assessment (EA) Study for the Improvement of Winston Churchill Boulevard

May 15, 2015

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1 Background

Peel Region has initiated an Environmental Assessment study examining the need for improvement for a section of Winston Churchill Boulevard extending from Highway 401 to Embleton Road / 5 Side Road. The purpose of the study is to identify the improvements required to address existing operational and safety issues and to accommodate future traffic demands. This report summarizes the findings of a safety assessment of the existing conditions and possible countermeasures that could be considered in the development of a preferred design concept for this section of Winston Churchill Boulevard. It is intended that the findings and recommendations of this report will be incorporated into the Environmental Study Report (ESR).

At present, Winston Churchill Boulevard is a boundary road between the Region of Peel (east side) and Halton Region (west side). This roadway consists of a 4-lane arterial roadway, with added turning lanes at key intersections between the Highway 401 north ramp terminal and Steeles Avenue. South of the Highway 401 north ramp terminal to Argentia Road, the roadway consists of a 6-lane arterial cross section. North of Steeles Avenue to the entrance to Maple Lodge Farms the roadway is a 5-lane urban cross section with a two-way left turn lane along the centre. North of the Maple Lodge Farms access, Winston Churchill Boulevard narrows to a 2-lane cross section with a single traffic lane in each direction and a large painted median approximately 3 m wide that appears to serve as a centre turning lane providing access to adjacent properties despite not being signed this way. This cross section is continued to 5 Side Road/ Embleton Road where additional turning lanes are provided at this signalized intersection.

2 Safety Assessment of Existing Conditions

2.1 Data Availability

2.1.1 Collision Data

Collision information for the study area was provided by the Region of Peel, Halton Region and the Ministry of Transportation for five intersection locations and four midblock locations for a six year period from 2008 to 2013. Locations along Winston Churchill Blvd that were studied include:

Intersections:

- Embleton Road and Winston Churchill Boulevard
- Steeles Avenue and Winston Churchill Boulevard
- Meadowpine Boulevard and Winston Churchill Boulevard
- Highway 401 WB Off-Ramp and Winston Churchill Boulevard
- Highway 401 EB Off-Ramp and Winston Churchill Boulevard

Midblock Sections:

- Between Embleton Road and Steeles Avenue
- Between Steeles Avenue and Meadowpine Boulevard
- Between Meadowpine Boulevard and Highway 401 WB Off-Ramp
- Between Highway 401 WB Off-Ramp and Highway 401 EB Off-Ramp

Information included collision location, collision severity, initial impact type, road surface condition, light and environmental conditions, vehicle manoeuvre, driver action, direction of travel and sequence of events.

2.1.2 Traffic Volume Data

Traffic volumes for intersections with major and minor roads were derived from the most recent turning movement counts conducted in May and December, 2014. Traffic volumes for the road segments were developed by averaging the total traffic on the east and west legs of the corresponding intersections at each end of the segment. The Empirical Bays (EB) methodology was applied in order to obtain the expected collision frequency. This method combines observed collisions and the predicted number of collisions derived from Safety Performance Functions (SPF), also known as the collision prediction model. SPFs are a function of Annual Average Daily Traffic (AADT) and are used to obtain the predicted number of collisions for each year of the study period (2008 – 2013). The AADT for each road section was required as an input for each of those years. In order to prepare the traffic forecasts for each of the years in the analysis period (2008-2013), a 4.5 percent annual growth rate was used to obtain the AADT for segments of Winston Churchill Boulevard. This rate of growth was developed through a separate analysis and approved by Region of Peel for use in this study.

2.2 Collision History

A review of the collision data provided by Peel Region indicated that there were a total of 163 collisions within the study area in the 2008 – 2013 period: 124 intersection collisions and 39 midblock collisions. The intersection of Steeles Avenue and Winston Churchill Boulevard experienced the highest number of collisions recorded (90), followed by Embleton Road and Winston Churchill Boulevard (13) and Meadowpine Boulevard and Winston Churchill Boulevard (13). The midblock section between Embleton Road and Steeles Avenue had the highest number of collisions (30) followed by the section between Steeles Avenue and Meadowpine Boulevard (9). There were no midblock collisions reported for the remaining two sections between Meadowpine Boulevard and the Hwy 401 WB Off-Ramp and the Hwy 401 WB Off-Ramp and Hwy 401 EB Off-Ramp. All intersections within the study area are signalized.

Table 1 presents a summary of collisions by severity; and **Table 2** presents, a summary by Impact Type.

Table 1 Intersection and Midblock Collisions by Severity

Location Along Winston Churchill	Fatal Collisions	Non-fatal Injury Collisions	Property Damage (PDO)	Non-Reportable	Total Collisions	Percentage of Total Collisions
Intersections						
Embleton Road	0	1	9	3	13	8%
Steeles Avenue	0	6	82	2	90	55%
Meadowpine Boulevard	0	0	12	1	13	8%
Highway 401 WB Off-Ramp	0	0	6	0	6	4%
Highway 401 EB Off-Ramp	0	0	2	0	2	1%
Subtotal:	**0**	**7**	**111**	**6**	**124**	**76%**
Midblock Sections						
Embleton Road to Steeles Avenue	0	5	24	1	30	18%
Steeles Avenue to Meadowpine Boulevard	0	2	7	0	9	6%
Meadowpine Boulevard to Highway 401 WB Off-Ramp	0	0	0	0	0	0%
Highway 401 WB Off-Ramp to Highway 401 EB Off-Ramp	0	0	0	0	0	0%
Subtotal:	**0**	**7**	**31**	**1**	**39**	**24%**
Grand Total:	**0**	**14**	**142**	**7**	**163**	**100%**

As shown in **Table 1**, there were no fatal collisions; however there were a small number of non-fatal injury collisions (14 or 9% of the total collisions). The majority of collisions that occurred (142 or 87%) were PDO (Property Damage), followed by non-reportable collisions (7 or %). The most frequent occurrence of collisions, 82 or 58% of property damage collisions, occurred at the intersections of Steeles Avenue and Winston Churchill Boulevard. The midblock sections of the study area experienced a small number of collisions, as they only account for 39 or 23% of the total collisions recorded. The majority of these occurred in the section from Embleton Road to Steeles Avenue (30 or 77 %), with the remaining midblock section collisions (9 or 23%) occurring in the section from Steeles Avenue to Meadowpine Boulevard. The remaining two midblock sections, Meadowpine Boulevard to Highway 401 WB Off-ramp and Highway 401 WB off-ramp to Highway 401 EB off-ramp, have no reported collisions. It should be noted that of the majority of collisions for the entire study area occurred at the intersection of Steeles Avenue and Winston Churchill Boulevard (90 or 55%), as more than half occurred at this location. There were only a very small number of non-reportable collisions, (7 or 4%), recorded within the study which allows for a more accurate collision analysis.

Table 2 Intersection and Midblock Collisions by Type

Location Along Winston Churchill	Approaching (head on)	Angle (T-bone)	Rear end	Sideswipe	Turning movement	SMV - unattended vehicle	SMV - Other	Other
Intersections								
Embleton Road	0	3	10	0	0	0	0	0
Steeles Avenue	3	6	48	10	15	0	4	4
Meadowpine Boulevard	0	4	6	2	0	0	1	0
Highway 401 WB Off-Ramp	0	0	4	0	2	0	0	0
Highway 401 EB Off-Ramp	0	0	0	1	1	0	0	0
Subtotal:	**3**	**13**	**68**	**13**	**18**	**0**	**5**	**4**
Midblock Sections								
Embleton Road to Steeles Avenue	1	2	15	4	1	1	6	0
Steeles Avenue to Meadowpine Boulevard	1	0	1	4	0	1	2	0
Meadowpine Boulevard to Highway 401 WB Off-Ramp	0	0	0	0	0	0	0	0

Location Along Winston Churchill	Approaching (head on)	Angle (T-bone)	Rear end	Sideswipe	Turning movement	SMV - unattended vehicle	SMV - Other	Other
Highway 401 WB Off-Ramp to Highway 401 EB Off-Ramp	0	0	0	0	0	0	0	0
Subtotal:	**2**	**2**	**16**	**8**	**1**	**2**	**8**	**0**
Grand Total:	**5**	**15**	**84**	**21**	**19**	**2**	**13**	**4**

Table 2 summarizes the collisions that occurred at each intersection and midblock section by the impact designation. The majority of collisions for both intersections and midblock sections were rear end collisions (84 or 52% of total collisions). While most of these collisions occurred at Steeles Avenue and Winston Churchill Boulevard (48 or 71% of intersection rear end collisions), significant numbers of them occurred within the midblock section of Embleton Road to Steeles Avenue (15 or 94% or the total midblock rear end collisions). Rear end collisions are followed by sideswipe collisions (21 or 13%), turning movement collisions (19 or 12 %) and angle collisions (15 or 9%). The highest frequency for each collision type occurred at the intersection of Steeles Avenue. There were also 13 collisions recorded that were not assigned an impact classification. These have been displayed under the "Other" column above and the majority have occurred at the Steeles Avenue intersection and the midblock sections of Embleton Road to Steeles Avenue.

2.3 Collision Analysis

A detailed review of collisions that occurred within the study limits was undertaken to identify:

- Overall collision characteristics and trends;
- Collision characteristics and trends at the individual locations (intersections and road segments); and
- Locations that showed a potential for safety improvement.

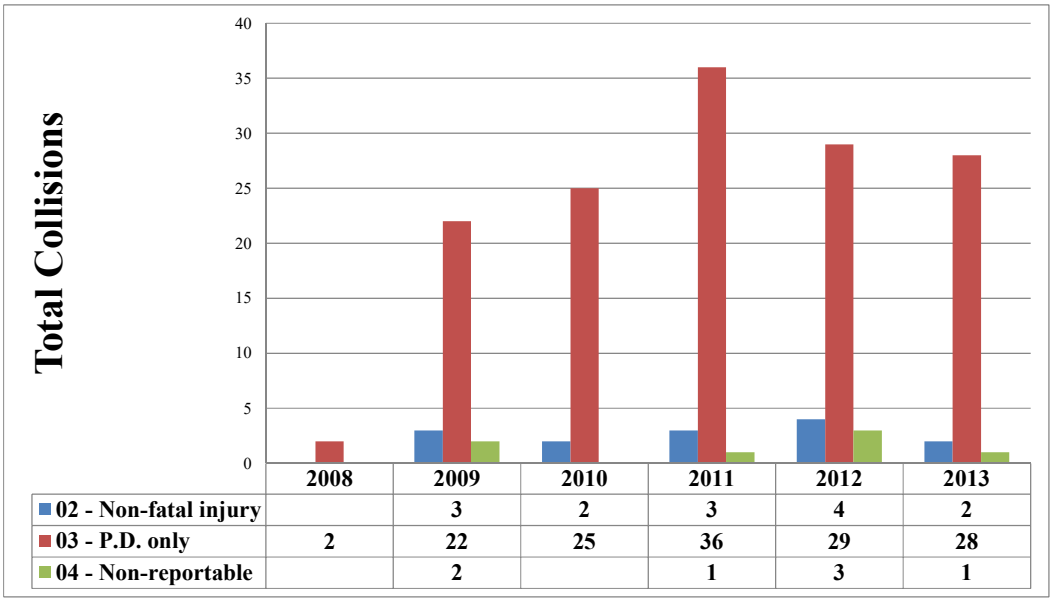
2.3.1 Overall Collision Characteristics and Trends throughout the Study Limits

As noted above, there were a total of 163 collisions within the study area in the 2008 – 2013 period: 124 intersection collisions and 39 midblock collisions. **Figure 1** through **Figure 8** summarizes the overall collision characteristics and trends along Winston Churchill Boulevard within the study limits.

Figure 1 shows the summary of collision occurrences in each year. As shown, collision occurrences were high during the period from 2011 to 2013 compared to other years of the study period but no fatal collisions occurred within the entire study period from 2008-2013. Collision occurrences were low for the non-fatal injury and the non-

reportable severity types throughout the period under study. The P.D.O impact type was high during 2011, and was followed closely by the years 2012 and 2013.

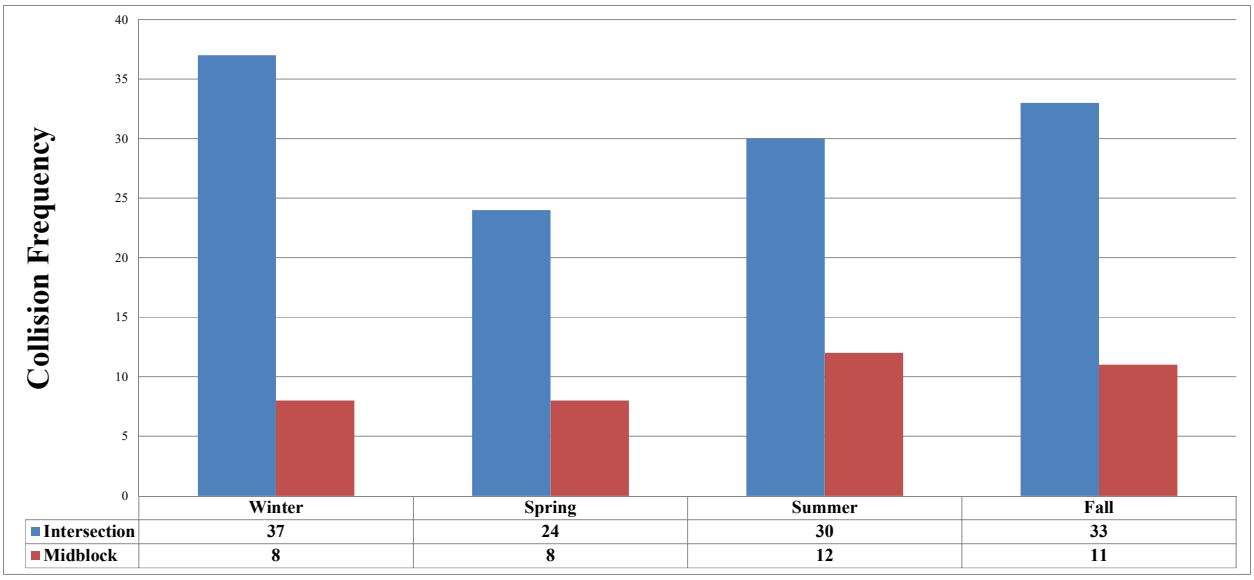
Figure 1 Study Area Collision Distribution by Year



	2008	2009	2010	2011	2012	2013
02 - Non-fatal injury		3	2	3	4	2
03 - P.D. only	2	22	25	36	29	28
04 - Non-reportable		2		1	3	1

Figure 2 shows the summary of collision data based on the season of the year and location. The highest number of collisions occurred in the winter (28%) and fall (27%), followed by summer (26%) and spring (19%).

Figure 2 Study Area Collision Distribution by Season and Location

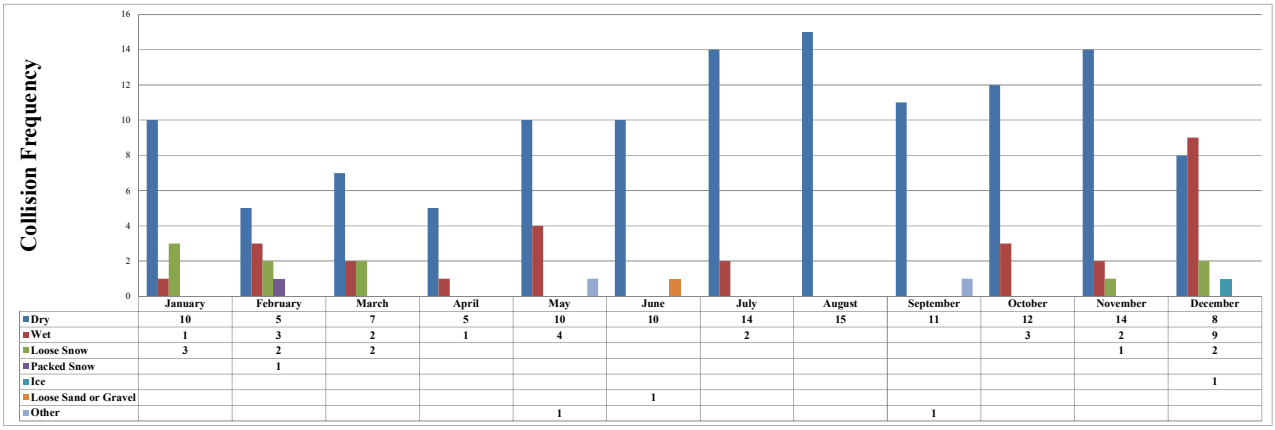


	Winter	Spring	Summer	Fall
Intersection	37	24	30	33
Midblock	8	8	12	11

Figure 3 shows the summary of collision data based on the month of year cross referenced with different road surface conditions. The majority of the collisions

occurred during the months of July, August and November within the six-year period. The majority of these collisions occurred under dry road surface conditions.

Figure 3 Study Area Collision Distribution by Month under Different Road Surface Condition



	January	February	March	April	May	June	July	August	September	October	November	December
Dry	10	5	7	5	10	10	14	15	11	12	14	8
Wet	1	3	2	1	4		2			3	2	9
Loose Snow	3	2	2								1	2
Packed Snow		1										
Ice												1
Loose Sand or Gravel						1						
Other					1				1			

Figure 4 shows the overall distribution of collisions by severity type and **Figure 5** shows the distribution of collisions by severity type and location within the study limits. The majority of the collisions that occurred were PDO collisions. Most of the Non-fatal injury and PDO collisions occurred at the intersection of Steeles Avenue.

Figure 4 Study Area Collision Distribution by Severity Type

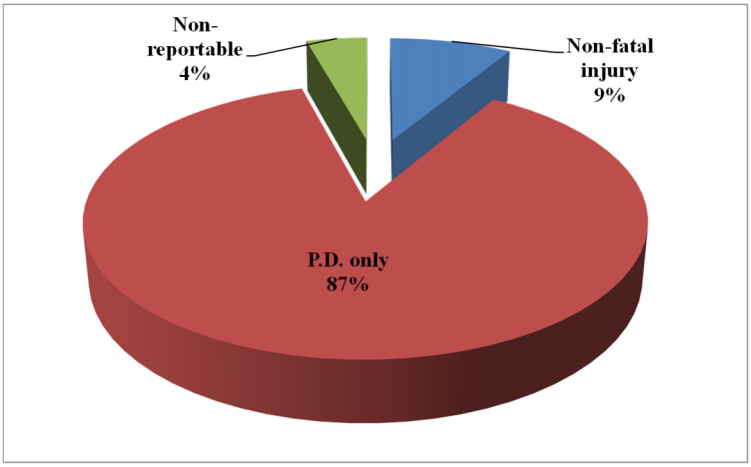
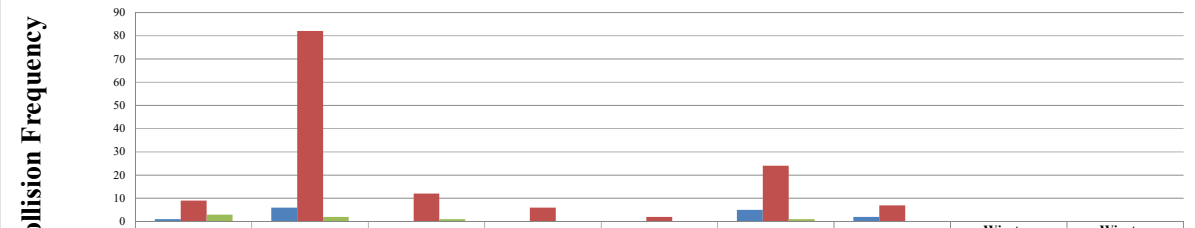


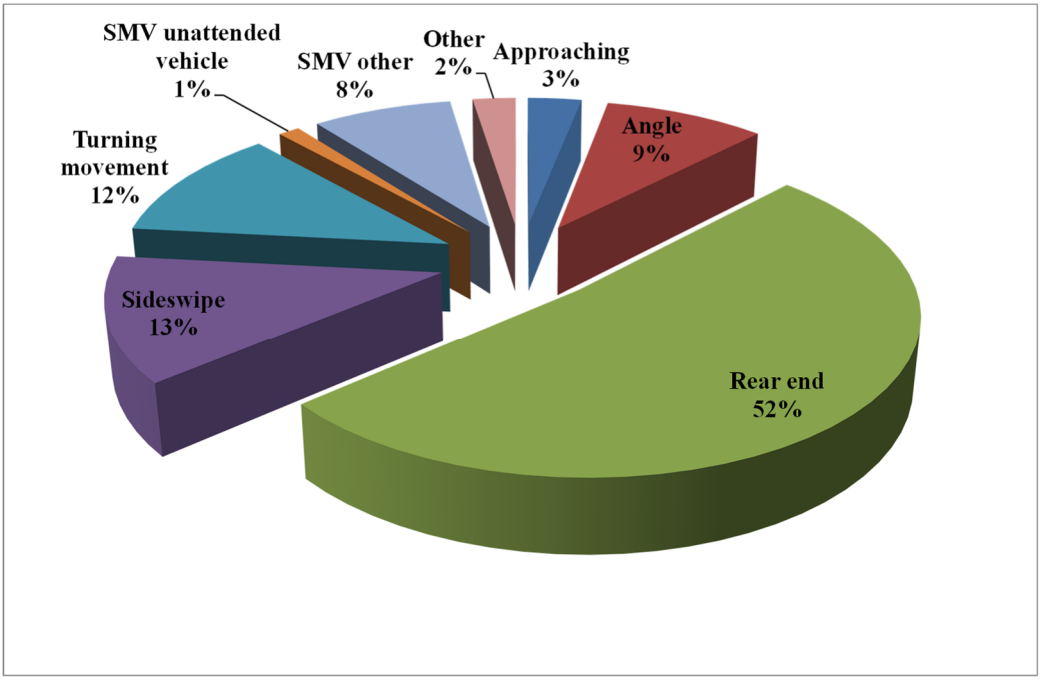
Figure 5 Study Area Collision Distribution by Severity and Location



	Embleton Rd @ Winston Churchill Blvd	Steeles Ave @ Winston Churchill Blvd	Meadowpine Blvd @ Winston Churchill Blvd	Highway 401 WB Off-Ramp @ Winston Churchill Blvd	Highway 401 EB Off-Ramp @ Winston Churchill Blvd	Winston Churchill Blvd btwn Embleton Rd & Steeles Ave	Winston Churchill Blvd btwn Steeles Ave & Meadowpine Blvd	Winston Churchill Blvd btwn Meadowpine Blvd & Highway 401 WB Off-Ramp	Winston Churchill Blvd btwn Highway 401 WB Off-Ramp & Highway 401 EB Off-Ramp
Non-fatal injury	1	6				5	2		
P.D. only	9	82	12	6	2	24	7		
Non-reportable	3	2	1			1			

Figure 6 shows the summary of collision data based on the initial impact type. Of the total collisions that have occurred along Winston Churchill Boulevard within the analysis period, the majority of the collisions were rear-end (52%), sideswipe (13%) and turning movement (12%) impact types.

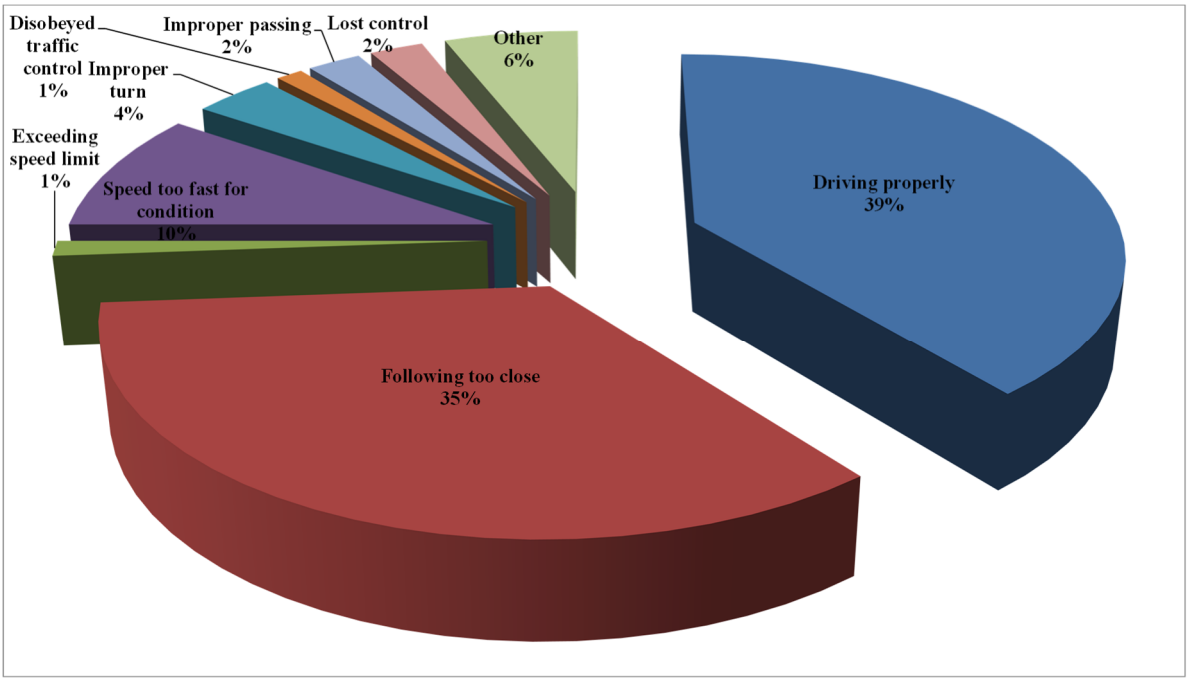
Figure 6 Study Area Collision Distribution by Initial Impact Type



To determine the possible contributing factors for the three predominant collisions types including rear end, angle (T-bone), and sideswipe; further analysis was done on these impact types with the results shown in **Figure 7** through **Figure 9**. As shown in

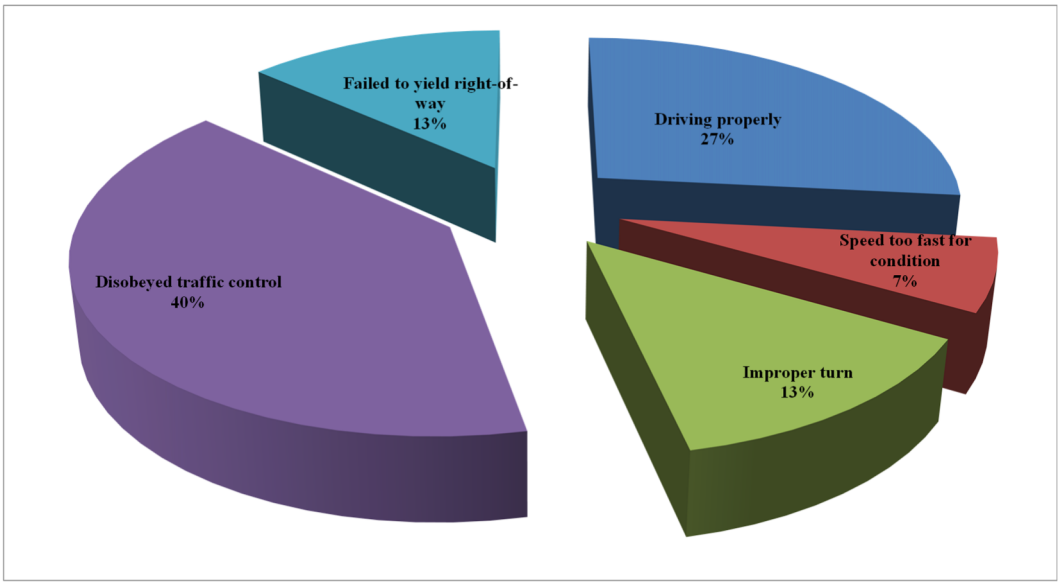
Figure 7, the majority (39%) of rear-end collisions occurred while the driver was driving properly; however this is followed very closely by drivers following too close (35%). Most of these collisions resulted from slowing or stopping manoeuvres under dry road surface conditions.

Figure 7 Apparent Causes of Rear-End Collisions



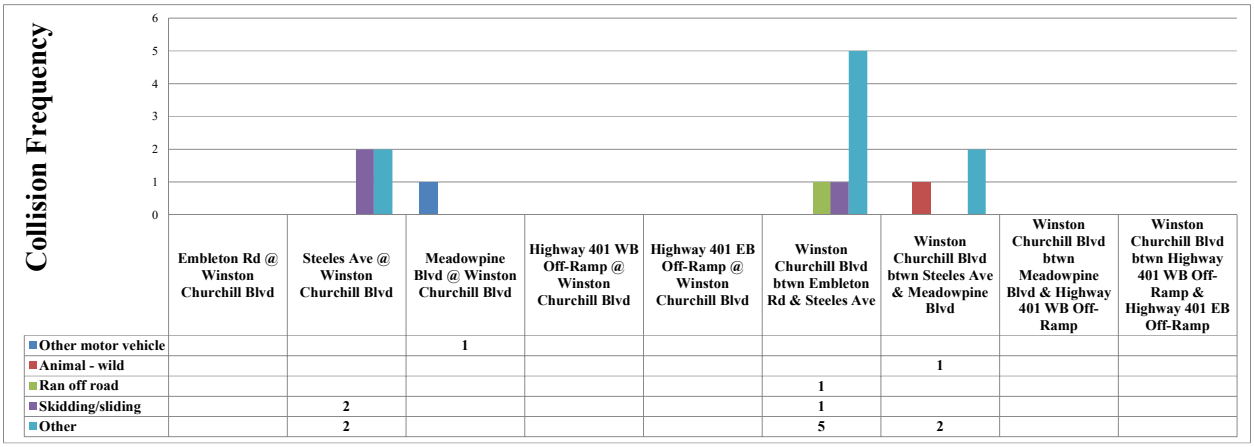
As shown in **Figure 8**, the majority of the angle collisions (40%) resulted from drivers disobeying the traffic control, this is followed by drivers driving properly (27%).The remaining collisions were split fairly evenly between collisions occurring as a result of drivers failing to yield the right-of-way (13%), drivers making an improper turn (13%) and drivers speed too fast for conditions (7%).

Figure 8 Apparent Causes of Angle Collisions



As shown in **Figure 9,** the majority of the SMV collisions (61%) were reported as being the result of "Other" unknown causes. A portion of the remaining collisions occurred as a result of skidding/sliding (21%), running off the road (6 %), an animal (6%) or another motor vehicle (6%).

Figure 9 Apparent Causes of SMV Collisions at Different Locations along Winston Churchill Boulevard



	Embleton Rd @ Winston Churchill Blvd	Steeles Ave @ Winston Churchill Blvd	Meadowpine Blvd @ Winston Churchill Blvd	Highway 401 WB Off-Ramp @ Winston Churchill Blvd	Highway 401 EB Off-Ramp @ Winston Churchill Blvd	Winston Churchill Blvd btwn Embleton Rd & Steeles Ave	Winston Churchill Blvd btwn Steeles Ave & Meadowpine Blvd	Winston Churchill Blvd btwn Meadowpine Blvd & Highway 401 WB Off-Ramp	Winston Churchill Blvd btwn Highway 401 WB Off-Ramp & Highway 401 EB Off-Ramp
Other motor vehicle			1						
Animal - wild							1		
Ran off road						1			
Skidding/sliding		2				1			
Other		2				5	2		

2.3.2 Collision Characteristics and Trends at the Individual Locations

A detailed review of the collisions was undertaken for individual locations within the study limits. These locations, in order of collision frequency (highest to lowest), were:

Intersections

- Winston Churchill Boulevard and Steeles Avenue
- Winston Churchill Boulevard and Embleton Road
- Winston Churchill Boulevard and Meadowpine Boulevard
- Winston Churchill Boulevard and Highway 401 WB Off-Ramp
- Winston Churchill Boulevard and Highway 401 EB Off-Ramp

Road Segments

- Winston Churchill Boulevard between Embleton Road and Steeles Avenue
- Winston Churchill Boulevard between Steeles Avenue and Meadowpine Boulevard
- Winston Churchill Boulevard between Meadowpine Boulevard and Highway 401 WB Off-Ramp
- Winston Churchill Boulevard between Highway 401 WB Off-Ramp and Highway 401 EB Off-Ramp

The various collision characteristics at these locations were examined to identify the trends based on the following characteristics:

- Severity classification – Non-fatal injury, PDO and non-reportable
- Impact type – rear-end, angle, SMV, sideswipe, etc.;
- Hourly distribution;
  - Early Morning (12am to 6am)
  - AM Peak Hour (6am to 10am)
  - Midday (10am to 4pm)
  - PM Peak Hour (4pm to 8pm)
  - Evening (8pm to 12am)
- Road surface condition – dry, wet, snow, slush, ice, etc.;
- Light condition – Daylight, dusk, dawn, dark, etc.;
- Environmental condition – Clear, snow, rain, etc.; and
- Seasonal Distribution – Winter, spring, summer, fall.

Intersections

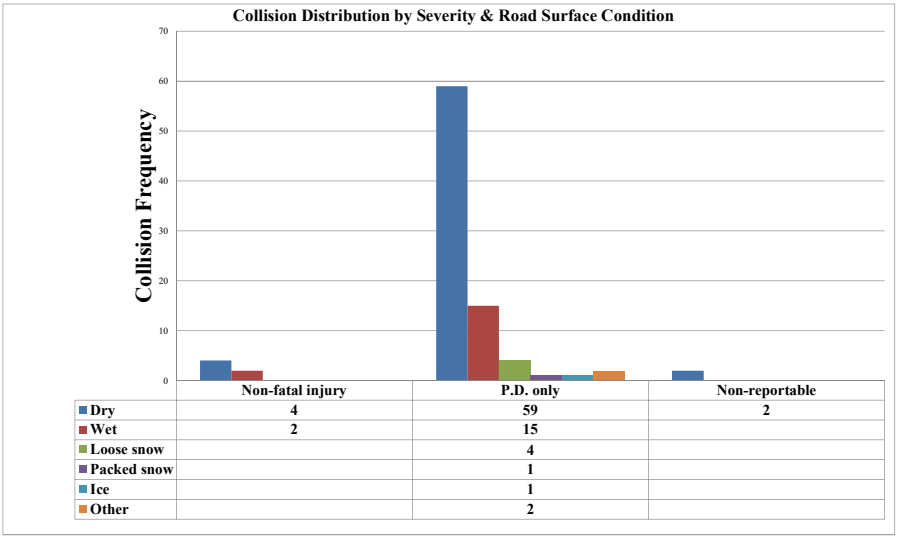
Winston Churchill Boulevard and Steeles Avenue

Ninety (90) collisions were found to be associated with this intersection during the study period. Of these collisions the following was observed:

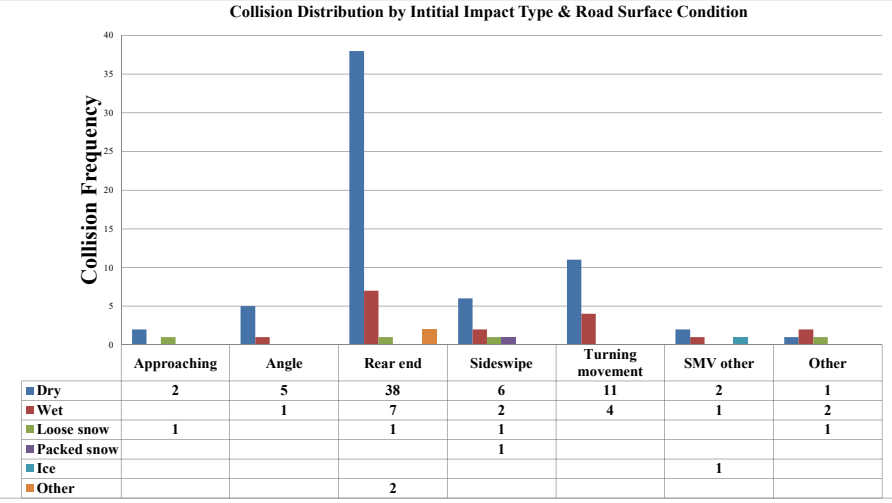
- Eighty-eight (82) were recorded as Property Damage, six (6) were non-fatal injury collisions, and the remaining two (2) collisions were reported as non-reportable collisions.
- The predominant impact types were rear end (48) and turning movement collisions (15).
  - Most of the angle collisions occurred as a result of the driver driving properly, however this is followed closely by the collision occurring as a result of the driver making an improper turn; and
- Most of the rear-end collisions occurred during proper driving conditions and as a result of a sudden stop under a dry road surface conditions.
- The majority of collisions occurred during daylight and under clear environment conditions.
- Sixty-five (65) collisions occurred under dry road surface conditions and fifteen (15) collisions under wet surface conditions;
- Twenty-eight (28, or 31%) of collisions occurred during the winter, with summer closely following with (24, or 27%). Of the remaining collisions, twenty (20) collisions occurred in the fall and eighteen (18) collisions occurred in the spring season; and
- Twenty-eighty (28) collisions occurred in midday peak hour followed closely by twenty-six (26) in the AM peak hour. Of the remaining collisions twenty-three (23) occurred in the PM peak hour, nine (9) in the early morning and the remaining four (4) in the evening.

Figure 10 presents a summary of this information**.**

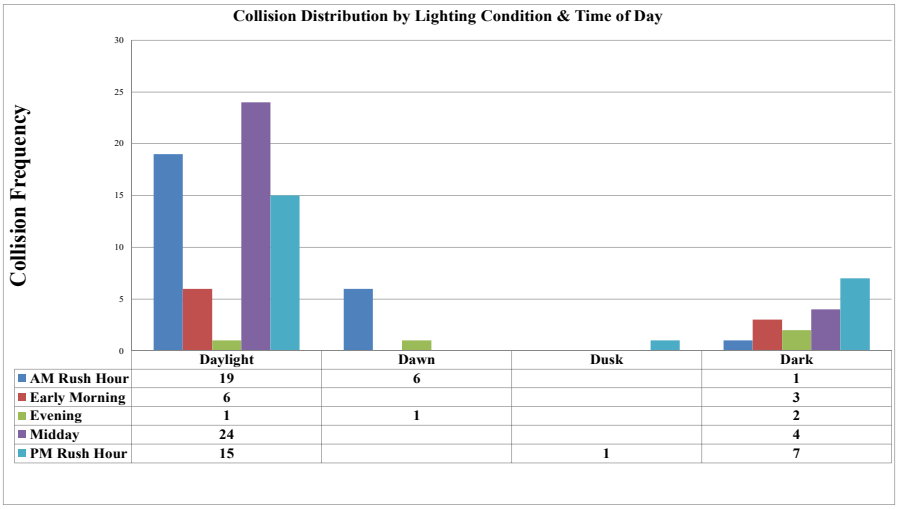
Figure 10 Collision Distribution at the Intersection of Winston Churchill Boulevard and Steeles Avenue



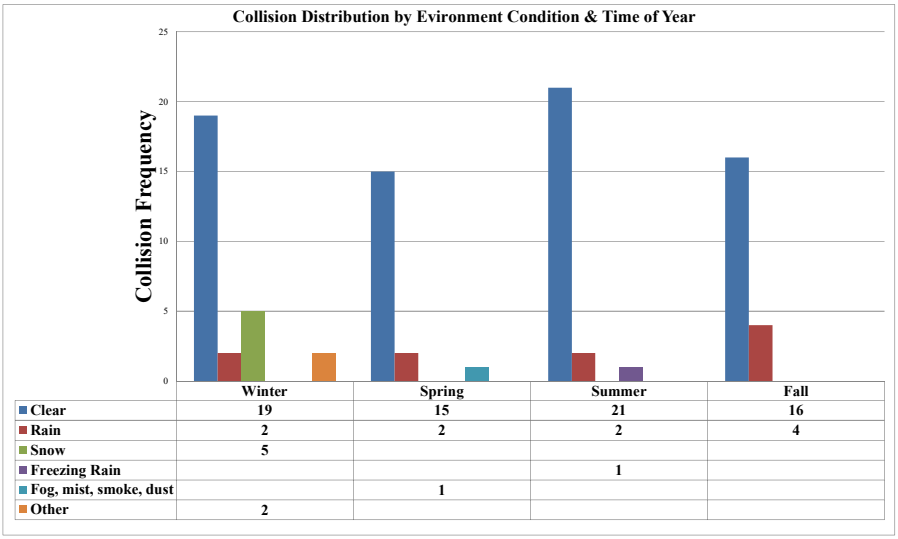
	Non-fatal injury	P.D. only	Non-reportable
Dry	4	59	2
Wet	2	15	
Loose snow		4	
Packed snow		1	
Ice		1	
Other		2	



	Approaching	Angle	Rear end	Sideswipe	Turning movement	SMV other	Other
Dry	2	5	38	6	11	2	1
Wet		1	7	2	4	1	2
Loose snow	1		1	1			1
Packed snow				1			
Ice						1	
Other			2				



	Daylight	Dawn	Dusk	Dark
AM Rush Hour	19	6		1
Early Morning	6			3
Evening	1	1		2
Midday	24			4
PM Rush Hour	15		1	7



	Winter	Spring	Summer	Fall
Clear	19	15	21	16
Rain	2	2	2	4
Snow	5			
Freezing Rain			1	
Fog, mist, smoke, dust		1		
Other	2			

Winston Churchill Boulevard and Embleton Road

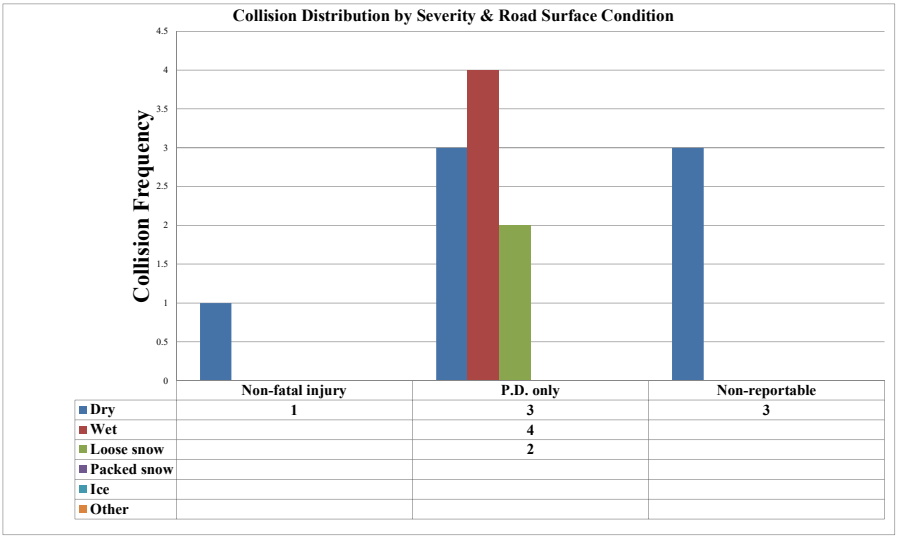
Thirteen (13) collisions were found to be associated with this intersection during the study period. Of these collisions the following was observed:

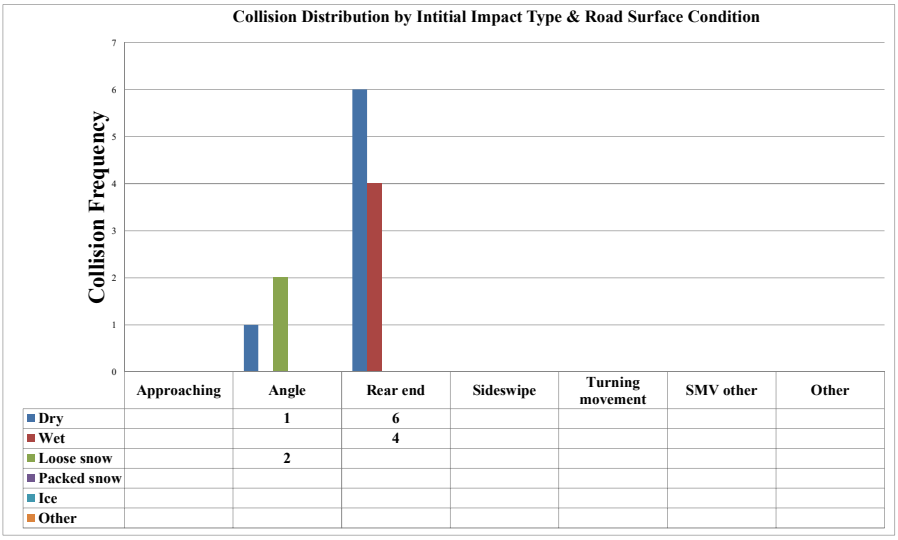
- Nine (9) collisions were reported as property damage only, three (3) were non-reportable and one (1) as a non-fatal injury collision.
- The collision impact types were rear-end (10) and angle collisions (3);
  - Most of the rear-end collisions occurred as a result of drivers following too closely on dry surface conditions; and
- Eight (8) collisions occurred during daylight and one hundred and eight (8) under clear environment conditions;
- The majority of collisions (54%) occurred under dry road surface conditions, followed by 31% under wet surface conditions;

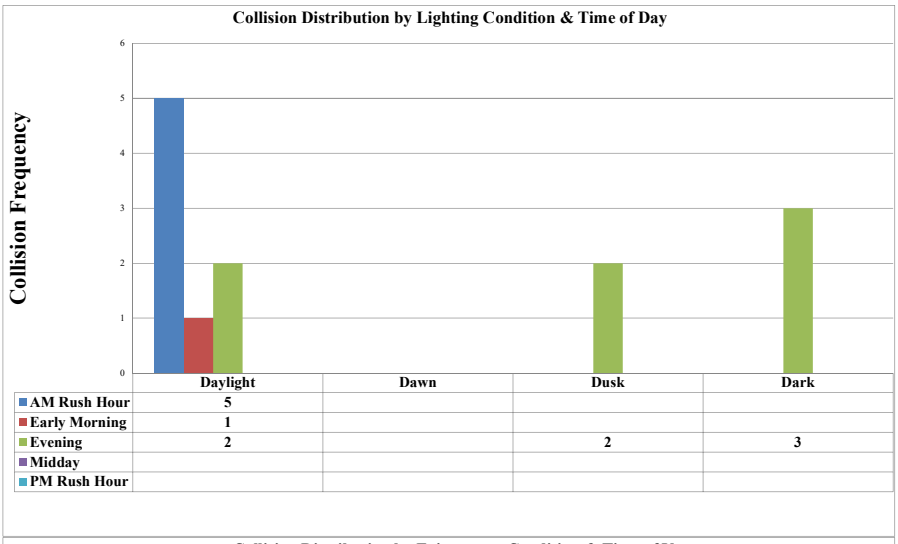
- Six (6) of the thirteen collisions (46%) occurred during the winter. This was followed by four (4, or 31%) in the fall, two (2, or 15%) in the spring, and the remaining one collision occurring in the summer;
- Seven (7) collisions occurred in the evening peak hour, and five (5) in the AM peak hour period. The remaining one (1) collision occurred during the early morning period.

Figure 11 presents a summary of this information.

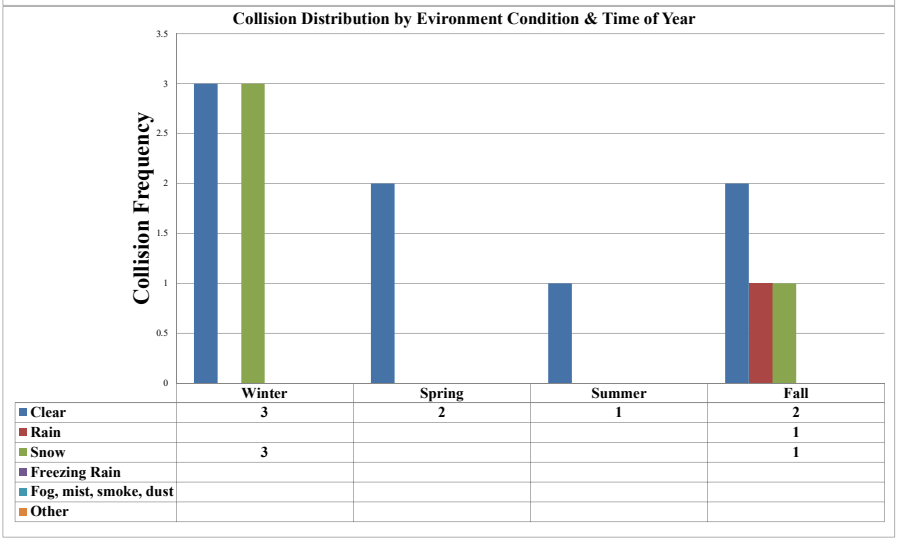
Figure 11 Collision Distribution at the Intersection of Winston Churchill Boulevard and Embleton Road







	Daylight	Dawn	Dusk	Dark
AM Rush Hour	5			
Early Morning	1			
Evening	2		2	3
Midday				
PM Rush Hour				



	Winter	Spring	Summer	Fall
Clear	3	2	1	2
Rain				1
Snow	3			1
Freezing Rain				
Fog, mist, smoke, dust				
Other				

Winston Churchill Boulevard and Meadowpine Road

Thirteen (13) collisions were found to be associated with this intersection during the study period.

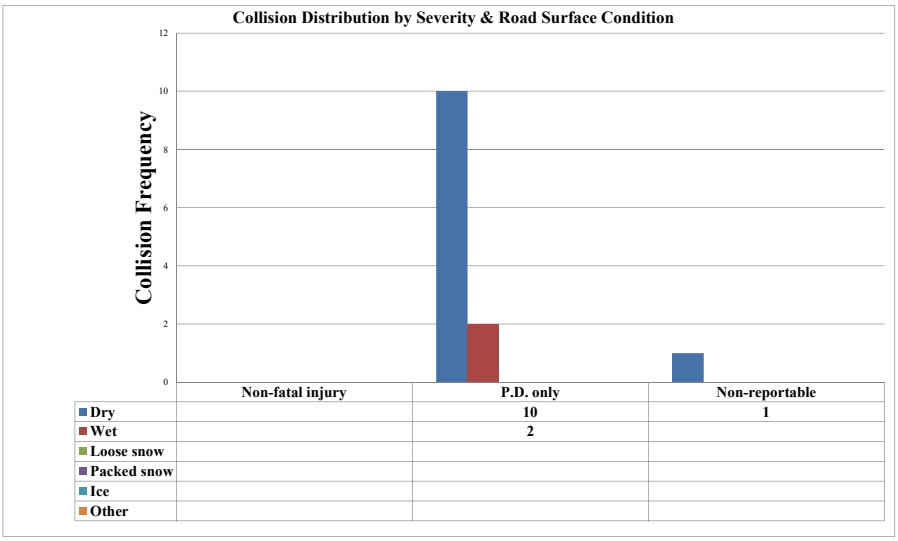
- Twelve (12) of the total collisions were recorded as property damage only and one (1) as non-reportable;
- The predominant impact types at this intersection were rear end (6) followed by angle (4), sideswipe (2) and SMV (1);
  - All of the rear-end collisions occurred under dry road surface conditions. Most of the angle collisions were the result of drivers disobeying the traffic control.
- The majority of the collisions occurred during daylight (10) and the remaining collisions occurred during the dark (2) and at dawn (1). The distribution of these

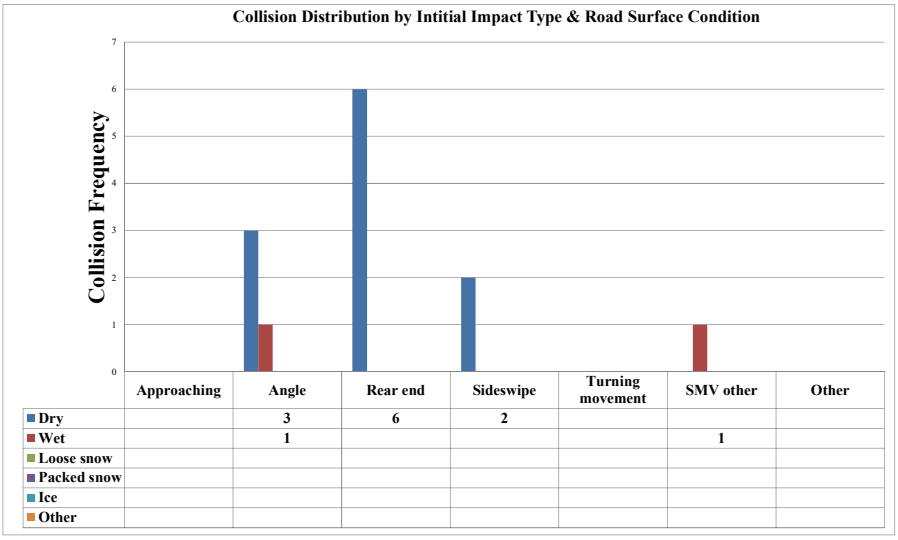
collisions occurring throughout the time of the day is: AM peak hour - 4, early morning – 1, midday – 5, PM peak hour -2, evening – 1;

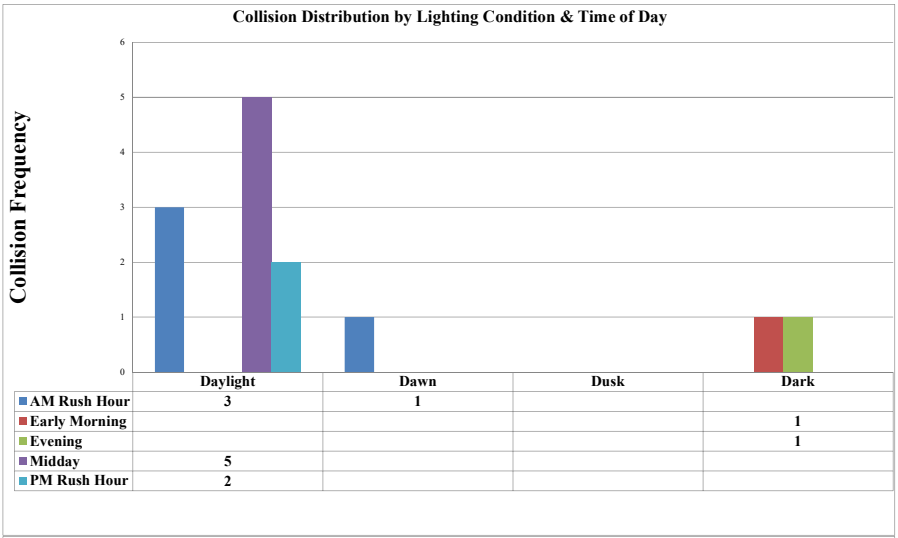
- The majority of the collisions occurred with dry road surface conditions (11) with the remaining (2) collisions occurring in wet conditions; and
- With the exception of the fall (8), the collision distribution is fairly even throughout the other seasons: Spring (3), winter (1) and summer (1).

Figure 12 shows the collision summary at this intersection.

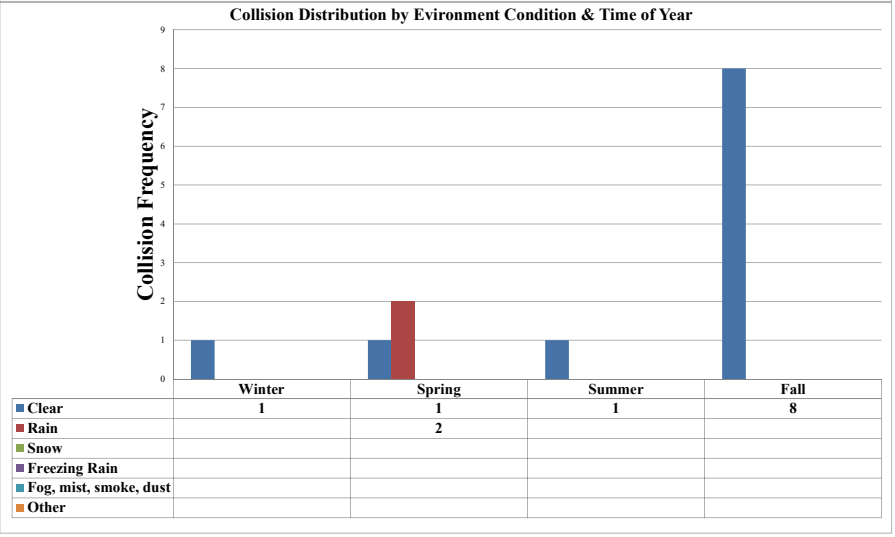
Figure 12 Collision Distribution at the Intersection of Winston Churchill Boulevard and Meadowpine Road







	Daylight	Dawn	Dusk	Dark
AM Rush Hour	3	1		
Early Morning				1
Evening				1
Midday	5			
PM Rush Hour	2			



	Winter	Spring	Summer	Fall
Clear	1	1	1	8
Rain		2		
Snow				
Freezing Rain				
Fog, mist, smoke, dust				
Other				

Winston Churchill Boulevard and Highway 401 WB Off-Ramp

Six (6) collisions were found to be associated with this intersection during the study period.

- All six (6) of the collisions reported were recorded as PD only collisions.
- The predominant impact types at this intersection were rear end (4) followed by two (2) turning movement collisions:
  - The rear-end collisions occurred an equal amount under dry (2) and wet (2) road surface conditions. Most collisions were the result of drivers driving properly.

- All of the collisions occurred during daylight with the majority (4) occurring in clear weather conditions. The distribution of these collisions occurring throughout the time of the day is: AM peak hour - 4, midday – 2;
- The distribution of collision road surface conditions are evenly split with three (3) occurring in dry and three (3) in wet road conditions;
- The summer (3) experience the most collisions, followed by the winter (2), and the remaining collision occurring in the spring.

Winston Churchill Boulevard and Highway 401 EB Off-Ramp

Two (2) collisions were found to be associated with this intersection during the study period.

- The two (2) collisions that were reported resulted in property damage only.
- The two collisions included one sideswipe and one turning movement collision:
  - These two collisions both occurred in the daylight, under clear weather conditions and dry road surface conditions. Both collisions occurred in the AM peak hour.
  - The sideswipe collision was the result of the driver making an improper lane change and the turning movement collision was the result of the driver disobeying the traffic control.

Road Segments

Winston Churchill Boulevard between Embleton Road and Steeles Avenue

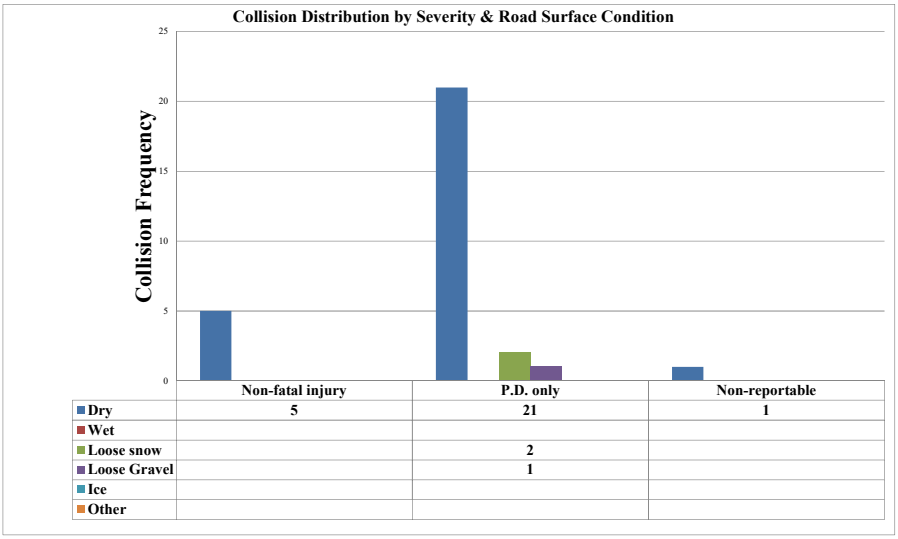
Thirty (30) collisions were found to be associated with this road segment during the study period.

- Twenty-four (24) of total collisions were recorded as PD only collisions, with five (5) as non-fatal injury collisions and the remaining one (1) was a non-reportable collision;
- The predominant impact type in this section was rear end collisions (15):
  - The majority of collisions occurred during daylight and was a result of drivers following too closely;
- Twenty-five (25) of total collisions occurred during daylight conditions and the remaining four (4) in the dark;
- Twenty-six (26) of the total collisions occurred under dry road surface conditions, two (2) as a result of loose snow and the remaining collision as a result of loose sand/gravel;
- The collision distribution is Summer (9), Fall (10), Winter (4) and Spring (7);

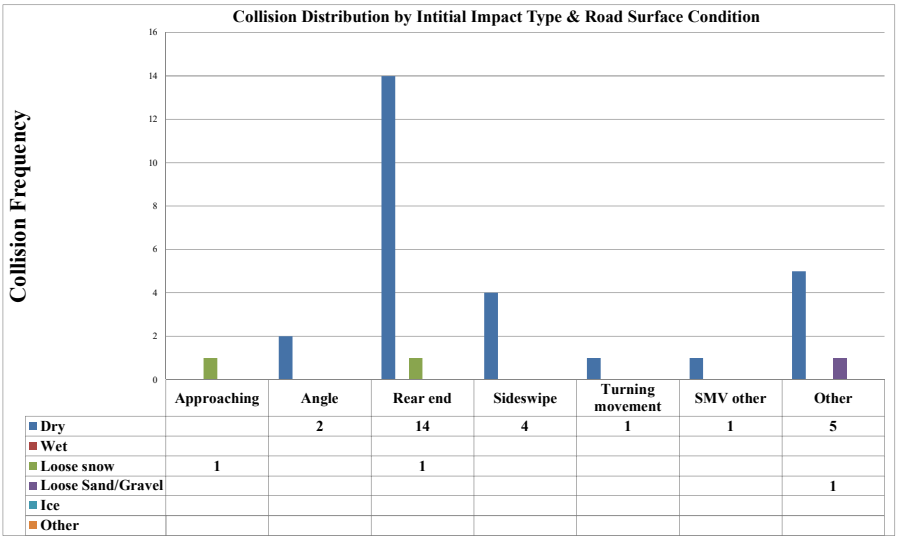
- The majority of collisions occurred during the midday (10) and PM peak hour (14).

Figure 13 shows the collision summary at the Winston Churchill segment between the Embleton Road and Steeles Avenue intersections.

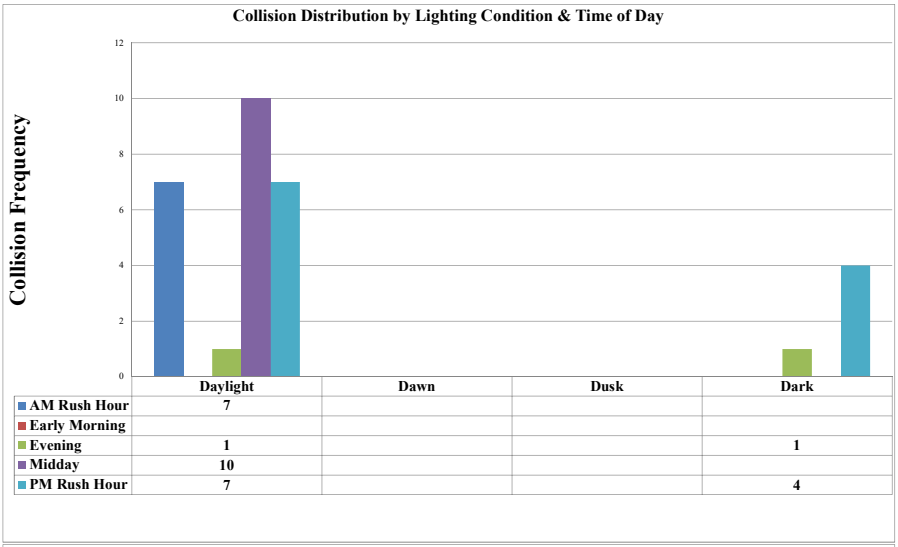
Figure 13 Collision Distribution at the Road Segment between Embleton Road and Steeles Avenue



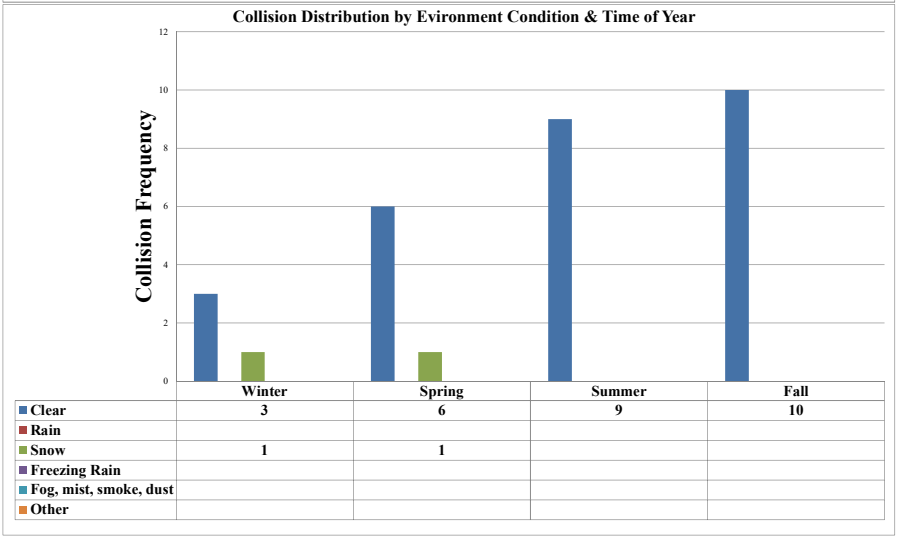
	Non-fatal injury	P.D. only	Non-reportable
Dry	5	21	1
Wet			
Loose snow		2	
Loose Gravel		1	
Ice			
Other			



	Approaching	Angle	Rear end	Sideswipe	Turning movement	SMV other	Other
Dry		2	14	4	1	1	5
Wet							
Loose snow	1		1				
Loose Sand/Gravel							1
Ice							
Other							



	Daylight	Dawn	Dusk	Dark
AM Rush Hour	7			
Early Morning				
Evening	1			1
Midday	10			
PM Rush Hour	7			4



	Winter	Spring	Summer	Fall
Clear	3	6	9	10
Rain				
Snow	1	1		
Freezing Rain				
Fog, mist, smoke, dust				
Other				

Winston Churchill Boulevard between Steeles Avenue and Meadowpine Boulevard

Nine (9) collisions were found to be associated with this road segment during the study period.

- A total of seven (7) collisions were reported as PD only with the remaining two (2) collisions resulting in non-fatal injuries;
- The predominant impact type at this intersection was sideswipe collisions (4) followed closely by SMV collisions (3):
  - The majority of these collisions occurred under dry road conditions and clear weather;
  - The sideswipe collisions were the result of the driver making an improper lane change;

- Six (6) of the total collisions occurred during daylight conditions, two (2) at dusk and one occurred during dark conditions;
- The collision distribution is fairly even across the seasons: Winter (4), Fall (1), Summer (3) and Spring (1); and
- The majority of collisions occurred during the PM peak hour period (5), with three (3) during the midday peak period and the remaining collision occurring during the AM peak period.

2.4 Potential for Safety Improvement (PSI)

In order to identify the locations with the greatest potential for safety improvement, the PSI index was calculated for the road segments and intersections in the study area where collision data were available.

The use of the PSI method focuses on roadway segments or intersections which could benefit the most from safety improvements. Traditional safety analysis methods focus on those sites experiencing the most collisions which may or may not have potential to experience a benefit from safety improvements. The PSI index is a measure of excess collision frequency, above the expected value, that might be reduced if a safety improvement were implemented.

The collision and roadway characteristics for the entire study area that have been used in the analysis are detailed in **Table 3** and **Table 4** ;

Table 3 Intersection Characteristics

Location	Traffic Control Type	No. of Legs	MAJOR Road AADT 2014 (Both Directions)	MINOR Road AADT 2014 (Both Directions)	Fatal and Injury Collision	PDO
Embleton Rd.	Signalized	4	11560	8070	1	9
Steeles Ave.	Signalized	4	28190	21950	6	82
Meadowpine Blvd	Signalized	3	22190	8130	0	12
Hwy 401 WB Off-Ramp	Signalized	3	25560	7200	0	6
Hwy 401 EB Off-Ramp	Signalized	3	25530	8050	0	2

Table 4 Road Segment Characteristics

Segment	Road Environment	Segment Length (km)	AADT 2014 (Both Directions)	Fatal and Injury Collision	PDO
Embleton Rd to Steeles Ave.	Rural	3.1	11560	5	24
Steeles Ave. to Meadowpine Blvd.	Rural	0.6	22190	2	7
Meadowpine Blvd. to Hwy. 401 WB Off-Ramp	Urban	0.3	25560	0	0
Hwy 401 WB Off-Ramp to Highway 401 EB Off-Ramp	Urban	0.4	25530	0	0

PSI values were calculated for intersections and road segments within the study area to enable the study team to identify the high risk locations. Engineering investigations could then be conducted to identify the contributing factors to the collisions and recommend countermeasures for mitigation. The step-by-step procedure involved in obtaining these PSI values is described below:

Step 1: Predicting the number of collisions at the intersections and road segments

- For intersections and road segments, the collision prediction models available in the *Highway Safety Manual* (HSM)[1] were used to obtain these predicted values. The models are provided in **Table 5** and **Table 6**. All SPFs were multiplied by the calibration factor calculated for each year to obtain the predicted collisions for that particular year.

[1]AASHTO (American Association of State Highway and Transportation Officials) *"Highway Safety Manual 2010",* provides tools to conduct quantitative safety analyses, allowing for safety to be quantitatively evaluated alongside other transportation performance measures such as traffic operations, environmental impacts, and construction costs.

Table 5 Collision Prediction Models for Intersections

Intersection Type	Model Form							
	$N_{bimv} = exp\ (a + b \times ln(AADT_{maj}) + c \times ln(AADT_{min}))$							
	Fatal and Injury Collisions				PDO (Property Damage Only) Collisions			
	Dispersion Parameter (k)	Intercept Ln(a)	$AADT_{maj}$ (b)	$AADT_{min}$ (c)	Dispersion Parameter (k)	Intercept Ln(a)	$AADT_{maj}$ (b)	$AADT_{min}$ (c)
4-leg Signalized	0.33	-13.14	1.18	0.22	0.44	-11.02	1.02	0.24
3-Leg Signalized	0.30	-11.58	1.02	0.17	0.36	-13.24	1.14	0.30

Note: AADTmaj = Major road AADT, AADTmin = Minor road AADT, Nbimv = Base Number of Collisions at Intersection for Multiple-Vehicle.

Table 6 Collision Prediction Models for Road Segments

Intersection Type	Model Form					
	$N = \exp(a + b * \ln(AADT)) + \ln(Length)$					
	Fatal and Injury Collisions			PDO (Property Damage Only) Collisions		
	Dispersion Parameter (k)	*Intercept* (a)	*Intercept* (b)	Dispersion Parameter (k)	*Intercept* (a)	*Intercept* (b)
Three Lane Arterials	0.59	-16.45	1.69	0.59	-11.95	1.33
Five- Lane Arterials with TWLTL	0.62	-10.47	1.12	0.88	-9.97	1.17

Step 2: Calculating the expected number of collisions using Empirical Bays Methodology

- The expected number of collisions was obtained by combining the predicted number of collisions and the observed number of collisions using the Empirical Bayes methodology. The Empirical Bayes (EB) methodology is an approach that combines observed and expected collision frequencies to provide estimates of the safety performance of specific sites that are not biased by regression to the mean. Observed collision data are subject to regression to the mean, because high short-term accident frequencies are likely to decrease and low short-term accident frequencies are likely to increase as a matter of course, even if no improvements are made.

According to the EB technique, for a specific collision severity level, the following formula was used to determine the expected number of collisions per year:

$$m = w \times E\{n\} + (1 - w) \times x$$

Where: $E\{n\}$ is the predicted number of collisions in *n* years, estimated from the Collision Prediction model/Safety Performance Function SPF

n is the number of years for which collision data are available

x is the observed counts of collisions in *n* years and

w is the weight estimated from the dispersion parameter (k) obtained through model calibration and is given by:

$$w = \frac{1}{1 + k\mu}$$

Where: $0 \leq w \geq 1$

μ is the model prediction for *n* years

k is the dispersion parameter

Step 3: Calculating the potential for safety improvement at each location

- Potential for safety improvement is the difference between the expected and predicted number of collisions. Locations with positive PSI values have a potential for safety improvement; the larger the positive value, the greater the potential. Likewise, negative values have limited potential for improvement because the expected number of collisions is less than the predicted number of collisions. **Table 7** and **Table 8** show the locations that have potential for safety improvement in the Study Area.

Table 7 Potential for Safety Improvements for Intersections

Intersection	Fatal/Injury				PDO				Total			
	Observed	Predicted	Expected	PSI	Observed	Predicted	Expected	PSI	Observed	Predicted	Expected	PSI
Embleton Rd.	1	5	2	-2.39	9	11	9	-1.70	10	16	11	-5.10
Steeles Ave.	6	11	7	-3.50	82	21	76	54.75	88	32	84	51.87
Meadowpine Blvd	0	8	2	-5.29	12	15	14	-0.95	12	23	12	-10.61
Hwy 401 WB Off-Ramp	0	8	2	-6.08	6	17	8	-8.64	6	25	7	-18.31
Hwy 401 EB Off-Ramp	0	9	2	-6.35	2	18	4	-13.48	2	27	3	-23.46

Table 8 Potential for Safety Improvements for Road Segments

Road Segment	Fatal/Injury				PDO				Total			
	Observed	Predicted	Expected	PSI	Observed	Predicted	Expected	PSI	Observed	Predicted	Expected	PSI
Embleton Road to Steeles Ave.	5	8.53	5.59	-2.94	24	27.36	24.20	-3.16	29	35.89	29.28	-6.61
Steeles Ave. to Meadowpine Blvd.	2	6.65	2.91	-3.74	7	18.00	7.65	-10.35	9	24.65	1.18	-23.48
Meadowpine Blvd. to Highway 401 WB Off-Ramp	0	3.90	1.14	-2.76	0	10.64	1.03	-9.62	0	14.54	1.14	-13.41
Highway 401 WB Off-Ramp to Highway 401 Eb Off-Ramp	0	5.19	1.23	-3.96	0	14.17	1.05	-13.12	0	19.36	1.16	-18.20

Table 7 shows that among the five intersections analysed, only one of the intersections has a positive PSI values for at least one of the severity types. The PSI value calculated is quite high; hence the intersection has good potential for safety improvement:

- Winston Churchill Boulevard and Steeles Avenue – potential for reduction in PDO collisions.

The remaining four intersections that were analyzed were all calculated to have negative PSI values and therefore there is no requirement for improvement to the overall safety of the intersection.

Table 8 shows that all the road segments within the study area have negative PSI values. Since all the sections show negative PSI values, there is no requirement for safety improvement within these sections of Winston Churchill Boulevard at this time.

3 Road Improvements and Safety Benefits

The existing cross section for Winston Churchill Boulevard between Embleton Road and Highway 401 varies from section to section. The road is predominately a 5-lane undivided road with a two-way left turning lane (TWLTL) through the middle of most sections of the study area. Currently there are no sidewalks along Winston Churchill Boulevard, only at the intersection of Steeles Avenue. The two kilometre section south of Embleton Road contains gravel shoulders on both sides of Winston Churchill. After this section, all the way to approximately 300 metres south of Steeles Avenue, the road contains curbed shoulders. The remaining section of Winston Churchill Blvd contains paved shoulders with guardrails along both sides.

Winston Churchill Blvd is recommended to receive a number of geometric improvements, predominately to accommodate the capacity requirements for existing and future growth. As show in the PSI calculations from the **Section 2.4**, the intersection of Steeles Avenue and Winston Churchill Blvd was the only area within the Study Area to show potential for safety improvement.

Based on the collision analysis, the existing intersection at Steeles Avenue and Winston Churchill Boulevard experiences a high percentage of rear end collisions (53% of the total collisions at this intersection). Of the total rear end collisions, 42 percent occurred on the south leg of the intersection with vehicles travelling northbound on Winston Churchill Boulevard. One possible reason for the high number of collisions could be due to the existing surrounding roadway geometrics. Vehicles travelling northbound approaching Steeles Avenue along Winston Churchill Blvd travel overtop of Highway 401 and approach the intersection on a downhill slope. This is potentially causing drivers to speed up to a point where there is insufficient space available to react to vehicles stopped at Steeles Avenue.

A potential countermeasure to investigate is to install a traffic calming device such as transverse rumble strips along the roadway approaching this intersection from the south. These rumble strips can help to warn drivers to watch their speed and prepare to slow down and stop at the upcoming intersection.

3.1 Collision Modification Factors

Based on the roadway widening and other related pedestrian and cyclist improvements under consideration, collision modification factors were determined to estimate potential increases/decreases in the total collisions along Winston Churchill Boulevard associated with each improvement. The collision modification factors selected are outlined in the following tables.

Converting Roadway from 4 lanes to 6 Lanes

The midblock section between Meadowpine Boulevard and north of Steeles Avenue, 2 kilometres south of Embleton Road, has an existing cross section of 4 lanes. Future improvements to the area recommend that the roadway section from Meadowpine Blvd to Steeles Avenue, be widened to incorporate a six lane cross section by the year 2021. Collision modification factors were obtained from the Collision Modification Clearinghouse for converting from 4 lanes to 6 lanes. Further future improvements recommended that the remaining sections of Winston Churchill Blvd from Meadowpine Blvd to Embleton Rd be widened from a 4 lane to a 6 lane cross section. The results of the CMF's are as follows in **Table 9**.

Table 9 Collision Modifacation Factors for Converting From 4 Lanes to 6 Lanes

CMF	CRF(%)	Crash Type	Crash Severity	Area Type	Reference	Comments
1.25	-25	All	All	Urban	Kononov et al., 2008	

Note: CRF- Collision Reduction Factor, CMF -Collision Modification Factor (1-CRF)

From the provided CMF, it can be anticipated that with the widening from 4 lanes to 6 lanes will contribute to an increase of up to 25 percent in the frequency of all collision types.

Converting Roadway from 3 lanes to 4 Lanes

The midblock section of Winston Churchill Blvd from Steeles Ave to Embleton Rd is currently broken up into two subsections that is split at approximately 2 kilometres south of Embleton Rd. Currently the section on the south side of the split to Steeles Ave has a cross section of 4 lanes. The section north of the split has an existing cross section of 3 lanes with a two way centre left turning lane. Future improvements to

Winston Churchill Blvd recommend that the section north of the split is to be widened to a 4 lane cross section by the year 2021.

The available sources for collision modification factors, for example, the CMF Clearinghouse, provide CMF's for reducing 4-lane undivided roads to 3-lane roads (2 travel lanes and a centre TWLTL) but not the reverse of changing a 3-lane road to a 4-lane road. For this analysis, it has been assumed that an appropriate CMF for the 3-lane to 4-lane conversion would be the reciprocal of the 4-lane to 3-lane case. Data from the CMF Clearinghouse indicates the following CMF's for the 4-lane to 3-lane conversion:

Table 10 Collision Modification Factors for Converting Roadway from 4 Lanes to 3 Lanes

CMF	CRF(%)	Crash Type	Crash Severity	Area Type	Reference	Comments
0.47	53	All	All	Suburban	Persaud et. al, 2010	
0.748	25.2	All	All	Urban	Pawlovich et al., 2006	CMF calculation is for reduction … [*read more*]
0.812	18.8	All	All	Urban	Pawlovich et al., 2006	CMF calculation is for reduction … [*read more*]

The average CMF for all collision types and severities is 0.677, indicating a reduction of approximately 67% in all crashes. Converting a 3-lane road to a 4-lane road would be expected to have the reverse effect, that is, result in an increase in collisions of all types and severities by approximately 48% (1 / 0.677). PDO and fatal/injury collisions in the midblock sections of Winston Churchill Blvd are approximately 61% and 39% of the total collisions, so we expect that a 3-lane to 4-lane conversion will result in the CMF's shown in **Table 11** below.

Table 11 Collision Modification Factors for Converting Roadway from 3 Lanes to 4 Lanes

CMF	CRF(%)	Crash Type	Crash Severity	Area Type
1.19	-19	All	Fatal, Serious Injury, Minor Injury	Suburban
1.29	-29	All	Property Damage Only	Suburban

Note: CRF- Collision Reduction Factor, CMF -Collision Modification Factor (1-CRF)

Addition of Bicycle Lanes

As shown in **Table 12**, research indicates that adding bicycle lanes to a roadway may contribute to a 14 percent increase in all impact types of fatal, serious injury, minor injury collisions and 1 percent increase in all impact types of property damage only collisions can be expected through additional of bicycle lanes to the roadway cross section.

Table 12 Collision Modifacation Factors for Adding Bicycle Lanes

CMF	CRF(%)	Crash Type	Crash Severity	Area Type	Reference	Comments
1.14	-14	All	Fatal, Serious Injury, Minor Injury	Suburban	Jensen, 2008	
1.01	-1	All	Property Damage Only	Suburban	Jensen, 2008	

Note: CRF- Collision Reduction Factor, CMF -Collision Modification Factor (1-CRF)

Approximate Effect of Improvement Combination

The combined effect of incorporating these improvements can be determined by multiplying the collision modification factors of each improvement together.

a) Converting 3-Lane Road to 4-Lane Undivided Road, with dedicated on-road bicycle lanes.

   Combined CMF (Fatal Injury/Injury) = (1.19 x 1.14) = 1.36

   Combined CMF (Property Damage Only) = (1.29 x 1.01) = 1.30

   The combined effect of these improvements is multiplicative, where together they may result in an approximate 36 percent increase in injury collisions and approximate 30 percent increase in PDO collisions.

b) Converting 4-Lane Road to 6-Lane Road with dedicated bicycle lanes.

   Combined CMF (Fatal Injury/Injury) = (1.25 x 1.14) = 1.43

   Combined CMF (Property Damage Only) = (1.25 x 1.01) = 1.26

   The combined effect of these improvements is multiplicative, where together they may result in an approximate 43 percent increase in injury collisions and approximate 26 percent increase in PDO collisions.

Using the calculated factors, the potential increase or decrease in collision frequency can be calculated for each midblock section. In **Table 13** below the results of applying the calculated CMF's are displays for the short term requirements.

Table 13 – Short Term Improvements Potential Increase/Decrease in Collision Frequency

Short Term Improvements			
Highway 401 North Ramp to Meadowpine Boulevard	Convert 4-Lane Roadway to 6-Lane Roadway		
		Fatal/Injury Collisions	PDO Collisions
	Existing Collision Frequency (per year)	0	0
	CMF Applied	1.25	1.25
	Predicted Future Collision Frequency	0	0
	Increase(Decrease) in Collision Frequency per year	**0**	**0**
Meadowpine Boulevard to Steeles Avenue	Convert 4-Lane Roadway to 6-Lane Roadway		
		Fatal/Injury Collisions	PDO Collisions
	Existing Collision Frequency (per year)	0.4	1.4
	CMF Applied	1.25	1.25
	Predicted Future Collision Frequency	+ 0.50	+ 1.75
	Increase(Decrease) in Collision Frequency per year	**0.10**	**0.35**

The conversion of Winston Churchill Boulevard, between Meadowpine Boulevard and Steeles Avenue, from a 4 lane to a 6 lane cross section will see an increase in both fatal/injury and PDO collisions. Fatal/injury collision frequency can expect to increase by **0.10 collisions per year**, and PDO collisions by **0.35 collisions per year. Table 14** below displays the CMF's applied for the medium term improvements at the 2021 horizon year.

Table 14 - 2021 Horizon Potential Increase/Decrease in Collision Frequency

2021 Horizon Year Improvements			
Embleton Road to Steeles Avenue	Convert 3-Lane Roadway to 4-Lane Roadway with Bicycle Lanes		
		Fatal/Injury Collisions	PDO Collisions
	Existing Collision Frequency (per year)	1	4.8
	CMF Applied	1.36	1.30
	Predicted Future Collision Frequency	+ 1.36	6.24
	Increase(Decrease) in Collision Frequency per year	**0.36**	**1.44**

The conversion of Winston Churchill Boulevard, between Steeles Avenue and Embleton Road, from a 3 lane to a 4 lane cross section, with the addition of bicycle lanes, will see an increase in both fatal/injury and PDO collisions. Fatal/injury collision frequency can expect to increase by **0.36 collisions per year**, and PDO collisions by **1.44 collisions per year. Table 15** below displays the CMF's applied for the medium term improvements at the 2031 horizon year.

Table 15 - 2031 Horizon Potential Increase/Decrease in Collision Frequency

2031 Horizon Year Improvements			
Embleton Road to Steeles Avenue	Convert 4-Lane Roadway to 6-Lane Roadway with Bicycle Lanes		
		Fatal/Injury Collisions	PDO Collisions
	Existing Collision Frequency (per year)	1	4.8
	CMF Applied	1.43	1.26
	Predicted Future Collision Frequency	+ 1.43	+ 6.05
	Increase(Decrease) in Collision Frequency per year	**0.43**	**1.25**

The conversion of Winston Churchill Boulevard, between Steeles Avenue and Embleton Road, from a 3 lane to a 4 lane cross section, with the addition of bicycle lanes, will see an increase in both fatal/injury and PDO collisions. Fatal/injury collision frequency can expect to increase by **0.43 collisions per year**, and PDO collisions by **1.25 collisions per year.**

4 Findings and Recommendations

4.1.1 Summary of Findings

The key findings of the safety assessment along the entire study area are summarized below:

Collision Review – Overall Study Area

- A total of 163 collisions occurred along Winston Churchill Boulevard within the study limits. Seventy-six (76) percent of these collisions occurred at intersections for the 6-year period from 2008 to 2013. The remaining twenty-four (24) percent occurred on the road segments;
- The distribution of the collisions from year to year was fairly even from 2009 to 2013, with 2011 experiencing the highest number of collisions. Collision

occurrences were high for the PDO severity type across the study period, and was low for the Non-fatal injury;

- The majority of the collisions occurred between the months of July and August within the 6-year analysis period. Most of these collisions occurred under dry road surface conditions (74 percent of total collisions);

- Rear-end and sideswipe collisions are the most predominant impact type, constituting 65 percent of the total collisions that have occurred along Winston Churchill Boulevard within the study limits;

    - 86 percent of the total rear-end collisions occurred either under proper driving conditions or a result of drivers driving properly and occurred when drivers were following too closely under dry road surface conditions.

- Turning movement collisions constituted 12 percent of the total collisions that have occurred along Winston Churchill Boulevard within the study limits; and

- The majority (32 percent) of the turning movement collisions resulted from drivers driving properly. The remaining collisions occurred as a result of making an improper turn (26 percent), disobeyed traffic control (18 percent) and failed to yield right-of-way (11 percent).

Collision Review – Intersections and Road Segments

- A total of 124 collisions occurred at the study area intersections. There were no fatal collisions reported, 7 non-fatal injury, 111 PDO and 6 non-reportable collisions. With regard to initial impact type, 68 collisions were recorded as rear-end, 13 angle (T-bone), 13 sideswipe, 5 SMV, 18 turning movement, 3 head-on, and 4 as unknown.

- A total of 39 collisions occurred at the study area road segments. There were no fatal collisions, 7 non-fatal injuries, 31 PDO and 1 non-reportable collision. With regard to initial impact type, 16 collisions were recorded as rear-end, 2 angle (T-bone), 8 sideswipe, 3 SMV, 1 turning movement, and 2 head-on collisions.

Individual Locations

Only the intersections of Winston Churchill Boulevard and Steeles Avenue, Winston Churchill Boulevard and Embleton Road and Winston Churchill Boulevard and Meadowpine Boulevard, as well as the road segment of Winston Churchill Boulevard between Embleton Road and Steeles Avenue are discussed here. These locations were identified as those that experienced the highest collision frequency over the 6-year

analysis period. Details for other intersections and road segment locations are provided in **subsection 2.3.2.**

Winston Churchill Boulevard at Steeles Avenue

Ninety (90) collisions were found to be associated with the intersection of Winston Churchill Boulevard and Steeles Avenue during the study period. Eighty-two collisions (82) of the total were recorded as PDO, six (6) as non-fatal-injury collisions and two (2) as non-reportable. The predominant impact type was rear-end (48) collisions. Most of the rear-end collisions occurred as a result of drivers driving properly and a sudden stop on dry road conditions. The majority of the collisions occurred during daylight and under clear environment conditions. Twenty-eight (28) collisions occurred in midday peak hour. Of the remaining collisions twenty-six (26) occurred in the AM peak hour, twenty-two (22) in the PM peak hour, nine (9) in the early morning and the remaining four (4) occurred during the evening period.

Winston Churchill Boulevard at Embleton Road

Thirteen (13) collisions were found to be associated with this intersection during the study period. Nine (9) collisions were reported as PDO, three (3) were non-reportable and one (1) was reported as a non-fatal injury collision. The predominant impact type was rear end (10). Most of the rear-end collisions occurred during proper driving conditions and as a result of a sudden stop under a dry road surface conditions and clear weather. Eight (8) collisions occurred during daylight and eight (8) under clear environment conditions. Seven (7) collisions occurred in evening peak hour, five (5) in the AM peak hour period and the remaining collision (1) occurred in the early morning period.

Winston Churchill Boulevard at Meadowpine Boulevard

Thirteen (13) collisions were found to be associated with this intersection during the study period. Twelve (12) collisions were reported as PDO and one (1) was recorded as non-reportable. The predominant impact type was rear end (6) followed closely by angle collisions (4). All of the rear-end collisions occurred during proper driving conditions and as a result of a sudden stop under a dry road surface conditions. The majority (10) of the collisions occurred during daylight and eleven (11) under clear environment conditions. Four (4) collisions occurred in AM peak hour, one (1) in the early morning period, five (5) in the midday hour, two (2) in the PM peak hour and the remaining collision in the evening.

Winston Churchill Boulevard between Embleton Road and Steeles Avenue

Thirty (30) collisions were found to be associated with this road segment during the study period. Twenty-four (24) of total collisions were recorded as PDO collisions; five

(5) as non-fatal injury collisions and the remaining one (1) was a non-reportable collision. The predominant impact type at this intersection was rear end collisions (15). The majority of collisions occurred during daylight and was a result of drivers following too close. Twenty-five (25) of total collisions occurred during daylight conditions with the remaining four (4) in dark conditions. The majority of collisions occurred during the midday (10) and PM peak hour (14).

Potential for Safety Improvement (PSI)

Among the five intersections analysed only one intersection has a positive PSI value greater than 6.0 for one of the severity types. The intersection of Winston Churchill Blvd at Steeles Ave has a high positive PSI values hence some potential for safety improvement (**Table 7**). The most common collisions at this location are rear-end collisions that may be the result of drivers making sudden unexpected stops due to signal changes or pedestrian movements. Turning movement collisions are also significant and may be the result of drivers failing to yield and making improper turns (during intergreen or on red).

All of the road segments analysed within the study area have either negative or low positive PSI values for at least one of the severity types hence have very limited potential for safety improvement (**Table 8**).

The widening of Winston Churchill Boulevard, between Embleton Road and Steeles Avenue, to include 2 traffic lanes in each direction would likely result in an increase in the number of total collisions experienced in this section. The degree of the increase in collisions will depend on other changes to the cross section such as incorporating bicycle lanes.

Widening of Winston Churchill Blvd, from Highway 401 to Steeles Avenue, to include 3 traffic lanes in each direction will likely result in an increase in the number of total collisions. Winston Churchill Blvd will again be widened between Embleton Road and Steeles Avenue to include 3 travel lanes in each direction. Again, this will contribute to an increase in total collisions experienced. The degree of the increase in collisions will depend on other changes to the cross section for this section such as incorporating bicycle lanes.

These countermeasures will result in increased capacity but may also contribute to increase traffic speeds. Counter measures to ensure traffic speeds remain close to the posted speed limit should be considered with this alternative. These measures could include use of narrower traffic lanes, use of cycle tracks in lieu of simple dedicated bicycle lanes and possibly raised island treatments where interference with local access will not occur.