TRANSPORTATION IMPACT STUDY ADDENDUM

2055 BROCK ROAD
PROPOSED RESIDENTIAL DEVELOPMENT
CITY OF PICKERING, REGIONAL MUNICIPALITY OF DURHAM

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CROZIER
CONSULTING ENGINEERS

Revision Number	Date	Comments
Rev. 0	November 2019	Issued for coordination
Rev. 1	April 2020	First Submission
Rev. 2	August 2021	Internal Review
Rev. 3	September 2021	Second Submission

1.0 Executive Summary

CF Crozier & Associates Inc. (Crozier) was retained by Brock Road Duffins Forest Inc. to undertake a Transportation Impact Study in support of a Zoning By-Law Amendment (ZBA) and Site Plan Application (SPA) for a proposed residential development located at 2055 Brock Road, in the City of Pickering, Regional Municipality of Durham.

The purpose of the study is to assess the impacts of the proposed development on the boundary road network and to recommend any required mitigation measures, if warranted.

The Transportation Impact Study was completed in accordance with the agreed upon Terms of Reference with the City of Pickering and Regional Municipality of Durham's (Durham Region) staff.

First Submission

A Transportation Impact Study (TIS) was previously submitted in April 2020 based on an older development proposal of 307 condominium units, 9 units of street townhouses, and 64 units of stacked townhouses. The addendum herein addresses the City and Region's first submission comments, as well as reviews the changes in the most recent Site Plan.

The revised development suggests a 20-storey residential tower with 328 units, 10 units of street townhouses, and 34 units of back-to-back townhouses. 513 parking spaces are proposed at-grade and underground to facilitate the residential subdivision, and a full-moves site access is also proposed at Usman Road.

Existing Conditions

Although the boundary road network is currently operating at capacity with a level of service (LOS) "D" or better with a maximum control delay of 35.8 seconds and a maximum theoretical volume-to-capacity ratio of 1.24, it was determined that the analysis can be considered conservative as it did not consider drivers proceeding through Brock Road (RR1) and Finch Avenue (RR37) intersection during intergreen phases. The analysis also did not consider "slip through" vehicles in queued traffic at Major Oaks Road intersection. These maneuvers were consistently observed during existing peak period traffic conditions, and thus, marginally improve traffic capacity.

When accounting for driving behaviours observed with a lost time adjustment, the boundary road network operates at a level or service "C" with a maximum control delay of 30.2 seconds and a maximum theoretical volume-to-capacity ratio of 1.11.

The high volume-to-capacity ratios of the boundary road network is primarily attributed to the shared turning and through movement configurations. The boundary road network can marginally improve during existing and immediate short-term future via signal optimization and lost time adjustments. However, road widening along Brock Road (as identified in Durham Region's Transportation Master Plan) will be required in the short to medium term future to accommodate continued traffic growth in the area.

Future Background Conditions

Per correspondence with the City of Pickering and Durham Region staff, future background traffic volumes at the study intersections were determined using a 2% annual compounded growth rate, as well as background trips generated by future development at 2071 Brock Road.

2024 Future Background Conditions

Should Brock Road widening not be implemented by 2024, the following interim improvements are recommended for consideration due to the existing and future background conditions:

- Optimize signal timing at Brock Road and Finch Ave:
  - EBR overlapping Phase with NBL
  - Optimized splits (maintained cycle length)

- Optimize signal timing at Brock Road and Major Oaks Road/Usman Drive:
  - EBR slip lane via pavement marking
  - An increased cycle length of 110 seconds with an advanced southbound left-turn and optimized splits in the weekday a.m. and Friday mid-day peak periods
  - An unchanged cycle length of 100 seconds with optimized splits in the weekday p.m. peak period

With the interim improvements mentioned above, intersection analyses of the 2024 future background traffic volumes indicate the intersection of Brock Road and Finch Avenue is expected to operate at a level of service "F" or better during the weekday a.m., p.m. and Friday mid-day peak periods, with a maximum control delay of 95.0 seconds and maximum theoretical volume-to-capacity ratio of 1.25. The remaining boundary road network is expected to operate with a level of service "D" or better during the weekday a.m., p.m. and Friday mid-day peak periods, with a maximum control delay of 43.9 seconds and maximum theoretical volume-to-capacity ratio of 1.29. As such, Brock Road widening is ultimately recommended by 2024.

Based on the OTM Book 12 signal justifications 1-7, a signal is not required at intersection of Brock Road and Usman Road. Nevertheless, it is recommended as signalization could provide pedestrian and cycling crossing opportunity across Brock Road.

2029 Future Background Conditions

As expected, the boundary road network is anticipated to continue to experience high levels of delay and capacity issues in 2029 future background conditions without road widening. Without road widening, the intersection of Brock Road and Finch Avenue is expected to continue to operate at a level of service "F" during the weekday a.m., p.m. and Friday mid-day peak periods, with a maximum control delay of 138.6 seconds and a maximum theoretical volume-to-capacity ratio of 1.41. The remaining boundary road network is expected to operate at a level of service "E" or better during the weekday a.m., p.m. and Friday mid-day peak periods, with a maximum control delay of 74.2 seconds and maximum theoretical volume-to-capacity ratio of 2.18.

Upon road widening of Brock Road (RR1), intersection analyses indicate that the boundary road network can significantly improve under 2029 future background traffic conditions.

Intersection analyses of the 2029 future background traffic volumes with road widening indicate the intersection of Brock Road and Finch Avenue is expected to operate at an improved level of service "E" or better during the weekday a.m., p.m. and Friday mid-day peak periods, with a maximum control delay of 65.9 seconds and maximum theoretical volume-to-capacity ratio of 1.18. The remaining boundary road network is expected to operate at an improved level of service "D" or better during the weekday a.m., p.m. and Friday mid-day peak periods, with a maximum control delay of 42.5 seconds and a maximum theoretical volume-to-capacity ratio of 1.04.

Future Total Conditions

The proposed residential development is expected to add 121 and 139 unadjusted two-way trips to the boundary road network in the weekday a.m. and p.m. peak periods, respectively.

As the Friday mid-day period between 12:00 p.m. to 4:00 p.m. is not typically associated with residential peak period nor commuter peak period, trips generated in weekday p.m. peak (139 two-way trips) are conservatively applied to all future total Friday mid-day traffic analysis.

As-of-Right Comparisons

When compared to a previously approved Draft Plan for the Subject Property, the proposed development is expected to generate 64 more trips in the weekday a.m. peak hour and 5 less trips in the weekday p.m. and Friday mid-day peak hours.

2024 Future Total Conditions

With the same interim improvements as recommended in the future background analysis, the intersection of Brock Road and Finch Avenue is expected to operate at an unchanged level of service "F" or better during the weekday a.m., p.m. and Friday mid-day peak periods under 2024 future total conditions (without road widening). The intersection is expected to operate with a maximum control delay of 105.8 seconds and a maximum theoretical volume-to-capacity ratio of 1.29. The remaining boundary road network is expected to operate at a level of service "E" or better during the weekday a.m., p.m. and Friday mid-day peak periods, with a maximum control delay of 55.9 seconds and a maximum theoretical volume-to-capacity ratio of 1.72.

2029 Future Total Conditions

Intersection analyses of the 2029 future total traffic volumes (with road widening) indicate that the intersection of Brock Road and Finch Avenue is anticipated to operate at an unchanged level of service "E" or better during the weekday a.m., p.m. and Friday mid-day peak periods. The intersection is expected to operate with a maximum control delay of 71.8 seconds and a maximum theoretical volume-to-capacity ratio of 1.20. The remaining boundary road network is expected to operate at an unchanged level of service "D" or better during the weekday a.m., p.m. and Friday mid-day peak periods, with a maximum control delay of 52.7 seconds and a maximum theoretical volume-to-capacity ratio of 1.08 or less.

In comparison to 2029 future background conditions (with road widening), the subject development does not materially alter the traffic operations at the intersection. Accordingly, the development can be supported from a traffic operations perspective.

The proposed site access is expected to operate efficiently at a level of service "B" or better during weekday a.m., p.m. and Friday mid-day peak periods, with a maximum control delay of 10.6 seconds or less and low maximum volume-to-capacity ratios of 0.21 or less. The proposed site access is supportable from a traffic operations perspective.

The future traffic operations analysis can be considered conservative as it did not account for left-turn vehicles during intergreen phases (no lost time adjustment). The aggressive driving behaviour was observed in the existing turning movement counts, and is equivalent to approximately 72 left-turn vehicles per hour for the intersection of Brock Road (RR1) at Finch Avenue (RR37). Additionally, a peak hour factor of 0.92 for the weekday a.m. and p.m. peak hours was used in all future analyses, this is conservative compared to existing and expected future peak hour factors. Accordingly, the actual traffic operations are expected to be better than indicated above.

Sensitivity Analysis

A sensitivity analysis confirms that when analyzed with the observed PHF of 0.98 (in the weekday p.m. peak hour) the intersection of Brock Road (RR1) and Finch Avenue (RR37) is expected to operate at an improved level of service with reduced maximum control delay and volume-to-capacity ratios. Additionally, the intersection operations can further improve with a cycle length of 110 seconds, as there is an opportunity to implement green light progression along the Brock Road corridor.

It is expected that regular commuters will choose to make a southbound left-turn at the signalized intersection of Brock Road at Major Oaks/Usman Road (north) rather than Brock Road at Usman Road (south) in order to avoid delays. A sensitivity analysis confirms that in the case that 50% of the southbound left-turning traffic at Brock Road and Usman Road (south) turns at Brock Road and Major Oaks/Usman Road (north) instead, the intersection still operates acceptably with no additional improvements required.

Regardless of the improvements, future total conditions are not expected to materially change from future background conditions. The traffic generated by the development does not materially change the traffic operations of the boundary road network. Thus, the proposed development is supportable from a traffic operations perspective, even prior to the planned Brock Road widening.

Assessment of sight distance at the site access indicate that there is sufficient sight distance for vehicles entering and exiting the Subject Property. The sight distance analysis can be considered conservative as the site access is located at the 90-degree bend of Usman Road, forming the third approach of a T-intersection. Vehicles approaching from both directions are not expected to travel at or above the posted speed, towards and exiting the turn. Regardless of the assumed design speed, adequate sight distance is achieved.

Summary of Recommended Improvement

Based on the operations outlined above, a summary of the recommended improvements in outlined below.

Recommended Improvements

Horizon	Recommended Improvements
2024	**Interim:** Optimize signal timing at Brock Road and Finch Ave: • EBR overlapping Phase with NBL • Optimized splits (maintained cycle length) Optimize signal timing at Brock Road and Major Oaks Road/Usman Drive: • EBR slip lane via pavement marking (as is proposed in the Brock Road widening design plates) • An increased cycle length of 110 seconds with an advanced southbound left-turn and optimized splits in the weekday a.m. and Friday mid-day peak periods • An unchanged cycle length of 100 seconds with optimized splits in the weekday p.m. peak period
	Ultimate: Advance Brock Road Widening to 6 Lane Cross-section Signal Optimization Signalization of Brock Road and Usman Road
2029	Brock Road Widening to 6 Lane Cross-section Signal Optimization Signalization of Brock Road and Usman Road

Minimum Parking and Loading Requirements

According to the City of Pickering's Site-specific Zoning By-Law 7085/10 and City of Pickering Area-specific Zoning By-Law 3036, 509 vehicle parking spaces and no bicycle parking or loading spaces are required. As the Site Plan proposes 513 parking spaces, 177 bicycle parking spaces and two loading spaces, the City of Pickering's Zoning By-Law is satisfied.

Transportation Demand Management

The proposed development can be supported by several TDM strategies, including:

- Existing Modal Split
- Transit Network
- Transit Incentives
- Active Transportation Network
- Future Transit Opportunities
- Site Specific TDM measures
    - Marketing & Promotions
    - Secure Bicycle Parking/Excess Bicycle Parking and Bike Repair Stations
    - Bicycle Reimbursement
    - Pre-loaded Presto Cards
    - Priority Rideshare Pickup/Drop-Off Areas
    - Real-Time Transit Information
    - Unbundled and Paid Parking
    - Site Plan Design

The analysis contained within this report was prepared using the most recent Site Plan prepared by Kohn Partnership Architects Inc. Any minor revisions to the Site Plan are not expected to affect the conclusions contained with this report.

In conclusion, the proposed residential development at 2055 Brock Road can be supported from a traffic operations and safety perspective, with the implementations of the noted recommendations.

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2.0 Introduction

2.1 Background

CF Crozier & Associates Inc. (Crozier) was retained by Brock Road Duffins Forest Inc. to undertake a Transportation Impact Study in support of a Zoning By-Law Amendment (ZBA) and Site Plan Application (SPA) for a proposed residential development located at 2055 Brock Road, in the City of Pickering, Regional Municipality of Durham.

The purpose of the study is to assess the impacts of the proposed development on the boundary road network and to recommend any required mitigation measures, if warranted.

The study has been completed in accordance with the agreed upon Terms of Reference with the City of Pickering's and Regional Municipality of Durham's (Durham Region) staff, as well as general conformance with Durham Region's Transportation Impact Study Guidelines, with the associated analyses and findings outlined herein. The Terms of Reference for the study can be found in correspondence included in **Appendix A**.

A Transportation Impact Study (TIS) was previously submitted in April 2020 based on an older development proposal of 307 condominium units, 9 units of street townhouses, and 64 units of stacked townhouses. The addendum herein addresses the City and Region's first submission comments, as well as reviews the changes in the most recent Site Plan. The first submission comment response matrix is included in **Appendix B.**

2.2 Development Proposal

According to the updated Site Plan dated August 12, 2021, the proposed residential development will consist of a 20-storey tower with 328 residential units, 10 street townhouses, and 34 back-to-back townhouses. A total of 513 parking spaces are proposed at-grade and underground to facilitate the overall residential subdivision. A full-moves site access is also proposed at Usman Road. The full buildout is estimated to occur within five years (2024).

Table 1 summarizes the proposed development statistics. The most recent Site Plan and the site location are illustrated in **Figure 1** and **Figure 2,** respectively.

Table 1
Development Statistics

Proposed Development	Number of Units
Block A Residential Tower High Rise w. 4 storey podium	328
Block B Street Townhouse 3 storeys	10
Block C & D Back-to-Back Townhouses 3 storeys	34
Total	**372**
Parking & Loading Supply	
Surface	37
Underground Garage	476
Total Vehicle Parking	**513**
Loading Space	Type G – 2 Provided
Bicycle Parking	177

3.0 Existing Conditions

3.1 Development Lands

The Subject Property covers an area of approximately 1.3 ha and currently consists of an open, vacant field. The site lies within a residential neighbourhood and is bound by Usman Road to the north, empty greenfield to the east, forest areas to the south, and Brock Road (Regional Road RR1) to the west.

3.2 Study Area

The study area encompasses the boundary road network surrounding the Subject Property as described in **Section 3.3**. The Transportation Impact Study analyzes the following intersections as agreed upon in the Terms of Reference with the City of Pickering and Durham Region, attached in **Appendix A**.

- Brock Road (RR 1) at Usman Road
- Brock Road (RR1) at Major Oaks Road/Usman Road
- Brock Road (RR1) at Finch Avenue (RR 37)
- Usman Road at Site Access

3.3 Boundary Road Network

The boundary road network is described in **Table 2** and illustrated in **Figure 3**.

Table 2
Boundary Road Network

Feature	Roadway			
	Major Oaks Road	**Finch Avenue (RR37)**	**Usman Road**	**Brock Road (RR 1)**
Direction	Two-Way (East-West)	Two-Way (East-West)	Two-Way (East-West)	Two-Way (North-South)
Classification	Collector	Major Arterial (Local to the east of Brock)	Local (Prop. Collector)	Major Arterial
Jurisdiction	City of Pickering	West of Brock: Durham Region East of Brock: City of Pickering	City of Pickering	Durham Region
Speed Limit	50 km/h (assumed)	West of Brock: 60 km/h (posted) East of Brock: 40 km/h (posted)	40 km/h (posted)	60 km/h (posted)
Span	Usman Road to Meriadoc Drive	Scarborough Pickering Townline (City Boundary) to Bluebird Crescent	Brock Road (RR1) to Brock Road (RR1) at Major Oaks Road	Uxbridge Pickering Townline (City Boundary) to Private Property at Montgomery Parks Road

Table 2
Boundary Road Network (Continued)

Feature	Major Oaks Road	Finch Avenue (RR37)	Usman Road	Brock Road (RR 1)
Major Arterial Intersections	Brock Road (RR1)	Brock Road (RR1), Whites Road (RR38), Glendale Drive (RR29), Alton Road (RR27), Scarborough Pickering Townline (RR30)	Brock Road (RR1)	Central St/Ninth Concession Rd (RR5), Seventh Concession Rd (RR31), Highway 7, Fifth Concession Road, Taunton Road (RR4), Peter Matthews Drive, Finch Avenue (RR37), Kingston Rd (Hwy 2), Bayly St (RR22)
Number of lanes total	Two travel lanes	Four Travel lanes East of Brock: Two travel lanes	Two travel lanes	Four travel lanes
Median type	None	None	None	Concrete Median
Pedestrian Facilities	Yes	Yes (South side)	Yes	Yes
Cycling Facilities	No	No	No	No
On-Street Parking	Yes	No	No	No

3.4 Existing Pedestrian and Cycling Movements

According to the City of Pickering's Zoning map, the Subject Property is located in the eastern limits of the City, in a residential neighbourhood abutting open space (recreational) areas. Sidewalks are provided on majority of the roadways while no cycling facilities are provided.

3.5 Transit Operations

Durham Region Transit (DRT) operates local and regional transit services for Durham Region. Specifically, DRT provides services to the City of Oshawa, Municipality of Clarington, Town of Whitby, Town of Ajax, City of Pickering, Townships of Brock, Scugog and Uxbridge. GO Transit is a regional transit services offered by Metrolinx (Province of Ontario) connecting passengers across the Golden Horseshoe region of Ontario.

Major transit hubs near the Subject Property include Pickering GO Station, Pickering Parkway Terminal and Ajax GO station. **Table 3** below outlines the existing transit routes, direction, days of operation, peak hour headways, and the location of bus stops in the study area.

Table 3
Existing Transit Services

Route	Direction	Span	Days of Operation	Peak Hour Headways (min)	Bus Stops in Study Area
111 East Pickering	East-West	Pickering Parkway Terminal to Pickering Parkway Terminal (Loop services)	Monday to Sunday	20-33	Brock Rd at Finch Ave (350 metres south; 5 min walk)
112 Brock	North-South	Pickering GO to William Jackson at Brock Road	Monday to Sunday	13-16	Bus Stop #1846 (Fronting Subject Property)
193B Pickering Community Route	n/a	Pickering Town Centre to Pickering Town Centre (Loop Services)	Monday to Saturday	n/a	Brock Rd. at Kingston Rd. (650 metres south; 8 min walk)
291 Ajax Community Route	North-South	Pickering Town Centre To Westney at Harwood	Monday to Sunday	60	Brock Rd. at Kingston Rd. (650 metres south; 8 min walk)
603 Pickering - Port Perry	North-South	Pickering Parkway Terminal to Port Perry Terminal	Monday to Friday	60	Bus Stop #1846 (Fronting Subject Property)
900 PULSE Highway 2	East-West	Centennial Circle to Richmond at Ontario	Monday to Sunday	10	Brock Rd. at Kingston Rd. (650 metres south; 8 min walk)
916 Rossland	East-West	Pickering Parkway Terminal to Harmony Terminal	Monday to Sunday	15-20	Bus Stop #1846 (Fronting Subject Property)
GO Transit 92 Oshawa/Yorkdale	East-West	Yorkdale Bus Terminal to Oshawa Bus Terminal	Monday to Sunday	30	Brock Rd. at Kingston Rd. (650 metres south; 8 min walk)

The transit services described above, provide residents and visitors in the City of Pickering frequent, easily accessible and direct transit services throughout the City and Region. In addition, major employment, commercial and tourist attractions such as Downtown Toronto, Oshawa, or greater Toronto areas can be accessed using GO Transit, via direct bus connection at Pickering GO or Ajax GO. As such, transit is a convenient mode of transport for both residents and visitors of this proposed development.

Appendix C contains relevant transit information.

3.6 Traffic Data

Turning movement counts for the study intersections were conducted by Spectrum Traffic Data Inc. staff on Tuesday October 8th, 2019 between 7:00 a.m. to 9:00 a.m., 4:30 p.m. to 7:00 p.m., as well as on Friday October 18th, 2019 between 12:00 p.m. to 4:00 p.m. to reflect the typical commuter peak periods of the roadway and the peak periods of a residential property. Signal timing plans were provided by Durham Region staff for modelling purposes.

Intersection analysis for existing conditions was conducted utilizing peak hour factors (PHFs) calculated for each intersection for each peak period. **Table 4** below outlines the calculated peak hour factors at each intersection.

Table 4
Peak Hour Factors

Intersection	Peak Hour	Intersection Peak Hour Factor
Brock Road (RR1) at Finch Avenue (RR37)	Weekday A.M. 7:30 a.m. – 8:30 a.m.	0.97
	Weekday P.M. 4:45 p.m. – 5:45 p.m.	0.98
	Friday Mid-day 3:00 p.m. to 4:00 p.m.	0.89
Brock Road (RR1) at Major Oaks Road/Usman Road	Weekday A.M. 7:30 a.m. – 8:30 a.m.	0.95
	Weekday P.M. 4:45 p.m. – 5:45 p.m.	0.97
	Friday Mid-day 3:00 p.m. to 4:00 p.m.	0.84
Brock Road (RR1) at Usman Road	Weekday A.M. 7:30 a.m. – 8:30 a.m.	0.97
	Weekday P.M. 4:45 p.m. – 5:45 p.m.	0.96
	Friday Mid-day 3:00 p.m. to 4:00 p.m.	0.90

The traffic count data and signal timing cards are provided in **Appendix D**. **Figure 4** illustrates the 2019 existing traffic volumes.

3.7 Intersection Modelling

The intersection operations are modelled based on default parameters provided by Synchro 10 and Sim Traffic 10, as well as in general conformance with Durham Region's Transportation Impact Study Guidelines.

3.8 Intersection Operations

The operations of the critical intersections were analyzed based on the traffic volumes illustrated in **Figure 4,** 2019 Existing Traffic Volumes. Analysis of all intersections were based on signal timings as provided by Durham Region. Level of Service definitions are included in **Appendix E.** Signal timing plans have been included in **Appendix D**.

Table 5 outlines 2019 existing traffic level of service for the counts taken at the study intersections under existing conditions and geometric configurations. Intersection PHFs as outlined in **Table 4,** are applied. Detailed capacity analyses are included in **Appendix F.**

Table 5
2019 Existing Level of Service

Intersection	Control	Peak Hour	Level of Service[1]	Control Delay	Maximum V/C Ratios[2]	95th Percentile Queue > Storage Length
Brock Road (RR1) at Finch Avenue (RR37)	Signalized	A.M.	C	29.4 s	1.02 (SBTR)	None
		P.M.	D	35.8 s	1.24 (EBLT)	85.7 m > 63.0 m (NBL)
		Friday Mid-day	C	31.7 s	1.11 (EBLT) 0.96 (NBL)	68.9 m > 63.0 m (NBL) 16.3 m > 13.0 m (SBL)
	Signalized (With Loss Time[3])	P.M.	C	30.2 s	1.11 (EBLT)[3]	85.7 m > 63.0 m (NBL)
		Friday Mid-day	C	28.5 s	0.99 (EBLT)[3] 0.96 (NBL)	68.9 m > 63.0 m (NBL) 16.3 m > 13.0 m (SBL)
Brock Road (RR1) at Major Oaks Road/Usman Road	Signalized	A.M.	C	24.8 s	1.01 (WBL)	28.8 m > 20.0 m (WBL)
		P.M.	A	9.2 s	0.81 (WBL)	21.6 m > 20.0 m (WBL)
		Friday Mid-day	B	16.9 s	0.94 (WBL)	36.3 m > 20.0 m (WBL)
Brock Road (RR1) at Usman Road	One-Way Stop Controlled	A.M.	B	10.9 s	0.59 (SBT)	None
		P.M.	B	10.9 s	0.63 (NBT)	None
		Friday Mid-day	B	12.6 s	0.61 (NBT)	None

Note1: The Level of Service of a signalized intersection is based on the average control delay per vehicle. The level of Service of a stop-controlled intersection is based on the minor (stopped) approach control delay per vehicle.
Note2: The critical v/c ratio is considered to be the maximum v/c ratio at the intersection. All v/c ratios greater than 0.90 are outlined and highlighted.
Note3: A lost time adjustment of -3.0 seconds was added to the eastbound left turn movement at Finch Avenue as aggressive driving behaviour was consistently observed at the intersection during the weekday p.m. and mid-day peak periods.

Without Lost Time Adjustments:

The signalized intersection of Brock Road (RR1) and Finch Avenue (RR37) is currently operating at a level of service "D" during the weekday p.m. peak period, and level of service "C" during the weekday a.m. and Friday mid-day peak periods. The intersection's maximum control delay is 35.8 seconds or less, and the theoretical maximum volume-to-capacity ratios are 1.02 (SBTR), 1.24 (EBLT) and 1.11 (EBLT) in the weekday a.m., p.m. and Friday mid-day peak hours, respectively.

The signalized intersection of Brock Road (RR1) at Major Oaks Road/Usman Road is currently operating at a level of service "C" or better during the weekday a.m., p.m. and Friday mid-day peak periods. The intersection is operating at a moderate control delay of 24.8 seconds or less and a theoretical maximum volume-to-capacity ratio 1.01 (WBL) or less.

Although the signalized intersection of Brock Road (RR1) at Major Oaks/Usman Road appears to be operating at capacity, the analysis above can be considered conservative as a single eastbound lane was assumed. As Major Oaks Road has more than 5.7 metres in width for both directions of traffic, right turn vehicles have adequate room to slip through queued left-turn and through traffic. These slip through maneuvers were consistently observed during the turning movement counts.

Lastly, the one-way stop-controlled intersection of Brock Road (RR1) at Usman Road is currently operating at a level of service "B" during the weekday a.m., p.m. and Friday mid-day peak periods. The intersection is operating with low control delays of 12.6 seconds or less, and a maximum volume-to-capacity ratio of 0.63 (NBT) or less. These metrics indicate that the stop-controlled intersection is operating efficiently with acceptable delays and reserve capacity to accommodate future traffic growth.

With Lost Time Adjustments:

As eastbound left-turn drivers were consistently observed to proceed through the intersection of Brock Road (RR1) and Finch Avenue (RR37) during the intergreen phases, -3.0 seconds lost time adjustment was applied to the left turn movement during the weekday p.m. and Friday mid-day peak periods. Reduced theoretical maximum volume-to-capacity ratios of 1.11 (EBLT) and 0.99 (EBLT) in the weekday p.m. and Friday mid-day peak hours, respectively, were calculated in the revised operations analysis. Regardless of the lost time adjustments, these metrics indicate that the intersection is currently operating at capacity with moderate delays.

While the intersection is operating at capacity, the intersections and the eastbound left turn delays are still acceptable and are typical for major arterials roadways during commuter peak periods. Due to the low opposing westbound and pedestrian volumes, all eastbound traffic can proceed through the intersection within one or a maximum of two cycle lengths. Likewise, northbound left turn vehicles can proceed through the intersection within one or two cycles.

Recommended Improvements

Signal optimization can reduce maximum volume-to-capacity ratios for the signalized intersection of Brock Road (RR1) at Finch Avenue (RR37). The high volume-to-capacity ratios shown above are associated with the high eastbound left-turn volumes, coupled with high eastbound right-turn volumes, as well as the geometric constraints of the intersection (i.e., shared left-through eastbound configuration). Accordingly, to minimize aggressive driving behaviour and to improve existing traffic operations, a signal optimization is recommended. Based on the previously submitted TIS, signal optimization (existing cycle length maintained) with the implementation of an overlapping eastbound right-turn phase with the northbound left-turn phases can sufficiently reduce the volume-to-capacity ratio, as such future analysis scenarios simulate the signalized intersection of Brock Road (RR1) at Finch Avenue (RR37) with an optimized signal timing plan.

Next, based on the previously submitted TIS, a reconfigured eastbound lane and optimized signal timing plan can significantly improve operations at the intersection of Brock Road and Major Oaks/Usman Road (north). Eastbound vehicles can slip through queued left or through vehicles, thus

effectively reducing the intersection's control delay, as well as improving eastbound and westbound operations to well below a volume-to-capacity ratios of 1.0. Hence, all future analysis scenarios simulate the signalized intersection of Brock Road (RR1) at Major Oaks Road/Usman Road (north) with an exclusive eastbound right-turn lane consistent with observed driver behaviour, and an optimized signal timing plan.

4.0 Future Background Conditions

4.1 Horizon Years

The Subject Development is anticipated to be fully built out and operational prior to 2024; therefore, horizon years of 2024 and 2029 are assumed, as agreed upon in the Terms of Reference with the City of Pickering and Durham Region.

4.2 Growth Rate

Due to inconclusive historical AADT data obtained from Durham Region, per discussion with Region staff, a 2% annual compounded growth rate is assumed for all traffic movements in future traffic analysis.

4.3 Proposed Road Improvements

Based on a review of recommended capital works, future road improvements are being planned in order to accommodate further traffic growth in the Region and to improve traffic safety and efficiency. Per Durham Region's Transportation Master Plans, Brock Road (RR1) is proposed to be widened from 5 to 7 lanes in the medium to long term future (est. 2027-2031). Similarly, Finch Avenue (RR37) is proposed to be widened from two lanes to three lanes throughout the corridor between Brock Road (RR1) and Altona Road in 2022-2026. These improvements are expected to increase the boundary road network capacity, improve traffic flow and ultimately reduce delays and queues throughout the network.

Per discussion with the Region, construction of the Brock Road widening is currently forecasted beyond 2031. As such, Brock Road widening is not considered for the 2024 future analysis and operations with and without road widening have been included for the 2029 future analysis.

The road widening scenarios have been modelled based on the road design plates dated June 26th, 2014, presented in Appendix B.11 of the Brock Road Environmental Assessment. In addition, it is understood that the Brock Road widening will be used as curbside high occupancy vehicle (HOV) lane. As a result, all future analyses with road widening considered, were modelled using a lane utilization factor of 0.8 with the assumption that 20% is the HOV lane usage.

The road widening design plates are included in **Appendix D**. Relevant excerpts of the Transportation Master Plan are included in **Appendix G**.

4.4 Background Developments

Aside from the 2065-2071 Brock Road building addition, no significant background developments have been identified within the study area per the City of Pickering's development application map. Accordingly, in consultation with the City and Region, it is assumed that any other developments in the area will be accounted for in the assumed annual compounded growth rate of 2%.

2065-2071 Brock Road Development

The adjacent property to the north, 2065-2071 Brock Road, proposes a three-storey building addition of 3,419.24 square metres. The background trip generation and trip assignments are included in future traffic operations analysis per the background Traffic Impact Study provided.

Relevant excerpt of the background Traffic Impact Study is included in **Appendix H**. **Figure 5** summarizes the trip assignment as provided by the background Traffic Impact Study.

4.5 Intersection Operations

Tables 6 and **7** outline 2024 and 2029 future background's level of service associated with the boundary road network based on the future background traffic volumes illustrated in **Figures 6** and **Figure 7**, with detailed capacity analyses included in **Appendix F**. It is noted that future traffic analysis does not account for lost time adjustments, and a default PHF of 0.92 is assumed for weekday a.m. and p.m. peak hours. As requested by the Region, existing PHFs for the Friday mid-day peak hour were maintained for all future analysis as the lower of the two PHFs (existing PHFs vs. Synchro default PHFs) was used for conservative analysis.

As noted in **Section 3.8,** an optimized signal timing plan is recommended and has been applied to the intersection of Brock Road (RR1) and Finch Avenue (RR37). The optimized signal timing plan proposes an unchanged existing cycle length, with optimized splits and implementation of an overlapping eastbound right-turn phase with the northbound left-turn phase.

In addition, an optimized signal timing plan was applied to the intersection of Brock Road (RR1) and Major Oaks/Usman Road. The optimized signal timing plan consists of:

- An increased cycle length of 110 seconds with an advanced southbound left turn and optimized splits in the weekday a.m. and Friday mid-day peak periods
- An unchanged cycle length of 100 seconds with optimized splits in the weekday p.m. peak period

Furthermore, the intersection of Brock Road (RR1) and Major Oaks/Usman Road was modelled with an exclusive eastbound right-turn lane, as mentioned in the existing conditions.

These optimized signal timing plans and improvements have been carried through all future analysis scenarios.

Table 6
2024 Future Background Level of Service (optimized without Road Widening)

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Maximum V/C Ratios[2]	95th Percentile Queue > Storage Length
Brock Road (RR1) at Finch Avenue (RR37)	Signalized Intersection (Optimized with overlapping phase)	A.M.	F	95.0 s	1.25 (SBTR)	None
		P.M.	F	88.2 s	1.17 (NBTR) 1.09 (EBLT) 1.05 (NBL) 1.08 (SBTR)	105.8 m > 63.0 m (NBL) 16.7 m > 13.0 m (SBL)
		Friday Mid-day	E	67.3 s	1.12 (NBL) 1.06 (EBLT) 1.09 (NBTR) 1.00 (SBTR)	101.1 m > 63.0 m (NBL) 13.7 m > 13.0 m (SBL)
Brock Road (RR1) at Major Oaks Road/Usman Road	Signalized (Reconfigured and optimized)	A.M.	D	41.1 s	1.03 (SBTR)	44.1 m > 30.0 m (EBR) 54.5 m > 20.0 m (WBL) 106.6 m > 60.0 m (SBL)
		P.M.	C	23.6 s	0.98 (NBT)	31.4 m > 30.0 m (EBR) 52.3 m > 20.0 m (WBL)
		Friday Mid-day	D	43.9 s	1.05 (NBT)	40.1 m > 30.0 m (EBR) 59.4 m > 20.0 m (WBL)
Brock Road (RR1) at Usman Road	One-Way Stop Controlled	A.M.	B	10.9 s	0.71 (SBT)	134.4 m > 60.0 m (SBL)
		P.M.	B	12.3 s	1.12 (SBL)	89.5 m > 60.0 m (SBL)
		Friday Mid-day	B	14.4 s	1.29 (SBL)	125.7 m > 60.0 m (SBL)

The signalized intersection of Brock Road (RR1) at Finch Avenue (RR37) is expected to operate at a level of service (LOS) "F" or better. Although the intersection is still expected to operate at capacity, with a maximum theoretical volume-to-capacity ratio of 1.25, these conditions are consistent with 2019 existing traffic operations. The maximum control delay is expected to be 95.0 seconds or less and northbound and southbound left-turn queued vehicles are expected to continue to exceed the

storage length provided. Nevertheless, vehicles are not expected to impede downstream intersections. These delays, observed and warranted by existing conditions, were worsened by future background traffic growth in the area.

Accordingly, due to the high volume-to-capacity ratios and the high turning movement volumes in the existing and future background traffic, Brock Road improvement and road widening as identified in Durham Region's Transportation Master Plan, should be considered by 2024 by the Region, in light of ongoing development within the City. However, even in the absence of advancing the Brock Road widening, the intersection control delay is still considered acceptable for arterial intersections.

It is also noted that the future background analysis herein, did not account for left turns during intergreen as observed in the existing turning movement counts. As an average of two left-turn vehicles proceed during each cycle's intergreen phases, increase in northbound left turn capacity by approximately 72 left-turns per hour were not accounted for in the operation analysis above (using existing 100 seconds per cycle length, 36 cycles per hour, 2 left turns per intergreen). Thus, the above analysis can be considered conservative.

Furthermore, as requested by the Region, Synchro default PHFs of 0.92 were used during the weekday a.m. and p.m. peak hours. As the existing PHFs were well above 0.92 during existing weekday a.m. and p.m. conditions, the above analysis can once again be considered conservative.

Alternatively, the signalized intersection of Brock Road (RR1) at Finch Avenue (RR37) may be re-configured to a dedicated eastbound left turn with shared eastbound through-right turn (instead of shared left-through with dedicated eastbound right-turn). Such improvement can also improve maximum volume-to-capacity ratios; however, the intersection is still expected to operate at capacity. As this improvement may requires a physical realignment of the receiving eastbound lane and modification to the south-east intersection curb radius, such interim improvement is not ideal. Accordingly, signal optimization with overlapping eastbound right-turn protected green phase is recommended in the interim scenario should the road widening not occur by 2024 as this is the least intrusive and cost-effective method of improving traffic operations temporarily.

The signalized intersection of Brock Road (RR1) at Major Oaks/Usman Road is expected to operate at a level of service "D" or better. Although the intersection is still operating at capacity, with a maximum theoretical volume-to-capacity ratio of 1.05, these conditions are consistent with 2019 existing traffic operations. The maximum control delay is expected to be 43.9 seconds or less and westbound and southbound left-turn and eastbound right-turn queued vehicles are expected to continue to exceed the storage length provided. Nevertheless, vehicles are not expected to impede downstream intersections. These delays, observed and warranted by existing conditions, worsen by future background traffic growth in the area.

The one-way stop-controlled intersection of Brock Road (RR1) Usman Road is expected to operate at an unchanged level of service "B". The southbound left-turn movement of the intersection is expected to operate at capacity, with a maximum theoretical volume-to-capacity ratio of 1.29. The maximum control delay is expected to be 14.4 seconds or less and southbound left-turn queued vehicles are expected to exceed the storage length provided. Nevertheless, vehicles are not expected to impede downstream intersection.

Table 7
2029 Future Background Level of Service (without Road Widening)

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Max V/C Ratios[2]	95th Percentile Queue > Storage Length
Brock Road (RR1) at Finch Avenue (RR37)	Signalized (Optimized with overlapping phase)	A.M.	F	138.6 s	1.41 (SBTR)	None
		P.M.	F	129.1 s	1.29 (NBTR) 1.21 (EBLT) 1.15 (NBL) 1.18 (SBTR)	105.0 m > 63.0 m (NBL) 17.4 m > 13.0 m (SBL)
		Friday Mid-day	F	104.2 s	1.23 (NBL) 1.17 (EBLT) 1.20 (NBTR) 1.10 (SBTR)	102.1 m > 63.0 m (NBL)
Brock Road (RR1) at Major Oaks Road/Usman Road	Signalized (Reconfigured & optimized)	A.M.	E	70.8 s	1.16 (SBTR)	40.6 m > 30.0 m (EBR) 31.3 m > 20.0 m (WBL) 110.8 m > 60.0 m (SBL)
		P.M.	D	46.4 s	1.08 (NBTR)	40.8 m > 30.0 m (EBR) 31.0 m > 20.0 m (WBL) 83.1 m > 72.0 m (NBL) 136.9 m > 60.0 m (SBL)
		Friday Mid-day	E	74.2 s	1.18 (NBTR) 0.93 (NBL) 0.90 (SBTR)	44.7 m > 30.0 m (EBR) 32.2 m > 20.0 m (WBL) 80.1 m > 72.0 m (NBL) 145.3 m > 60.0 m (SBL)
Brock Road (RR1) at Usman Road	One-Way Stop Controlled	A.M.	B	10.9 s	0.79 (SBT)	159.4 m > 60.0 m (SBL)
		P.M.	B	12.3 s	1.89 (SBL)	166.2 m > 60.0 m (SBL)
		Friday Mid-day	B	15.0 s	2.18 (SBL)	167.1 m > 60.0 m (SBL)

Note[1]: The Level of Service of a signalized intersection is based on the average control delay per vehicle. The level of Service of a stop-controlled intersection is based on the minor (stopped)approach control delay per vehicle.

Note2: The critical v/c ratio is considered to be the maximum v/c ratio at the intersection. All v/c ratios greater than 0.90 are outlined and highlighted.

As shown above, the boundary road network is expected to continue to experience high levels of delay and expected to continue to experience capacity issues in 2029. Accordingly, road widening is recommended by 2024 future background conditions and is required by 2029 future background conditions. **Table 8** in **Section 4.7** below, outlines the traffic conditions with road widening accounted for in 2029 future background conditions.

It is noted that while the southbound left-turn movement at the intersection of Brock Road and Usman Road is anticipated to operate over capacity and with queue lengths exceeding storage lengths, it is expected that frequent commuters will choose to turn left at the signalized intersection of Brock Road and Major Oaks/Usman Road to avoid delays. This scenario is analyzed in a sensitivity analysis included in **Section 7.0**.

4.6 Signal Warrant

As requested by the City of Pickering staff, a signal warrant analysis was conducted at the existing one-way stop-controlled intersection of Brock Road at Usman Road (south).

Based on OTM Book 12's signal warrant guidelines, signals are not warranted at the one-way stop-controlled intersection of Brock Road at Usman Road (south) under 2029 future total conditions. However, it is recommended to construct the necessary underground provisions for future signalization. Signal warrant analysis results can be found in **Appendix I.**

Although not warranted under OTM Book 12 conditions, signalization could provide benefits, such as pedestrian and cycling crossing opportunity across Brock Road. Due to the residential nature of the Subject Site, and the residential, and recreational nature of the neighbourhood across Brock Road (i.e., Brock Ridge Community Park, Pine Ridge Secondary School, Beverley Morgan Park etc.), high pedestrian and cycling crossing volumes are expected. Thus, the Region can consider signalization in the context of future widening of Brock Road.

It is understood that at this time, the Region does not support signalization at the intersection of Brock Road and Usman Road (south) due to concerns regarding intersection spacing and plans for Brock Road widening. Based on a preliminary review, the signalized intersection spacing between Brock Road at Usman Road (South) and Brock Road at Usman Road (North)/Major Oaks Road is over 200 metres. As signalized intersection spacing of 163 metres are observed to the south (see Brock Road at Pickering Parkway), and intersection spacing of 250 metres are observed to the south (see Brock Road at Finch Avenue, and Brock Road at Kingston Road), such 'closely' spaced signalized intersection conditions are not atypical. Signal coordination and/or slave-master signal operations can adequately support the two "closely spaced" intersections, if required.

As shown below in **Table 8**, the intersection is expected to operate acceptably with no capacity issues and low delays, post-road widening.

4.7 2029 Future Background with Road Widening

Table 8
2029 Future Background Level of Service (with Road Widening)

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Max V/C Ratios[2]	95th Percentile Queue > Storage Length
Brock Road (RR1) at Finch Avenue (RR37)	Signalized (Optimized)	A.M.	C	29.8 s	0.98 (SBT)	None
		P.M.	E	65.9 s	1.18 (EBL) 1.05 (NBL) 1.11 (NBT)	101.4 m > 63.0 m (NBL) 25.4 m > 13.0 m (SBL)
		Friday Mid-day	D	47.8 s	1.09 (EBL) 1.05 (NBT)	91.7 m > 63.0 m (NBL)
Brock Road (RR1) at Major Oaks Road/Usman Road	Signalized (Optimized)	A.M.	C	27.4 s	0.90 (SBTR)	43.6 m > 30.0 m (EBR) 55.7 m > 20.0 m (WBL)
		P.M.	C	29.9 s	0.95 (NBTR) 0.90 (NBL) 0.94 (SBL)	32.4 m > 30.0 m (EBR) 58.2 m > 20.0 m (WBL) 91.7 m > 72.0 m (NBL)
		Friday Mid-day	D	42.5 s	1.04 (NBTR) 0.91 (NBL)	37.8 m > 30.0 m (EBR) 53.0 m > 20.0 m (WBL) 72.8 m > 72.0 m (NBL)
Brock Road (RR1) at Usman Road	One-Way Stop Controlled	A.M.	B	10.9 s	0.52 (SBT)	None
		P.M.	B	11.6 s	0.64 (WBR, NBTR)	105.8 m > 60.0 m (SBL)
		Friday Mid-day	B	13.0 s	0.56 (NBTR)	111.2 m > 60.0 m (SBL)

Note1: The Level of Service of a signalized intersection is based on the average control delay per vehicle. The level of Service of a stop-controlled intersection is based on the minor (stopped)approach control delay per vehicle.
Note2: The critical v/c ratio is considered to be the maximum v/c ratio at the intersection. All v/c ratios greater than 0.90 are outlined and highlighted.

With the road widening improvement, as shown in **Table 8**, the signalized intersection of Brock Road (RR1) and Finch Avenue (RR37) is expected to operate at an improved level of service "C", "E", and "D" during the weekday a.m., p.m., and Friday mid-day peak periods, respectively, under 2029 future

background traffic conditions. The intersection is expected to experience a maximum control delay of 65.9 seconds or less, and maximum volume to-capacity ratios of 0.98 (SBT), 1.18 (EBL), and 1.09 (EBL) during the weekday a.m., p.m. and Friday mid-day peak periods, respectively. These metrics indicate that the intersection is expected to improve upon the road widening.

Similarly, the signalized intersection of Brock Road (RR1) at Major Oaks Road/Usman Road, is expected to operate at a level of service "D" or better during the weekday a.m., p.m. and Friday mid-day peak hours in 2029 future background traffic conditions. The intersection is expected to operate at a maximum control delay of 42.5 seconds or less, and maximum volume to-capacity ratios of 0.90 (SBTR), 0.95 (NBTR), and 1.04 (NBTR) during the weekday a.m., p.m. and Friday mid-day peak periods, respectively. These metrics indicate that the intersection is expected to improve upon the road widening.

The one-way stop-controlled intersection of Brock Road (RR1) at Usman Road is expected to operate efficiently at a level of service "B" during the weekday a.m., p.m. and Friday mid-day peak hours in 2029 future background traffic conditions. The intersection is expected to operate at a maximum control delay of 13.0 seconds or less and a maximum volume-to-capacity ratio of 0.64 (WBR, NBTR) or less. These metrics indicate that intersection is expected to improve upon the road widening and operate efficiently with low control delays and reserve capacity to accommodate future increases in traffic volume.

Accordingly, traffic operations are expected to improve significantly upon the road widening of Brock Road (RR1) as recommended in the Region's Transportation Master Plan.

4.8 Summary of Recommended Improvements

The simulations and future background conditions herein did not account for left turns during intergreen phases, as observed during 2019 existing traffic counts. Thus, an increased left turning capacity of 72 vehicles per hour were not accounted for at all intersections, and the analysis above can be considered conservative. Additionally, a peak hour factor (PHF) of 0.92 for the weekday a.m. and p.m. peak hours was used in all future analyses. This may be considered conservative as higher PHFs were observed in existing conditions. Accordingly, the actual future traffic operations are expected to be better than indicated above.

Based on the operations outlined above, a summary of recommended improvements is outlined in **Table 9.**

Table 9
Recommendation Summary

Horizon	Recommended Improvements
2024	**Interim:** Optimize signal timing at Brock Road and Finch Ave: • EBR overlapping Phase with NBL • Optimized splits (maintained cycle length) Optimize signal timing at Brock Road and Major Oaks Road/Usman Drive: • EBR slip lane via pavement marking • An increased cycle length of 110 seconds with an advanced southbound left-turn and optimized splits in the weekday a.m. and Friday mid-day peak periods • An unchanged cycle length of 100 seconds with optimized splits in the weekday p.m. peak period
	Ultimate: Advance Brock Road Widening to 6 Lane Cross-section Signal Optimization Signalization of Brock Road and Usman Road
2029	Brock Road Widening to 6 Lane Cross-section Signal Optimization Signalization of Brock Road and Usman Road

By 2024 future background conditions without road widening, the traffic operations are expected to operate at capacity with high delays. With the noted interim improvements and signal optimizations, the traffic operations can be improved, however road widening is still recommended by 2024 to reduce delays and capacity issues.

Similarly, due to the high background traffic volumes in the area, Brock Road (RR1) widening is required by 2029 future background conditions. Additionally, signalization of Brock Road and Usman Road is recommended by 2029 future background conditions to facilitate increased pedestrian and

cycling volumes.

5.0 Site Generated Traffic

5.1 Trip Generation

The proposed residential development will result in additional vehicles on the boundary road network that previously did not exist. The proposed development will also create additional turning movements at the study intersections.

The trip generation of the townhouses and high-rise residential tower were forecasted using Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition, under the Land Use Category 221 "Multi-family Housing (Mid-Rise)" and Land Use Category 222 "Multi-family Housing (High-Rise)". These land use categories include apartments, townhouses, and condominiums. Mid-rise multi-family housing is defined as residential housing with three dwelling units or more, between three (3) to ten (10) levels/floors while a high-rise is defined similarly with more than 10 levels.

Fitted curves and average rate forecasts were provided by ITE. The trip generation forecast is based on fitted curve estimates (if available and deemed accurate with R^2 over 0.80) established by ITE data for the number of dwelling units provided, in a general urban and suburban setting.

The forecasted trips are tabulated in **Table 10**.

Table 10
Trip Generation

Use	Units	Roadway Peak Hour	Number of Trips		
			Inbound	Outbound	Total
LUC 221 Multifamily Housing (Mid-Rise)	44	Weekday A.M.	4	12	16
		Weekday P.M.	12	7	19
		Friday Mid-Day[1]	12	7	19
LUC 222 Multifamily Housing (High-Rise)	328	Weekday A.M.	25	80	105
		Weekday P.M.	73	47	120
		Friday Mid-day[1]	73	47	120
Total		**Weekday A.M.**	**29**	**92**	**121**
		Weekday P.M.	**85**	**54**	**139**
		Friday Mid-day[1]	**85**	**54**	**139**

Note 1: As requested by Region Staff, Friday Mid-day period between 12:00 p.m. to 4:00 p.m. is included into traffic analysis. As ITE Trip Generation Manual does not provide residential trips generated during Friday mid-day, weekday p.m. trips generation were conservatively assumed for analysis.

According to the ITE Trip Generation Manual, the residential development is forecasted to generate an upper bound of 121 and 139 two-way trips in the weekday a.m. and p.m. peak hours, respectively. As Friday mid-day is not a peak period for residential developments, weekday p.m. peak period's trip generation is conservatively assumed and applied to future total mid-day traffic analysis.

5.2 Trip Generation Comparison

As requested by the City of Pickering staff, trip generation for the previously approved site plan (September 2015), attached in **Appendix J,** has been included for comparison. **Table 11** below outlines the forecasted two-way peak hour trips for the previously approved site plan.

Similar to the above, the trip generation of the previously approved site plan was forecasted using Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition. Trip generation for the retail and commercial uses were forecasted under the Land Use Category 820 - "Shopping Centre". Trip generation for the office space was forecasted under Land Use Category 710 – "General Office Building". Trip generation for the residential units was forecasted under Land Use Category 221 – "Multifamily Housing (Mid-Rise)". Fitted curve and average rate estimates were provided. Yields from fitted curve equations were used if deemed accurate ($R^2 > 0.80$, with more than 20 studies).

Table 11
Previously Approve Site Plan Trip Generation

Use	Units/GFA	Roadway Peak Hour	Number of Trips		
			Inbound	Outbound	Total
LUC 820 – Shopping Centre	12,863 sq. ft.	Weekday A.M.	7	5	12
		Weekday P.M.	57	62	119
		Friday Mid-Day[1]	57	62	119
LUC 710 – General Office Building	15,822 sq. ft.	Weekday A.M.	35	6	41
		Weekday P.M.	3	17	20
		Friday Mid-day[1]	3	17	20
LUC 221 Multifamily Housing (Mid-Rise)	12 units	Weekday A.M.	1	3	4
		Weekday P.M.	3	2	5
		Friday Mid-day[1]	3	2	5
Total		**Weekday A.M.**	**43** (+14 trips)	**14** (-78 trips)	**57** (-64 trips)
		Weekday P.M.	**63** (-22 trips)	**81** (+27 trips)	**144** (+5 trips)
		Friday Mid-day[1]	**63** (-22 trips)	**81** (+27 trips)	**144** (+5 trips)

Note 1: As requested by Region Staff, Friday Mid-day period between 12:00 p.m. to 4:00 p.m. is included into traffic analysis. As ITE Trip Generation Manual does not provide residential trips generated during Friday mid-day, weekday p.m. trips generation were conservatively assumed for analysis.

As shown, the previously approved site plan is forecasted to generate an upper bound of 57 and 144 two-way trips in the weekday a.m. and p.m. peak hours, respectively. As Friday mid-day is not a peak period for residential developments, weekday p.m. peak period's trip generation is conservatively assumed.

When compared to the previously approved site plan, the current site plan is forecasted to generate 64 more trips in the weekday a.m. peak hour and 5 less trips in the weekday p.m. and Friday mid-day peak hours.

5.3 Trip Distribution

The trips generated by the proposed development were assigned to the boundary road network based on Transportation Tomorrow Survey (TTS) data. TTS is a comprehensive survey of transportation characteristics of households in the Golden Horseshoe, Simcoe County and surrounding areas.

For the proposed development, TTS results were filtered to auto trips exiting 2006 GTA Zone 1033, a primary residential zone in which the subject property is located in. Trips were filtered to the weekday a.m., peak period. From this query, trip destinations were determined, and percentage of trips assigned to each destination was accounted for. Trips were assumed to travel to and from their destination based on the most convenient route possible. Based on the existing traffic volumes, the assumed trip distribution per TTS results is in general conformance with commuter travel patterns.

The trip distribution that was applied for the weekday a.m. peak period was inversely applied to the weekday p.m. peak period and Friday mid-day peak period. **Table 12** below outlines the assumed trip distribution for the proposed development. The trip distributions and trip assignments are illustrated in **Figure 8** and **Figure 9,** respectively.

Table 12
Trip Distributions

Departing To/Arriving From	Percentage
Brock Road (North)	30%
Brock Road (South)	60%
Finch Avenue (South)	10%

6.0 Future Total Conditions

6.1 Basis of Assessment

The traffic impacts arising from the proposed development were assessed on the basis of the site generated traffic illustrated in **Figures 9**, superimposed on the future background traffic volumes in **Figure 6** and **Figure 7** using the same optimized signal timing plans as mentioned in future background conditions**.** The resulting future total traffic volumes for the weekday a.m. and p.m. and Friday mid-day peak hours are illustrated in **Figures 10** and **Figure 11** for the 2024 and 2029 horizon year.

6.2 2024 Interim Conditions

Again, road widening improvements warranted by existing and future background conditions are recommended by 2024 to alleviate delays and capacity issues. Should the improvement not occur by 2024, interim, non-intrusive improvements may be considered to mitigate traffic operations specifically at the intersection of Brock Road (RR1) and Finch Avenue (RR37).

Consistent with the future background analysis and recommendations, **Table 13** outlines 2024 future

total traffic conditions with existing lane configurations (without road widening) and accounting for the same optimized signal timing plans as in the future background analysis.

Similar to the above analysis, lost time adjustment was not accounted for, and a PHF of 0.92 is assumed for weekday a.m. and p.m. peak hours. Existing PHF for Friday mid-day peak hour were maintained for Friday mid-day future total analysis. Detailed capacity analyses are included in **Appendix F**.

Table 13
2024 Future Total Level of Service (without Road Widening)

Intersection	Control	Peak Hour	Level of Service[1]	Control Delay	Maximum V/C Ratios[2]	95th Percentile Queue > Storage Length
Brock Road (RR1) Finch Avenue (RR37)	Signalized Intersection (Optimized with overlapping phase)	A.M.	F	105.8 s	1.29 (SBTR)	None
		P.M.	F	98.5 s	1.20 (NBTR) 1.11 (EBLT) 1.05 (NBL) 1.11 (SBTR)	104.8 m > 63.0 m (NBL)
		Friday Mid-day	E	75.9 s	1.12 (NBL, NBTR) 1.09 (EBLT) 1.02 (SBTR)	101.6 m > 63.0 m (NBL)
Brock Road (RR1) at Major Oaks Road/Usman Road	Signalized (Reconfigured & Optimized)	A.M.	D	47.8 s	1.06 (SBTR)	44.6 m > 30.0 m (EBR) 71.6 m > 20.0 (WBL) 91.2 m > 60.0 m (SBL)
		P.M.	C	30.5 s	1.02 (NBT)	34.6 m > 30.0 m (EBR) 63.7 m > 20.0 (WBL) 73.5 m > 72.0 m (NBL)
		Friday Mid-day	E	55.9 s	1.10 (NBT)	44.4 m > 30.0 m (EBR) 81.4 m > 20.0 m (WBL) 82.1 m > 72.0 m (NBL) 196.9 m > 60.0 m (SBL)
Brock Road (RR1) at Usman Road	One-Way Stop Controlled	A.M.	B	11.2 s	0.73 (SBT)	164.6 m > 60.0 m (SBL)
		P.M.	B	12.5 s	1.56 (SBL)	102.5 m > 60.0 m (SBL)
		Friday Mid-day	B	14.9 s	1.72 (SBL)	155.2 m > 60.0 m (SBL)

Table 13
2024 Future Total Level of Service (continued)

Intersection	Control	Peak Hour	Level of Service[1]	Control Delay	Maximum V/C Ratios[2]	95th Percentile Queue > Storage Length
Usman Road Site Access	One-Way Stop Controlled	A.M.	A	9.7 s	0.12 (NBLR)	None
		P.M.	B	10.5 s	0.20 (EBTR)	None
		Friday Mid-day	B	10.1 s	0.15 (EBTR)	None

Without road widening, the signalized intersection of Brock Road (RR1) and Finch Avenue (RR37) is expected to continue to operate at capacity during weekday a.m., p.m. and Friday mid-day peak hours. In comparison to 2024 future background conditions (optimized without road widening, see **Table 6**), the signalized intersection is expected to operate with an increase in control delay of 10.8 seconds or less and an increase in maximum volume-to-capacity ratios of 0.04. The 95th percentile queue length for northbound left turn movement is expected to continue to exceed the provided storage length. However, it is not expected to impede into downstream intersections. These metrics indicate that the subject development does not materially affect traffic conditions. Accordingly, the development is supportable from a traffic operations perspective.

The remaining boundary road network is expected to operate at a level of service "E" or better. When compared to the 2024 future background traffic conditions, the remaining boundary road network is expected to operate with an increase in maximum control delay of 12.0 seconds or less. Although the intersection of Brock Road at Major Oaks Road/Usman Road, and the southbound left-turn lane of the intersection of Brock Road at Usman Road, are operating at capacity, this is consistent with future background operations and is expected to improve significantly upon Brock Road widening. These metrics indicate that the subject development does not materially affect traffic conditions. Accordingly, the development is supportable from a traffic operations perspective.

The proposed site access is expected to operate efficiently with a level of service "B" or better, and a maximum control delay of 10.5 seconds or less.

6.3 2029 Future Total Conditions

Table 14 outlines the 2029 future total traffic conditions with Brock Road widening. Similar to the future background conditions, lost time adjustment was not accounted for, and optimized signal timings were kept consistent with 2029 future background conditions for comparative purposes.

Once again, Brock Road widening is warranted in existing and future background conditions in all horizon years.

Similarly, although the Region does not support a signalization of Brock Road at Usman Road, due to future background capacity issues at the one-way stop intersection, and the lack of pedestrian and cycling cross opportunity to the west, to access recreational and residential neighbourhoods there, a signal is recommended by 2029 future background conditions at the latest.

Table 14
2029 Future Total Level of Service (with Road Widening)

Intersection	Control	Peak Hour	Level of Service[1]	Control Delay	Maximum V/C Ratios[2]	95th Percentile > Storage Length
Brock Road (RR1) at Finch Avenue (RR37)	Signalized (Optimized)	A.M.	C	33.4 s	1.01 (SBT)	None
		P.M.	E	71.8 s	1.20 (EBL) 1.05 (NBL) 1.14 (NBT)	99.8 m > 63.0 m (NBL) 29.9 m > 13.0 m (SBL)
		Friday Mid-day	D	53.3 s	1.11 (EBL) 1.08 (NBT)	91.1 m > 63.0 m (NBL)
Brock Road (RR1) at Major Oaks Road/Usman Road	Signalized (Optimized)	A.M.	C	31.2 s	0.94 (SBTR) 0.91 (WBL)	43.5 m > 65.7 m (EBR) 68.4 m > 20.0 m (WBL)
		P.M.	D	35.4 s	0.99 (NBTR) 0.95 (NBL) 0.94 (SBL)	35.3 m > 30.0 m (EBR) 74.5 m > 20.0 m (WBL) 96.4 m > 72.0 m (NBL)
		Friday Mid-day	D	52.7 s	1.08 (NBTR) 0.93 (NBL)	40.6 m > 30.0 m (EBR) 70.0 m > 20.0 m (WBL) 78.3 m > 72.0 m (NBL)
Brock Road (RR1) at Usman Road	One-Way Stop Controlled	A.M.	B	11.2 s	0.54 (SBT)	None
		P.M.	B	11.8 s	0.80 (SBL)	167.8 m > 60.0 m (SBL)
		Friday Mid-day	B	13.3 s	0.66 (SBL)	147.7 m > 60.0 m (SBL)

Intersection	Control	Peak Hour	Level of Service[1]	Control Delay	Maximum V/C Ratios[2]	95th Percentile > Storage Length
Usman Road Site Access	One-Way Stop Controlled	A.M.	A	9.7 s	0.12 (NBLR)	None
		P.M.	B	10.6 s	0.21 (EBTR)	None
		Friday Mid-day	B	10.3 s	0.16 (EBTR)	None

Note1: The Level of Service of a signalized intersection is based on the average control delay per vehicle. The level of Service of a stop-controlled intersection is based on the minor (stopped)approach control delay per vehicle.

Note2: The critical v/c ratio is considered to be the maximum v/c ratio at the intersection. All v/c ratios greater than 0.90 are outlined and highlighted.

The signalized intersection of Brock Road (RR1) and Finch Avenue (RR37) is expected to operate at an unchanged level of service "C", "E", and "D" during the weekday a.m., p.m. and Friday mid-day peak hours under 2029 future total traffic conditions. In comparison to the 2029 future background traffic conditions (optimized with road widening, see **Table 8)**, the intersection is expected to experience a minor increase in control delay of 5.9 seconds or less. The maximum volume-to-capacity ratio is expected to increase by 0.03 or less. These metrics indicate that the subject development does not materially affect traffic conditions. Accordingly, the development is supportable from a traffic operations perspective.

The signalized intersection of Brock Road (RR1) and Major Oaks Road/Usman Road is expected to operate at a level of service "D" or better during the weekday a.m., p.m. and Friday mid-day peak hours under 2029 future total traffic conditions. In comparison to the 2029 future background traffic conditions, the intersection is expected to experience an increase in control delays of 10.2 seconds or less. The maximum volume-to-capacity ratio is expected to increase by 0.04 or less. These metrics indicate that the subject development does not materially affect traffic conditions. Accordingly, the development is supportable from a traffic operations perspective.

The one-way stop-controlled intersection of Brock Road (RR1) and Usman Road is expected to continue to operate at a level of service "B" with low control delays and moderate maximum volume-to-capacity ratios under 2029 future total traffic conditions. In comparison to the 2029 future background conditions, the intersection is expected to operate at a negligible increase in control delay of 0.3 seconds or less and an increase of maximum volume-to-capacity ratios of 0.16 or less. These metrics indicate that the subject development does not materially affect traffic conditions. Accordingly, the development is supportable from a traffic operations perspective.

The proposed site access is expected to operate at a level of service "B" or better during the weekday a.m., p.m. and Friday mid-day peak hours under 2029 future total traffic conditions. The site access is expected to experience low maximum control delays of 10.6 seconds or less, and low maximum volume-to-capacity ratios of 0.21 or less. Accordingly, the proposed site access is supportable from a transportation operations perspective.

Finally, traffic operations for 2029 future total conditions without road widening can be found for reference in **Appendix K**.

6.4 Summary of Recommended Improvements

The simulations and future total conditions herein did not account for left turns during intergreen phases, as observed during 2019 existing traffic counts. Thus, an increased left turning capacity of 72 vehicles per hour were not accounted for at all intersections, and the analysis above can be considered conservative. Additionally, a peak hour factor of 0.92 for the weekday a.m. and p.m. peak hours was used in all weekday a.m. and p.m. future analyses. This may be considered conservative as higher PHFs were observed in existing conditions. Accordingly, the actual traffic operations are expected to be better than indicated above.

Regardless of the improvements, future total traffic operations are not materially different from future background conditions with or without the road widening being brought forward. The traffic generated by the development does not materially change the traffic operations of the boundary road network as summarized in **Tables 13** and **14**. Moreover, there are no further improvements needed, beyond those recommended and warranted by existing and future background conditions. Thus, the proposed development is supportable from a traffic operations perspective.

Table 15 provides a summary of the recommended improvements in the study area.

Table 15
Recommendation Summary

Horizon	Recommended Improvements
2024	**Interim:** Optimize signal timing at Brock Road and Finch Ave: • EBR overlapping Phase with NBL • Optimized splits (maintained cycle length) Optimize signal timing at Brock Road and Major Oaks Road/Usman Drive: • EBR slip lane via pavement marking (as is proposed in the Brock Road widening design plates) • An increased cycle length of 110 seconds with an advanced southbound left-turn and optimized splits in the weekday a.m. and Friday mid-day peak periods • An unchanged cycle length of 100 seconds with optimized splits in the weekday p.m. peak period
	Ultimate: Advance Brock Road Widening to 6 Lane Cross-section Signal Optimization Signalization of Brock Road and Usman Road
2029	Brock Road Widening to 6 Lane Cross-section Signal Optimization Signalization of Brock Road and Usman Road

As mentioned above, there are no further improvements needed, beyond those recommended and warranted by future background conditions.

By 2024 future background conditions without road widening, the traffic operations are expected to operate at capacity with high delays. With the noted interim improvements and signal optimizations, the traffic operations can be improved, however the intersection is still expected to operate at capacity. Thus, Brock Road widening is recommended by 2024. Regardless of the improvements, the proposed development is supportable from a traffic operations perspective as the site generated traffic does not materially alter future traffic conditions with or without the road widening.

Similarly, due to the high background traffic volumes in the area, Brock Road (RR1) widening is required by 2029 future background conditions. Additionally, signalization of Brock Road and Usman Road is recommended by 2029 future background conditions to facilitate increased pedestrian and cycling volumes.

6.5 U-Turn and Weaving Concerns

Per discussion with the Durham Region staff, there were northbound U-turns and weaving concerns on Brock Road between Usman Road (south) and Usman Road (north)/Major Oaks Road.

While northbound U-turns are prohibited at the Major Oaks intersection, some motorists still perform this manoeuvre. Some vehicles from the development may enter Brock Road at the south Usman intersection then weave across lanes to make this U-turn or to turn left onto Major Oaks. Any available data or observations regarding the U-turn should noted in the report, and the potential for the development to contribute to weaving issues on Brock Road northbound between the two intersections should be discussed.

U-turn restrictions are clearly marked along Brock Road, approaching Usman Road (north)/Major Oaks Road. As residents of the proposed development will become familiar with the boundary road network, movement restrictions, typical peak hour delays and intersection operations, as well as alternative route available (i.e., via westbound left at Usman Road north), little to no illegal northbound U-turns are expected in the future.

Furthermore, as noted in **Section 6.3** above, northbound left-turns are approaching capacity during the peak periods. Due to the expected delays for the movement, residents of the development heading southbound are not expected to use northbound U-turns and are expected to use westbound left turn via Usman Road (north), as it is the most efficient route, with minimal delays, available.

Finally, based on previously conducted Turning Movement Counts during the weekday a.m., p.m. and Friday mid-day peak hours at the intersection of Brock Road and Major Oaks/Usman Road, minimal northbound U-turns were observed. Zero (0) northbound U-turns were observed during the weekday a.m. and p.m. peak hours and only two (2) were observed during the Friday mid-day peak hour. Accordingly, U-turns and weaving are not expected to be a concern.

Relevant comments and responses have been attached in **Appendix B.**

7.0 Sensitivity Analysis

7.1 Brock Road (RR1) and Finch Avenue (RR37)

As requested by the Region, the default peak hour factor (PHF) of 0.92 (or the lower existing PHF for Friday mid-day) was used for all future analysis. However, higher PHFs were observed in the weekday a.m. and p.m. peak hours as outlined in **Table 4**, signifying a more uniform distribution of traffic throughout the peak hour (as opposed to sudden larger wave of traffic).

Table 16 below outlines the improved operations of the intersection of Brock and Finch Avenue in the weekday p.m. peak hour with the observed PHF of 0.98 under 2029 future total conditions with road widening.

In addition, as an optimized signal timing plan has been recommended for the intersection of Brock Road and Major Oaks/Usman Road, a similar cycle length of 110 seconds was applied to Brock Road and Finch Avenue as there is an opportunity to implement green light progression. It is recommended that the Region continue to monitor the traffic conditions along the Brock Road corridor and consider signal progressions along Brock Road after the widening is completed.

Table 16
2029 Future Total Level of Service (with Road Widening)

Intersection	Control	Peak Hour	Level of Service[1]	Control Delay	Maximum V/C Ratios[2]
PHF = 0.98, Cycle Length = 100 seconds					
Brock Road (RR1) Finch Avenue (RR37)	Signalized Intersection (Optimized)	P.M.	D	54.2 s	1.12 (EBLT) 1.07 (NBTR)
PHF = 0.98, Cycle Length = 110 seconds					
Brock Road (RR1) Finch Avenue (RR37)	Signalized Intersection (Optimized)	P.M.	D	52.7 s	1.11 (EBLT) 1.06 (NBTR)

With a PHF of 0.98 and a cycle length of 100 seconds, the intersection of Brock Road and Finch Avenue is expected to operate at an improved level of service "D" during the weekday p.m. peak hour under 2029 future total conditions with road widening. The intersection is expected to operate with a maximum control delay of 54.2 seconds and theoretical maximum volume-to-capacity ratio of 1.12. In comparison to operations using the default PHF of 0.92 (see **Table 14**), the maximum control delay and maximum theoretical volume-to-capacity ratio are reduced by 17.6 seconds and 0.08, respectively.

With a PHF of 0.98 and a cycle length of 110 seconds the intersection of Brock Road and Finch Avenue is expected to operate with a level of service "D" during the weekday p.m. peak hour under 2029 future total conditions with road widening. The intersection is expected to operate with an improved maximum control delay of 52.7 seconds and an improved theoretical maximum volume-to-capacity ratio of 1.11 when compared to operations using a cycle length of 100 seconds. Additionally, when compared to the operational analysis with default PHF of 0.92 (see **Table 14**), the maximum control delay and maximum theoretical volume-to-capacity ratio are reduced by 19.1 seconds and 0.09, respectively.

Accordingly, the intersection is expected to operate significantly better than outlined in **Table 14**, as the default PHF of 0.92 is conservative compared to the observed PHF of 0.98.

7.2 Brock Road at Major Oaks Road/Usman Road (North)

As mentioned in **Section 4.5,** prior to road widening, significant delays and capacity issues are expected for the southbound left-turn movement at Brock Road and Usman Road (south). As such, it is expected that regular commuters of the area will alternatively choose to make the southbound left-turn at the signalized intersection of Brock Road and Major Oaks Road/Usman Road (north), in order to avoid delays.

The analysis outlined in **Table 17** below, reviews the operations of both Brock at Major Oaks Road/Usman Road (north) and Brock Road at Usman Road (south) if 50% of the traffic assumed to make a southbound left-turn at Brock Road and Usman Road (south), did so at Brock Road and Major Oaks Road/Usman Road (north) instead.

As road widening is recommended by 2029 and the intersection of Brock Road and Usman Road (south) operates acceptably post-road widening, the analysis is reviewed only for 2024 future total volumes without road widening. The analysis has been conducted for the Friday Mid-day peak hour as this peak period yielded the highest delays and the highest theoretical volume-to-capacity ratio based on the 2024 future total operations outlined in **Table 13**.

Table 17
2024 Future Total Level of Service (without Road Widening)

Intersection	Control	Peak Hour	Level of Service[1]	Control Delay	Maximum V/C Ratios[2]
Brock Road (RR1) at Major Oaks Road/Usman Road (north)	Signalized (Reconfigured & Optimized)	Friday Mid-day	E	67.4 s	1.15 (NBT)
Brock Road (RR1) at Usman Road (south)	One-Way Stop Controlled	Friday Mid-day	B	14.9 s	0.86 (SBL)

As shown above in **Table 17,** the intersection of Brock Road at Major Oaks/Usman Road (north) continues to operate at an unchanged level of service "E" during the Friday Mid-day peak hour despite the expected additional southbound left-turning vehicles. When compared to the operations in **Table 13**, the intersection is expected to operate with a minor, but acceptable, increase in control delay of 11.5 seconds and a minor increase in maximum theoretical volume-to-capacity ratio of 0.05.

The intersection of Brock Road and Usman Road (south) is expected to continue to operate at an unchanged level of service "B" with an unchanged control delay of 14.9 seconds during the Friday Mid-day peak hour. The intersection is expected to operate with a maximum volume-to-capacity ratio of 0.86, a material improvement from 1.72 as previously shown in **Table 13**.

As such, if regular commuters of the area choose to avoid the unsignalized intersection of Brock Road and Usman Road (south) by making the southbound left-turn at the signalized intersection of Brock Road and Major Oaks Road/Usman Road (north), the intersection is expected to continue to operate acceptably with no additional improvements required.

8.0 Sight Distance Assessment

The available sightlines at the proposed site access on Usman Road was measured and compared to the standards set out in the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR). Sight distances were measured from the proposed site access using the following assumptions:

- A standard drive eye height of 1.08 metres for a passenger car
- A 4.4-5.4 metre setback from the approximate extension of the outer curb to represent a vehicle waiting to exit the site

Intersection sight distance is calculated using equation 9.9.1 from the GDGCR as outlined below:

$$ISD = 0.278 * V\ major * tg$$

Where,

ISD = Intersection Sight Distance
V major = design speed of roadway (km/h)
tg = assumed time gap for vehicles to turn from stop onto roadway (s)

The design speed of a roadway in an urban environment is typically 10 km/h greater than the posted speed limit. As 40 km/h is currently posted along the site frontage, a design speed of 50 km/h was conservatively assumed for the sight distance analysis.

Table 18 below outlines the sight distance analysis for the proposed site access.

Table 18
Sight Distance Analysis

Parameter	Site Access (Usman Road)
Access Type	Full Moves
Posted Speed Limit of Roadway	40 km/h
Assumed Design Speed	50 km/h
Base Time Gap (Passenger Cars)	Left Turn: 7.5 s Right Turn: 6.5 s
Additional Time Gap	n/a
Grade of Roadway	Less than 3%
Horizontal Alignment of Roadway	Straight left and right of the site access (Site Access forms a T-intersection)
Sight Stopping Distance (TAC GDGCR Table 2.5.2)	65 m
Sight Distance Required (TAC GDGCR Eqn. 9.9.1)	Left Turn: 105 m Right Turn: 95 m
Measured Sight Distance	Left: 110 m Right: 200 m
Minimum Sight Distance Satisfied	Yes

As outlined in **Table 18,** 105 metres of sight distance is required at the site access. As more than 110 metres of sight distance can be observed in both directions, adequate sight distance is provided.

Although Usman Road has a 90-degree bend, adequate sight distance is achieved as the site access is located at the "elbow" of the roadway, forming the third leg of a T-intersection. The above analysis is also considered conservative as cars approaching from either direction will not be travelling at the design speed towards and exiting the turn.

Appendix L contains sight distance analysis excerpts.

9.0 Parking and Loading Requirements

The City of Pickering's Site-specific Zoning By-Law (ZBL) 7085/10 and Brock Ridge Area-specific Zoning By-Law (ZBL) 3036 were reviewed to determine the parking and loading requirements of the Subject Development. **Table 19** below summarizes the requirements per the existing Zoning By-Laws.

Table 19
Parking and Loading Requirements per City of Pickering Zoning By-Law

Requirement	Land Use	Units	Minimum Requirement		Spaces Required	Spaces Provided
			Tenant	Visitors		
Vehicle Parking (Site-specific ZBL 7085/10)	Multiple Dwelling-Vertical Uses	328	1 space per unit	0.25 space per unit	410 spaces	513 spaces
	Multiple Dwelling-Horizontal Uses	44	2 spaces per unit	0.25 space per unit	99	
Total Parking					**509**	**513 (+4)**
Bicycle Parking	Residential	372	-- (Not Specified; Required in City Center Only)		0	177 **(+177)**
Loading (Site-specific ZBL 7085/10) & (Area-specific ZBL 3036)	Residential	372	-- (Not Specified; Required for Industrial or Commercial Use Only)		0	Two 12 m x 3.5 m Loading Spaces are provided.

Vehicle Parking Spaces

As outlined in **Table 19**, a total of 509 vehicle parking spaces are required for the Subject Development per the site-specific Zoning By-Law 7085/10. As the development proposes 513 parking spaces, the parking requirements are satisfied.

Bicycle Parking Spaces

The Site-specific Zoning By-Law 7085/10 and Brock Ridge Area-specific Zoning By-Law 3036 did not provide minimum bicycle parking requirements. As such, no bicycle parking spaces are required for the proposed development. Accordingly, as 177 bicycle parking spaces are proposed, the development proposes a surplus of bicycle parking spaces.

Loading Requirement

Furthermore, to determine the adequacy of the proposed loading spaces, the City of Pickering's Brock Ridge Area-specific Zoning By-Law 3036 was reviewed. Based on clause 5.21 "Off-street Loading Requirements", no loading space is required for a residential building. Accordingly, the proposed two loading spaces are supportable.

Per further discussion with the City Zoning Examiner, should a loading space be provided, the loading space must have a minimum size of 20 ft by 10 ft with a vertical clearance of 14 ft. As the proposed Site Plan illustrates loading area of 12 m by 3.5 m (39 ft x 11 ft), the loading area satisfies the loading dimensions requirement.

Appendix M contains the City of Pickering's Site-specific and Area-specific Zoning By-Law excerpts.

10.0 Vehicle Turning Assessment

The development proposes waste to be collected along the internal access provided. Curb side pick-up is proposed at the front of each townhouse dwelling, while the condominium waste is proposed to be collected at the designated loading spaces.

A "T-turnaround" is proposed at the cul-de-sac of the townhouse portion of the development while a full roundabout is proposed for the condominium, west limits of the development.

The loading operations analysis indicates that the proposed site layout accommodates standard Durham Region's waste collection vehicles, standard pumper and aerial fire trucks, as well as Medium Single Unit Truck (MSU).

The vehicle turning diagrams are attached in **Appendix N**.

11.0 Transportation Demand Management (TDM)

A number of TDM opportunities currently exist for the proposed development, primarily due to the site's proximity to commercial uses, employment and institutional areas, facilitated by a comprehensive transit and active transportation network. The existing TDM opportunities, as well as future TDM opportunities proposed by the City of Pickering, Durham Region and Metrolinx are summarized below.

11.1 Existing Modal Split

The Transportation Tomorrow Survey (TTS) was once again used to determine the preferred mode of transportation in the study area. TTS data was used to forecast the number of trips made into and out of the local area via different modes of transportation, in order to approximate the modal split.

TTS data was selected for trips to and from City of Pickering in order to capture the predominant mode of transportation for travellers in the City. TTS results are outlined in **Table 20**. The TTS data has been provided in **Appendix D**.

Table 20
TTS Data for Primary Mode of Transportation for Trips to and from the City of Pickering

Mode of Transportation	Modal Split	
	Weekday A.M.	Weekday P.M.
Auto Driver	74%	73%
Carpooling	14%	14%
Public Transit	6%	6%
Walk	4%	4%
Other	2%	3%
Total	*100%*	*100%*

As illustrated in **Table 20** above, approximately 75% of trips made to, from, and within the study area are done via auto drivers. Accordingly, the remaining 25% of trips are made via carpool, transit and active transportation modes.

The TTS survey data illustrates that although the predominant mode of transportation is auto driver, over 25% of travellers in the study area use alternate primary modes of transportation. These results indicate a strong existing willingness by residents of the area to utilize alternate modes of transportation, especially during typical commuter peak period where higher level of congestion is experienced, thereby reducing the barriers of entry for further TDM initiatives aimed at reducing SOV trips.

11.2 Transit Network

The development is located in close proximity to multiple Durham Region Transit and GO transit routes as mentioned in **Section 3.5.**

The high level of transit services described above, provide residents and visitors in the City of Pickering with quick, easily accessible and direct transit services throughout the City and Region. As Pickering Supercentre is 1.4 km directly south of the Subject Property, also on Brock Road (RR1), transit is a convenient alternative option. Likewise, as Pickering Town Centre is 9 minutes away by transit, residents and visitors of the Subject Property can easily access these large but local commercial attractions by transit.

In addition, major employment, commercial and tourist attractions outside of the Region, such as Downtown Toronto, Oshawa, or greater Toronto areas can be accessed using GO transit, via direct bus connection at Pickering GO or Ajax GO. As such, transit is a convenient mode of transport for both residents and visitors of this proposed development.

11.3 Transit Incentives

Inter-Transit Connections

Durham Region, Metrolinx and other municipalities currently offers numerous transit discounted fares, promotions, and incentives to encourage transit use.

For instance, riders to and from GO Transit will receive a discounted fare of $0.80 per trip when connecting to and from GO transit. Similar transit transfer discounts are also offered for York Regional Transit, Brampton Transit (including Züm Express), Mississauga Transit (MiWay), Oakville Transit, Burlington Transit and Hamilton Street Railway (HSR) as long as the maximum transfer period have not expired.

Discounted fares are also offered for transit users under the age of 12 (Child fare), youth between the ages of 13 to 19, or those over the age of 65. Alternatively, children at age 12 or under can ride for free with a fare paying passenger.

Frequent Transit Users Discount

Durham Region Transit also offers discounted monthly passes between September and June to students in Durham Region. The monthly discount can be uploaded directly onto Presto card, a smart contactless payment system used throughout GTHA, and provide savings of up to $200 in 10 months.

GO Transit and other transit agencies also offer regular monthly and GTA weekly discounted passes for frequent transit users and commuters working within or outside of Durham Region.

Lastly, Durham Region also offers Universal Transit Pass (U-Pass) for eligible students at participating colleges and universities with unlimited travel on DRT and OneFare DRT-GO Transit routes.

It is recommended that landowners of the proposed development educate individual tenants, to explore the various transportation incentives offered by the Region and or employers.

11.4 Active Transportation Network

As described in **Table 2**, sidewalks are provided in all roadways within the study area. Pedestrian may connect directly between residential neighbourhoods to transit stops, schools and local commercial facilities.

Aside from Trans Canada Trail, West Duffins Trail, and local multi-use trails within City's recreational parks, separate cycling facility is currently not provided within the study area. Cycling in the City of Pickering is permitted on all roadways within the City Centre and on local residential roads. Motorists and cyclists are required to share the road where specific facilities have not been provided.

Based on modal split data, cycling is currently under utilized in the City of Pickering. Nevertheless, the City and Region have additional cycling proposals in place for the near- and medium-term future to improve safety and to promote active transportation within the City and Region.

Per Durham Region's Regional Cycling Plan dated November 2012, 218.6 km of new cycling facilities are proposed for Durham Region between 2012 to 2032. Of the 218.6 km of recommended cycling network, 112.4 km of which are multi-use boulevard path, 11.4 km road cycling lanes and 16.7 km of buffered cycling lanes. These improvements are all proposed for implementation between 2017 to 2032. Specifically, within the study area, multi-use paths are proposed along Brock Road (RR1), and Finch Avenue (RR32) between 2017 to 2032. Each of the mentioned categories illustrates the Region's commitment in cycling initiatives.

Per City of Pickering's Urban Design Guidelines dated April 3rd, 2017, buffered cycle lane is currently proposed for Kingston Road (RR1). Additional multi-use trails, as well as at-grade cycling lanes are also

proposed within the City Centre area. Accordingly, with the future multi-use paths along Brock Road (RR1), residents may directly access large commercial attractions to the south, City Centre area, as well as to local recreational parks and schools safely via walking and cycling.

11.5 Future Transit Opportunities

There are many significant transit expansion and transit improvement projects proposed by the Government of Ontario (Metrolinx/GO-transit) that will improve transit service within the study area.

Specifically, the following projects have been proposed:

- Regional Express Rail (RER): improved, electrified, fast and frequent two-way GO-train services throughout Greater Toronto Hamilton Area by 2025.
    - Within the Study Area, the Lakeshore East GO line is proposed to be an all-day, two-way, 15 minutes or better service, which will substantially improve transit connections between Pickering, Oshawa, Whitby, Ajax, Scarborough, and Downtown Toronto.
    - Metrolinx has begun construction to increase transit capacity at various GO stations) with new train platform, new station facility, new passenger pick-up and drop-off area, and improved pedestrian and vehicle connections.
    - Similar improvements are also proposed for other GO lines such as Lakeshore West GO, Kitchener GO, Milton GO and more.
    - RER will significantly improve transit connections, transit accessibility, and travel time as commuters and visitors have greater flexibility and transit options to the Greater Toronto and Hamilton Areas.

- Durham-Scarborough BRT: a 36-km bus rapid transit line from downtown Oshawa, through Whitby, Ajax, Pickering, leading to Scarborough Centre.
    - The Durham-Scarborough BRT is planned to have frequent service with 5-minute or better service during peak hours.
    - The BRT is anticipated to improve transit rider's travel time improve transit accessibility for those travelling across Durham and Scarborough, with connections to Durham Region Transit, TTC and GO Transit routes.

In addition, as mentioned above, HOV lanes are planned alongside Brock Road widening. As such, future high frequency transit would operate in the HOV lanes is proposed on Brock Road with frequencies 10-minutes or less. Accordingly, transit services will improve significantly, reducing the need for personal vehicles on a day-to-day basis and subsequently, improving traffic operations in the area.

Based on the above future transit improvements, transit services in the medium to long term, are expected to improve materially. Residents and visitors are expected to benefit significantly by the Durham-Scarborough BRT, as well as the electrification of the GO Train lines and the 15 minutes or better two-way services.

Consequently, these improvements will considerably increase transit capacity and reliability within the study area. The accessibility of transit throughout the Durham Region and Greater Toronto Hamilton Area will also improve substantially. Accordingly, reduced vehicle ownership, and reduced auto-vehicle trips are expected.

11.6 Site Specific TDM Recommendations

There are several opportunities for the development to promote TDM measures in support of reduced automobile use. The following recommendations outlined in **Table 21,** are expected to contribute to reduced automobile use and increased sustainable mode share.

Table 21
Site Specific TDM Recommendations

Recommended/Provided TDM Measure	Implementation Summary
TDM Information Package for New Tenants	Upon and prior to occupancy, a TDM information package should be provided to new and prospective residents and owners. Promotional material should also be readily available (and continuously updated) in the building's lobby to increase awareness of available alternate travel modes and reduce the barriers to adopting more sustainable travel behaviour. Such marketing allows prospective tenants to be aware of sustainable travel options, as well as updates in the transit and cycling infrastructures improvements of the area. TDM Information Package can comprise of: • Active transportation network maps • Transit maps and schedules • Car rental and carshare locations Neighbourhood commercial, retail, and institutional facilities should also be included in the marketing package to promote local businesses and to promote a walkable mixed-use community. Information on the future transit projects could be provided to prospective buyers to make them aware of pending mass transit opportunities, which can encourage measures such as reduced vehicle ownership. Periodic Transit and TDM information updates, can also be provided to tenants via mailbox.
Secure Bike Storage Facilities, Excess Bicycle Parking Spaces	Safe and secure bicycle parking is proposed for the development. Although the City's Zoning By-Law, requires no minimum bicycle parking spaces for the residential development, the development proposes 177 indoor bicycle parking spaces. Access to safe and secure bicycle parking will increase confidence and reliability for prospective cyclists to cycle as their primary mode of transportation. The provision of cycling maps, short term bicycle parking spaces, and secure long-term spaces encourages bicycle use and provides residents and visitors convenient and safe storage for frequent bicycle use.

Recommended/Provided TDM Measure	Implementation Summary
Bicycle Repair Station	A small, compact bicycle repair station with a toolkit and pump are also recommended. These stations can be provided near the bicycle parking in order to promote cycling use. These stations also increase confidence and reliability for prospective cyclists to cycle as their primary mode of transportation.
Bicycle Reimbursement	To promote TDM and to encourage cycling as an alternative transportation mode, a credit reimbursement for first time bicycle buyers may be provided as an incentive.
Pre-loaded Presto Cards	One-time pre-loaded or discounted Presto cards should be provided to new tenants to encourage transit use as resident's primary mode of transportation.
Priority Rideshare Pickup/Drop-off Areas	A designated drop-off area near the entrance to the residential tower is proposed. This area will provide a convenient space for pick-up and drop-off, to facilitate taxi, rideshare (Uber, Lyft), small package or food deliveries, and carpool drop off near the building entrance and is expected to contribute to reduced SOV trips.
Real-Time Transit Information	The provision of Real-time transit information screens is recommended and can be displayed in the lobby or elevators via wall mounted screens. This provides residents information on transit schedules and real time service delays, increasing reliability for residents to use transit as their primary mode of transportation. Residents should also be encouraged to download the Rocketman App through landlord-tenant communications. The Rocketman App provides users with real-time transit information including real time passenger volume counts on buses to assist with trip planning. The app allows buses to be tracked along its route and allows for live arrival countdowns that help minimize wait times and notify users if an approaching bus is not-busy (0%-30% of capacity) to very busy (>80% of capacity). Additionally, this transit information will educate residents and visitors on the range of routes available by Durham Region Transit and connecting GO Transit services. This increased awareness of convenient transit options has been historically shown to increase transit mode share in similar developments and may provide similar benefit to the subject development. Overall, this measure is expected to increase transit reliability and perception for tenants to use transit as primary mode.

Recommended/Provided TDM Measure	Implementation Summary
Unbundled and Paid Parking	Parking is to be leased separately from unit rentals. Parking is to be leased to tenants on a first come first-serve basis. Parking will be priced variably by demand and supply. Prospective tenants should be advised in advance of the parking availability and cost of renting a parking space, if available. Potential tenants will also be warned of the limited on-street parking in the area. As such, the residential parking demand can be significantly reduced and controlled. By advising the parking availability to potential tenants prior to the rental agreements, the ambiguity of the parking demand and parking availability can be managed. This strategy allows for prospective tenants to choose whether they wish to incur the added cost of leasing a parking space, particularly if parking is not desired due to vehicle ownership choices. Additionally, this strategy allows parking spaces to be acquired on a first come, first-served basis, and once resident spaces are no longer available, prospective residents requiring the use of a parking space would seek alternate accommodations or make alternate arrangements to secure monthly parking in a proximal lot.
Site Plan Design	The Site Plan configuration promotes medium density residential dwellings as well as increased non-auto mode share among future residents. The higher density residential townhouses and high-rise residential tower (in comparison to the existing low density, single detached residential houses nearby) are proposed in close proximity to Brock Road Street (Regional Road 1), with existing sidewalks, and bus stops. A range of large commercial attractions, institutional and recreational facilities are also located within 15 minutes transit, reducing the day-to-day need for automobile.

11.7 Responsibilities of Stakeholders

In order for the TDM measures to function effectively, the implementation must be supported by local and regional governments, existing neighbouring property owners, as well as future developers. Continuous monitoring efforts must be made by all stakeholders to ensure the TDM strategies are operating as planned, and to advise should improvements or repairs are required.

11.8 Projected Trip Generation Reductions

The proposed active transportation and TDM measures are expected to reduce single occupant vehicle (SOV) trips during the peak hour. **Appendix O** lists expected trip reductions based on various literature studies in North America.

11.9 Performance Monitoring

Performance of the TDM measures can be monitored via questionnaire surveys as well as periodic field observations (i.e., traffic movement counts to and from the proposed site access). Surveys is an effective performance measurement tool as it provides direct feedback from tenants living in the proposed development. Their feedback may indicate challenges and constraints that are specific to the property, experienced only by the residents in the area.

DRT can also monitor transit ridership in the area over the years to determine the effectiveness of the TDM strategies. Periodic traffic movement counts can indicate traffic volume changes over the years, as well as bicycle and pedestrian volumes and usage along the corridor.

It is important to note that TDM performance can vary significantly due to a variety of factors (i.e., gas price, cost of vehicle ownership etc.). It is equally important to note the external changes that may influence the internal TDM performance.

12.0 Conclusions & Recommendations

Brock Road Duffins Forest Inc. proposes a new residential development at 2055 Brock Road in the City of Pickering, Durham Region. The analysis contained within this report has resulted in the following key findings:

Existing Conditions

- Although the boundary road network is currently operating at capacity with a level of service (LOS) "D" or better with a maximum control delay of 35.8 seconds and a maximum theoretical volume-to-capacity ratio of 1.24, it was determined that the analysis can be considered conservative as it did not consider drivers proceeding through Brock Road (RR1) and Finch Avenue (RR37) intersection during intergreen phases. The analysis also did not consider "slip through" drivers in queued traffic at Major Oaks Road intersection. These maneuvers were consistently observed during existing peak period traffic conditions, thus, marginally improve traffic operations.

- When accounting for aggressive driving behaviours, using a lost time adjustment, the boundary road network operates at a level or service "C" with a lower maximum control delay of 30.2 seconds and a reduced maximum theoretical volume-to-capacity ratio of 1.11.

- The high volume-to-capacity ratios of the boundary road network is primarily attributed to the shared turning and through movement configurations. The boundary road network can marginally improve during existing and immediate short-term future via signal optimization and lost time adjustments. However, a road widening along Brock Road (as identified in Durham Region's Transportation Master Plan) will be required in the short to medium term future to accommodate continued traffic growth in the area.

Future Background Conditions

- Should Brock Road widening not be implemented by 2024, the following interim improvements are recommended for consideration due to the existing and future background conditions:

  - Optimize signal timing at Brock Road and Finch Ave:
    - EBR overlapping Phase with NBL
    - Optimized splits (maintained cycle length)

  - Optimize signal timing at Brock Road and Major Oaks Road/Usman Drive:
    - EBR slip lane via pavement marking
    - An increased cycle length of 110 seconds with an advanced southbound left-turn and optimized splits in the weekday a.m. and Friday mid-day peak periods
    - An unchanged cycle length of 100 seconds with optimized splits in the weekday p.m. peak period

- With the interim improvements mentioned above, intersection analyses of the 2024 future background traffic volumes indicate the intersection of Brock Road and Finch Avenue is expected to operate at a level of service "F" or better during the weekday a.m., p.m. and Friday mid-day peak periods, with a maximum control delay of 95.0 seconds and maximum theoretical volume-to-capacity ratio of 1.25. The remaining boundary road network is expected to operate with a level of service "D" or better during the weekday a.m., p.m. and Friday mid-day peak periods, with a maximum control delay of 43.9 seconds and maximum theoretical volume-to-capacity ratio of 1.29. As such, Brock Road widening is ultimately recommended by 2024.

- Based on the OTM Book 12 signal justifications 1-7, a signal is not required at intersection of Brock Road and Usman Road. Nevertheless, it is recommended as signalization could provide pedestrian and cycling crossing opportunity across Brock Road.

- As expected, the boundary road network is anticipated to continue to experience high levels of delay and capacity issues in 2029 future background conditions without road widening. Without road widening, the intersection of Brock Road and Finch Avenue is expected to continue to operate at a level of service "F" during the weekday a.m., p.m. and Friday mid-day peak periods, with a maximum control delay of 138.6 seconds and a maximum theoretical volume-to-capacity ratio of 1.41. The remaining boundary road network is expected to operate at a level of service "E" or better during the weekday a.m., p.m. and Friday mid-day peak periods, with a maximum control delay of 74.2 seconds and maximum theoretical volume-to-capacity ratio of 2.18.

- Upon road widening of Brock Road (RR1), intersection analyses indicate that the boundary road network can significantly improve under 2029 future background traffic conditions.

- Intersection analyses of the 2029 future background traffic volumes with road widening indicate the intersection of Brock Road and Finch Avenue is expected to operate at an improved level of service "E" or better during the weekday a.m., p.m. and Friday mid-day peak periods, with a maximum control delay of 65.9 seconds and maximum theoretical volume-to-capacity ratio of 1.18. The remaining boundary road network is expected to operate at an improved level of service "D" or better during the weekday a.m., p.m. and Friday mid-day peak periods, with a maximum control delay of 42.5 seconds and a maximum theoretical volume-to-capacity ratio of 1.04.

Future Total Conditions

- The proposed residential development is expected to add 121 and 139 unadjusted two-way trips to the boundary road network in the weekday a.m. and p.m. peak periods, respectively.

- As Friday mid-day period between 12:00 p.m. to 4:00 p.m. is not typically associated with residential peak period nor commuter peak period, trips generated in weekday p.m. peak hour (139 two-way trips) are conservatively applied to all future total mid-day traffic analysis.

- When compared to a previously approved site plan for the Subject Property, as requested by the City of Pickering, the proposed development is expected to generate 64 more trips in the weekday a.m. peak hour and 5 less trips in the weekday p.m. and Friday mid-day peak hours.

- With the same interim improvements as recommended in the future background analysis, the intersection of Brock Road and Finch Avenue is expected to operate at an unchanged level of service "F" or better during the weekday a.m., p.m. and Friday mid-day peak periods under 2024 future total conditions (without road widening). The intersection is expected to operate with a maximum control delay of 105.8 seconds and a maximum theoretical volume-to-capacity ratio of 1.29. The remaining boundary road network is expected to operate at a level of service "E" or better during the weekday a.m., p.m. and Friday mid-day peak periods, with a maximum control delay of 55.9 seconds and a maximum theoretical volume-to-capacity ratio of 1.72.

- Intersection analyses of the 2029 future total traffic volumes (with road widening) indicate that the intersection of Brock Road and Finch Avenue is anticipated to operate at an unchanged level of service "E" or better during the weekday a.m., p.m. and Friday mid-day peak periods. The intersection is expected to operate with a maximum control delay of 71.8 seconds and a maximum theoretical volume-to-capacity ratio of 1.20. The remaining boundary road network is expected to operate at an unchanged level of service "D" or better during the weekday a.m., p.m. and Friday mid-day peak periods, with a maximum control delay of 52.7 seconds and a maximum theoretical volume-to-capacity ratio of 1.08 or less.

- In comparison to 2029 future background conditions (with road widening), the subject development does not materially alter the traffic operations at the intersection. Accordingly, the development can be supported from a traffic operations perspective.

- The proposed site access is expected to operate efficiently at a level of service "B" or better during weekday a.m., p.m. and Friday mid-day peak periods, with a maximum control delay of 10.6 seconds or less and low maximum volume-to-capacity ratios of 0.21 or less. The proposed site access is supportable from a traffic operations perspective.

- The future traffic operations analysis can be considered conservative as it did not account for left-turn vehicles during intergreen phases (no lost time adjustment). The aggressive driving behaviour was observed in the existing turning movement counts, and accounts for approximately 72 vehicles per hour for the intersection of Brock Road (RR1) at Finch Avenue (RR37). Additionally, a peak hour factor of 0.92 for the weekday a.m. and p.m. peak hours was used in all future analyses, this is considered conservative as existing peak hour factors were much higher. Accordingly, the actual traffic operations are expected to be better than indicated above.

- A sensitivity analysis confirms that when analyzed with the observed PHF of 0.98 (in the weekday

p.m. peak hour) the intersection of Brock Road (RR1) and Finch Avenue (RR37) is expected to operate at an improved level of service with reduced maximum control delay and volume-to-capacity ratios. Additionally, the intersection operations can further improve with a cycle length of 110 seconds, as there is an opportunity to implement green light progression along the Brock Road corridor.

- It is expected that regular commuters will choose to make a southbound left-turn at the signalized intersection of Brock Road at Major Oaks/Usman Road (north) rather than Brock Road at Usman Road (south) in order to avoid delays. A sensitivity analysis confirms that in the case that 50% of the southbound left-turning traffic at Brock Road and Usman Road (south) turns at Brock Road and Major Oaks/Usman Road (north) instead, the intersection still operates acceptably with no additional improvements required.

- Regardless of the improvements, the traffic generated by the development does not materially change the traffic operations of the boundary road network. Aside from the recommended improvements noted and warranted in future background conditions, additional improvements are not required for future total conditions. Thus, the proposed development is supportable from a traffic operations perspective, even prior to the planned Brock Road widening.

- The proposed site access is supportable from a sight distance perspective.

Minimum Parking and Loading Requirements

- According to the City of Pickering's Site-specific Zoning By-Law 7085/10 and City of Pickering Area-specific Zoning By-Law 3036, 509 vehicle parking spaces and no bicycle parking or loading spaces are required. As the Site Plan proposes 513 parking spaces, 177 bicycle parking spaces and 2 loading spaces, the City of Pickering's Zoning By-Law is satisfied.

Transportation Demand Management

- The proposed development can be supported by several TDM strategies, including:

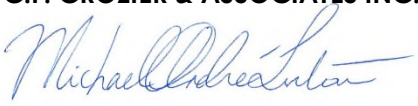
    - Existing Modal Split
    - Transit Network
    - Transit Incentives
    - Active Transportation Network
    - Future Transit Opportunities
    - Site Specific TDM measures
        - Marketing & Promotions
        - Secure Bicycle Parking/Excess Bicycle Parking and Bike Repair Stations
        - Bicycle Reimbursement
        - Pre-loaded Presto Cards
        - Priority Rideshare Pickup/Drop-Off Areas
        - Real-Time Transit Information
        - Unbundled and Paid Parking
        - Site Plan Design

The analysis contained within this report was prepared using the most recent Site Plan prepared by Kohn Partnership Architects Inc. Any minor revisions to the Site Plan are not expected to affect the conclusions contained with this report.

In conclusion, the proposed residential development at 2055 Brock Road can be supported from a traffic operations and safety perspective, with the implementations of the noted recommendations.

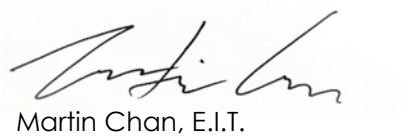
Respectfully submitted by,

C.F. CROZIER & ASSOCIATES INC.



Michael A. Linton, MASc., P.Eng.
Associate, Transportation

C.F. CROZIER & ASSOCIATES INC.



Martin Chan, E.I.T.
EIT, Transportation

C.F. CROZIER & ASSOCIATES INC.



Kierra Harper
Engineering Intern, Transportation

/MC/KH
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APPENDIX A

Correspondence

Martin Chan

From: Zahoor, Nadeem <nzahoor@pickering.ca>
Sent: October 4, 2019 3:16 PM
To: Martin Chan; doug.robertson@durham.ca
Cc: Michael Linton
Subject: RE: Terms of Reference: 2055 Brock Road TIS

Hi Martin,

Thanks for sending the TOR for the City review. This development is at the Regional intersection and most of the comments will come from Doug. Overall it looks good to me. However, I have the following couple of comments:

- For the background development information, please contact Nilesh Surti, Manager Urban Design, at nsurti@pickering.ca. His extension is 2035

- Add a discussion on active transportation network (cycling and pedestrian)

Thanks Nad

From: Martin Chan <mchan@cfcrozier.ca>
Sent: Wednesday, October 2, 2019 9:52 AM
To: doug.robertson@durham.ca; Zahoor, Nadeem <nzahoor@pickering.ca>
Cc: Michael Linton <mlinton@cfcrozier.ca>
Subject: Terms of Reference: 2055 Brock Road TIS

Good Morning Nadeem & Doug,

Crozier & Associates has been retained to conduct a Traffic Impact Study for a residential development located at 2055 Brock Road in the City of Pickering, Region Municipality of Durham. As you may recall, a Traffic letter was previously prepared by BA Group based on an older site stats. The revised proposal suggests a 299 units 20-storey high-rise condominium/apartment, 9 street townhouses and 28 stacked townhouses.

The development is anticipated to generate 139 unadjusted two-way trips or less, during the weekday peak periods. On that basis, we proposed the following scope for the Traffic Impact Study;

- The intersections to be analyzed are:
    - Brock Road at Usman Road
    - Brock Road at Major Oaks Road/Usman Road
    - Brock Road at Finch Avenue
    - Usman Road Site Access

- The weekday a.m. (7:00 a.m. – 9:00 a.m.) and weekday p.m. (4:00 pm – 7:00 pm) peak hours will be analyzed.

- As the development is proposed to be built by 2023, five- and ten- year study horizons of 2024 and 2029 are proposed.

- A few background developments have been identified along Brock Road per the City's development application webpage. As they are located relatively far from the proposed development, only the background development

at 2071 Brock will be considered for analysis as any other development is assumed to be represented within the background growth rate. Is this supportable from the City and Region?

- Furthermore, does the City or Region have any projected traffic growth rate for this area? Based on the review of the background TIS reports, 2% was previously used. Is this acceptable for us to assume as well? The AADT data available only covers 2016-2018 (during which construction occurred) and the data on various Brock Road segments is not consistent.

- Trip generation for the proposed development will be calculated using published data from the ITE Trip Generation Manual, 10th Edition

- Trip distribution will be based on existing travel patterns or TTS data.

- Conduct a safety review of the proposed site access including sight distance review for ingressing and egressing vehicles using TAC GDGCR.

- Confirm the parking supply proposed by the development satisfies the City of Pickering's site specific Zoning By-Law

- Evaluate Transportation Demand Management Opportunities for the Site.

- Confirm loading supply proposed by the development satisfies the City of Pickering's Zoning By-Law; truck turning diagrams will be provided for waste collection and fire trucks. Fire trucks dimensions will be based on standard fire truck per TAC GDGCR manual and waste collection dimensions will be based on the below excerpt from Durham's By-law.

Appendix "A"

Waste Collection Vehicles and Container Dimension

The following table illustrates typical vehicle dimensions for typical waste collection v
The dimensions are approximate and may vary from actual. All measurements are i

Vehicle Type	Length	Width	Height	Turning Radiu
1. Recycling	**10.76 m**	**2.77 m**	**3.69 m** **5.08 m with bucket up**	**11.50 m**
2. Front-end	**9.85 m**	**2.77 m**	**4.31 m** **6.15 m with forks extended**	**11.50 m**
3. Rear Packer	**11.54 m**	**2.77 m**	**3.69 m**	**13.00 m**
4. Side Packer	**10.46 m**	**2.98 m**	**3.85 m**	**13.00 m**

I trust that the above covers all the elements required for the study. If you have any questions or comments, please feel free to contact me or my colleague, Michael Linton, included in this email. You can reach us by email or our office number 416-477-3392.

Thank you,

Martin

Martin Chan EIT | Transportation
C.F. Crozier & Associates Consulting Engineers
211 Yonge Street, Suite 301 | Toronto, ON M5B 1M4
cfcrozier.ca | mchan@cfcrozier.ca
tel: 416.477.3392 ext: 512

Martin Chan

From: Lynda Motschenbacher <Lynda.Motschenbacher@Durham.ca>
Sent: October 9, 2019 9:12 AM
To: Martin Chan
Subject: FW: Terms of Reference: 2055 Brock Road TIS

Good morning Martin,

A growth rate of 2% is acceptable.

Please include in your analysis, in addition to the weekday am and pm peak hours, Friday afternoons from 12:00 pm to 4:00 pm.

Please contact me if you have any questions.

Regards,

Lynda Motschenbacher
Project Coordinator- Transportation Infrastructure
Works Department
Regional Municipality of Durham
605 Rossland Road East, Level 5
PO Box 623
Whitby, ON L1N 6A3
Phone: 905-668-4113 ext 3492
Fax: 905-668-2051
Lynda.motschenbacher@durham.ca

From: Martin Chan <mchan@cfcrozier.ca>
Sent: Wednesday, October 02, 2019 9:52 AM
To: Doug Robertson <Doug.Robertson@Durham.ca>; nzahoor@pickering.ca
Cc: Michael Linton <mlinton@cfcrozier.ca>
Subject: Terms of Reference: 2055 Brock Road TIS

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- As the development is proposed to be built by 2023, five- and ten- year study horizons of 2024 and 2029 are proposed.

- A few background developments have been identified along Brock Road per the City's development application webpage. As they are located relatively far from the proposed development, only the background development at 2071 Brock will be considered for analysis as any other development is assumed to be represented within the background growth rate. Is this supportable from the City and Region?

- Furthermore, does the City or Region have any projected traffic growth rate for this area? Based on the review of the background TIS reports, 2% was previously used. Is this acceptable for us to assume as well? The AADT data available only covers 2016-2018 (during which construction occurred) and the data on various Brock Road segments is not consistent.

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4. Side Packer	**10.46 m**	**2.98 m**	**3.85 m**	**13.00 m**

I trust that the above covers all the elements required for the study. If you have any questions or comments, please feel free to contact me or my colleague, Michael Linton, included in this email. You can reach us by email or our office number 416-477-3392.

Thank you,

Martin

Martin Chan EIT | Transportation
C.F. Crozier & Associates Consulting Engineers
211 Yonge Street, Suite 301 | Toronto, ON M5B 1M4
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Martin Chan

From: Surti, Nilesh <nsurti@pickering.ca>
Sent: October 17, 2019 9:22 AM
To: Martin Chan
Subject: RE: Terms of Reference: 2055 Brock Road TIS

Good Morning Martin,

Sorry for the delay in responding to your email. There is no other active development applications within the immediate area that should be included in your study. However, we have had couple of pre-consultation meetings for the future redevelopment of the Smart Centre lands to the south and the lands municipally known as 2177 and 2185 Brock Road. Let me know if you would like any additional information for these two potential developments to be included in your study.

Regards,

Nilesh Surti, MCIP, RPP
Manager, Development Review & Urban Design | City Development Department
905.420.4660 ext. 2035 | 1.866.683.2760
nsurti@pickering.ca

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pingstreet

From: Martin Chan <mchan@cfcrozier.ca>
Sent: Wednesday, October 9, 2019 9:27 AM
To: Surti, Nilesh <nsurti@pickering.ca>
Subject: RE: Terms of Reference: 2055 Brock Road TIS

Good morning Nilesh,

Just following up on the below request.

We have recently been provided a 2% growth rate for our TIS study. In addition to the growth rate and the expansion at 2071 Brock Road, are there any other relevant background developments that the City would like us to include for future background analysis?

Thanks

Martin

Martin Chan EIT | Transportation
C.F. Crozier & Associates Consulting Engineers

APPENDIX B

First Submission Comment Response Matrix

Department/Agency	Comment	Status/Response
City of Pickering – Development Engineering Comment & Response Matrix dated May 2021 Richard Holborn, Director c/o Dominique Fox, Admin. Asst. 905.420.4660 ext. 2118	**1.0 General Comments (August 17th, 2020)**	
	1.1.8 All documents should name the property owner as Brock Road Duffin Forest Inc.	Client's name is updated to "Brock Road Duffins Forest Inc."
	1.3 Traffic Comments (August 17th, 2020)	
	1.3.1 Table 2 of the Transportation Impact Study (TIS) states that the parking is available on Usman Road. However, as per the City of Pickering Traffic By-law, parking is prohibited on Usman Road from Brock Road to Saffron Drive at all times. Please update Table 2.	Updated.
	1.3.2 Include the proposed access curb radii and the access width on the plans.	Architect to update.
	1.3.3 Section 13 of the TIS provides various recommendations to improve the existing and future Brock Road intersections. These intersections are under the jurisdiction of Durham Region and they will review these recommendations and provide their feedback.	Noted.
	1.3.4 Transportation Impact Study Several area residents expressed concerns that existing traffic levels along Usman Road are already high and the proposal will only worsen the existing traffic issues experienced along this roadway.	Noted. Existing traffic issues have been noted in City's Transportation Study. A dedicated bus/HOV lane is proposed in the future following the widening of Brock Road to a 6-lane cross section. The dedicated bus HOV lane is expected to improve travel times by bus and thus, improve transit services in the area. As a result, a mode shift of auto driving to transit is expected. We also note that the existing signals at Brock Road and Usman (N) are expected to operate with acceptable levels of service in the future horizons with and without site-generated traffic.
	Area residents have commented that the proposal should have direct access from Brock Road instead of Usman Road in order minimize traffic issues on the existing neighbourhood.	Noted. As confirmed with Region Staff, direct access to Regional Road (Brock Road) is not supportable.

Department/Agency	Comment	Status/Response
	In addition, Members of Council also questioned if the Brock Road and Usman Road intersection could be signalized to support increased traffic flows.	A signal warrant analysis of the intersection at Brock Road and Usman Road is included in the TIS Addendum. Although pedestrians may benefit from an additional signalized intersection crossing, it is understood that the Region would like to keep this intersection unsignalized.
	Additionally, area residents have expressed that the submitted Transportation Impact Study does not address the programming currently conducted by the Islamic Centre which will also be expanding.	The submitted TIS accounted for the Islamic Centre expansion traffic volumes. This was included as "2065-2071 Brock Road Development". Furthermore, weekday AM, Friday Mid-day and weekday PM peak periods were reviewed. Friday Mid-day peak hour traffic was specifically requested during the Terms of Reference, due to the expected high traffic demands of the Islamic Centre.
	A Transportation Impact Study (TIS), prepared by Crozier Consulting Engineers, dated April 2020, was submitted in support of the proposed development. The study has been reviewed by City staff and the Region of Durham. In comments initial comments dated October 27, 2020 and additional comments December 7, 2020, the Region has requested that revisions to the TIS be completed and additional information is provided.	Acknowledged.

Department/Agency	Comment	Status/Response
	In addition to the information and revisions requested by the Region, City staff request that the following matters be included in the submitted TIS, in an effort to address the comments and concerns expressed by area residents regarding the negative traffic impact of the proposal: A signal warrant analysis for the signalization of the Brock Road/Usman Road intersection, which examines if the increase in vehicular traffic as a result of the proposed development will justify an additional signalized intersection and if such signalization will improve the function of the Brock Road/Major Oaks Road/Usman Road intersection. Please also address if signalization of the Brock Road/Usman Road intersection would decrease the number of traffic trips between the subject lands and the Brock Road/Major Oaks/Usman Road intersection.	Noted. A signal warrant analysis of the intersection at Brock Road and Usman Road is included in the TIS Addendum. As noted in the previous comment response, although signalization will provide additional pedestrian crossing opportunity, the Region does not support signalization of Brock Road at Usman (south) at this time.
	Traffic trip generation data (AM/PM Peak and Friday Afternoon), based on the current permitted uses of the current "RH/MU-3" – Multi-Residential/Mixed zone and the previously approved site plan, which has been attached. This data will enable staff to provide a comparison of vehicular traffic between the current proposal and the as-of-right land use, and identify if an increase or decrease in two-way vehicle trips are observed as a result of the current proposal.	Noted; trip generation estimates are provided in the TIS Addendum for comparison purposes.

Department/Agency	Comment	Status/Response
Durham Region **Comment & Response Matrix dated May 2021** Valerie Hendry, MCIP, RPP, Project Planner (905) 668-7711 ext. 2577 / 1-800-372-1102 / GARY MULLER, MCIP, RPP, Director of Planning Peter Castellan, Supervisor, Development Approvals (905) 668-771 ext. 3411	**9.0 Traffic Comments (October 28th, 2020, and December 7th, 2020)**	
	9.1.1 The Region requires the applicant to submit a waste plan. See the comments below: – Block A (20-storey 307 units condominium apartment building) shows overhead garage door to waste storage. Clearer understanding of the truck movement is required. Require an auto-turn to show tip and movement of a front-end waste vehicle. The internal waste areas with a tri-sorter meets the Region's requirement (refer to dual stream recycling/waste).	A Vehicle Turning Diagram was included as part of the original TIS study as Appendix J. Updated diagrams have been included in the TIS Addendum.
	– Block B (9 street townhouse units) would receive curbside waste/recycling collection. Set out is at the driveway. Roads show 6.5m.	A Vehicle Turning Diagram was included as part of the original TIS study as Appendix J. Updated diagrams have been included in the TIS Addendum.
	– Block C and D (2 - 32 unit, 3 storey stacked back to back townhouses) have no waste area nor any set out point. These will require multi-residential waste services. The plan must show clearly where the collection point for waste is to be staged and collected.	A Vehicle Turning Diagram was included as part of the original TIS study as Appendix J. Updated diagrams have been included in the TIS Addendum.
	– The proposed development must fully comply with Regional waste collection requirements in order to receive service.	Noted. Architect to confirm.

	Supporting Information: – As per the Guidelines for Municipal Waste Collection service on Private Property found in Schedule "P" of the Regional Waste Bylaw 46-2011 roads must be 6.5m in width and a 13m turn radius provided. The road configuration enables the waste vehicle to move in a forward motion without reversing as per municipal waste collection guidelines.	Noted. Architect to confirm Site Plan to meet the minimum dimensions. Older and updated vehicle turning diagrams indicated that the waste collection vehicle could enter/exit the site in a forward motion.
	9.1.4 Traffic Impact Study (TIS), prepared by C.F. Crozier & Associates Inc., dated April 2020. The Region requires the TIS to be revised as per comments. Page 8: There is no Pickering Golf Club transit terminal as stated in the report.	Noted and updated in report.
	Page 8: Route 603 peak frequency is not every 26 – 30 minutes. The most frequent service operated is 60 minutes.	Noted and updated in report.
	Page 32: Brock Road is identified as a future BRT line in the report. As shown in the 2017 Durham TMP, this corridor is identified as a future high frequency bus route in HOV lanes, not Bus Rapid Transit (BRT).	Noted and updated in report.
	Page 32: The Y10 fare discount is valid for students only and not employees as stated in the report.	Noted and updated in report.
	The site plan showing the details for Brock Road abutting the site should be included in the report.	Noted. Architect to update.

	Given the proposed density of the development, strong active transportation, transit and TDM initiatives are required in order to manage the traffic impacts. It is recommended that further actions be considered, with specific details and stakeholder commitments.	Noted; Additional TDM initiatives have been included in the TIS Addendum.
	Measures should be taken (e.g. fencing etc.) to try to discourage pedestrians from crossing Brock Road at Usman Road and instead encourage crossings at the traffic control signal at Major Oaks Rd/north leg of Usman Rd.	Noted. We also note that fencing and other physical elements of the site design will also be subject to Urban Design review. Pedestrian linkages and entrances are proposed to the external Brock Road sidewalk and bus stop. Pedestrian linkages to the POPs area from Brock Road are also proposed in order to satisfy other design-related comments and increase pedestrian circulation. Potential pedestrian signage options (e.g., "Cross Only at Major Oaks Rd" sign) will be considered. For detailed design of the Brock Road widening, the Region may also consider a pedestrian crossover at Brock Road and Usman (south) or near the Brockridge Community Park entrance should future conditions warrant.
	The Region's updated cycling plan will likely include the provision of an MUP on Brock Road. It is recommended that the opportunity to install an MUP across the property frontage be considered.	Noted; architect to consider MUP across frontage (replacing existing sidewalk)

	It is critical to quantify the number of trips expected during the a.m. and p.m. peak hours that will be exiting from Usman Road to make a northbound left or northbound U-turn movement at Major Oaks. Figure illustrating the site traffic and future traffic would be helpful. Existing U-turn movements from site observations/counts should be factored accordingly to account for additional development.	See Section 6.5 of the updated TIS Addendum.
	PHF of .92 should be used for all scenarios for comparison. Any deviation from this value should be noted and justified in the body of the report.	Synchro modelling has been updated. The observed PHFs were maintained in existing conditions, while PHFs of 0.92 were used for future background and future total scenarios. Existing PHFs were maintained for future analysis of the Friday Mid-day peak hours as the existing PHFs were lower and can be considered conservative.
	The Region requires HCM Synchro Reports for analysis as per the Design specifications, not the lanes / timings / volumes reports.	Noted; updated report will include additional HCM reports.
	All reports should be clearly labelled, especially the intersection name.	All reports included intersection names in the Synchro Reports appended to the previous submission.
	Under the future 2024 condition, the Synchro model at Brock Rd and Major Oaks / Usman Road shows an additional SB left-turn lane, this is incorrect.	The lane configurations for 2024 and 2029 only showed one SBL turn lane and did not show an additional SBL turn lane.

	The amber time for this phase should be 3, and the all-red 0.	Noted and updated.
	A resubmission of the modeling is required in order to determine the impact of the development.	Acknowledged. It is noted that the same signal timing plans were applied to future background and future total conditions for comparative purposes.

APPENDIX C

Transit Information

111 East Pickering

Effective September 2, 2019

Web **durhamregiontransit.com**
Phone **1-866-247-0055**

Sunday — Clockwise

Pickering Parkway Terminal **Stop #93112**	Kingston Westbound @ Dixie **Stop #1611**	Finch Eastbound @ Forest Park **Stop #1893**	Bainbridge Southbound @ Kingston **Stop #1941**	Pickering Parkway Terminal **Stop #93112**
A 9:35	9:38	9:45	9:48	10:01
A 10:35	10:38	10:45	10:48	11:01
A 11:35	11:38	11:45	11:48	12:01
A 12:35	12:38	12:45	12:48	13:01
A 13:35	13:38	13:45	13:48	14:01
A 14:35	14:38	14:45	14:48	15:01
A 15:35	15:38	15:45	15:48	16:01
A 16:35	16:38	16:45	16:48	17:01
A 17:35	17:38	17:45	17:48	18:01
A 18:35	18:38	18:45	18:48	19:01
A 19:35	19:38	19:45	19:48	20:01

A To Pickering Parkway Terminal clockwise

Sunday — Counter-clockwise

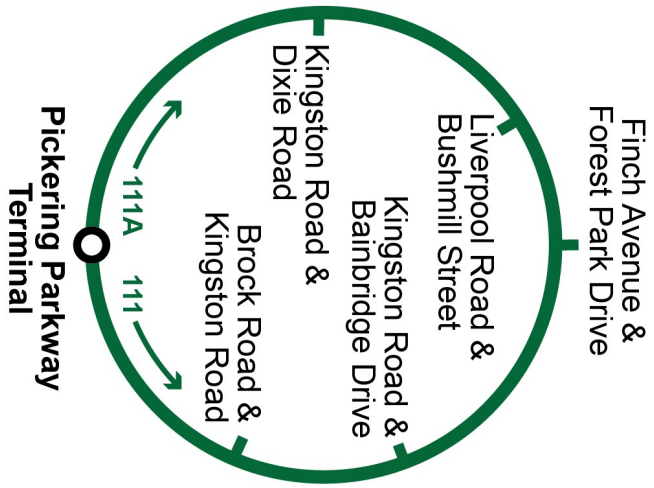
Pickering Parkway Terminal **Stop #93112**	Brock Road Northbound @ Kingston **Stop #1724**	Finch Westbound @ Forest Park **Stop #1867**	Dixie Southbound @ Kingston **Stop #1979**	Pickering Parkway Terminal **Stop #93112**
9:05	9:16	9:21	9:29	9:35
10:05	10:16	10:21	10:29	10:35
11:05	11:16	11:21	11:29	11:35
12:05	12:16	12:21	12:29	12:35
13:05	13:16	13:21	13:29	13:35
14:05	14:16	14:21	14:29	14:35
15:05	15:16	15:21	15:29	15:35
16:05	16:16	16:21	16:29	16:35
17:05	17:16	17:21	17:29	17:35
18:05	18:16	18:21	18:29	18:35
19:05	19:16	19:21	19:29	19:35

181 Late night shuttle from Pickering Station

Weekday	Saturday	Sunday
23:00	23:05	21:05
00:00	00:05	22:05
01:00		

Late night shuttle service is available to regular bus stops in Pickering. Once on board, inform the operator of your intended bus stop, who will then create a customized route.

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Weekday — Clockwise

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—	—	—	5:35	5:47
—	—	—	5:58	6:10
A 6:12	6:16	6:24	6:28	6:40
A 6:42	6:46	6:54	6:58	7:10
A 7:12	7:16	7:24	7:28	7:40
A 7:45	7:48	7:55	7:58	8:11
A 8:15	8:18	8:25	8:28	8:41
A 9:15	9:18	9:25	9:28	9:41
A 10:15	10:18	10:25	10:28	10:41
A 11:15	11:18	11:25	11:28	11:41
A 12:15	12:18	12:25	12:28	12:41
A 13:15	13:18	13:25	13:28	13:41
A 14:15	14:18	14:25	14:28	14:41
A 15:15	15:18	15:25	15:28	15:41
A 15:45	15:48	15:55	15:58	16:11
A 16:00	16:04	16:12	16:19	16:31
A 16:40	16:44	16:52	16:59	17:11
A 17:10	17:14	17:22	17:29	17:41
A 17:40	17:44	17:52	17:59	18:11
A 18:10	18:14	18:22	18:29	18:41
A 18:40	18:44	18:52	18:59	19:11
A 19:05	19:09	19:17	19:24	19:36

A To Pickering Parkway Terminal clockwise

Saturday — Clockwise

Pickering Parkway Terminal **Stop #93112**	Kingston Westbound @ Dixie **Stop #1611**	Finch Eastbound @ Forest Park **Stop #1893**	Bainbridge Southbound @ Kingston **Stop #1941**	Pickering Parkway Terminal **Stop #93112**
A 9:35	9:38	9:45	9:48	10:01
A 10:35	10:38	10:45	10:48	11:01
A 11:35	11:38	11:45	11:48	12:01
A 12:35	12:38	12:45	12:48	13:01
A 13:35	13:38	13:45	13:48	14:01
A 14:35	14:38	14:45	14:48	15:01
A 15:35	15:38	15:45	15:48	16:01
A 16:35	16:38	16:45	16:48	17:01
A 17:35	17:38	17:45	17:48	18:01
A 18:35	18:38	18:45	18:48	19:01
A 19:35	19:38	19:45	19:48	20:01

A To Pickering Parkway Terminal clockwise

Weekday — Counter-clockwise

Pickering Parkway Terminal **Stop #93112**	Brock Road Northbound @ Kingston **Stop #1724**	Finch Westbound @ Forest Park **Stop #1867**	Dixie Southbound @ Kingston **Stop #1979**	Pickering Parkway Terminal **Stop #93112**
—	—	5:55	6:03	6:09
6:10	6:21	6:26	6:34	6:40
6:40	6:51	6:56	7:04	7:10
7:15	7:26	7:31	7:39	7:45
7:45	7:56	8:01	8:09	8:15
8:15	8:26	8:31	8:39	8:45
8:45	8:56	9:01	9:09	9:15
9:45	9:56	10:01	10:09	10:15
10:45	10:56	11:01	11:09	11:15
11:45	11:56	12:01	12:09	12:15
12:45	12:56	13:01	13:09	13:15
13:45	13:56	14:01	14:09	14:15
14:45	14:56	15:01	15:09	15:15
15:45	15:56	16:01	16:09	16:15
16:15	16:28	16:33	16:40	16:48
16:36	16:49	16:54	17:01	17:09
17:10	17:23	17:28	17:35	17:43
17:40	17:53	17:58	18:05	18:13
18:15	18:28	18:33	18:40	18:48
18:40	18:53	18:58	19:05	19:13
19:05	19:18	19:23	19:30	19:38
19:35	19:46	19:51	19:59	20:05

Saturday — Counter-clockwise

Pickering Parkway Terminal **Stop #93112**	Brock Road Northbound @ Kingston **Stop #1724**	Finch Westbound @ Forest Park **Stop #1867**	Dixie Southbound @ Kingston **Stop #1979**	Pickering Parkway Terminal **Stop #93112**
9:05	9:16	9:21	9:29	9:35
10:05	10:16	10:21	10:29	10:35
11:05	11:16	11:21	11:29	11:35
12:05	12:16	12:21	12:29	12:35
13:05	13:16	13:21	13:29	13:35
14:05	14:16	14:21	14:29	14:35
15:05	15:16	15:21	15:29	15:35
16:05	16:16	16:21	16:29	16:35
17:05	17:16	17:21	17:29	17:35
18:05	18:16	18:21	18:29	18:35
19:05	19:16	19:21	19:29	19:35

112 Brock

Effective September 2, 2019

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Sunday — North

Pickering Station **Stop #2549**	Brock Road Northbound @ Kingston **Stop #1724**	Brock Road Northbound @ Major Oaks **Stop #1847**	Dellbrook Eastbound @ Melman **Stop #93435**	William Jackson Eastbound @ Brock Road **Stop #93279**
10:00	10:08	10:09	10:14	10:18
11:00	11:08	11:09	11:14	11:18
12:00	12:08	12:09	12:14	12:18
13:00	13:08	13:09	13:14	13:18
14:00	14:08	14:09	14:14	14:18
15:00	15:08	15:09	15:14	15:18
16:00	16:08	16:09	16:14	16:18
17:00	17:08	17:09	17:14	17:18
18:00	18:07	18:08	18:13	18:17
19:00	19:07	19:08	19:13	19:17
20:00	20:07	20:08	20:13	20:17

Sunday — South

William Jackson Eastbound @ Brock Road **Stop #93279**	Dellbrook Westbound @ Melman **Stop #1849**	Brock Road Southbound @ Kingston **Stop #1726**	Brock Road Southbound @ Pickering Parkway **Stop #1727**	Pickering Station **Stop #2549**
9:19	9:28	9:35	9:36	9:40
10:18	10:27	10:34	10:35	10:39
11:18	11:27	11:34	11:35	11:39
12:18	12:27	12:34	12:35	12:39
13:18	13:27	13:34	13:35	13:39
14:18	14:27	14:34	14:35	14:39
15:18	15:27	15:34	15:35	15:39
16:18	16:27	16:34	16:35	16:39
17:18	17:27	17:34	17:35	17:39
18:17	18:26	18:33	18:34	18:38
19:17	19:26	19:33	19:34	19:38
20:17	20:26	20:33	20:34	20:38

181 Late night shuttle from Pickering Station

Weekday	Saturday	Sunday
23:00	23:05	21:05
00:00	00:05	22:05
01:00		

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Weekday — North

Pickering Station **Stop #2549**	Brock Road Northbound @ Kingston **Stop #1724**	Brock Road Northbound @ Major Oaks **Stop #1847**	Dellbrook Eastbound @ Melman **Stop #93435**	William Jackson Eastbound @ Brock Road **Stop #93279**
6:06	6:14	6:15	6:20	6:24
6:36	6:44	6:45	6:50	6:54
6:46	6:54	6:55	7:00	7:04
7:04	7:12	7:13	7:18	7:22
7:20	7:28	7:29	7:34	7:38
7:33	7:41	7:42	7:47	7:51
7:46	7:54	7:55	8:00	8:04
7:59	8:07	8:08	8:13	8:17
8:15	8:23	8:24	8:29	8:33
8:40	8:48	8:49	8:54	8:58
9:10	9:18	9:19	9:24	9:28
9:40	9:48	9:49	9:54	9:58
10:10	10:18	10:19	10:24	10:28
10:40	10:48	10:49	10:54	10:58
11:10	11:18	11:19	11:24	11:28
11:40	11:48	11:49	11:54	11:58
12:10	12:18	12:19	12:24	12:28
12:40	12:48	12:49	12:54	12:58
13:10	13:18	13:19	13:24	13:28
13:40	13:48	13:49	13:54	13:58
14:10	14:18	14:19	14:24	14:28
14:40	14:49	14:51	14:56	15:00
15:10	15:19	15:21	15:26	15:30
15:30	15:39	15:41	15:46	15:50
16:00	16:09	16:11	16:16	16:20
16:20	16:29	16:31	16:36	16:40
16:35	16:44	16:46	16:51	16:55
16:55	17:04	17:06	17:11	17:15
17:10	17:19	17:21	17:26	17:30
17:30	17:39	17:41	17:46	17:50
17:40	17:49	17:51	17:56	18:00
17:50	17:59	18:01	18:06	18:10
18:15	18:24	18:26	18:31	18:35
18:40	18:47	18:48	18:53	18:57
19:05	19:12	19:13	19:18	19:22
19:30	19:37	19:38	19:43	19:47
20:05	20:12	20:13	20:18	20:22
21:00	21:07	21:08	21:13	21:17
22:00	22:07	22:08	22:13	22:17

Weekday — South

William Jackson Eastbound @ Brock Road **Stop #93279**	Dellbrook Westbound @ Melman **Stop #1849**	Brock Road Southbound @ Kingston **Stop #1726**	Brock Road Southbound @ Pickering Parkway **Stop #1727**	Pickering Station **Stop #2549**
5:25	5:34	5:41	5:42	5:46
5:50	5:59	6:06	6:07	6:11
6:24	6:33	6:40	6:41	6:45
6:54	7:03	7:10	7:11	7:15
7:04	7:13	7:20	7:21	7:25
7:22	7:31	7:38	7:39	7:43
7:38	7:47	7:54	7:55	7:59
7:51	8:00	8:07	8:08	8:12
8:04	8:13	8:20	8:21	8:25
8:17	8:26	8:33	8:34	8:38
8:33	8:42	8:49	8:50	8:54
8:58	9:07	9:14	9:15	9:19
9:28	9:37	9:44	9:45	9:49
9:58	10:07	10:14	10:15	10:19
10:28	10:37	10:44	10:45	10:49
10:58	11:07	11:14	11:15	11:19
11:28	11:37	11:44	11:45	11:49
11:58	12:07	12:14	12:15	12:19
12:28	12:37	12:44	12:45	12:49
12:58	13:07	13:14	13:15	13:19
13:28	13:37	13:44	13:45	13:49
13:58	14:07	14:14	14:15	14:19
14:28	14:37	14:44	14:45	14:49
15:00	15:09	15:16	15:17	15:21
15:30	15:39	15:46	15:47	15:51
15:50	15:59	16:06	16:07	16:11
16:20	16:29	16:36	16:37	16:41
16:40	16:49	16:56	16:57	17:04
16:55	17:04	17:11	17:12	17:19
17:15	17:24	17:31	17:32	17:39
17:30	17:39	17:46	17:47	17:54
18:00	18:09	18:16	18:17	18:24
18:35	18:44	18:51	18:52	18:59
18:57	19:06	19:13	19:14	19:18
19:23	19:32	19:39	19:40	19:44
20:22	20:31	20:38	20:39	20:43
21:17	21:26	21:33	21:34	21:38
22:18	22:27	22:34	22:35	22:39

112 Brock

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Saturday				North
Pickering Station **Stop #2549**	Brock Road Northbound @ Kingston **Stop #1724**	Brock Road Northbound @ Major Oaks **Stop #1847**	Dellbrook Eastbound @ Melman **Stop #93435**	William Jackson Eastbound @ Brock Road **Stop #93279**
7:30	7:38	7:39	7:44	7:48
8:00	8:08	8:09	8:14	8:18
8:30	8:38	8:39	8:44	8:48
9:00	9:08	9:09	9:14	9:18
9:30	9:38	9:39	9:44	9:48
10:00	10:08	10:09	10:14	10:18
10:30	10:38	10:39	10:44	10:48
11:00	11:08	11:09	11:14	11:18
11:30	11:38	11:39	11:44	11:48
12:00	12:08	12:09	12:14	12:18
12:30	12:38	12:39	12:44	12:48
13:00	13:08	13:09	13:14	13:18
13:30	13:38	13:39	13:44	13:48
14:00	14:08	14:09	14:14	14:18
14:30	14:38	14:39	14:44	14:48
15:00	15:08	15:09	15:14	15:18
15:30	15:38	15:39	15:44	15:48
16:00	16:08	16:09	16:14	16:18
16:30	16:38	16:39	16:44	16:48
17:00	17:08	17:09	17:14	17:18
17:30	17:38	17:39	17:44	17:48
18:00	18:07	18:08	18:13	18:17
18:33	18:40	18:41	18:46	18:50
19:00	19:07	19:08	19:13	19:17
20:00	20:07	20:08	20:13	20:17
21:00	21:07	21:08	21:13	21:17
22:03	22:10	22:11	22:16	22:20

Saturday				South
William Jackson Eastbound @ Brock Road **Stop #93279**	Dellbrook Westbound @ Melman **Stop #1849**	Brock Road Southbound @ Kingston **Stop #1726**	Brock Road Southbound @ Pickering Parkway **Stop #1727**	Pickering Station **Stop #2549**
7:19	7:28	7:35	7:36	7:40
7:48	7:57	8:04	8:05	8:09
8:18	8:27	8:34	8:35	8:39
8:48	8:57	9:04	9:05	9:09
9:18	9:27	9:34	9:35	9:39
9:48	9:57	10:04	10:05	10:09
10:18	10:27	10:34	10:35	10:39
10:48	10:57	11:04	11:05	11:09
11:18	11:27	11:34	11:35	11:39
11:48	11:57	12:04	12:05	12:09
12:18	12:27	12:34	12:35	12:39
12:48	12:57	13:04	13:05	13:09
13:18	13:27	13:34	13:35	13:39
13:48	13:57	14:04	14:05	14:09
14:18	14:27	14:34	14:35	14:39
14:48	14:57	15:04	15:05	15:09
15:18	15:27	15:34	15:35	15:39
15:48	15:57	16:04	16:05	16:09
16:18	16:27	16:34	16:35	16:39
16:48	16:57	17:04	17:05	17:09
17:18	17:27	17:34	17:35	17:39
17:48	17:57	18:04	18:05	18:09
18:17	18:26	18:33	18:34	18:38
18:50	18:59	19:06	19:07	19:11
19:17	19:26	19:33	19:34	19:38
20:17	20:26	20:33	20:34	20:38
21:17	21:26	21:33	21:34	21:38
22:20	22:29	22:36	22:37	22:41

193 Pickering Community Route

Effective September 2, 2019

Web **durhamregiontransit.com**
Phone **1-866-247-0055**

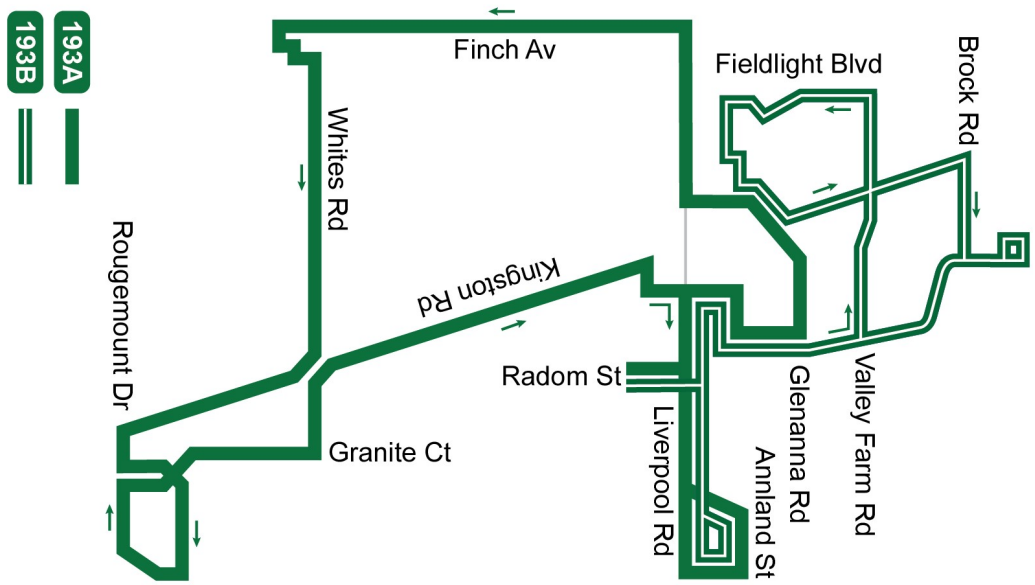
Weekday and Saturday — 193A

Pickering Town Centre **Stop #1909**	Liverpool Northbound @ Glenanna **Stop #1732**	Finch Westbound @ Whites **Stop #93420**	Whites Southbound @ Kingston **Stop #93216**	Rosebank Southbound @ Rougemount **Stop #1634**	Kingston Eastbound @ Whites **Stop #1779**	Kingston Eastbound @ Dixie **Stop #1782**	Radom Westbound @ St Martins **Stop #1996**	Southbound @ 725 Krosno **Stop #1832**	Pickering Town Centre **Stop #1909**
10:30	10:33	10:38	10:44	10:51	10:58	11:01	11:10	11:15	11:26
12:30	12:33	12:38	12:44	12:51	12:58	13:01	13:10	13:15	13:26
14:30	14:33	14:38	14:44	14:51	14:58	15:01	15:10	15:15	15:26

Weekday and Saturday — 193B

Pickering Town Centre **Stop #1909**	Valley Farm Northbound @ Avonmore **Stop #1907**	Fieldlight Southbound @ Faylee **Stop #1899**	Kingston Eastbound @ Glenanna **Stop #1786**	Walmart Northbound @ Pickering Parkway **Stop #1948**	Pickering Parkway Terminal **Stop #93112**	Radom Westbound @ St Martins **Stop #1996**	Southbound @ 725 Krosno **Stop #1832**	Pickering Town Centre **Stop #1909**
11:30	11:33	11:37	11:40	11:48	11:56	12:02	12:07	12:18
13:30	13:33	13:37	13:40	13:48	13:56	14:02	14:07	14:18
15:30	15:33	15:37	15:40	15:48	15:56	16:02	16:07	16:18

Dashes indicate the stop is not served by a trip. Trip notes are indicated by a letter or symbol and explained at the bottom of each timetable. Schedule times are shown in 24-hour clock. If you require this information in an accessible format, please contact Customer Service at 1-866-247-0055. See durhamregiontransit.com for more information.



193 Pickering Community Route
Effective September 2, 2019

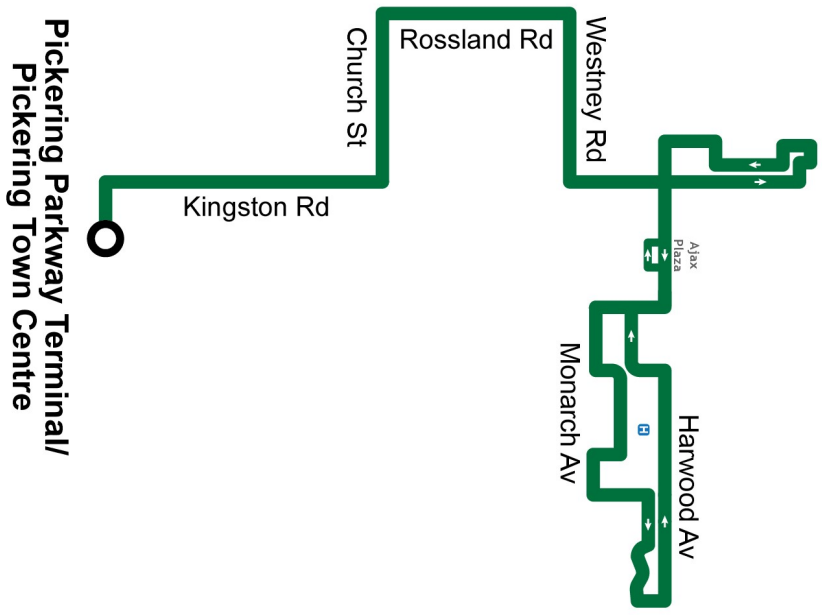
291 Ajax Community Route

Effective September 2, 2019

Web **durhamregiontransit.com**
Phone **1-866-247-0055**

Sunday							West	Sunday							East
Westney Eastbound @ Harwood **Stop #2276**	Clover Ridge Southbound @ Pittmann **Stop #2059**	Northbound @ 655 Harwood **Stop #2068**	Harwood Plaza Eastbound **Stop #3327**	Durham Centre Westbound @ Harwood **Stop #90003**	Rossland Westbound @ Ravenscroft **Stop #93016**	Church Southbound @ Kingston **Stop #2209**	Pickering Town Centre **Stop #1909**	Pickering Town Centre **Stop #1909**	Church Northbound @ Sherwood **Stop #3229**	Rossland Eastbound @ Ravenscroft **Stop #92017**	Kingston Eastbound @ Westney Heights Plaza **Stop #3029**	Durham Centre Westbound @ Harwood **Stop #90003**	Harwood Plaza Westbound **Stop #3332**	Bayly Eastbound @ Kitney **Stop #2305**	Westney Eastbound @ Harwood **Stop #2276**
11:21	11:23	11:28	11:36	11:54	12:04	12:10	12:19	12:30	12:39	12:45	12:52	13:06	13:12	13:15	13:20
13:21	13:23	13:28	13:36	13:54	14:04	14:10	14:19	14:30	14:39	14:45	14:52	15:06	15:12	15:15	15:20
15:21	15:23	15:28	15:36	15:54	16:04	16:10	16:19	16:30	16:39	16:45	16:52	17:06	17:12	17:15	17:20
17:21	17:23	17:28	—	—	—	—	—								

Dashes indicate the stop is not served by a trip. Trip notes are indicated by a letter or symbol and explained at the bottom of each timetable. Schedule times are shown in 24-hour clock. If you require this information in an accessible format, please contact Customer Service at 1-866-247-0055. See durhamregiontransit.com for more information.



Durham Region Transit

291 Ajax Community Route

Effective September 2, 2019

291 Ajax Community Route

Effective September 2, 2019

Web **durhamregiontransit.com**
Phone **1-866-247-0055**

Weekday — West

Westney Eastbound @ Harwood **Stop #2276**	Clover Ridge Southbound @ Pittmann **Stop #2059**	Northbound @ 655 Harwood **Stop #2068**	Harwood Plaza Eastbound **Stop #3327**	Walmart Westbound @ Kingston **Stop #1940**	Durham Centre Westbound @ Harwood **Stop #90003**	Kingston Westbound @ Westney Heights Plaza **Stop #1597**	Rossland Westbound @ Ravenscroft **Stop #93016**	Church Southbound @ Kingston **Stop #2209**	Pickering Town Centre **Stop #1909**
—	—	* 8:35	8:42	8:58	9:05	9:09	9:15	9:20	9:31
9:24	9:26	9:32	9:39	9:55	10:02	10:06	10:12	10:17	10:28
10:24	10:26	10:32	10:39	10:55	11:02	11:06	11:12	11:17	11:28
11:24	11:26	11:32	11:39	11:55	12:02	12:06	12:12	12:17	12:28
12:24	12:26	12:32	12:39	12:55	13:02	13:06	13:12	13:17	13:28
13:24	13:26	13:32	13:39	13:55	14:02	14:06	14:12	14:17	14:28
14:24	14:26	14:32	14:39	14:55	15:02	15:06	15:12	15:17	15:28
15:24	15:26	15:32	15:39	15:55	16:02	16:06	16:12	16:17	16:28
16:24	16:26	16:32	16:39	16:55	17:02	17:06	17:12	17:17	17:28
17:24	17:26	17:31	—	—	—	—	—	—	—
18:24	18:26	18:31	—	—	—	—	—	—	—

* On school days this trip begins at Lake Driveway & Walker at 8:26

Weekday — East

Pickering Town Centre **Stop #1909**	Church Northbound @ Sherwood **Stop #3229**	Rossland Eastbound @ Ravenscroft **Stop #92017**	Kingston Eastbound @ Westney Heights Plaza **Stop #3029**	Walmart Westbound @ Kingston **Stop #1940**	Durham Centre Westbound @ Harwood **Stop #90003**	Harwood Plaza Westbound **Stop #3332**	Bayly Eastbound @ Kitney **Stop #2305**	Westney Eastbound @ Harwood **Stop #2276**
—	8:40	8:46	8:53	9:02	9:07	9:13	9:16	9:21
9:30	9:39	9:45	9:52	10:01	10:06	10:12	10:15	10:20
10:30	10:39	10:45	10:52	11:01	11:06	11:12	11:15	11:20
11:30	11:40	11:46	11:53	12:02	12:07	12:15	12:18	12:23
12:30	12:40	12:46	12:53	13:02	13:07	13:15	13:18	13:23
13:30	13:40	13:46	13:53	14:02	14:07	14:15	14:18	14:23
14:30	14:40	14:46	14:53	15:02	15:07	15:15	15:18	15:23
15:30	15:40	15:46	15:53	16:02	16:07	16:15	16:18	16:23
16:30	16:40	16:46	16:53	17:02	17:07	17:15	17:18	17:23
17:30	17:40	17:46	17:53	18:02	18:07	18:15	18:18	18:23

291 Ajax Community Route

Effective September 2, 2019

Web **durhamregiontransit.com**
Phone **1-866-247-0055**

Saturday — West

Westney Eastbound @ Harwood **Stop #2276**	Clover Ridge Southbound @ Pittmann **Stop #2059**	Northbound @ 655 Harwood **Stop #2068**	Harwood Plaza Eastbound **Stop #3327**	Walmart Westbound @ Kingston **Stop #1940**	Durham Centre Westbound @ Harwood **Stop #90003**	Kingston Westbound @ Westney Heights Plaza **Stop #1597**	Rossland Westbound @ Ravenscroft **Stop #93016**	Church Southbound @ Kingston **Stop #2209**	Pickering Town Centre **Stop #1909**
8:21	8:23	8:28	8:36	8:49	8:54	8:58	9:04	9:10	9:19
9:21	9:23	9:29	9:36	9:52	9:59	10:03	10:09	10:14	10:25
10:21	10:23	10:29	10:36	10:52	10:59	11:03	11:09	11:14	11:25
11:21	11:23	11:29	11:36	11:52	11:59	12:03	12:09	12:14	12:25
12:21	12:23	12:29	12:36	12:52	12:59	13:03	13:09	13:14	13:25
13:21	13:23	13:29	13:36	13:52	13:59	14:03	14:09	14:14	14:25
14:21	14:23	14:29	14:36	14:52	14:59	15:03	15:09	15:14	15:25
15:21	15:23	15:29	15:36	15:52	15:59	16:03	16:09	16:14	16:25
16:21	16:23	16:29	16:36	16:52	16:59	17:03	17:09	17:14	17:25
17:21	17:23	17:28	—	—	—	—	—	—	—
18:21	18:23	18:28	—	—	—	—	—	—	—

Saturday — East

Pickering Town Centre **Stop #1909**	Church Northbound @ Sherwood **Stop #3229**	Rossland Eastbound @ Ravenscroft **Stop #92017**	Kingston Eastbound @ Westney Heights Plaza **Stop #3029**	Walmart Westbound @ Kingston **Stop #1940**	Durham Centre Westbound @ Harwood **Stop #90003**	Harwood Plaza Westbound **Stop #3332**	Bayly Eastbound @ Kitney **Stop #2305**	Westney Eastbound @ Harwood **Stop #2276**
—	8:40	8:46	8:53	9:02	9:07	9:13	9:16	9:21
9:30	9:39	9:45	9:52	10:01	10:06	10:12	10:15	10:20
10:30	10:39	10:45	10:52	11:01	11:06	11:12	11:15	11:20
11:30	11:39	11:45	11:52	12:01	12:06	12:12	12:15	12:20
12:30	12:39	12:45	12:52	13:01	13:06	13:12	13:15	13:20
13:30	13:39	13:45	13:52	14:01	14:06	14:12	14:15	14:20
14:30	14:39	14:45	14:52	15:01	15:06	15:12	15:15	15:20
15:30	15:39	15:45	15:52	16:01	16:06	16:12	16:15	16:20
16:30	16:39	16:45	16:52	17:01	17:06	17:12	17:15	17:20
17:30	17:39	17:45	17:52	18:01	18:06	18:12	18:15	18:20

603 Pickering-Port Perry

Effective September 2, 2019

Web **durhamregiontransit.com**
Phone **1-866-247-0055**

Weekday							North
Glenanna Southbound @ The Esplanade (South side stop) **Stop #1915**	Pickering Parkway Terminal **Stop #93112**	Brock Road & Highway 407 Park and Ride Platform 6 **Stop #3376**	Old Brock Northbound @ Central **Stop #3385**	Eastbound @ 6 Welwood **Stop #2416**	Toronto Northbound @ Brock Street (South side stop) **Stop #93018**	Reach Eastbound @ East **Stop #2428**	Curts Eastbound @ Port Perry Terminal **Stop #2491**
10:31	10:32	10:47	10:55	11:10	—	—	—
14:01	14:02	14:17	14:25	14:40	—	—	—
16:01	16:02	16:17	16:25	16:45	16:50	17:06	17:17
17:01	17:02	17:17	17:25	17:45	17:50	18:06	18:17
18:01	18:02	18:17	18:25	18:45	18:50	19:06	19:17

Weekday							South
Curts Eastbound @ Port Perry Terminal **Stop #2491**	Reach Westbound @ Simcoe **Stop #2454**	Franklin Northbound @ Reach **Stop #3224**	Toronto Southbound @ Brock Street (South side stop) **Stop #2438**	Eastbound @ 6 Welwood **Stop #2416**	Old Brock Southbound @ Central **Stop #3386**	Brock Road & Highway 407 Park and Ride Platform 5 **Stop #3377**	Pickering Parkway Terminal **Stop #93112**
6:08	6:17	6:29	6:30	6:35	6:50	6:58	7:15
7:08	7:17	7:29	7:30	7:35	7:50	7:58	8:15
—	—	—	—	11:15	11:30	11:38	11:55
—	—	—	—	15:45	16:00	16:08	16:25
—	—	—	—	17:15	17:30	17:38	17:55

Dashes indicate the stop is not served by a trip. Trip notes are indicated by a letter or symbol and explained at the bottom of each timetable. Schedule times are shown in 24-hour clock. If you require this information in an accessible format, please contact Customer Service at 1-866-247-0055. See durhamregiontransit.com for more information.

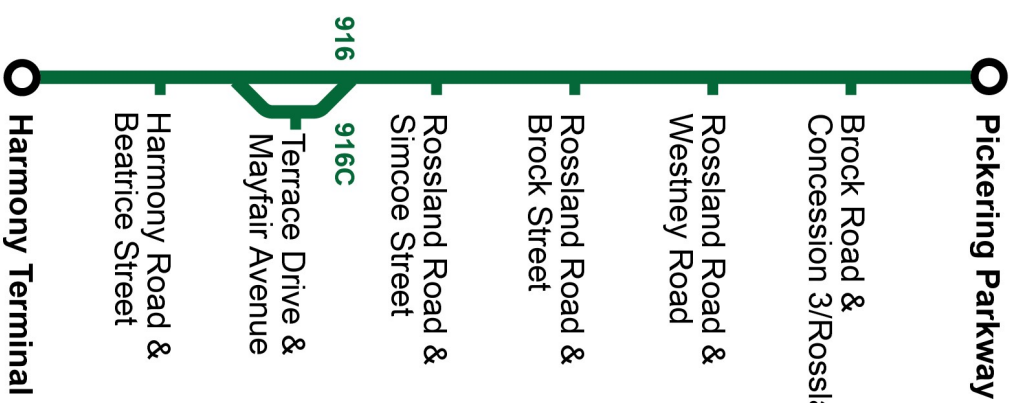
603 Pickering-Port Perry

Effective September 2, 2019

- **Port Perry Terminal**
- Reach Street & Simcoe Street (Port Perry)
- Reach Street & East Street/ Franklin Street (Uxbridge)
- Toronto Street & Brock Street (Uxbridge)
- Toronto Street & Welwood Drive (Uxbridge)
- Old Brock Road & Cental Street (Claremont)
- **Brock Road and Highway 407 Park and Ride**
- **Pickering Parkway Terminal**

Dashes indicate the stop is not served by a trip. Trip notes are indicated by a letter or symbol and explained at the bottom of each timetable. Schedule times are shown in 24-hour clock. If you require this information in an accessible format, please contact Customer Service at 1-866-247-0055. See durhamregiontransit.com for more information.

Durham Region Transit
916 Rossland
Effective September 2, 2019



916 Rossland

Effective September 2, 2019

Web **durhamregiontransit.com**
Phone **1-866-247-0055**

Weekday — East

Pickering Parkway Terminal **Stop #93112**	Brock Road Northbound @ Concession 3 **Stop #93442**	Rossland Eastbound @ Westney **Stop #2169**	Rossland Eastbound @ Brock Street **Stop #476**	Rossland Eastbound @ Simcoe **Stop #573**	Terrace Northbound @ Mayfair **Stop #579**	Harmony Terminal **Stop #812**
—	—	5:10	5:21	5:33	—	5:42
—	—	5:40	5:51	6:03	—	6:12
5:55	6:05	6:11	6:23	6:36	—	6:47
6:15	6:25	6:31	6:43	6:56	—	7:07
6:45	6:55	7:01	7:13	7:26	—	7:37
C 7:00	7:10	7:16	7:28	7:41	7:45	7:54
7:15	7:25	7:31	7:43	7:56	—	8:07
C 7:30	7:40	7:46	7:58	8:11	8:15	8:24
7:45	7:55	8:01	8:13	8:26	—	8:37
C 8:05	8:15	8:21	8:33	8:46	8:50	8:59
8:20	8:30	8:36	8:48	9:01	—	9:12
C 8:35	8:45	8:51	9:03	9:16	9:20	9:29
8:50	9:00	9:05	9:16	9:28	—	9:37
C 9:05	9:15	9:20	9:31	9:43	9:46	9:54
C 9:35	9:45	9:50	10:01	10:13	10:16	10:24
C 10:05	10:15	10:21	10:33	10:46	10:50	10:59
C 10:35	10:45	10:51	11:03	11:16	11:20	11:29
C 11:05	11:15	11:21	11:33	11:46	11:50	11:59
C 11:35	11:45	11:51	12:03	12:16	12:20	12:29
C 12:05	12:15	12:21	12:33	12:46	12:50	12:59
C 12:35	12:45	12:51	13:03	13:16	13:20	13:29
C 13:05	13:15	13:21	13:33	13:46	13:50	13:59
C 13:35	13:47	13:55	14:08	14:22	14:26	14:35
C 14:05	14:17	14:25	14:38	14:52	14:56	15:05
14:20	14:30	14:40	14:53	15:07	—	15:18
C 14:35	14:47	14:55	15:08	15:22	15:26	15:35

C To Harmony Terminal via Terrace Drive

Weekday — East

Pickering Parkway Terminal **Stop #93112**	Brock Road Northbound @ Concession 3 **Stop #93442**	Rossland Eastbound @ Westney **Stop #2169**	Rossland Eastbound @ Brock Street **Stop #476**	Rossland Eastbound @ Simcoe **Stop #573**	Terrace Northbound @ Mayfair **Stop #579**	Harmony Terminal **Stop #812**
14:50	15:00	15:10	15:23	15:37	—	15:48
C 15:05	15:17	15:25	15:38	15:52	15:56	16:05
15:20	15:30	15:40	15:53	16:07	—	16:18
C 15:35	15:47	15:55	16:08	16:22	16:26	16:35
15:50	16:00	16:10	16:23	16:37	—	16:48
C 16:05	16:17	16:25	16:38	16:52	16:56	17:05
16:20	16:32	16:40	16:53	17:07	—	17:18
C 16:40	16:52	17:00	17:13	17:27	17:31	17:40
17:00	17:12	17:20	17:33	17:47	—	17:58
C 17:15	17:27	17:35	17:48	18:02	18:06	18:15
17:30	17:42	17:50	18:03	18:17	—	18:28
C 17:45	17:55	18:00	18:11	18:23	18:26	18:34
18:00	18:10	18:15	18:26	18:38	—	18:47
C 18:15	18:25	18:30	18:41	18:53	18:56	19:04
18:30	18:40	18:45	18:56	19:08	—	19:17
C 18:45	18:55	19:00	19:11	19:23	19:26	19:34
19:05	19:15	19:20	19:31	19:43	—	19:52
19:35	19:45	19:50	20:01	20:13	—	20:22
20:05	20:15	20:20	20:31	20:43	—	20:52
20:35	20:45	20:50	21:01	21:13	—	21:22
21:00	21:10	21:15	21:26	21:38	—	21:47
21:30	21:40	21:45	21:56	22:08	—	22:17
22:00	22:10	22:15	22:26	22:38	—	22:47
23:00	23:10	23:15	23:26	23:38	—	23:47
0:00	0:10	0:15	0:26	0:38	—	0:47

C To Harmony Terminal via Terrace Drive

916 Rossland

Effective September 2, 2019

Web **durhamregiontransit.com**
Phone **1-866-247-0055**

Weekday — West

Harmony Terminal **Stop #812**	Terrace Southbound @ Mayfair **Stop #590**	Rossland Westbound @ Simcoe **Stop #597**	Rossland Westbound @ Brock Street **Stop #465**	Rossland Westbound @ Westney **Stop #93143**	Brock Road Southbound @ Clearside **Stop #93441**	Pickering Parkway Terminal **Stop #93112**
4:55	—	5:05	5:19	5:30	5:36	5:45
5:18	—	5:28	5:42	5:53	5:59	6:08
5:48	—	5:58	6:12	6:23	6:29	6:38
C 5:58	6:05	6:10	6:24	6:35	6:41	6:50
6:18	—	6:28	6:42	6:53	6:59	7:08
C 6:30	6:37	6:42	6:56	7:07	7:13	7:22
6:50	—	7:00	7:14	7:25	7:31	7:40
C 7:05	7:12	7:17	7:31	7:42	7:48	7:57
7:20	—	7:30	7:44	7:55	8:01	8:10
C 7:30	7:37	7:42	7:56	8:07	8:13	8:22
7:45	—	7:55	8:09	8:20	8:26	8:35
C 8:00	8:07	8:12	8:26	8:37	8:43	8:52
8:20	—	8:30	8:44	8:55	9:01	9:10
C 8:40	8:47	8:52	9:06	9:17	9:23	9:32
C 9:10	9:17	9:22	9:36	9:47	9:53	10:02
C 9:40	9:47	9:52	10:06	10:17	10:23	10:32
C 10:10	10:17	10:22	10:36	10:47	10:53	11:02
C 10:40	10:47	10:52	11:06	11:17	11:23	11:32
C 11:10	11:17	11:22	11:36	11:47	11:53	12:02
C 11:40	11:47	11:52	12:06	12:17	12:23	12:32
C 12:10	12:17	12:22	12:36	12:47	12:53	13:02
C 12:40	12:47	12:52	13:06	13:17	13:23	13:32
C 13:10	13:17	13:22	13:36	13:47	13:53	14:02
C 13:40	13:48	13:53	14:07	14:19	14:25	14:34
C 14:10	14:18	14:23	14:37	14:49	14:55	15:04

C To Pickering Parkway Terminal via Terrace Drive

Weekday — West

Harmony Terminal **Stop #812**	Terrace Southbound @ Mayfair **Stop #590**	Rossland Westbound @ Simcoe **Stop #597**	Rossland Westbound @ Brock Street **Stop #465**	Rossland Westbound @ Westney **Stop #93143**	Brock Road Southbound @ Clearside **Stop #93441**	Pickering Parkway Terminal **Stop #93112**
14:30	—	14:41	14:55	15:07	15:13	15:22
C 14:45	14:53	14:58	15:12	15:24	15:30	15:39
15:00	—	15:11	15:25	15:37	15:43	15:52
C 15:15	15:23	15:28	15:42	15:54	16:00	16:09
15:30	—	15:41	15:55	16:07	16:13	16:22
C 15:45	15:53	15:58	16:12	16:24	16:30	16:39
C 16:00	16:08	16:13	16:27	16:39	16:45	16:54
16:15	—	16:26	16:40	16:52	16:58	17:07
C 16:30	16:38	16:43	16:57	17:09	17:15	17:24
16:45	—	16:56	17:10	17:22	17:28	17:37
C 17:00	17:08	17:13	17:27	17:39	17:45	17:54
17:15	—	17:25	17:37	17:49	17:54	18:01
C 17:30	17:37	17:42	17:54	18:06	18:11	18:18
17:50	—	18:00	18:12	18:24	18:29	18:36
C 18:10	18:17	18:22	18:34	18:46	18:51	18:58
18:33	—	18:43	18:55	19:07	19:12	19:19
19:03	—	19:13	19:25	19:37	19:42	19:49
19:33	—	19:43	19:55	20:07	20:12	20:19
20:03	—	20:13	20:25	20:37	20:42	20:49
20:33	—	20:43	20:55	21:07	21:12	21:19
21:03	—	21:13	21:25	21:37	21:42	21:49
21:33	—	21:43	21:55	22:07	22:12	22:19
22:03	—	22:13	22:25	22:37	22:42	22:49
22:33	—	22:43	22:55	23:07	23:12	23:19
23:03	—	23:13	23:25	23:37	23:42	23:49

C To Pickering Parkway Terminal via Terrace Drive

916 Rossland

Effective September 2, 2019

Web **durhamregiontransit.com**
Phone **1-866-247-0055**

Saturday — West

Harmony Terminal **Stop #812**	Terrace Southbound @ Mayfair **Stop #590**	Rossland Westbound @ Simcoe **Stop #597**	Rossland Westbound @ Brock Street **Stop #465**	Rossland Westbound @ Westney **Stop #93143**	Brock Road Southbound @ Clearside **Stop #93441**	Pickering Parkway Terminal **Stop #93112**
5:03	—	5:13	5:25	5:37	5:42	5:49
5:33	—	5:43	5:55	6:07	6:12	6:19
6:03	—	6:13	6:25	6:37	6:42	6:49
6:33	—	6:43	6:55	7:07	7:12	7:19
7:03	—	7:13	7:25	7:37	7:42	7:49
C 7:33	7:40	7:45	7:57	8:09	8:14	8:21
8:03	—	8:13	8:25	8:37	8:42	8:49
C 8:33	8:40	8:45	8:57	9:09	9:14	9:21
9:03	—	9:13	9:25	9:37	9:42	9:49
C 9:33	9:40	9:45	9:57	10:09	10:14	10:21
10:10	—	10:20	10:34	10:45	10:51	11:00
C 10:40	10:47	10:52	11:06	11:17	11:23	11:32
11:10	—	11:20	11:34	11:45	11:51	12:00
C 11:40	11:47	11:52	12:06	12:17	12:23	12:32
12:10	—	12:20	12:34	12:47	12:53	13:02
C 12:40	12:48	12:52	13:06	13:19	13:25	13:34
13:10	—	13:20	13:34	13:47	13:53	14:02
C 13:40	13:48	13:52	14:06	14:19	14:25	14:34
14:10	—	14:20	14:34	14:47	14:53	15:02
C 14:40	14:48	14:52	15:06	15:19	15:25	15:34
15:10	—	15:20	15:34	15:47	15:53	16:02
C 15:40	15:48	15:52	16:06	16:19	16:25	16:34
16:10	—	16:20	16:34	16:47	16:53	17:02
C 16:40	16:48	16:52	17:06	17:19	17:25	17:34
17:10	—	17:20	17:34	17:47	17:53	18:02
C 17:40	17:48	17:52	18:06	18:19	18:25	18:34
18:10	—	18:20	18:34	18:47	18:53	19:02
18:40	—	18:50	19:04	19:17	19:23	19:32
19:03	—	19:13	19:25	19:37	19:42	19:49
19:33	—	19:43	19:55	20:07	20:12	20:19
20:03	—	20:13	20:25	20:37	20:42	20:49
21:03	—	21:13	21:25	21:37	21:42	21:49
22:03	—	22:13	22:25	22:37	22:42	22:49
23:03	—	23:13	23:25	23:37	23:42	23:49

C To Pickering Parkway Terminal via Terrace Drive

Saturday — East

Pickering Parkway Terminal **Stop #93112**	Brock Road Northbound @ Concession 3 **Stop #93442**	Rossland Eastbound @ Westney **Stop #2169**	Rossland Eastbound @ Brock Street **Stop #476**	Rossland Eastbound @ Simcoe **Stop #573**	Terrace Northbound @ Mayfair **Stop #579**	Harmony Terminal **Stop #812**
—	—	5:20	5:31	5:43	—	5:52
—	—	5:50	6:01	6:13	—	6:22
6:05	6:13	6:20	6:31	6:43	—	6:52
6:35	6:43	6:50	7:01	7:13	—	7:22
7:05	7:13	7:20	7:31	7:43	—	7:52
7:35	7:43	7:50	8:01	8:13	—	8:22
8:05	8:13	8:20	8:31	8:43	—	8:52
C 8:35	8:43	8:50	9:01	9:13	9:16	9:24
9:05	9:13	9:21	9:32	9:45	—	9:56
C 9:35	9:43	9:51	10:02	10:15	10:19	10:28
10:05	10:13	10:21	10:32	10:45	—	10:56
C 10:35	10:43	10:51	11:02	11:15	11:19	11:28
11:05	11:13	11:21	11:32	11:45	—	11:56
C 11:35	11:43	11:51	12:02	12:15	12:19	12:28
12:05	12:15	12:21	12:33	12:46	—	12:57
C 12:35	12:46	12:53	13:04	13:16	13:20	13:29
13:05	13:15	13:21	13:33	13:46	—	13:57
C 13:35	13:46	13:53	14:04	14:16	14:20	14:29
14:05	14:15	14:21	14:33	14:46	—	14:57
C 14:35	14:46	14:53	15:04	15:16	15:20	15:29
15:05	15:15	15:21	15:33	15:46	—	15:57
C 15:35	15:46	15:53	16:04	16:16	16:20	16:29
16:05	16:15	16:21	16:33	16:46	—	16:57
C 16:35	16:46	16:53	17:04	17:16	17:20	17:29
17:05	17:15	17:21	17:33	17:46	—	17:57
C 17:35	17:46	17:53	18:04	18:16	18:20	18:29
18:05	18:13	18:21	18:32	18:45	—	18:56
C 18:35	18:43	18:51	19:02	19:15	19:19	19:28
19:05	19:13	19:21	19:32	19:45	—	19:56
19:35	19:43	19:51	20:02	20:15	—	20:26
20:05	20:13	20:20	20:31	20:43	—	20:52
21:05	21:13	21:20	21:31	21:43	—	21:52
22:00	22:08	22:15	22:26	22:38	—	22:47
23:00	23:08	23:15	23:26	23:38	—	23:47
0:00	0:08	0:15	0:26	0:38	—	0:47

C To Harmony Terminal via Terrace Drive

916 Rossland

Effective September 2, 2019

Web **durhamregiontransit.com**
Phone **1-866-247-0055**

Sunday — West

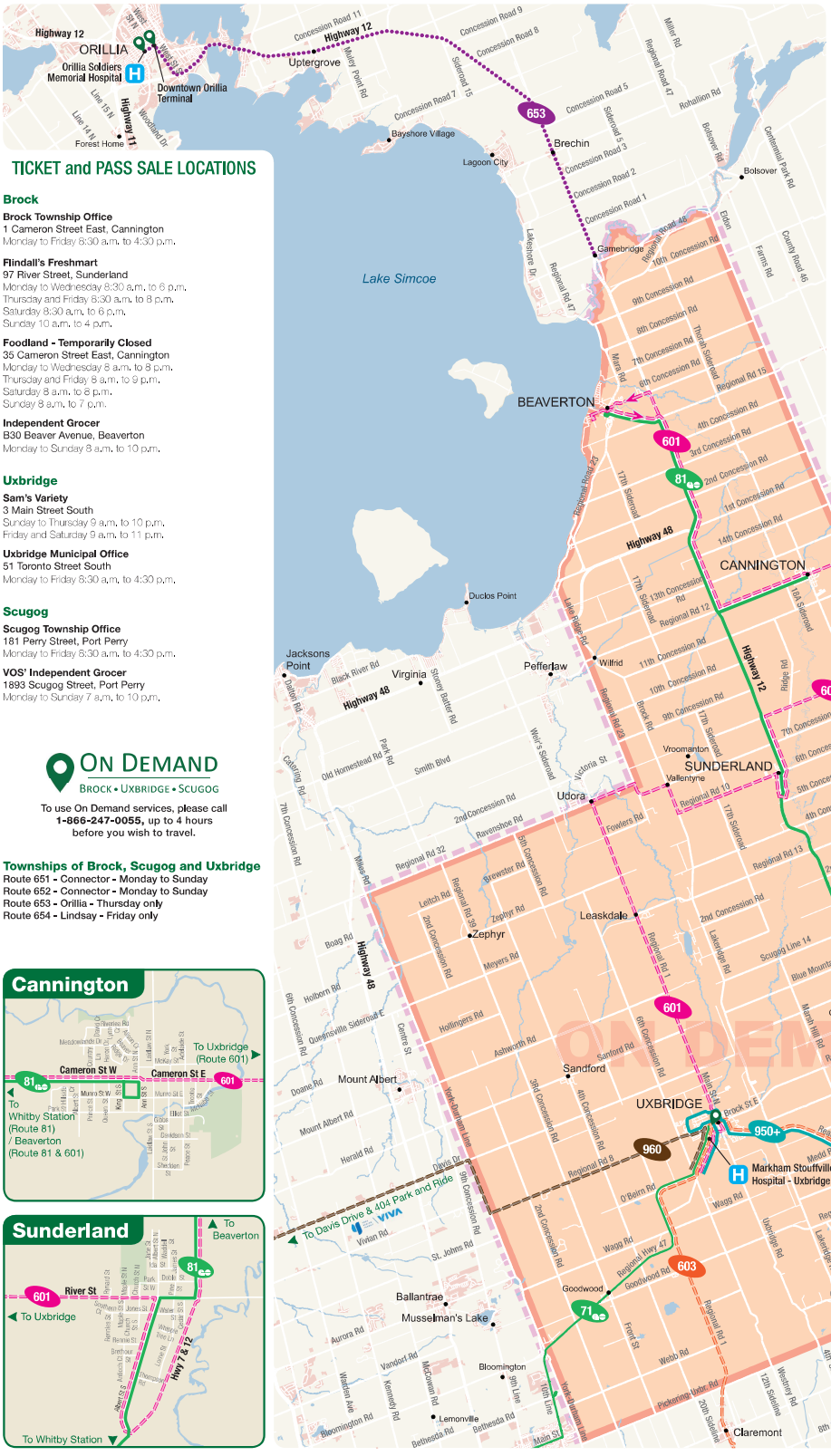
Harmony Terminal **Stop #812**	Terrace Southbound @ Mayfair **Stop #590**	Rossland Westbound @ Simcoe **Stop #597**	Rossland Westbound @ Brock Street **Stop #465**	Rossland Westbound @ Westney **Stop #93143**	Brock Road Southbound @ Clearside **Stop #93441**	Pickering Parkway Terminal **Stop #93112**
7:03	—	7:13	7:25	7:37	7:42	7:49
C 7:33	7:40	7:45	7:57	8:09	8:14	8:21
8:03	—	8:13	8:25	8:37	8:42	8:49
C 8:33	8:40	8:45	8:57	9:09	9:14	9:21
9:03	—	9:13	9:25	9:37	9:42	9:49
C 9:33	9:40	9:45	9:57	10:09	10:14	10:21
10:10	—	10:20	10:34	10:45	10:51	11:00
C 10:40	10:47	10:52	11:06	11:17	11:23	11:32
11:10	—	11:20	11:34	11:45	11:51	12:00
C 11:40	11:47	11:52	12:06	12:17	12:23	12:32
12:10	—	12:20	12:34	12:47	12:53	13:02
C 12:40	12:48	12:52	13:06	13:19	13:25	13:34
13:10	—	13:20	13:34	13:47	13:53	14:02
C 13:40	13:48	13:52	14:06	14:19	14:25	14:34
14:10	—	14:20	14:34	14:47	14:53	15:02
C 14:40	14:48	14:52	15:06	15:19	15:25	15:34
15:10	—	15:20	15:34	15:47	15:53	16:02
C 15:40	15:48	15:52	16:06	16:19	16:25	16:34
16:10	—	16:20	16:34	16:47	16:53	17:02
C 16:40	16:48	16:52	17:06	17:19	17:25	17:34
17:10	—	17:20	17:34	17:47	17:53	18:02
C 17:40	17:48	17:52	18:06	18:19	18:25	18:34
18:10	—	18:20	18:34	18:47	18:53	19:02
19:03	—	19:13	19:25	19:37	19:42	19:49
20:03	—	20:13	20:25	20:37	20:42	20:49
21:03	—	21:13	21:25	21:37	21:42	21:49
22:03	—	22:13	22:25	22:37	22:42	22:49

C To Pickering Parkway Terminal via Terrace Drive

Sunday — East

Pickering Parkway Terminal **Stop #93112**	Brock Road Northbound @ Concession 3 **Stop #93442**	Rossland Eastbound @ Westney **Stop #2169**	Rossland Eastbound @ Brock Street **Stop #476**	Rossland Eastbound @ Simcoe **Stop #573**	Terrace Northbound @ Mayfair **Stop #579**	Harmony Terminal **Stop #812**
—	—	6:15	6:26	6:38	—	6:47
—	—	6:45	6:56	7:08	—	7:17
—	—	7:15	7:26	7:38	—	7:47
7:35	7:43	7:50	8:01	8:13	—	8:22
8:05	8:13	8:20	8:31	8:43	—	8:52
C 8:35	8:43	8:50	9:01	9:13	9:16	9:24
9:05	9:13	9:21	9:32	9:45	—	9:56
C 9:35	9:43	9:51	10:02	10:15	10:19	10:28
10:05	10:13	10:21	10:32	10:45	—	10:56
C 10:35	10:43	10:51	11:02	11:15	11:19	11:28
11:05	11:13	11:21	11:32	11:45	—	11:56
C 11:35	11:43	11:51	12:02	12:15	12:19	12:28
12:05	12:15	12:21	12:33	12:46	—	12:57
C 12:35	12:46	12:53	13:04	13:16	13:20	13:29
13:05	13:15	13:21	13:33	13:46	—	13:57
C 13:35	13:46	13:53	14:04	14:16	14:20	14:29
14:05	14:15	14:21	14:33	14:46	—	14:57
C 14:35	14:46	14:53	15:04	15:16	15:20	15:29
15:05	15:15	15:21	15:33	15:46	—	15:57
C 15:35	15:46	15:53	16:04	16:16	16:20	16:29
16:05	16:15	16:21	16:33	16:46	—	16:57
C 16:35	16:46	16:53	17:04	17:16	17:20	17:29
17:05	17:15	17:21	17:33	17:46	—	17:57
C 17:35	17:46	17:53	18:04	18:16	18:20	18:29
18:05	18:13	18:21	18:32	18:45	—	18:56
C 18:35	18:43	18:51	19:02	19:15	19:19	19:28
19:05	19:13	19:21	19:32	19:45	—	19:56
20:05	20:13	20:20	20:31	20:43	—	20:52
21:05	21:13	21:20	21:31	21:43	—	21:52
22:00	22:08	22:15	22:26	22:38	—	22:47
23:00	23:08	23:15	23:26	23:38	—	23:47

C To Harmony Terminal via Terrace Drive



TICKET and PASS SALE LOCATIONS

Brock

Brock Township Office
1 Cameron Street East, Cannington
Monday to Friday 8:30 a.m. to 4:30 p.m.

Flindall's Freshmart
97 River Street, Sunderland
Monday to Wednesday 8:30 a.m. to 6 p.m.
Thursday and Friday 8:30 a.m. to 8 p.m.
Saturday 8:30 a.m. to 6 p.m.
Sunday 10 a.m. to 4 p.m.

Foodland - Temporarily Closed
35 Cameron Street East, Cannington
Monday to Wednesday 8 a.m. to 8 p.m.
Thursday and Friday 8 a.m. to 9 p.m.
Saturday 8 a.m. to 8 p.m.
Sunday 8 a.m. to 7 p.m.

Independent Grocer
B30 Beaver Avenue, Beaverton
Monday to Sunday 8 a.m. to 10 p.m.

Uxbridge

Sam's Variety
3 Main Street South
Sunday to Thursday 9 a.m. to 10 p.m.
Friday and Saturday 9 a.m. to 11 p.m.

Uxbridge Municipal Office
51 Toronto Street South
Monday to Friday 8:30 a.m. to 4:30 p.m.

Scugog

Scugog Township Office
181 Perry Street, Port Perry
Monday to Friday 8:30 a.m. to 4:30 p.m.

VOS' Independent Grocer
1893 Scugog Street, Port Perry
Monday to Sunday 7 a.m. to 10 p.m.

ON DEMAND
BROCK • UXBRIDGE • SCUGOG

To use On Demand services, please call **1-866-247-0055,** up to 4 hours before you wish to travel.

Townships of Brock, Scugog and Uxbridge

Route 651 - Connector - Monday to Sunday
Route 652 - Connector - Monday to Sunday
Route 653 - Orillia - Thursday only
Route 654 - Lindsay - Friday only

LEGEND

Regular DRT Route
Service operates Monday to Sunday during the daytime or longer.

DRT-GO One Fare Route
Board GO Transit for travel within Durham Region with a valid DRT ticket, pass or transfer. Presto and cash not available. Contact us for full details.

Limited Route
Service operates only part of the day. Limited number of trips. Consult the schedule for complete details.

On Demand Route
Service operates on certain days only, and must be pre-booked. Outside Durham Region, service stops only at On Demand bus stops.

Route 651 and 652 On Demand Connector Area
Pick up and drop off at Curb. May include transfer to scheduled service for part of your trip.

Durham Region Boundary

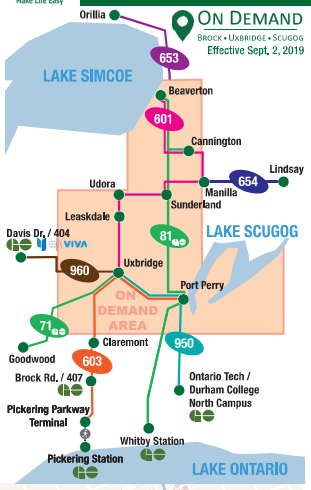
On Demand Stop
Stop with scheduled pick up and drop off times

Hospital

Route Number
Branch (+ is all branches)
Direction of Travel
Service Type

Brock - Uxbridge - Scugog Network Map

ON DEMAND
BROCK • UXBRIDGE • SCUGOG
Effective Sept. 2, 2019



MacLean Cartography
Cartography & Design 2019
GIS Data: Produced by Durham Region GIS Services, 2019
Ontario Ministry of Natural Resources. © Queen's Printer for Ontario, 2019.

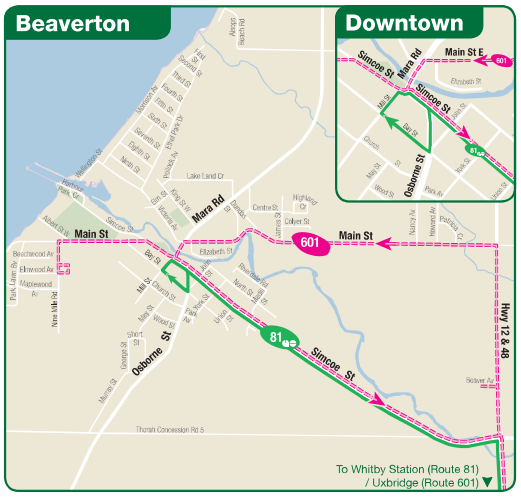
ROUTE 950 - REACH - SIMCOE NORTH

South to Ontario Tech / Durham College North Campus Terminal

Branch	Eastbound @ 6 Welwood Stop #2416	Toronto Northbound @ Brock Street (North side stop) Stop #2422	Brock Street Westbound @ Quaker Village Stop #93547	Eastbound @ 482 Paxton Drive (Lakeridge Health Port Perry) Stop #3268	Curts Eastbound @ Port Perry Terminal Stop #2491	Highway 7A Westbound @ SmartCentres Port Perry Stop #3300	Ontario Tech / Durham College North Campus Stop #688
Monday to Friday							
950H	-	06:15	06:18	-	06:46	-	07:15
950H	-	07:15	07:18	-	07:46	-	08:15
950F	08:30	08:35	08:38	09:04	09:09	09:15	09:41
950F	09:45	09:50	09:53	10:19	10:24	10:30	10:56
950F	11:15	11:20	11:23	11:49	11:54	12:00	12:26
950F	13:15	13:20	13:23	13:49	13:54	14:00	14:26
950F	14:45	14:50	14:53	15:19	15:24	15:30	15:56
950	-	-	-	-	17:20	17:26	17:52
950	-	-	-	-	18:20	18:26	18:52
950	-	-	-	-	19:20	19:26	19:52
950	21:10	21:15	21:18	-	21:46	21:52	22:18
	-	-	-	-	-	-	-
Saturday							
950	08:50	08:55	08:58	-	07:22	07:28	07:51
950	08:25	08:30	08:33	-	08:57	09:03	09:26
950	10:45	10:50	10:53	-	11:17	11:23	11:46
950	13:05	13:10	13:13	-	13:37	13:43	14:06
950	15:25	15:30	15:33	-	15:57	16:03	16:26
950	17:45	17:50	17:53	-	18:17	18:23	18:46
Sunday							
950	08:25	08:30	08:33	-	08:57	09:03	09:26
950	10:45	10:50	10:53	-	11:17	11:23	11:46
950	13:05	13:10	13:13	-	13:37	13:43	14:06
950	15:25	15:30	15:33	-	15:57	16:03	16:26
950	17:45	17:50	17:53	-	18:17	18:23	18:46

North to Uxbridge

Branch	Ontario Tech / Durham College North Campus Stop #688	Highway 7A Westbound @ SmartCentres Port Perry Stop #3300	Curts Eastbound @ Port Perry Terminal Stop #2491	Main Westbound @ Queen Stop #2453	Reach Westbound @ Simcoe Stop #2454	Quaker Village Southbound @ Colonel Sharpe Stop #3212	Toronto Southbound @ Brock Street (South side stop) Stop #2439	Eastbound @ 6 Welwood Stop #2416
Monday to Friday								
950B	06:35	-	07:03	-	-	-	-	-
950C	07:25	-	07:53	-	07:59	-	08:13	08:18
950F	08:30	08:55	09:02	09:05	09:12	9:33	09:39	09:44
950F	10:00	10:25	10:32	10:35	10:42	11:03	11:09	11:14
950F	11:55	12:20	12:27	12:30	12:37	12:58	13:04	13:09
950F	14:30	14:55	15:02	15:05	15:12	15:33	15:39	15:44
950F	16:00	16:25	16:32	16:35	16:42	17:03	17:09	17:14
950F	17:00	17:25	17:32	17:35	17:42	18:03	18:09	18:14
950F	18:00	18:25	18:32	18:35	18:42	19:03	19:09	19:14
950	19:00	19:25	19:32	-	19:38	19:59	20:05	20:10
950D	20:00	20:22	20:28	-	20:37	-	20:59	21:04
950D	22:25	22:47	22:53	-	22:59	23:16	23:22	-
Saturday								
950	09:35	09:57	10:03	-	10:09	10:26	10:32	10:37
950	11:55	12:17	12:23	-	12:29	12:46	12:52	12:57
950	14:15	14:37	14:43	-	14:49	15:06	15:12	15:17
950	16:35	16:57	17:03	-	17:09	17:26	17:32	17:37
950	18:50	19:12	19:18	-	19:24	19:41	19:47	19:52
950	19:55	20:17	20:23	-	20:29	20:46	20:52	20:57
Sunday								
950	09:35	09:57	10:03	-	10:09	10:26	10:32	10:37
950	11:55	12:17	12:23	-	12:29	12:46	12:52	12:57
950	14:15	14:37	14:43	-	14:49	15:06	15:12	15:17
950	16:35	16:57	17:03	-	17:09	17:26	17:32	17:37
950	18:50	19:12	19:18	-	19:24	19:41	19:47	19:52



ROUTE 960 - NEWMARKET - UXBRIDGE

West to Newmarket

Eastbound @ 6 Welwood Stop #2416	Toronto Northbound @ Brock Street (North side stop) Stop #2422	Brock Street Westbound @ Quaker Village Stop #93547	Regional Road 8 Westbound @ Mill Run Gate (Sikorsky) Stop #3237	Davis Drive & Highway 404 Park and Ride Stop #3241
Monday to Friday				
6:25	06:30	06:33	06:38	06:54
-	07:30	07:33	07:38	07:54
14:40	14:45	14:48	14:53	15:09
-	16:50	16:53	16:58	17:14
-	17:50	17:53	17:58	18:14

East to Uxbridge

Davis Drive & Highway 404 Park and Ride Stop #3241	Regional Road 8 Eastbound @ Mill Run Gate (Sikorsky) Stop #3238	Brock Street Eastbound @ South Balsam Stop #3210	Toronto Southbound @ Brock Street (North side stop) Stop #2424	Eastbound @ 6 Welwood Stop #2416
Monday to Friday				
07:00	07:16	07:21	07:25	-
08:00	08:16	08:21	08:25	08:30
15:15	15:31	15:36	15:40	15:45
17:20	17:36	17:41	17:45	-
18:20	18:36	18:41	18:45	18:50

ROUTE 601 - BEAVERTON - UXBRIDGE

North to Beaverton

Branch	Eastbound @ 6 Welwood Stop #2416	Regional Road 1 Northbound @ Harrison Lakeside) Stop #3198	Regional Road 1 Northbound @ Ravenshoe (Udora) Stop #3194	Albert Southbound @ Jones (Sunderland) Stop #3193	Simcoe Northbound @ Highway 7 (Manilla) Stop #3192	Cameron Southbound @ Ann (Cannington) Stop #93549	Highway 12 Northbound @ Beaver Stop #93530
Monday to Friday							
601B	13:30	13:45	13:50	14:01	-	-	-
601	15:50	16:05	16:10	16:21	16:33	16:42	16:57
	-	-	-	-	-	-	-

South to Uxbridge

Branch	Highway 12 Northbound @ Beaver Stop #93528	Southbound @ 661 Simcoe Stop #2539	Highway 12 Northbound @ Beaver Stop #93528	Simcoe Southbound @ Highway 7 (Manilla) Stop #3191	Regional Road 1 Southbound @ Ravenshoe (Udora) Stop #3195	Toronto Southbound @ Campbell Stop #2427	Eastbound @ 6 Welwood Stop #2416
Monday to Friday							
601	12:05	12:17	12:22	12:46	13:06	13:19	13:23
601	-	-	-	-	14:16	14:29	14:33
601	16:57	17:09	-	-	-	-	-



ON DEMAND

BROCK • UXBRIDGE • SCUGOG

To use On Demand services, please call 1-866-247-0055, up to 4 hours before you wish to travel.

Provide your start and end location, and a Booking Agent will confirm your trip plan. Trips may include connections to scheduled services where available.

ROUTE 603 - PICKERING - PORT PERRY

South to Pickering

Curts Eastbound @ Port Perry Terminal Stop #2491	Reach Westbound @ Simcoe Stop #2454	Franklin Northbound @ Reach Stop #3224	Toronto Southbound @ Brock Street (South side stop) Stop #2438	Eastbound @ 6 Welwood Stop #2416	Old Brock Southbound @ Central Stop #3386	Brock Road & Highway 407 Park and Ride Platform 5 Stop #3377	Pickering Parkway Terminal Stop #93112
Monday to Friday							
06:08	06:17	06:29	06:30	06:35	06:50	06:58	07:15
07:08	07:17	07:29	07:30	07:35	07:50	07:58	08:15
-	-	-	-	11:15	11:30	11:38	11:55
-	-	-	-	15:45	16:00	16:08	16:25
-	-	-	-	17:15	17:30	17:38	17:55

North to Port Perry

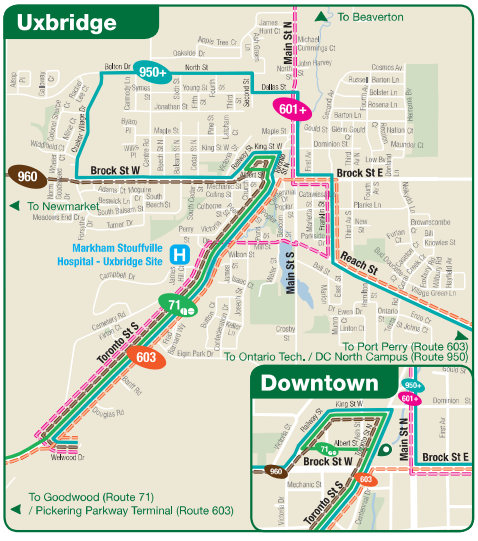
Glenanna Southbound @ The Esplanade (South side stop) Stop #1915	Pickering Parkway Terminal Stop #93112	Brock Road & Highway 407 Park and Ride Platform 6 Stop #3376	Old Brock Northbound @ Central Stop #3385	Eastbound @ 6 Welwood Stop #2416	Toronto Northbound @ Brock Street (South side stop) Stop #93018	Reach Eastbound @ East Stop #2428	Curts Eastbound @ Port Perry Terminal Stop #2491
Monday to Friday							
10:31	10:32	10:47	10:55	11:10	-	-	-
14:01	14:02	14:17	14:25	14:40	-	-	-
16:01	16:02	16:17	16:25	16:45	16:50	17:06	17:17
17:01	17:02	17:17	17:25	17:45	17:50	18:06	18:17
18:01	18:02	18:17	18:25	18:45	18:50	19:06	19:17

ROUTE 652 - CONNECTOR

Arrival time in Port Perry	Departure time from Port Perry
Monday to Friday	**Monday to Friday**
Curts & Water (Port Perry) Arrive Stop #2491	Curts & Water (Port Perry) Depart Stop #2491
6:00	6:55 - 7:10
6:36	8:00
7:00	9:15 - 9:40
7:36	10:40
8:55	12:00 - 12:35
10:15 - 10:25	14:00
11:45 - 12:15	15:10 - 15:30
13:45	16:40
14:55 - 15:15	17:25 - 17:40
16:00 - 16:20	18:25 - 18:40
17:10 - 17:20	19:25 - 19:40
18:10 - 18:20	-
Saturday and Sunday	**Saturday and Sunday**
7:12	10:10
8:47	12:05 - 12:30
9:37	14:50
11:07	16:30
13:27	17:10
14:07	19:25
15:47	-
18:07	-

ROUTE 651 - CONNECTOR

Arrival time in Uxbridge	Departure time from Uxbridge
Monday to Friday	**Monday to Friday**
Toronto & Brock (Uxbridge) Arrive Stop #2422	Toronto & Brock (Uxbridge) Depart Stop #2422
6:05 - 6:20	6:25 - 6:40
7:05 - 7:20	7:30 - 7:40
8:05 - 8:20	8:30 - 8:40
9:30 - 9:40	9:45 - 10:00
11:00 - 11:10	11:15 - 11:30
12:55 - 13:10	13:10 - 13:30
14:35	15:00
15:30 - 15:50	15:50
16:40 - 17:00	17:00 - 17:15
17:40	17:50 - 18:15
-	18:50 - 19:15
Saturday and Sunday	**Saturday and Sunday**
6:45	10:40
8:20	13:00
10:40	15:20
13:00	17:40
15:20	19:55
17:40	-



ROUTE 653 - ORILLIA

Arrival time in Orillia		Departure time from Orillia	
Mississauga @ West / Orillia Transit Terminal (Orillia) Stop #3425	Soldiers' Memorial Hospital (Orillia) Stop #3426	Soldiers' Memorial Hospital (Orillia) Stop #3426	Mississauga @ West Orillia Transit Terminal (Orillia) Stop #3425
Thursday Only		**Thursday Only**	
12:11	12:16	15:32	15:37

ROUTE 654 - LINDSAY

Arrival time in Lindsay			Departure time from Lindsay		
Lindsay Square Terminal (Lindsay) Stop #3427	Ross Memorial Hospital (Lindsay) Stop #3428	Adelaide @ Aut Trail (Lindsay Rec Centre) Stop #3834	Adelaide @ Aut Trail (Lindsay Rec Centre) Stop #3834	Ross Memorial Hospital (Lindsay) Stop #3429	Lindsay Square Terminal (Lindsay) Stop #3427
Friday Only			**Friday Only**		
11:43	11:48	11:54	15:55	16:03	16:08

CONTACT US

durhamregiontransit.com

DRTHelps@durham.ca

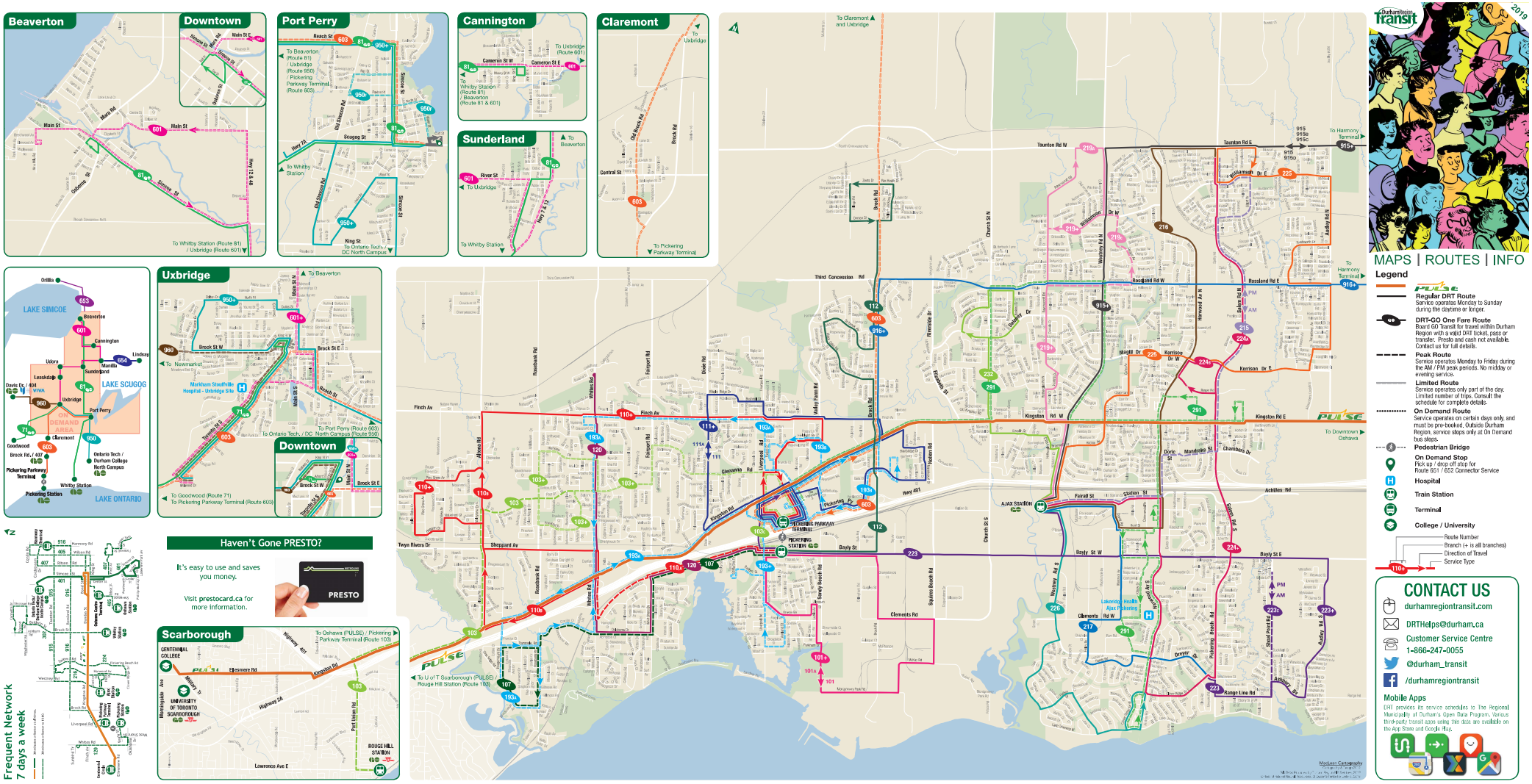
Customer Service Centre
1-866-247-0055

@durham_transit

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Mobile Apps

DRT provides its service schedules to The Regional Municipality of Durham's Open Data Program. Various third-party transit apps using this data are available on the App Store and Google Play.



2019

MAPS | ROUTES | INFO

Legend

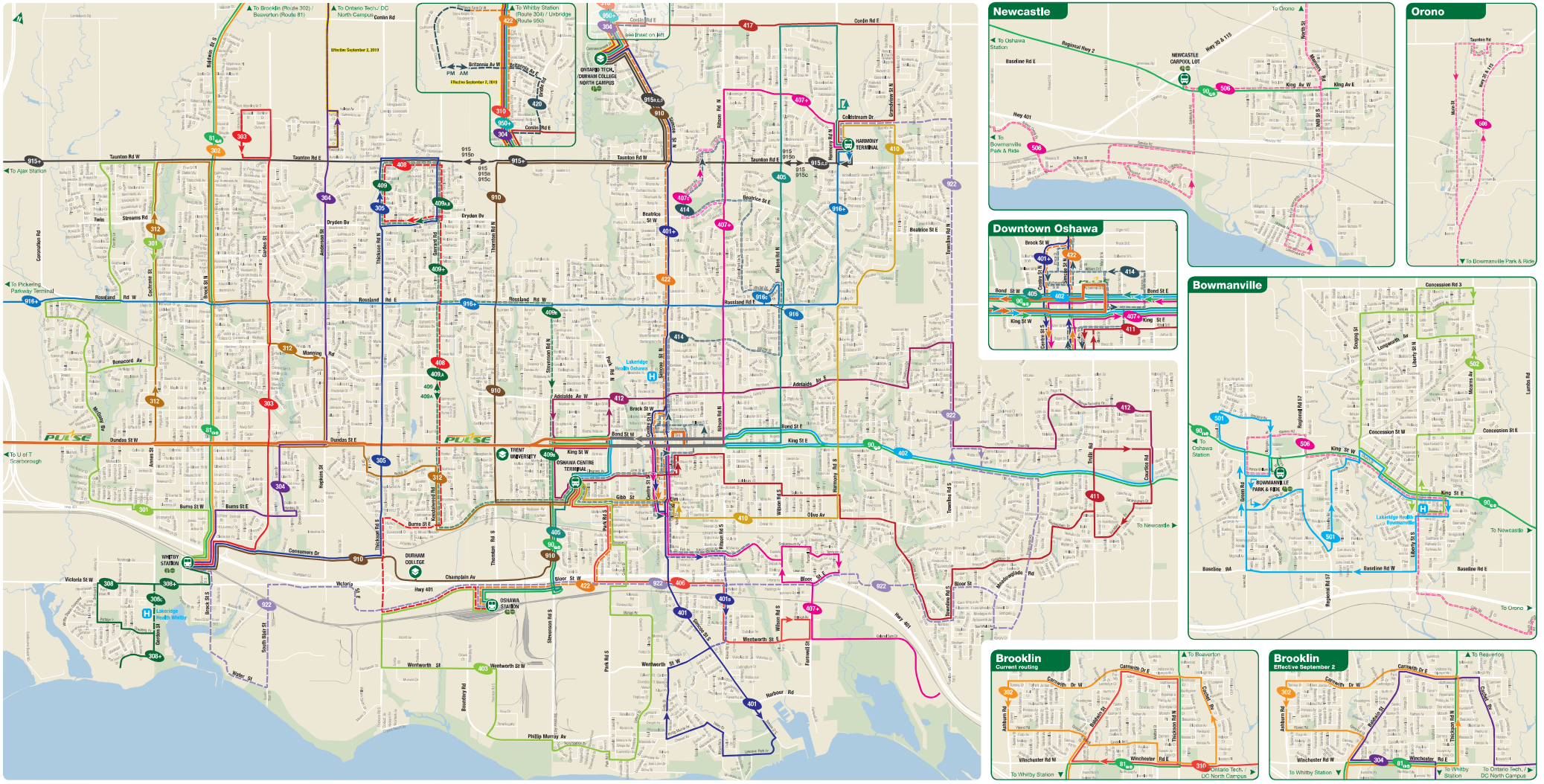
- PULSE
- Regular DRT Route
  Service operates Monday to Sunday during the daytime or longer.
- DRT-GO One Fare Route
  Board GO Transit for travel within Durham Region with a valid DRT ticket, pass or transfer. Presto and cash not available. Contact us for full details.
- Peak Route
  Service operates Monday to Friday during the AM / PM peak periods. No midday or evening service.
- Limited Route
  Service operates only part of the day. Limited number of trips. Consult the schedule for complete details.
- On Demand Route
  Service operates on certain days only, and must be pre-booked. Outside Durham Region, service stops only at On Demand bus stops.
- Pedestrian Bridge
- On Demand Stop
  Pick up / drop off stop for Route 651 / 652 Connector Service
- Hospital
- Train Station
- Terminal
- College / University
- Route Number
  Branch (+ is all branches)
  Direction of Travel
  Service Type

CONTACT US

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Customer Service Centre
1-866-247-0055
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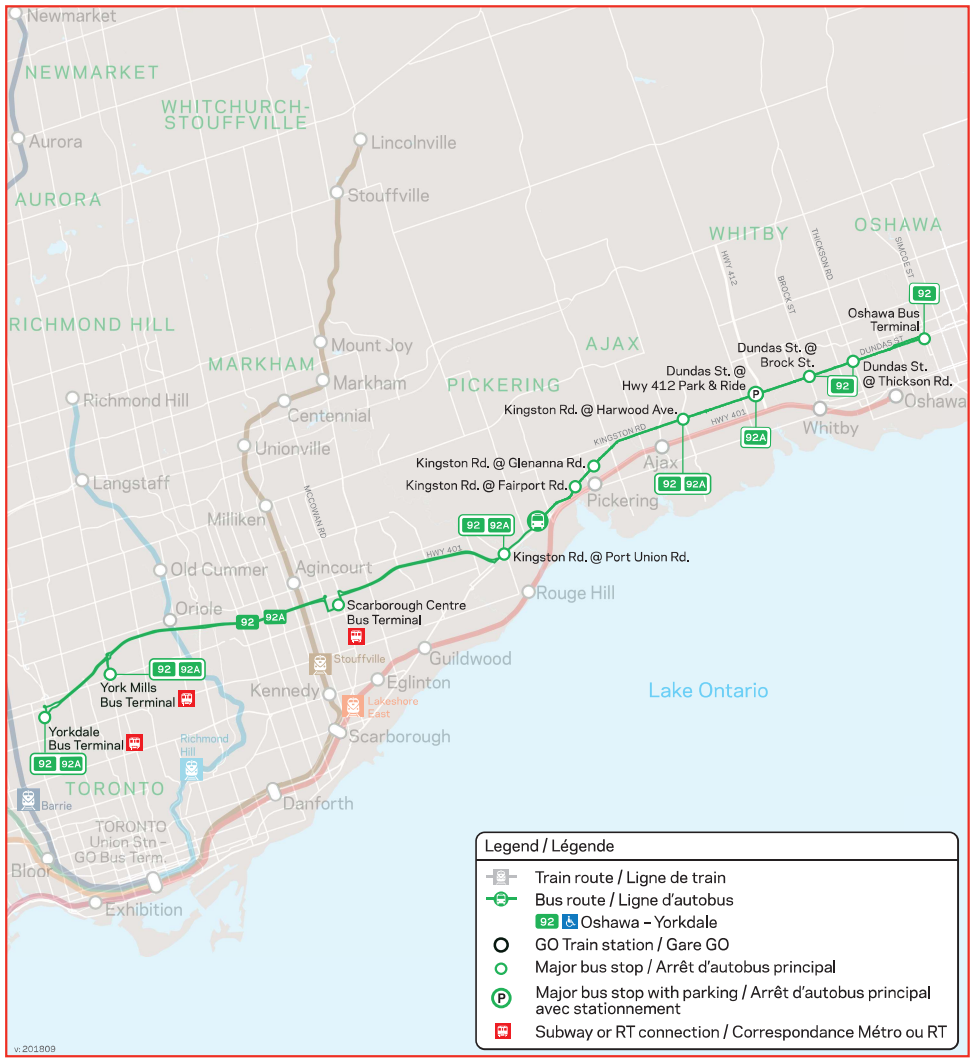
Mobile Apps

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Newcastle
Orono
Downtown Oshawa
Bowmanville
Brooklin
Current routing
Brooklin
Effective September 2
To Ajax Station
To Pickering Parkway Terminal
To U of T Scarborough
To Brooklin (Route 302) / Beaverton (Route 81)
To Ontario Tech. / DC North Campus
To Whitby Station (Route 304) / Uxbridge (Route 950)
Effective September 2, 2019
Taunton Rd W
Taunton Rd E
Conlin Rd E
Rossland Rd W
Rossland Rd E
Dundas St W
Dundas St E
King St W
King St E
Bond St W
Bond St E
Bloor St W
Bloor St
Beatrice St W
Beatrice St E
Wentworth St W
Wentworth St
Burns St W
Burns St E
Victoria St W
Victoria St
Consumers Dr
Champlain Av
Hwy 401
Water St
Phillip Murray Av
Northour Rd
Adelaide Av W
Bonacord Av
Streams Rd
Dryden Bv
Manning Rd
Gibb St
Olive Av
Windward Rd
Baseline Rd
Baseline Rd W
Baseline Rd E
Concession Rd 3
Concession St W
Concession St E
Longworth Av
Regional Rd 57
Scugog St
Liberty St N
Liberty St S
Lambs Rd
Means Av
Green Rd
Thickson Rd N
Thickson Rd S
Ritson Rd N
Ritson Rd S
Simcoe St N
Simcoe St S
Centre St N
Centre St S
Harmony Rd N
Harmony Rd S
Wilson Rd N
Wilson Rd S
Townline Rd S
Courtice Rd
Farewell St
Boundary Rd
Park Rd S
Stevenson Rd S
Cochrane St
Brock St N
Brock St S
Gordon St
Anderson St
Garden St
Harmony Rd
Thornton Rd N
Thornton Rd S
Coldstream Dr
Bridle Rd
Mearns Av
Main St
Regional Hwy 2
Baseline Rd E
Hwy 401
Hwy 35 & 115
Simcoe St
King Av W
King Av E
Taunton Rd
Main St
Brock St W
Centre St N
Centre St S
Bond St W
Bond St E
King St W
King St E
Concession Rd 3
Concession St W
Concession St E
Regional Rd 57
Scugog St
Liberty St N
Liberty St S
Lambs Rd
Means Av
Green Rd
Baseline Rd
Baseline Rd W
Baseline Rd E
Ashburn Rd
Carnwith Dr W
Carnwith Dr E
Crandall Dr
Baldwin St
Winchester Rd W
Winchester Rd E
Thickson Rd N
Thickson Rd S
Brawley Rd
To Oshawa Station
To Bowmanville Park & Ride
To Orono
To Newcastle
To Whitby Station
To Beaverton
NEWCASTLE CARPOOL LOT
BOWMANVILLE PARK & RIDE
HARMONY TERMINAL
OSHAWA CENTRE TERMINAL
OSHAWA STATION
WHITBY STATION
DERHAM COLLEGE
TRENT UNIVERSITY
ONTARIO TECH. / DURHAM COLLEGE NORTH CAMPUS
Lakeridge Health Oshawa
Lakeridge Health Whitby
Lakeridge Health Bowmanville
PULSE

92 Route number / Nombre d'itinéraire

Oshawa/Yorkdale



CONTACT US

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416-869-3200
TTY/ATS:
1-800-387-3652

gotransit.com/schedules

@GOtransitBus

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Say Something.
24/7 Transit Safety Dispatch:
1-877-297-0642

prestocard.ca

Sign-up for email or text alerts/ Inscrivez-vous pour recevoir des alertes par courriel ou message texte.
gotransit.com/OnTheGO

05-03-2019

Oshawa/ Yorkdale

GO Bus Schedule/
Horaire des autobus GO

METROLINX

92

- Oshawa
- Whitby
- Ajax
- Pickering
- Scarborough
- Toronto

Daily / Quotidiennement
Includes GO Bus routes 92/ Inclut les routes 92 d'autobus GO

Effective / À partir de:
6 APRIL AVRIL 2019

How to read our schedules

Step 1
Find the station or terminal you are departing from. Stops are listed across the top in the order they are served.

Step 2
The upper left corner tells you what day the schedule is for and the direction of travel.

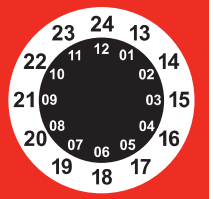
Step 3
Look across the rows for available departure times.

Step 4
Not all trains or buses stop at every station. If you see → the train or bus will not stop at that station.

Schedule times shown in 24-hour clock

Midnight to noon
00 01 - 12 00

Noon to midnight
12 01 - 24 00



Legend

Bus trips

→ Trip does not serve this location.

GO Bus service is accessible to passengers using mobility devices at this location.

Notes

For the latest schedule information and updates, please visit gotransit.com.

Bicycles

1. Bicycles are not allowed in Union Station or on-board trains during morning rush hour (6:30-9:30) and evening rush hour (15:30-18:30), Monday to Friday.

2. Foldable bicycles are allowed on-board trains at all times.

Comment lire nos horaires

Étape 1
Trouvez votre gare ou terminus de départ. La liste des arrêts est donnée en haut dans l'ordre dans lequel ils sont desservis.

Étape 2
Le coin supérieur gauche vous indique le jour pour lequel l'horaire est donné et la direction de circulation.

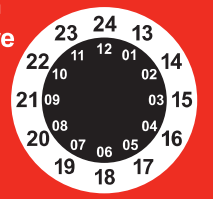
Étape 3
Regardez dans les rangées pour obtenir les heures de départ offertes.

Étape 4
Les trains ou les autobus ne s'arrêtent pas tous à chaque gare. Si vous voyez le symbole → le train ou l'autobus ne s'arrêtera pas à cette gare.

Indications selon un système horaire de 24 heures

De minuit à midi:
00 01 - 12 00

De midi à minuit:
12 01 - 24 00



Légende

Horaire des autobus

→ Trajet ne sert pas cette station.

Service d'autobus GO accessible aux personnes utilisant des aides à la mobilité à cet endroit.

Notes

Pour consulter les horaires les plus récents et les mises à jour, veuillez visiter gotransit.com.

Vélos

1. Les vélos ne sont pas autorisés dans la gare Union ou à bord des trains du lundi au vendredi, pendant l'heure de pointe (6:30-9:30) et pendant l'heure de pointe du soir (15:30-18:30).

2. Les vélos pliables sont permis à bord des trains en tout temps.

Monday to Friday (except holidays)
Du lundi au vendredi (sauf les jours fériés)

WESTBOUND / EN DIRECTION OUEST

Route Number / Nombre d'itinéraire	Trip Number / N° du trajet	Zone →	94	93	93	93	92	91	91	90	7	5	5
			Oshawa Dp.	Whitby	Whitby	Whitby	Ajax	Pickering	Pickering	Scarborough	Scarborough Ar.	North York Ar.	North York Ar.
			Oshawa Bus Terminal	**Dundas St. @ Thickson Rd.**	**Dundas St. @ Brock St.**	**Dundas St. @ Hwy. 412**	**Kingston Rd. @ Harwood Ave.**	**Kingston Rd. @ Glenanna Rd.**	**Kingston Rd. @ Fairport Rd.**	**Kingston Rd. @ Sheppard Ave. E**	**Scarborough Centre Bus Terminal**	**York Mills Bus Terminal**	**Yorkdale Bus Terminal**
92	92010		04 10	04 18	04 22	→	04 30	04 38	04 41	04 46	04 55	05 10	05 20
92	92030		04 40	04 48	04 52	→	05 00	05 08	05 11	05 16	05 25	05 40	05 50
92	92040		05 05	05 13	05 17	→	05 25	05 33	05 36	05 42	05 55	06 10	06 20
92A	92052					05 35	05 40	05 48	05 51	05 57	06 10	06 30	06 40
92	92050		05 30	05 38	05 42	→	05 50	05 59	06 02	06 09	06 25	06 45	06 55
92A	92062					06 00	06 05	06 14	06 17	06 24	06 40	07 05	07 15
92	92070		06 00	06 08	06 12	→	06 20	06 29	06 32	06 39	06 55	07 20	07 30
92A	92072					06 30	06 35	06 44	06 47	06 54	07 10	07 40	07 50
92	92090		06 25	06 33	06 37	→	06 45	06 54	06 57	07 04	07 25	07 55	08 05
92A	92112					06 54	06 59	07 09	07 12	07 19	07 40	07 10	08 20
92	92130		06 50	06 58	07 03	→	07 14	07 24	07 27	07 34	07 55	08 25	08 35
92A	92152					07 24	07 29	07 39	07 42	07 49	08 10	08 40	08 50
92	92150		07 20	07 28	07 33	→	07 44	07 54	07 57	08 04	08 25	08 55	09 05
92A	92172					07 54	07 59	08 09	08 12	08 19	08 40	09 05	09 15
92	92170		07 50	07 58	08 03	→	08 14	08 24	08 27	08 34	08 55	09 20	09 30
92	92220		08 25	08 33	08 38	→	08 49	08 59	09 02	09 09	09 25	09 50	10 00
92	92230		08 55	09 03	09 08	→	09 19	09 29	09 32	09 39	09 55	10 15	10 25
92	92250		09 25	09 33	09 38	→	09 49	09 59	10 02	10 09	10 25	10 40	10 50
92	92270		09 55	10 03	10 08	→	10 19	10 29	10 32	10 39	10 55	11 10	11 20
92	92290		10 25	10 33	10 38	→	10 49	10 59	11 02	11 09	11 25	11 40	11 50
92	92310		10 55	11 03	11 08	→	11 19	11 29	11 32	11 39	11 55	12 10	12 20
92	92330		11 25	11 33	11 38	→	11 49	11 59	12 02	12 09	12 25	12 40	12 50
92	92350		11 55	12 03	12 08	→	12 19	12 29	12 32	12 39	12 55	13 10	13 20

Monday to Friday (except holidays)
Du lundi au vendredi (sauf les jours fériés)

WESTBOUND / EN DIRECTION OUEST

Route Number / Nombre d'itinéraire	Trip Number / N° du trajet	Zone →	94	93	93	93	92	91	91	90	7	5	5
			Oshawa Dp.	Whitby	Whitby	Whitby	Ajax	Pickering	Pickering	Scarborough	Scarborough Ar.	North York Ar.	North York Ar.
			Oshawa Bus Terminal	**Dundas St. @ Thickson Rd.**	**Dundas St. @ Brock St.**	**Dundas St. @ Hwy. 412**	**Kingston Rd. @ Harwood Ave.**	**Kingston Rd. @ Glenanna Rd.**	**Kingston Rd. @ Fairport Rd.**	**Kingston Rd. @ Sheppard Ave. E**	**Scarborough Centre Bus Terminal**	**York Mills Bus Terminal**	**Yorkdale Bus Terminal**
92	92370		12 25	12 33	12 38	→	12 49	12 59	13 02	13 09	13 25	13 45	13 55
92	92390		12 55	13 03	13 08	→	13 19	13 29	13 32	13 39	13 55	14 15	14 25
92	92410		13 25	13 33	13 38	→	13 49	13 59	14 02	14 09	14 25	14 45	14 55
92	92430		13 55	14 03	14 08	→	14 19	14 29	14 32	14 39	14 55	15 15	15 30
92	92450		14 25	14 33	14 38	→	14 49	14 59	15 02	15 09	15 25	15 45	16 00
92	92470		14 55	15 03	15 08	→	15 19	15 29	15 32	15 39	15 55	16 15	16 30
92	92500		15 25	15 33	15 38	→	15 49	15 59	16 02	16 09	16 25	16 45	17 00
92	92530		15 55	16 03	16 08	→	16 19	16 29	16 32	16 39	16 55	17 15	17 30
92	92560		16 25	16 33	16 38	→	16 49	16 59	17 02	17 09	17 25	17 45	18 00
92	92590		16 55	17 03	17 08	→	17 19	17 29	17 32	17 39	17 55	18 15	18 25
92	92620		17 25	17 33	17 38	→	17 49	17 59	18 02	18 09	18 25	18 45	18 55
92	92650		18 00	18 08	18 12	→	18 20	18 29	18 32	18 39	18 55	19 15	19 25
92	92670		18 30	18 38	18 42	→	18 50	18 59	19 02	19 09	19 25	19 40	19 50
92	92700		19 00	19 08	19 12	→	19 20	19 29	19 32	19 39	19 55	20 10	20 20
92	92720		19 35	19 43	19 47	→	19 55	20 04	20 07	20 12	20 25	20 40	20 50
92	92740		20 05	20 13	20 17	→	20 25	20 34	20 37	20 42	20 55	21 10	21 20
92	92760		20 35	20 43	20 47	→	20 55	21 04	21 07	21 12	21 25	21 40	21 50
92	92780		21 05	21 13	21 17	→	21 25	21 34	21 37	21 42	21 55	22 10	22 20
92	92800		21 40	21 46	21 49	→	21 57	22 05	22 08	22 13	22 25	22 40	22 50
92	92820		22 10	22 16	22 19	→	22 27	22 35	22 38	22 43	22 55	23 10	23 20
92	92830		22 40	22 46	22 49	→	22 57	23 05	23 08	23 13	23 25	23 40	23 50
92	92860		23 40	23 46	23 49	→	23 57	00 05	00 08	00 13	00 25	00 40	00 50
92	92890		00 40	00 46	00 49	→	00 57	01 05	01 08	01 13	01 25	01 40	01 50

Monday to Friday (except holidays)
Du lundi au vendredi (sauf les jours fériés)

EASTBOUND / EN DIRECTION EST

Route Number / Nombre d'itinéraire	Trip Number / N° du trajet	Zone →	North York 5 Dp.	North York 5	Scarborough 7	Scarborough 90	Pickering 91	Pickering 91	Ajax 92	Whitby 93	Whitby 93	Whitby 93	Oshawa 94 Ar.
			Yorkdale Bus Terminal	**York Mills Bus Terminal**	**Scarborough Centre Bus Terminal**	**Kingston Rd. @ Port Union Rd.**	**Kingston Rd. @ Fairport Rd.**	**Kingston Rd. @ Glenanna Rd.**	**Kingston Rd. @ Harwood Ave.**	**Dundas St. @ Hwy. 412**	**Dundas St. @ Brock St.**	**Dundas St. @ Thickson Rd.**	**Oshawa Bus Terminal**
92	92021		04 50	05 00	05 15	05 24	05 29	05 32	05 40	→	05 48	05 52	06 00
92	92041		05 20	05 30	05 45	05 54	05 59	06 02	06 10	→	06 18	06 22	06 30
92	92061		05 50	06 00	06 15	06 25	06 30	06 33	06 41	→	06 49	06 53	07 05
92	92091		06 20	06 30	06 45	06 55	07 00	07 03	07 11	→	07 19	07 23	07 35
92	92121		06 50	07 00	07 15	07 25	07 30	07 35	07 44	→	07 54	07 58	08 10
92	92151		07 20	07 30	07 45	07 55	08 00	08 05	08 14	→	08 24	08 28	08 40
92	92171		07 45	07 55	08 15	08 25	08 30	08 35	08 44	→	08 54	08 58	09 10
92	92201		08 15	08 25	08 45	08 55	09 00	09 05	09 14	→	09 24	09 28	09 40
92	92231		08 45	08 55	09 15	09 25	09 30	09 35	09 44	→	09 54	09 58	10 10
92	92251		09 20	09 30	09 45	09 55	10 00	10 05	10 14	→	10 24	10 28	10 40
92	92271		09 50	10 00	10 15	10 25	10 30	10 35	10 44	→	10 54	10 58	11 10
92	92291		10 20	10 30	10 45	10 55	11 00	11 05	11 14	→	11 24	11 28	11 40
92	92311		10 50	11 00	11 15	11 25	11 30	11 35	11 44	→	11 54	11 58	12 10
92	92331		11 20	11 30	11 45	11 55	12 00	12 05	12 14	→	12 24	12 28	12 40
92	92351		11 50	12 00	12 15	12 25	12 30	12 35	12 44	→	12 54	12 58	13 10
92	92371		12 20	12 30	12 45	12 55	13 00	13 05	13 14	→	13 24	13 28	13 40
92	92391		12 50	13 00	13 15	13 25	13 30	13 35	13 44	→	13 54	13 58	14 10
92	92401		13 20	13 30	13 45	13 55	14 00	14 05	14 14	→	14 24	14 28	14 40
92	92431		13 50	14 00	14 15	14 25	14 30	14 35	14 44	→	14 54	14 58	15 10
92	92441		14 20	14 30	14 45	14 55	15 01	15 06	15 16	→	15 28	15 30	15 45
92	92471		14 45	14 55	15 15	15 25	15 31	15 36	15 46	→	15 56	16 00	16 15
92A	92483		15 00	15 10	15 30	15 40	15 46	15 51	16 01	16 11			
92	92481		15 15	15 25	15 45	15 55	16 01	16 06	16 17	→	16 28	16 34	16 50

Monday to Friday (except holidays)
Du lundi au vendredi (sauf les jours fériés)

EASTBOUND / EN DIRECTION EST

Route Number / Nombre d'itinéraire	Trip Number / N° du trajet	Zone →	North York 5 Dp.	North York 5	Scarborough 7	Scarborough 90	Pickering 91	Pickering 91	Ajax 92	Whitby 93	Whitby 93	Whitby 93	Oshawa 94 Ar.
			Yorkdale Bus Terminal	**York Mills Bus Terminal**	**Scarborough Centre Bus Terminal**	**Kingston Rd. @ Port Union Rd.**	**Kingston Rd. @ Fairport Rd.**	**Kingston Rd. @ Glenanna Rd.**	**Kingston Rd. @ Harwood Ave.**	**Dundas St. @ Hwy. 412**	**Dundas St. @ Brock St.**	**Dundas St. @ Thickson Rd.**	**Oshawa Bus Terminal**
92A	92523		15 30	15 40	16 00	16 10	16 16	16 21	16 32	16 49			
92	92521		15 40	15 50	16 15	16 25	16 31	16 36	16 47	→	16 58	17 04	17 20
92A	92543		15 55	16 05	16 30	16 40	16 46	16 51	17 02	17 19			
92	92561		16 05	16 15	16 45	16 55	17 01	17 06	17 17	→	17 28	17 34	17 50
92A	92573		16 20	16 30	17 00	17 12	17 19	17 24	17 35	17 49			
92	92571		16 35	16 45	17 15	17 27	17 34	17 39	17 50	→	18 01	18 07	18 25
92A	92593		16 50	17 00	17 30	17 42	17 49	17 54	18 05	18 19			
92	92591		17 05	17 15	17 45	17 55	18 01	18 06	18 17	→	18 28	18 34	18 50
92A	92613		17 20	17 30	18 00	18 10	18 16	18 21	18 32	18 44			
92	92631		17 40	17 50	18 15	18 25	18 31	18 36	18 47	→	18 58	19 04	19 20
92A	92633		17 55	18 05	18 30	18 40	18 46	18 49	18 59	19 09			
92	92651		18 10	18 20	18 45	18 55	19 01	19 04	19 14	→	19 23	19 29	19 45
92A	92653		18 30	18 40	19 00	19 10	19 16	19 19	19 29	19 39			
92	92681		18 45	18 55	19 15	19 25	19 31	19 34	19 43	→	19 52	19 56	20 10
92	92701		19 15	19 25	19 45	19 55	20 01	20 04	20 13	→	20 22	20 26	20 40
92	92731		19 50	20 00	20 15	20 25	20 31	20 34	20 43	→	20 52	20 56	21 10
92	92751		20 20	20 30	20 45	20 55	21 00	21 03	21 11	→	21 19	21 23	21 35
92	92771		20 50	21 00	21 15	21 25	21 30	21 33	21 41	→	21 49	21 53	22 05
92	92791		21 20	21 30	21 45	21 55	22 00	22 03	22 11	→	22 19	22 23	22 35
92	92811		21 50	22 00	22 15	22 25	22 30	22 33	22 41	→	22 49	22 53	23 05
92	92831		22 20	22 30	22 45	22 55	23 00	23 03	23 11	→	23 19	23 23	23 35
92	92841		22 50	23 00	23 15	23 25	23 30	23 33	23 41	→	23 49	23 53	00 05
92	92871		23 50	24 00	00 15	00 24	00 29	00 32	00 40	→	00 48	00 52	01 00
92	92901		00 50	01 00	01 15	01 24	01 29	01 32	01 40	→	01 48	01 52	02 00

Saturday and Sunday
Samedi et dimanche

WESTBOUND / EN DIRECTION OUEST

Route Number Nombre d'itinéraire	Trip Number N° du trajet	Zone→	94 Oshawa Dp. **Oshawa Bus Terminal**	93 Whitby **Dundas St. @ Thickson Rd.**	93 Whitby **Dundas St. @ Brock St.**	92 Ajax **Kingston Rd. @ Harwood Ave.**	91 Pickering **Kingston Rd. @ Glenanna Rd.**	91 Pickering **Kingston Rd. @ Fairport Rd.**	90 Scarborough **Kingston Rd. @ Sheppard Ave. E**	7 Scarborough Ar. **Scarborough Centre Bus Terminal**	5 North York Ar. **York Mills Bus Terminal**	5 North York Ar. **Yorkdale Bus Terminal**
92	92050		05 35	05 43	05 47	05 55	06 04	06 07	06 12	06 25	06 40	06 50
92	92070		06 05	06 13	06 17	06 25	06 34	06 37	06 42	06 55	07 10	07 20
92	92100		06 35	06 43	06 47	06 55	07 04	07 07	07 12	07 25	07 40	07 50
92	92130		07 05	07 13	07 17	07 25	07 34	07 37	07 42	07 55	08 10	08 20
92	92160		07 35	07 43	07 47	07 55	08 04	08 07	08 12	08 25	08 40	08 50
92	92190		08 05	08 13	08 17	08 25	08 34	08 37	08 42	08 55	09 10	09 20
92	92220		08 35	08 43	08 47	08 55	09 04	09 07	09 12	09 25	09 40	09 50
92	92240		09 00	09 08	09 12	09 20	09 29	09 32	09 39	09 55	10 10	10 20
92	92260		09 30	09 38	09 42	09 50	09 59	10 02	10 09	10 25	10 40	10 55
92	92280		10 00	10 08	10 12	10 20	10 29	10 32	10 39	10 55	11 10	11 25
92	92300		10 30	10 38	10 42	10 50	11 00	11 03	11 10	11 25	11 40	11 55
92	92310		11 00	11 08	11 12	11 20	11 30	11 33	11 40	11 55	12 10	12 25
92	92330		11 30	11 38	11 42	11 50	12 00	12 03	12 10	12 25	12 40	12 55
92	92350		12 00	12 08	12 12	12 20	12 30	12 33	12 40	12 55	13 10	13 25
92	92370		12 25	12 33	12 37	12 45	12 55	13 00	13 10	13 25	13 40	13 55
92	92390		12 55	13 03	13 07	13 15	13 25	13 30	13 40	13 55	14 12	14 30
92	92410		13 25	13 33	13 37	13 45	13 55	14 00	14 10	14 25	14 42	15 00

Saturday and Sunday
Samedi et dimanche

WESTBOUND / EN DIRECTION OUEST

Route Number Nombre d'itinéraire	Trip Number N° du trajet	Zone→	94 Oshawa Dp. **Oshawa Bus Terminal**	93 Whitby **Dundas St. @ Thickson Rd.**	93 Whitby **Dundas St. @ Brock St.**	92 Ajax **Kingston Rd. @ Harwood Ave.**	91 Pickering **Kingston Rd. @ Glenanna Rd.**	91 Pickering **Kingston Rd. @ Fairport Rd.**	90 Scarborough **Kingston Rd. @ Sheppard Ave. E**	7 Scarborough Ar. **Scarborough Centre Bus Terminal**	5 North York Ar. **York Mills Bus Terminal**	5 North York Ar. **Yorkdale Bus Terminal**
92	92430		13 55	14 03	14 07	14 15	14 25	14 30	14 40	14 55	15 12	15 30
92	92450		14 25	14 33	14 37	14 45	14 55	15 00	15 10	15 25	15 42	16 00
92	92470		14 55	15 03	15 07	15 15	15 25	15 30	15 40	15 55	16 12	16 30
92	92510		15 25	15 33	15 37	15 45	15 55	16 00	16 10	16 25	16 42	17 00
92	92530		16 00	16 08	16 12	16 20	16 30	16 33	16 40	16 55	17 12	17 30
92	92560		16 30	16 38	16 42	16 50	17 00	17 03	17 10	17 25	17 42	18 00
92	92590		17 00	17 08	17 12	17 20	17 30	17 33	17 40	17 55	18 12	18 30
92	92620		17 30	17 38	17 42	17 50	18 00	18 03	18 10	18 25	18 40	18 55
92	92660		18 00	18 08	18 12	18 20	18 30	18 33	18 40	18 55	19 10	19 25
92	92680		18 35	18 43	18 47	18 55	19 05	19 08	19 13	19 25	19 40	19 55
92	92700		19 05	19 13	19 17	19 25	19 35	19 38	19 43	19 55	20 10	20 25
92	92720		19 35	19 43	19 47	19 55	20 05	20 08	20 13	20 25	20 40	20 50
92	92740		20 05	20 13	20 17	20 25	20 35	20 38	20 43	20 55	21 10	21 20
92	92760		20 35	20 43	20 47	20 55	21 05	21 08	21 13	21 25	21 40	21 50
92	92800		21 35	21 43	21 47	21 55	22 05	22 08	22 13	22 25	22 40	22 50
92	92830		22 35	22 43	22 47	22 55	23 05	23 08	23 13	23 25	23 40	23 50
92	92860		23 35	23 43	23 47	23 55	00 05	00 08	00 13	00 25	00 40	00 50

Saturday and Sunday
Samedi et dimanche

EASTBOUND / EN DIRECTION EST

Route Number Nombre d'itinéraire	Zone→	North York 5 Dp.	North York 5	Scarborough 7	Scarborough 90	Pickering 91	Pickering 91	Ajax 92	Whitby 93	Whitby 93	Oshawa 94 Ar.
	Trip Number N° du trajet	**Yorkdale Bus Terminal**	**York Mills Bus Terminal**	**Scarborough Centre Bus Terminal**	**Kingston Rd. @ Port Union Rd.**	**Kingston Rd. @ Fairport Rd.**	**Kingston Rd. @ Glenanna Rd.**	**Kingston Rd. @ Harwood Ave.**	**Dundas St. @ Brock St.**	**Dundas St. @ Thickson Rd.**	**Oshawa Bus Terminal**
92	92121	06 50	07 00	07 15	07 24	07 29	07 32	07 40	07 48	07 52	08 00
92	92151	07 20	07 30	07 45	07 55	08 00	08 03	08 11	08 19	08 23	08 35
92	92181	07 50	08 00	08 15	08 25	08 30	08 33	08 41	08 49	08 53	09 05
92	92211	08 20	08 30	08 45	08 55	09 00	09 03	09 11	09 19	09 23	09 35
92	92231	08 50	09 00	09 15	09 25	09 30	09 33	09 41	09 49	09 53	10 05
92	92251	09 20	09 30	09 45	09 55	10 00	10 03	10 11	10 19	10 23	10 35
92	92271	09 50	10 00	10 15	10 25	10 30	10 33	10 41	10 49	10 53	11 05
92	92291	10 20	10 30	10 45	10 55	11 00	11 03	11 11	11 19	11 23	11 35
92	92311	10 50	11 00	11 15	11 25	11 30	11 33	11 42	11 52	11 56	12 10
92	92331	11 20	11 30	11 45	11 55	12 00	12 03	12 12	12 22	12 26	12 40
92	92351	11 50	12 00	12 15	12 25	12 30	12 33	12 42	12 52	12 56	13 10
92	92371	12 20	12 30	12 45	12 55	13 00	13 03	13 12	13 22	13 26	13 40
92	92391	12 50	13 00	13 15	13 25	13 30	13 33	13 42	13 52	13 56	14 10
92	92411	13 20	13 30	13 45	13 55	14 00	14 03	14 12	14 22	14 26	14 40
92	92431	13 50	14 00	14 15	14 25	14 30	14 33	14 42	14 52	14 56	15 10
92	92451	14 20	14 30	14 45	14 55	15 00	15 03	15 12	15 22	15 26	15 40
92	92471	14 50	15 00	15 15	15 25	15 30	15 33	15 42	15 52	15 56	16 10

Saturday and Sunday
Samedi et dimanche

EASTBOUND / EN DIRECTION EST

Route Number Nombre d'itinéraire	Zone→	North York 5 Dp.	North York 5	Scarborough 7	Scarborough 90	Pickering 91	Pickering 91	Ajax 92	Whitby 93	Whitby 93	Oshawa 94 Ar.
	Trip Number N° du trajet	**Yorkdale Bus Terminal**	**York Mills Bus Terminal**	**Scarborough Centre Bus Terminal**	**Kingston Rd. @ Port Union Rd.**	**Kingston Rd. @ Fairport Rd.**	**Kingston Rd. @ Glenanna Rd.**	**Kingston Rd. @ Harwood Ave.**	**Dundas St. @ Brock St.**	**Dundas St. @ Thickson Rd.**	**Oshawa Bus Terminal**
92	92491	15 20	15 30	15 45	15 55	16 00	16 03	16 12	16 22	16 26	16 40
92	92521	15 50	16 00	16 15	16 25	16 30	16 33	16 42	16 52	16 56	17 10
92	92551	16 20	16 30	16 45	16 57	17 03	17 07	17 16	17 26	17 31	17 45
92	92581	16 50	17 00	17 15	17 27	17 33	17 37	17 45	17 56	18 01	18 15
92	92611	17 20	17 30	17 45	17 55	18 00	18 03	18 12	18 22	18 26	18 40
92	92641	17 50	18 00	18 15	18 25	18 30	18 33	18 42	18 52	18 56	19 10
92	92671	18 20	18 30	18 45	18 55	19 00	19 03	19 12	19 22	19 26	19 40
92	92691	18 50	19 00	19 15	19 25	19 30	19 33	19 42	19 52	19 56	20 10
92	92711	19 20	19 30	19 45	19 55	20 00	20 03	20 12	20 22	20 26	20 40
92	92731	19 50	20 00	20 15	20 25	20 30	20 33	20 41	20 49	20 53	21 05
92	92751	20 20	20 30	20 45	20 55	21 00	21 03	21 11	21 19	21 23	21 35
92	92771	20 50	21 00	21 15	21 25	21 30	21 33	21 41	21 49	21 53	22 05
92	92791	21 20	21 30	21 45	21 55	22 00	22 03	22 11	22 19	22 23	22 35
92	92811	21 50	22 00	22 15	22 25	22 30	22 33	22 41	22 48	22 53	23 05
92	92841	22 50	23 00	23 15	23 24	23 29	23 32	23 40	23 48	23 52	24 00
92	92871	23 50	24 00	00 15	00 24	00 29	00 32	00 40	00 48	00 52	01 00
92	92901	00 50	01 00	01 15	01 24	01 29	01 32	01 40	01 48	01 52	02 00

APPENDIX D

Traffic Data

Turning Movement Count (1 . BROCK RD & FINCH AVE)

Start Time	N Approach						E Approach						S Approach						W Approach						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
06:30:00	17	346	0	0	0	363	1	1	4	0	0	6	0	113	15	0	1	128	25	0	12	0	2	37	534	
06:45:00	32	358	2	0	0	392	1	0	2	0	0	3	1	116	17	0	0	134	34	0	14	0	1	48	577	
07:00:00	35	337	0	0	0	372	0	0	3	0	0	3	1	158	20	0	0	179	31	1	21	0	3	53	607	
07:15:00	35	408	0	0	0	443	0	1	5	0	1	6	2	139	20	0	0	161	45	0	26	0	1	71	681	2399
07:30:00	54	419	0	0	0	473	2	2	4	0	1	8	0	164	31	0	1	195	54	0	27	0	3	81	757	2622
07:45:00	40	486	0	0	1	526	3	0	4	0	2	7	0	162	24	0	1	186	54	1	38	0	4	93	812	2857
08:00:00	31	458	0	0	0	489	0	0	4	0	0	4	3	170	30	0	0	203	53	2	38	0	0	93	789	3039
08:15:00	54	414	1	0	0	469	0	2	7	0	0	9	0	176	34	0	0	210	63	0	37	0	2	100	788	3146
08:30:00	50	402	0	0	0	452	2	3	1	0	1	6	2	151	38	0	0	191	40	3	34	0	4	77	726	3115
08:45:00	45	414	2	0	0	461	2	0	1	0	1	3	0	166	28	0	0	194	73	1	51	0	1	125	783	3086
BREAK																										
15:30:00	42	188	0	0	1	230	3	1	1	0	1	5	2	368	41	0	0	411	55	1	76	0	1	132	778	
15:45:00	40	192	3	0	1	235	1	2	4	0	1	7	2	330	54	0	0	386	64	3	72	0	3	139	767	
16:00:00	63	218	0	0	1	281	2	1	3	0	1	6	4	379	53	0	1	436	52	3	81	0	0	136	859	
16:15:00	45	193	0	0	3	238	2	0	4	0	2	6	4	358	50	0	2	412	60	2	82	0	0	144	800	3204
16:30:00	35	241	1	0	2	277	2	2	2	0	0	6	4	385	65	0	0	454	57	4	89	0	9	150	887	3313
16:45:00	34	202	1	0	1	237	1	2	3	0	3	6	4	416	57	0	0	477	65	2	93	0	6	160	880	3426
17:00:00	32	242	3	0	0	277	2	1	2	0	1	5	2	422	58	0	0	482	54	4	102	0	2	160	924	3491
17:15:00	46	216	1	0	1	263	2	0	2	0	2	4	7	437	49	0	0	493	66	3	98	0	0	167	927	3618
17:30:00	45	232	0	0	0	277	2	1	7	0	0	10	7	412	61	1	0	481	54	6	89	0	0	149	917	3648
17:45:00	50	226	1	0	0	277	1	1	3	0	2	5	3	380	57	0	0	440	70	3	68	0	2	141	863	3631
18:00:00	33	236	0	0	0	269	3	3	2	0	1	8	3	368	49	0	0	420	63	2	54	0	5	119	816	3523
18:15:00	39	201	1	0	0	241	1	3	3	0	4	7	3	378	62	0	0	443	75	4	71	0	7	150	841	3437
Grand Total	897	6629	16	0	11	7542	33	26	71	0	24	130	54	6148	913	1	6	7116	1207	45	1273	0	56	2525	**17313**	-
Approach%	11.9%	87.9%	0.2%	0%		-	25.4%	20%	54.6%	0%		-	0.8%	86.4%	12.8%	0%		-	47.8%	1.8%	50.4%	0%		-	-	-
Totals %	5.2%	38.3%	0.1%	0%		43.6%	0.2%	0.2%	0.4%	0%		0.8%	0.3%	35.5%	5.3%	0%		41.1%	7%	0.3%	7.4%	0%		14.6%	-	-
Heavy	35	365	3	0		-	5	3	4	0		-	3	385	25	0		-	45	4	31	0		-	-	-
Heavy %	3.9%	5.5%	18.8%	0%		-	15.2%	11.5%	5.6%	0%		-	5.6%	6.3%	2.7%	0%		-	3.7%	8.9%	2.4%	0%		-	-	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-

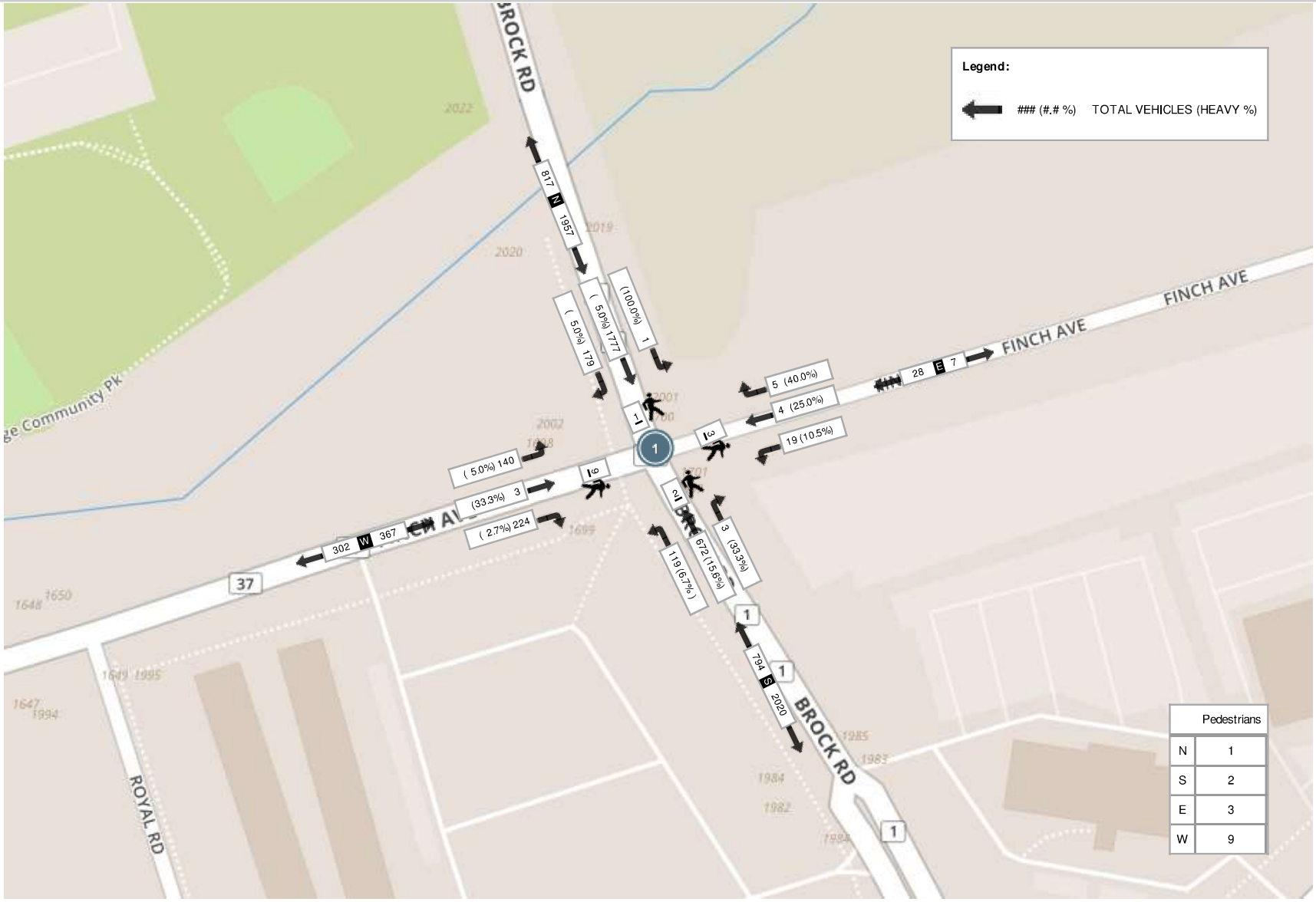
Peak Hour: 07:30 AM - 08:30 AM Weather: Clear Sky (6.1 °C)

Start Time	N Approach						E Approach						S Approach						W Approach						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
07:30:00	54	419	0	0	0	473	2	2	4	0	1	8	0	164	31	0	1	195	54	0	27	0	3	81	757
07:45:00	40	486	0	0	1	526	3	0	4	0	2	7	0	162	24	0	1	186	54	1	38	0	4	93	812
08:00:00	31	458	0	0	0	489	0	0	4	0	0	4	3	170	30	0	0	203	53	2	38	0	0	93	789
08:15:00	54	414	1	0	0	469	0	2	7	0	0	9	0	176	34	0	0	210	63	0	37	0	2	100	788
Grand Total	179	1777	1	0	1	1957	5	4	19	0	3	28	3	672	119	0	2	794	224	3	140	0	9	367	**3146**
Approach%	9.1%	90.8%	0.1%	0%		-	17.9%	14.3%	67.9%	0%		-	0.4%	84.6%	15%	0%		-	61%	0.8%	38.1%	0%		-	-
Totals %	5.7%	56.5%	0%	0%		62.2%	0.2%	0.1%	0.6%	0%		0.9%	0.1%	21.4%	3.8%	0%		25.2%	7.1%	0.1%	4.5%	0%		11.7%	-
PHF	0.83	0.91	0.25	0		0.93	0.42	0.5	0.68	0		0.78	0.25	0.95	0.88	0		0.95	0.89	0.38	0.92	0		0.92	-
Heavy	9	88	1	0		98	2	1	2	0		5	1	105	8	0		114	6	1	7	0		14	-
Heavy %	5%	5%	100%	0%		5%	40%	25%	10.5%	0%		17.9%	33.3%	15.6%	6.7%	0%		14.4%	2.7%	33.3%	5%	0%		3.8%	-
Lights	170	1689	0	0		1859	3	3	17	0		23	2	567	111	0		680	218	2	133	0		353	-
Lights %	95%	95%	0%	0%		95%	60%	75%	89.5%	0%		82.1%	66.7%	84.4%	93.3%	0%		85.6%	97.3%	66.7%	95%	0%		96.2%	-
Single-Unit Trucks	3	52	0	0		55	0	1	0	0		1	0	68	3	0		71	0	0	1	0		1	-
Single-Unit Trucks %	1.7%	2.9%	0%	0%		2.8%	0%	25%	0%	0%		3.6%	0%	10.1%	2.5%	0%		8.9%	0%	0%	0.7%	0%		0.3%	-
Buses	6	18	1	0		25	2	0	2	0		4	1	18	5	0		24	6	1	6	0		13	-
Buses %	3.4%	1%	100%	0%		1.3%	40%	0%	10.5%	0%		14.3%	33.3%	2.7%	4.2%	0%		3%	2.7%	33.3%	4.3%	0%		3.5%	-
Articulated Trucks	0	18	0	0		18	0	0	0	0		0	0	19	0	0		19	0	0	0	0		0	-
Articulated Trucks %	0%	1%	0%	0%		0.9%	0%	0%	0%	0%		0%	0%	2.8%	0%	0%		2.4%	0%	0%	0%	0%		0%	-
Bicycles on Road	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	1	-	-	-	-	-	3	-	-	-	-	-	2	-	-	-	-	-	9	-	-
Pedestrians%	-	-	-	-	6.7%		-	-	-	-	20%		-	-	-	-	13.3%		-	-	-	-	60%		-

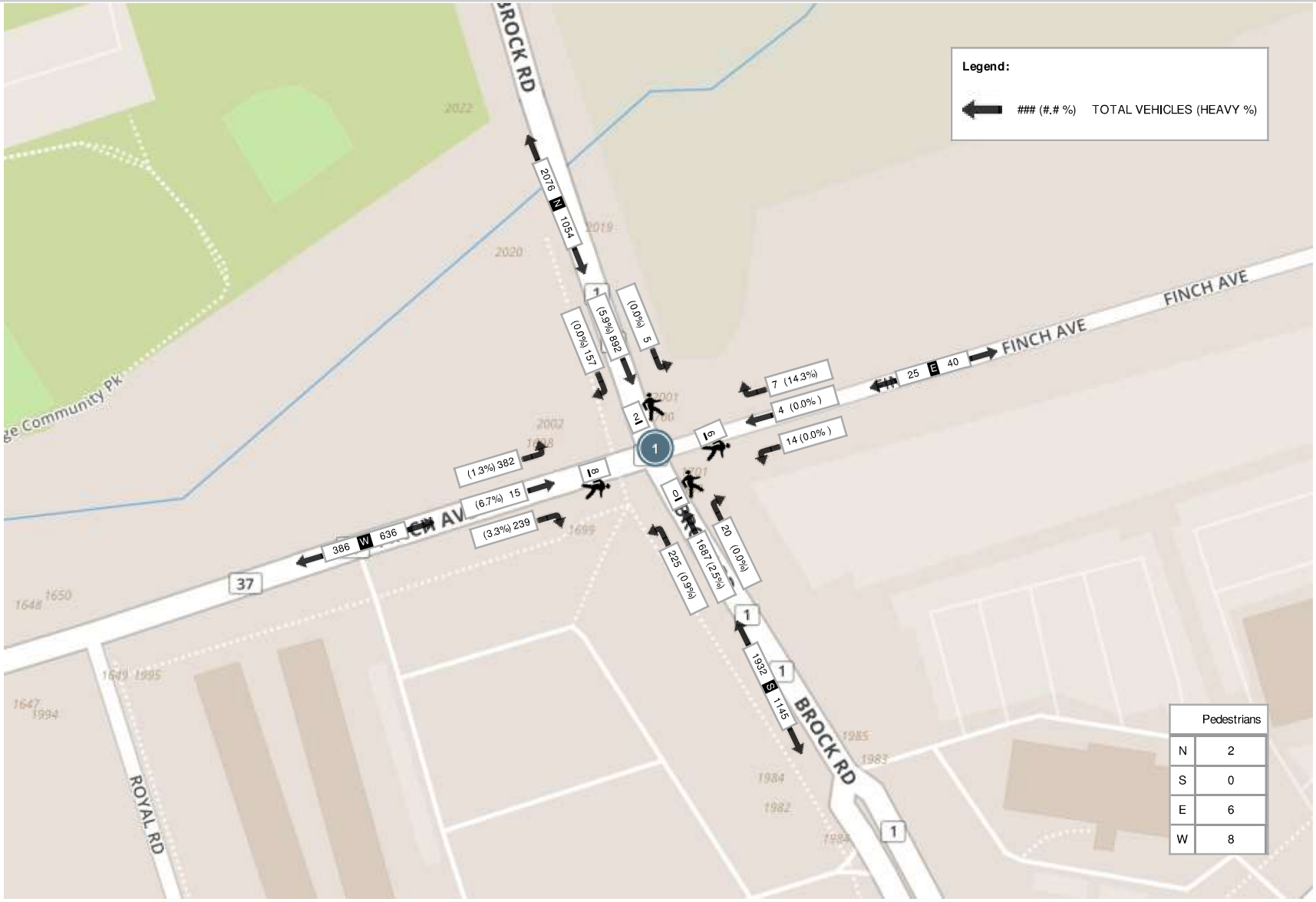
Peak Hour: 04:45 PM - 05:45 PM Weather: Clear Sky (16.41 °C)

Start Time	N Approach						E Approach						S Approach						W Approach						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:45:00	34	202	1	0	1	237	1	2	3	0	3	6	4	416	57	0	0	477	65	2	93	0	6	160	880
17:00:00	32	242	3	0	0	277	2	1	2	0	1	5	2	422	58	0	0	482	54	4	102	0	2	160	924
17:15:00	46	216	1	0	1	263	2	0	2	0	2	4	7	437	49	0	0	493	66	3	98	0	0	167	927
17:30:00	45	232	0	0	0	277	2	1	7	0	0	10	7	412	61	1	0	481	54	6	89	0	0	149	917
Grand Total	157	892	5	0	2	1054	7	4	14	0	6	25	20	1687	225	1	0	1933	239	15	382	0	8	636	**3648**
Approach%	14.9%	84.6%	0.5%	0%		-	28%	16%	56%	0%		-	1%	87.3%	11.6%	0.1%		-	37.6%	2.4%	60.1%	0%		-	-
Totals %	4.3%	24.5%	0.1%	0%		28.9%	0.2%	0.1%	0.4%	0%		0.7%	0.5%	46.2%	6.2%	0%		53%	6.6%	0.4%	10.5%	0%		17.4%	-
PHF	0.85	0.92	0.42	0		0.95	0.88	0.5	0.5	0		0.63	0.71	0.97	0.92	0.25		0.98	0.91	0.63	0.94	0		0.95	-
Heavy	0	53	0	0		53	1	0	0	0		1	0	43	2	0		45	8	1	5	0		14	-
Heavy %	0%	5.9%	0%	0%		5%	14.3%	0%	0%	0%		4%	0%	2.5%	0.9%	0%		2.3%	3.3%	6.7%	1.3%	0%		2.2%	-
Lights	157	839	5	0		1001	6	4	14	0		24	20	1643	223	1		1887	231	14	377	0		622	-
Lights %	100%	94.1%	100%	0%		95%	85.7%	100%	100%	0%		96%	100%	97.4%	99.1%	100%		97.6%	96.7%	93.3%	98.7%	0%		97.8%	-
Single-Unit Trucks	0	33	0	0		33	1	0	0	0		1	0	24	0	0		24	2	1	5	0		8	-
Single-Unit Trucks %	0%	3.7%	0%	0%		3.1%	14.3%	0%	0%	0%		4%	0%	1.4%	0%	0%		1.2%	0.8%	6.7%	1.3%	0%		1.3%	-
Buses	0	10	0	0		10	0	0	0	0		0	0	11	2	0		13	5	0	0	0		5	-
Buses %	0%	1.1%	0%	0%		0.9%	0%	0%	0%	0%		0%	0%	0.7%	0.9%	0%		0.7%	2.1%	0%	0%	0%		0.8%	-
Articulated Trucks	0	10	0	0		10	0	0	0	0		0	0	8	0	0		8	1	0	0	0		1	-
Articulated Trucks %	0%	1.1%	0%	0%		0.9%	0%	0%	0%	0%		0%	0%	0.5%	0%	0%		0.4%	0.4%	0%	0%	0%		0.2%	-
Bicycles on Road	0	0	0	0		0	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	-
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0.1%	0%	0%		0.1%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	2	-	-	-	-	-	6	-	-	-	-	-	0	-	-	-	-	-	8	-	-
Pedestrians%	-	-	-	-	12.5%		-	-	-	-	37.5%		-	-	-	-	0%		-	-	-	-	50%		-

Peak Hour: 07:30 AM - 08:30 AM Weather: Clear Sky (6.1 °C)



Peak Hour: 04:45 PM - 05:45 PM Weather: Clear Sky (16.41 °C)



Turning Movement Count (3 . BROCK RD & USMAN RD / MAJOR OAKS RD)

Start Time	N Approach						E Approach						S Approach						W Approach						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
06:30:00	1	315	0	0	1	316	0	0	11	0	1	11	0	106	7	0	0	113	64	0	3	0	2	67	507	
06:45:00	2	319	0	0	0	321	0	1	16	0	0	17	2	128	17	0	0	147	59	0	4	0	0	63	548	
07:00:00	0	310	0	0	3	310	0	0	12	0	0	12	1	147	20	0	0	168	49	0	5	0	1	54	544	
07:15:00	1	365	0	0	0	366	3	0	13	0	0	16	2	153	19	0	0	174	71	0	4	0	1	75	631	2230
07:30:00	2	424	0	0	1	426	1	1	12	0	0	14	0	171	23	0	0	194	62	0	8	0	1	70	704	2427
07:45:00	4	438	0	0	5	442	1	0	22	0	0	23	1	184	21	0	1	206	68	2	13	0	0	83	754	2633
08:00:00	7	409	1	0	0	417	3	2	28	0	0	33	4	161	32	0	0	197	55	0	5	0	1	60	707	2796
08:15:00	4	389	1	0	0	394	2	2	24	0	1	28	4	180	34	0	0	218	53	2	9	0	1	64	704	2869
08:30:00	4	379	1	0	0	384	4	2	18	0	0	24	5	154	19	0	0	178	85	1	11	0	2	97	683	2848
08:45:00	3	368	2	0	1	373	6	1	6	0	1	13	4	200	22	0	0	226	56	0	5	0	3	61	673	2767
BREAK																										
15:30:00	5	186	2	0	2	193	5	0	17	0	0	22	0	404	46	0	1	450	27	0	8	0	2	35	700	
15:45:00	4	195	6	0	0	205	1	1	12	0	0	14	0	336	47	0	1	383	32	0	14	0	1	46	648	
16:00:00	7	238	2	0	0	247	2	0	6	0	0	8	0	396	63	0	0	459	42	3	2	0	2	47	761	
16:15:00	8	201	4	0	0	213	3	0	5	0	0	8	4	394	55	0	0	453	32	1	8	0	0	41	715	2824
16:30:00	10	229	1	0	0	240	6	0	5	0	2	11	4	407	61	0	1	472	44	1	3	0	1	48	771	2895
16:45:00	10	190	2	0	2	202	8	0	3	0	0	11	5	442	70	0	1	517	37	0	3	0	2	40	770	3017
17:00:00	6	231	2	0	0	239	2	1	7	0	0	10	4	459	62	0	5	525	38	0	4	0	4	42	816	3072
17:15:00	4	222	6	0	1	232	2	2	18	0	0	22	6	452	64	0	1	522	46	9	7	0	0	62	838	3195
17:30:00	11	216	11	0	0	238	4	3	31	0	1	38	10	436	63	0	9	509	50	1	6	0	4	57	842	3266
17:45:00	5	214	0	0	0	219	0	1	19	0	2	20	2	371	72	0	1	445	48	0	1	0	3	49	733	3229
18:00:00	9	225	2	0	0	236	3	0	7	0	0	10	5	375	68	0	0	448	45	0	8	0	0	53	747	3160
18:15:00	10	188	3	0	0	201	4	2	6	0	1	12	3	378	76	0	2	457	48	1	11	0	8	60	730	3052
Grand Total	117	6251	46	0	16	6414	60	19	298	0	9	377	66	6434	961	0	23	7461	1111	21	142	0	39	1274	**15526**	-
Approach%	1.8%	97.5%	0.7%	0%		-	15.9%	5%	79%	0%		-	0.9%	86.2%	12.9%	0%		-	87.2%	1.6%	11.1%	0%		-	-	-
Totals %	0.8%	40.3%	0.3%	0%		41.3%	0.4%	0.1%	1.9%	0%		2.4%	0.4%	41.4%	6.2%	0%		48.1%	7.2%	0.1%	0.9%	0%		8.2%	-	-
Heavy	7	364	0	0		-	3	3	10	0		-	1	401	29	0		-	31	2	4	0		-	-	-
Heavy %	6%	5.8%	0%	0%		-	5%	15.8%	3.4%	0%		-	1.5%	6.2%	3%	0%		-	2.8%	9.5%	2.8%	0%		-	-	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-

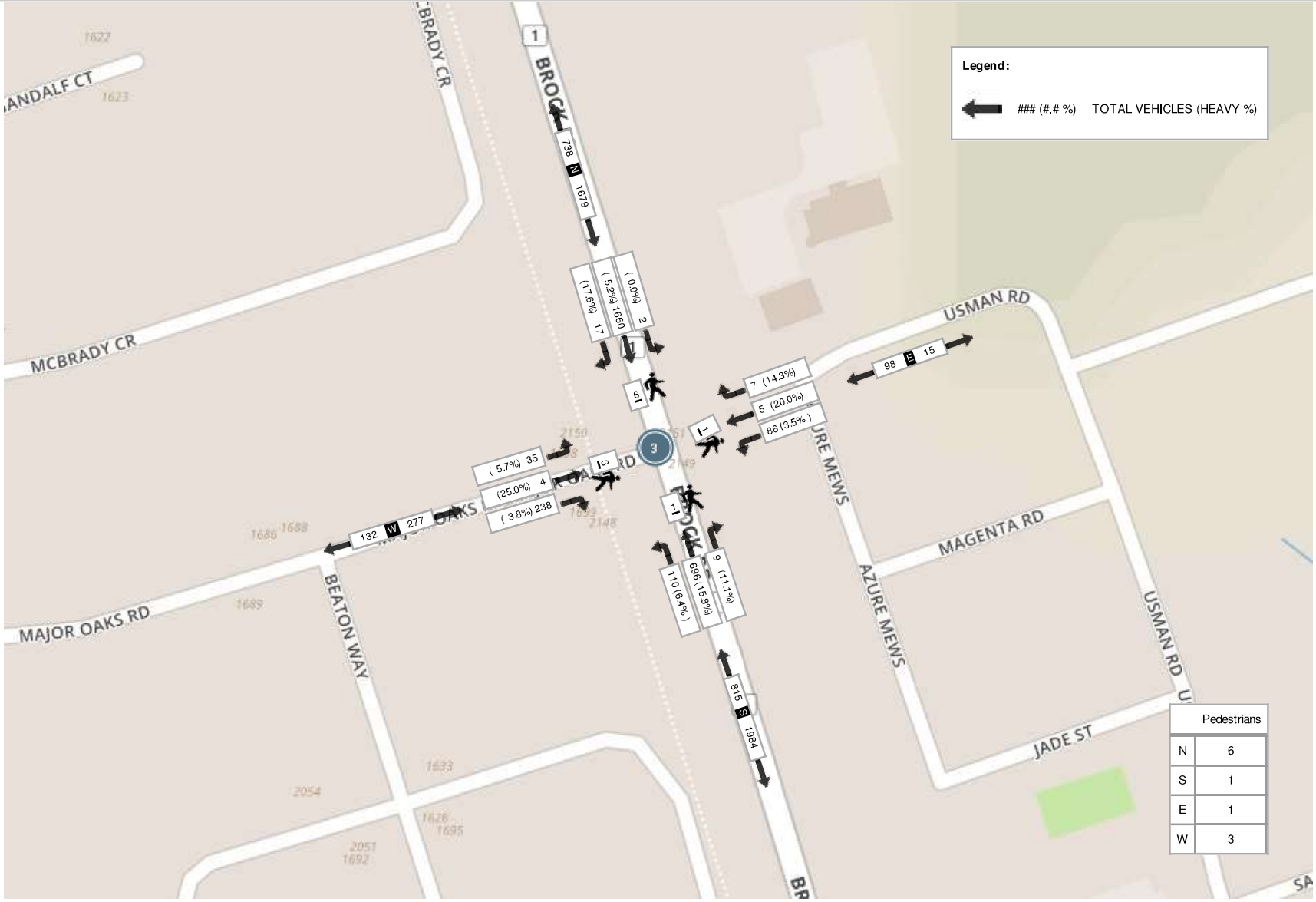
Peak Hour: 07:30 AM - 08:30 AM Weather: Clear Sky (6.1 °C)

Start Time	N Approach						E Approach						S Approach						W Approach						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
07:30:00	2	424	0	0	1	426	1	1	12	0	0	14	0	171	23	0	0	194	62	0	8	0	1	70	704
07:45:00	4	438	0	0	5	442	1	0	22	0	0	23	1	184	21	0	1	206	68	2	13	0	0	83	754
08:00:00	7	409	1	0	0	417	3	2	28	0	0	33	4	161	32	0	0	197	55	0	5	0	1	60	707
08:15:00	4	389	1	0	0	394	2	2	24	0	1	28	4	180	34	0	0	218	53	2	9	0	1	64	704
Grand Total	17	1660	2	0	6	1679	7	5	86	0	1	98	9	696	110	0	1	815	238	4	35	0	3	277	**2869**
Approach%	1%	98.9%	0.1%	0%		-	7.1%	5.1%	87.8%	0%		-	1.1%	85.4%	13.5%	0%		-	85.9%	1.4%	12.6%	0%		-	-
Totals %	0.6%	57.9%	0.1%	0%		58.5%	0.2%	0.2%	3%	0%		3.4%	0.3%	24.3%	3.8%	0%		28.4%	8.3%	0.1%	1.2%	0%		9.7%	-
PHF	0.61	0.95	0.5	0		0.95	0.58	0.63	0.77	0		0.74	0.56	0.95	0.81	0		0.93	0.88	0.5	0.67	0		0.83	-
Heavy	3	87	0	0		90	1	1	3	0		5	1	110	7	0		118	9	1	2	0		12	-
Heavy %	17.6%	5.2%	0%	0%		5.4%	14.3%	20%	3.5%	0%		5.1%	11.1%	15.8%	6.4%	0%		14.5%	3.8%	25%	5.7%	0%		4.3%	-
Lights	14	1573	2	0		1589	6	4	83	0		93	8	586	103	0		697	228	3	33	0		264	-
Lights %	82.4%	94.8%	100%	0%		94.6%	85.7%	80%	96.5%	0%		94.9%	88.9%	84.2%	93.6%	0%		85.5%	95.8%	75%	94.3%	0%		95.3%	-
Single-Unit Trucks	0	52	0	0		52	0	0	0	0		0	1	70	1	0		72	0	0	0	0		0	-
Single-Unit Trucks %	0%	3.1%	0%	0%		3.1%	0%	0%	0%	0%		0%	11.1%	10.1%	0.9%	0%		8.8%	0%	0%	0%	0%		0%	-
Buses	3	15	0	0		18	1	1	3	0		5	0	17	6	0		23	9	1	2	0		12	-
Buses %	17.6%	0.9%	0%	0%		1.1%	14.3%	20%	3.5%	0%		5.1%	0%	2.4%	5.5%	0%		2.8%	3.8%	25%	5.7%	0%		4.3%	-
Articulated Trucks	0	20	0	0		20	0	0	0	0		0	0	23	0	0		23	0	0	0	0		0	-
Articulated Trucks %	0%	1.2%	0%	0%		1.2%	0%	0%	0%	0%		0%	0%	3.3%	0%	0%		2.8%	0%	0%	0%	0%		0%	-
Bicycles on Road	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	1	0	0	0		1	-
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0.4%	0%	0%	0%		0.4%	-
Pedestrians	-	-	-	-	6	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	3	-	-
Pedestrians%	-	-	-	-	54.5%		-	-	-	-	9.1%		-	-	-	-	9.1%		-	-	-	-	27.3%		-

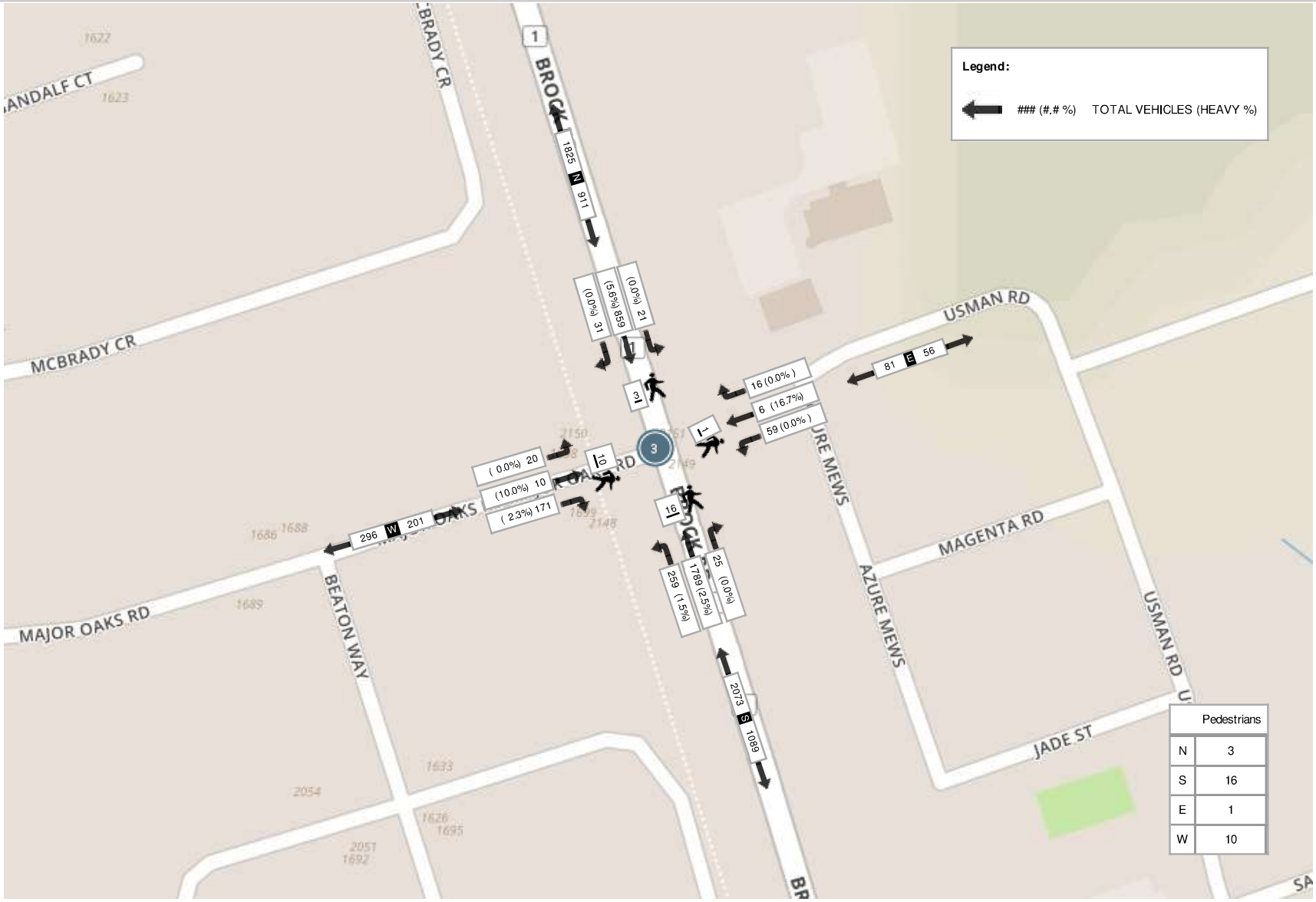
Peak Hour: 04:45 PM - 05:45 PM Weather: Clear Sky (16.41 °C)

Start Time	N Approach						E Approach						S Approach						W Approach						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:45:00	10	190	2	0	2	202	8	0	3	0	0	11	5	442	70	0	1	517	37	0	3	0	2	40	770
17:00:00	6	231	2	0	0	239	2	1	7	0	0	10	4	459	62	0	5	525	38	0	4	0	4	42	816
17:15:00	4	222	6	0	1	232	2	2	18	0	0	22	6	452	64	0	1	522	46	9	7	0	0	62	838
17:30:00	11	216	11	0	0	238	4	3	31	0	1	38	10	436	63	0	9	509	50	1	6	0	4	57	842
Grand Total	31	859	21	0	3	911	16	6	59	0	1	81	25	1789	259	0	16	2073	171	10	20	0	10	201	**3266**
Approach%	3.4%	94.3%	2.3%	0%		-	19.8%	7.4%	72.8%	0%		-	1.2%	86.3%	12.5%	0%		-	85.1%	5%	10%	0%		-	-
Totals %	0.9%	26.3%	0.6%	0%		27.9%	0.5%	0.2%	1.8%	0%		2.5%	0.8%	54.8%	7.9%	0%		63.5%	5.2%	0.3%	0.6%	0%		6.2%	-
PHF	0.7	0.93	0.48	0		0.95	0.5	0.5	0.48	0		0.53	0.63	0.97	0.93	0		0.99	0.86	0.28	0.71	0		0.81	-
Heavy	0	48	0	0		48	0	1	0	0		1	0	45	4	0		49	4	1	0	0		5	-
Heavy %	0%	5.6%	0%	0%		5.3%	0%	16.7%	0%	0%		1.2%	0%	2.5%	1.5%	0%		2.4%	2.3%	10%	0%	0%		2.5%	-
Lights	31	811	21	0		863	16	5	59	0		80	25	1744	255	0		2024	167	6	20	0		193	-
Lights %	100%	94.4%	100%	0%		94.7%	100%	83.3%	100%	0%		98.8%	100%	97.5%	98.5%	0%		97.6%	97.7%	60%	100%	0%		96%	-
Single-Unit Trucks	0	32	0	0		32	0	1	0	0		1	0	31	0	0		31	0	1	0	0		1	-
Single-Unit Trucks %	0%	3.7%	0%	0%		3.5%	0%	16.7%	0%	0%		1.2%	0%	1.7%	0%	0%		1.5%	0%	10%	0%	0%		0.5%	-
Buses	0	6	0	0		6	0	0	0	0		0	0	5	4	0		9	4	0	0	0		4	-
Buses %	0%	0.7%	0%	0%		0.7%	0%	0%	0%	0%		0%	0%	0.3%	1.5%	0%		0.4%	2.3%	0%	0%	0%		2%	-
Articulated Trucks	0	10	0	0		10	0	0	0	0		0	0	9	0	0		9	0	0	0	0		0	-
Articulated Trucks %	0%	1.2%	0%	0%		1.1%	0%	0%	0%	0%		0%	0%	0.5%	0%	0%		0.4%	0%	0%	0%	0%		0%	-
Bicycles on Road	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	3	0	0		3	-
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	30%	0%	0%		1.5%	-
Pedestrians	-	-	-	-	3	-	-	-	-	-	1	-	-	-	-	-	16	-	-	-	-	-	10	-	-
Pedestrians%	-	-	-	-	10%		-	-	-	-	3.3%		-	-	-	-	53.3%		-	-	-	-	33.3%		-

Peak Hour: 07:30 AM - 08:30 AM Weather: Clear Sky (6.1 °C)



Peak Hour: 04:45 PM - 05:45 PM Weather: Clear Sky (16.41 °C)



Turning Movement Count (4 . BROCK RD & USMAN RD (ATR))

Start Time	W Approach			E Approach			Int. Total (15 min)	Int. Total (1 hr)
	Thru W:E	UTurn W:W	Approach Total	Thru E:W	UTurn E:E	Approach Total		
06:30:00	13	0	13	0	0	0	13	
06:45:00	7	0	7	0	0	0	7	
07:00:00	8	0	8	0	0	0	8	
07:15:00	4	0	4	0	0	0	4	32
07:30:00	3	0	3	0	0	0	3	22
07:45:00	4	0	4	1	0	1	5	20
08:00:00	8	0	8	2	0	2	10	22
08:15:00	20	0	20	1	0	1	21	39
08:30:00	14	0	14	0	0	0	14	50
08:45:00	1	0	1	1	0	1	2	47
BREAK								
15:30:00	22	0	22	0	0	0	22	
15:45:00	13	0	13	0	0	0	13	
16:00:00	13	0	13	0	0	0	13	
16:15:00	7	0	7	0	0	0	7	55
16:30:00	11	0	11	0	0	0	11	44
16:45:00	5	0	5	0	0	0	5	36
17:00:00	7	0	7	2	0	2	9	32
17:15:00	22	0	22	9	0	9	31	56
17:30:00	29	0	29	8	0	8	37	82
17:45:00	11	0	11	1	0	1	12	89
18:00:00	20	0	20	0	0	0	20	100
18:15:00	5	0	5	1	0	1	6	75
Grand Total	247	0	247	26	0	26	**273**	-

Approach%	100%	0%	-	100%	0%	-	-	-
Totals %	90.5%	0%	90.5%	9.5%	0%	9.5%	-	-
Heavy	13	0	-	1	0	-	-	-
Heavy %	5.3%	0%	-	3.8%	0%	-	-	-
Bicycles	-	-	-	-	-	-	-	-
Bicycle %	-	-	-	-	-	-	-	-

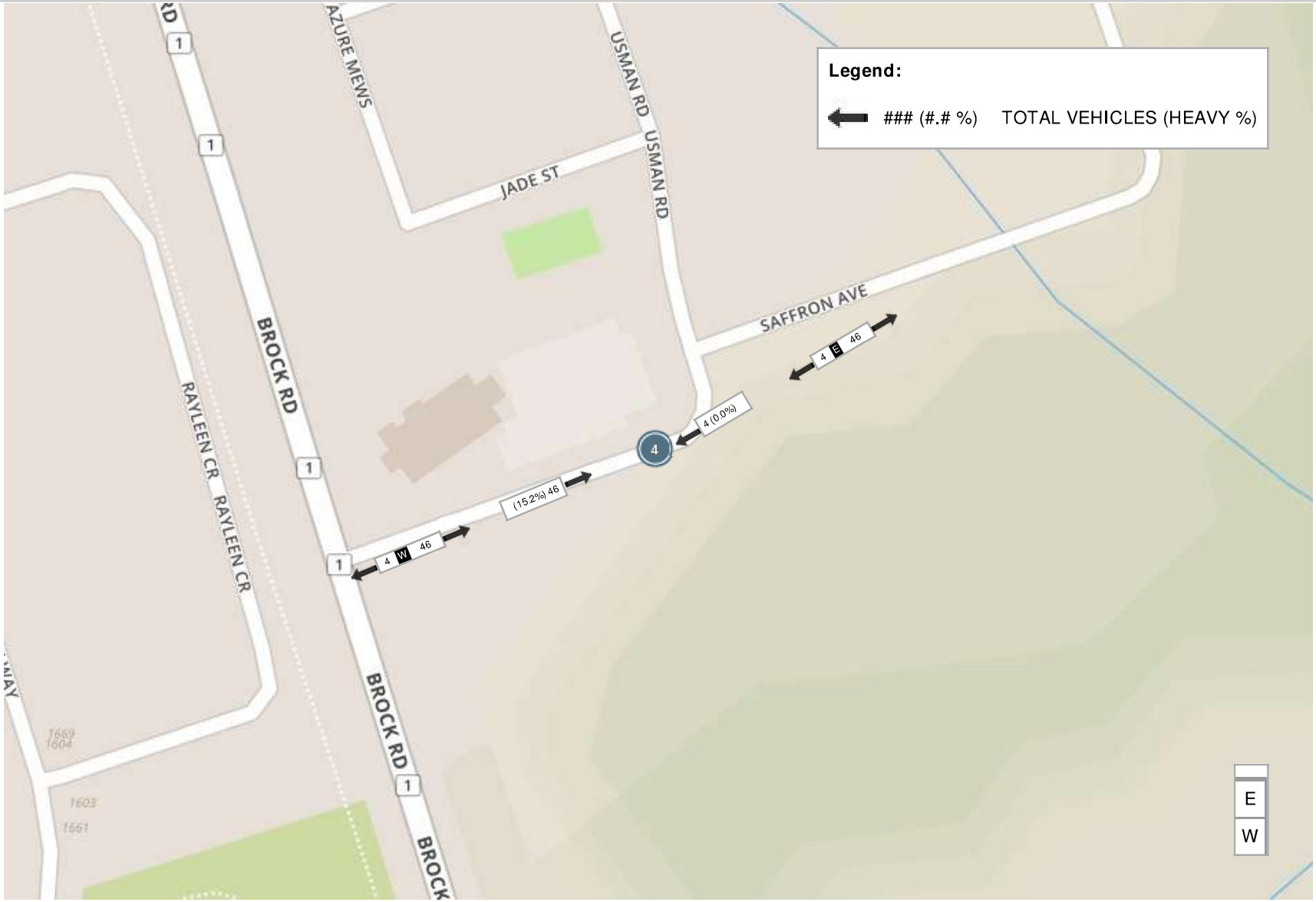
Peak Hour: 07:45 AM - 08:45 AM Weather: Clear Sky (6.1 °C)

Start Time	W Approach			E Approach			Int. Total (15 min)
	Thru	UTurn	Approach Total	Thru	UTurn	Approach Total	
07:45:00	4	0	4	1	0	1	5
08:00:00	8	0	8	2	0	2	10
08:15:00	20	0	20	1	0	1	21
08:30:00	14	0	14	0	0	0	14
Grand Total	46	0	46	4	0	4	**50**
Approach%	100%	0%	-	100%	0%	-	-
Totals %	92%	0%	92%	8%	0%	8%	-
PHF	0.58	0	0.58	0.5	0	0.5	-
Heavy	7	0	7	0	0	0	-
Heavy %	15.2%	0%	15.2%	0%	0%	0%	-
Lights	39	0	39	4	0	4	-
Lights %	84.8%	0%	84.8%	100%	0%	100%	-
Single-Unit Trucks	1	0	1	0	0	0	-
Single-Unit Trucks %	2.2%	0%	2.2%	0%	0%	0%	-
Buses	6	0	6	0	0	0	-
Buses %	13%	0%	13%	0%	0%	0%	-

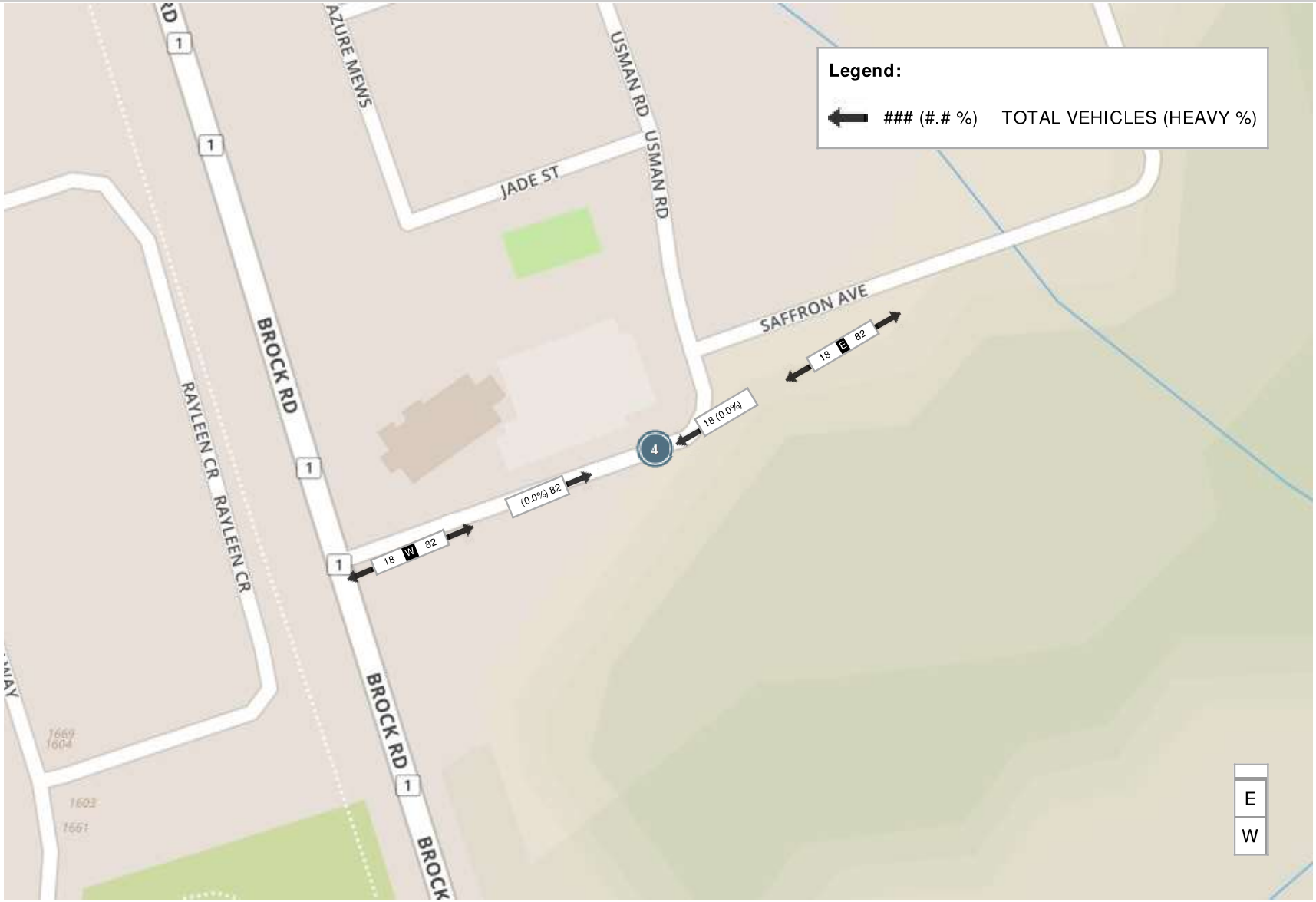
Peak Hour: 05:15 PM - 06:15 PM Weather: Clear Sky (16.41 °C)

Start Time	W Approach			E Approach			Int. Total (15 min)
	Thru	UTurn	Approach Total	Thru	UTurn	Approach Total	
17:15:00	22	0	22	9	0	9	31
17:30:00	29	0	29	8	0	8	37
17:45:00	11	0	11	1	0	1	12
18:00:00	20	0	20	0	0	0	20
Grand Total	82	0	82	18	0	18	**100**
Approach%	100%	0%	-	100%	0%	-	-
Totals %	82%	0%	82%	18%	0%	18%	-
PHF	0.71	0	0.71	0.5	0	0.5	-
Heavy	0	0	0	0	0	0	-
Heavy %	0%	0%	0%	0%	0%	0%	-
Lights	82	0	82	18	0	18	-
Lights %	100%	0%	100%	100%	0%	100%	-
Single-Unit Trucks	0	0	0	0	0	0	-
Single-Unit Trucks %	0%	0%	0%	0%	0%	0%	-
Buses	0	0	0	0	0	0	-
Buses %	0%	0%	0%	0%	0%	0%	-

Peak Hour: 07:45 AM - 08:45 AM Weather: Clear Sky (6.1 °C)



Peak Hour: 05:15 PM - 06:15 PM Weather: Clear Sky (16.41 °C)



Turning Movement Count (2 . BROCK RD & USMAN RD)

Start Time	N Approach					E Approach					S Approach					Int. Total (15 min)	Int. Total (1 hr)
	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	UTurn S:S	Peds S:	Approach Total		
06:30:00	387	5	0	0	392	2	0	0	1	2	10	120	0	0	130	524	
06:45:00	391	0	0	1	391	3	0	0	0	3	0	140	0	1	140	534	
07:00:00	377	0	0	0	377	2	0	0	0	2	5	166	0	0	171	550	
07:15:00	449	0	1	0	450	2	0	0	0	2	4	171	0	0	175	627	2235
07:30:00	491	1	1	0	493	1	0	0	1	1	2	194	0	0	196	690	2401
07:45:00	522	3	0	0	525	0	0	0	0	0	4	206	0	0	210	735	2602
08:00:00	492	6	0	0	498	1	0	0	1	1	9	211	0	0	220	719	2771
08:15:00	456	7	0	0	463	3	0	0	2	3	13	218	0	0	231	697	2841
08:30:00	480	1	0	0	481	1	0	0	0	1	11	177	0	0	188	670	2821
08:45:00	427	0	0	0	427	1	0	0	0	1	2	219	0	0	221	649	2735
BREAK																	
15:30:00	236	0	0	0	236	0	0	0	0	0	11	451	0	0	462	698	
15:45:00	233	0	0	0	233	1	0	0	0	1	13	391	0	0	404	638	
16:00:00	301	1	0	0	302	0	0	0	2	0	12	455	0	0	467	769	
16:15:00	250	0	0	0	250	1	0	0	0	1	5	452	0	2	457	708	2813
16:30:00	283	1	0	0	284	2	0	0	0	2	7	479	0	0	486	772	2887
16:45:00	236	1	1	0	238	0	0	0	2	0	8	505	0	0	513	751	3000
17:00:00	279	2	0	0	281	1	0	0	0	1	10	530	0	0	540	822	3053
17:15:00	271	21	0	0	292	4	0	0	2	4	25	521	0	0	546	842	3187
17:30:00	281	12	0	1	293	13	0	0	2	13	22	494	0	1	516	822	3237
17:45:00	275	2	0	0	277	2	0	0	0	2	11	446	0	0	457	736	3222
18:00:00	268	1	0	0	269	0	0	0	0	0	15	446	0	0	461	730	3130
18:15:00	239	3	1	0	243	1	0	0	0	1	10	436	0	0	446	690	2978
Grand Total	7624	67	4	2	7695	41	0	0	13	41	209	7428	0	4	7637	**15373**	-

Approach%	99.1%	0.9%	0.1%	-	100%	0%	0%	-	2.7%	97.3%	0%	-	-	-
Totals %	49.6%	0.4%	0%	50.1%	0.3%	0%	0%	0.3%	1.4%	48.3%	0%	49.7%	-	-
Heavy	405	3	0	-	1	0	0	-	12	411	0	-	-	-
Heavy %	5.3%	4.5%	0%	-	2.4%	0%	0%	-	5.7%	5.5%	0%	-	-	-
Bicycles	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycle %	-	-	-	-	-	-	-	-	-	-	-	-	-	-

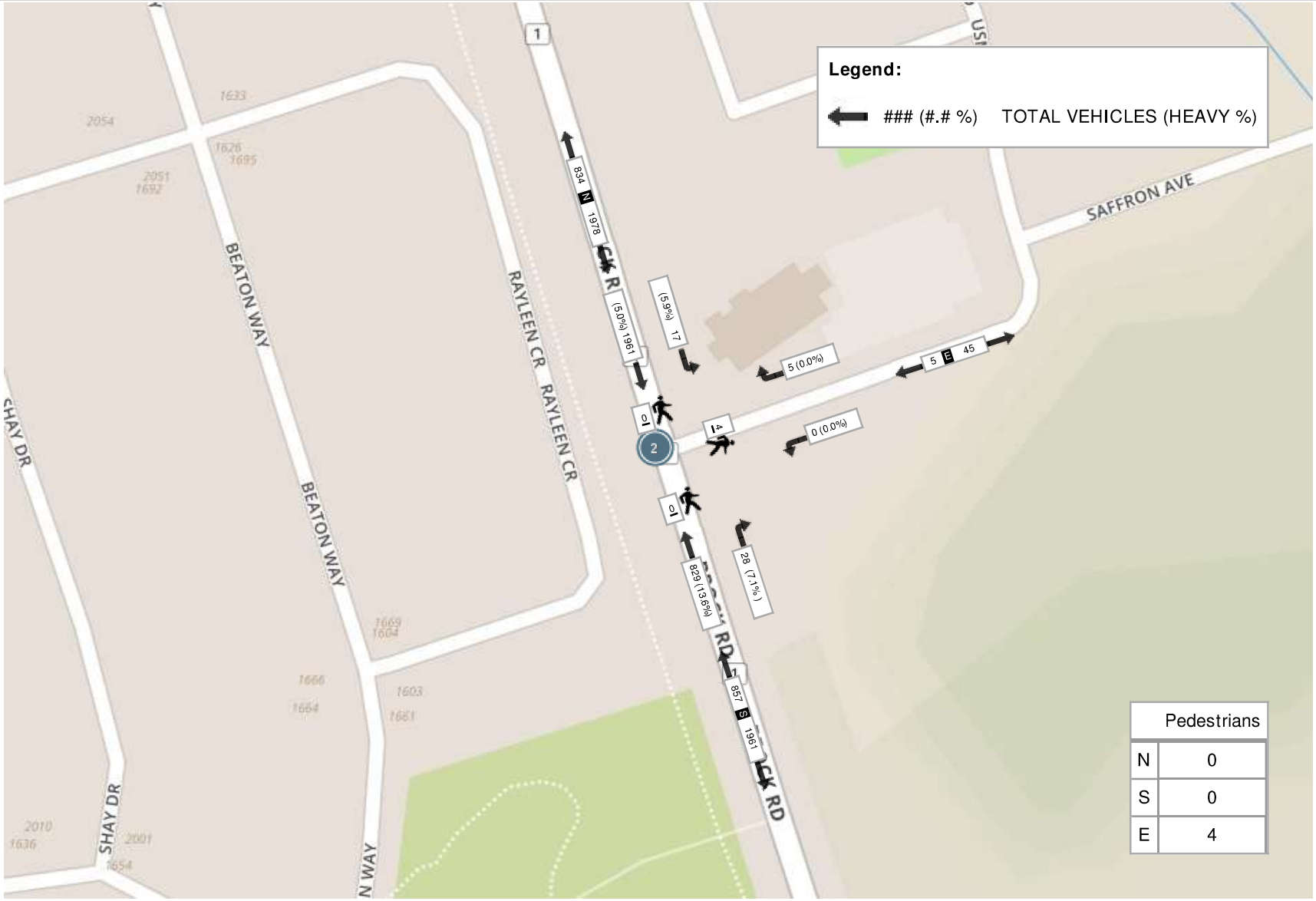
Peak Hour: 07:30 AM - 08:30 AM Weather: Clear Sky (6.1 °C)

Start Time	N Approach					E Approach					S Approach					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
07:30:00	491	1	1	0	493	1	0	0	1	1	2	194	0	0	196	690
07:45:00	522	3	0	0	525	0	0	0	0	0	4	206	0	0	210	735
08:00:00	492	6	0	0	498	1	0	0	1	1	9	211	0	0	220	719
08:15:00	456	7	0	0	463	3	0	0	2	3	13	218	0	0	231	697
Grand Total	1961	17	1	0	1979	5	0	0	4	5	28	829	0	0	857	**2841**
Approach%	99.1%	0.9%	0.1%		-	100%	0%	0%		-	3.3%	96.7%	0%		-	-
Totals %	69%	0.6%	0%		69.7%	0.2%	0%	0%		0.2%	1%	29.2%	0%		30.2%	-
PHF	0.94	0.61	0.25		0.94	0.42	0	0		0.42	0.54	0.95	0		0.93	-
Heavy	98	1	0		99	0	0	0		0	2	113	0		115	-
Heavy %	5%	5.9%	0%		5%	0%	0%	0%		0%	7.1%	13.6%	0%		13.4%	-
Lights	1863	16	1		1880	5	0	0		5	26	716	0		742	-
Lights %	95%	94.1%	100%		95%	100%	0%	0%		100%	92.9%	86.4%	0%		86.6%	-
Single-Unit Trucks	54	0	0		54	0	0	0		0	0	71	0		71	-
Single-Unit Trucks %	2.8%	0%	0%		2.7%	0%	0%	0%		0%	0%	8.6%	0%		8.3%	-
Buses	26	1	0		27	0	0	0		0	2	23	0		25	-
Buses %	1.3%	5.9%	0%		1.4%	0%	0%	0%		0%	7.1%	2.8%	0%		2.9%	-
Articulated Trucks	18	0	0		18	0	0	0		0	0	19	0		19	-
Articulated Trucks %	0.9%	0%	0%		0.9%	0%	0%	0%		0%	0%	2.3%	0%		2.2%	-
Pedestrians	-	-	-	0	-	-	-	-	4	-	-	-	-	0	-	-
Pedestrians%	-	-	-	0%		-	-	-	100%		-	-	-	0%		-

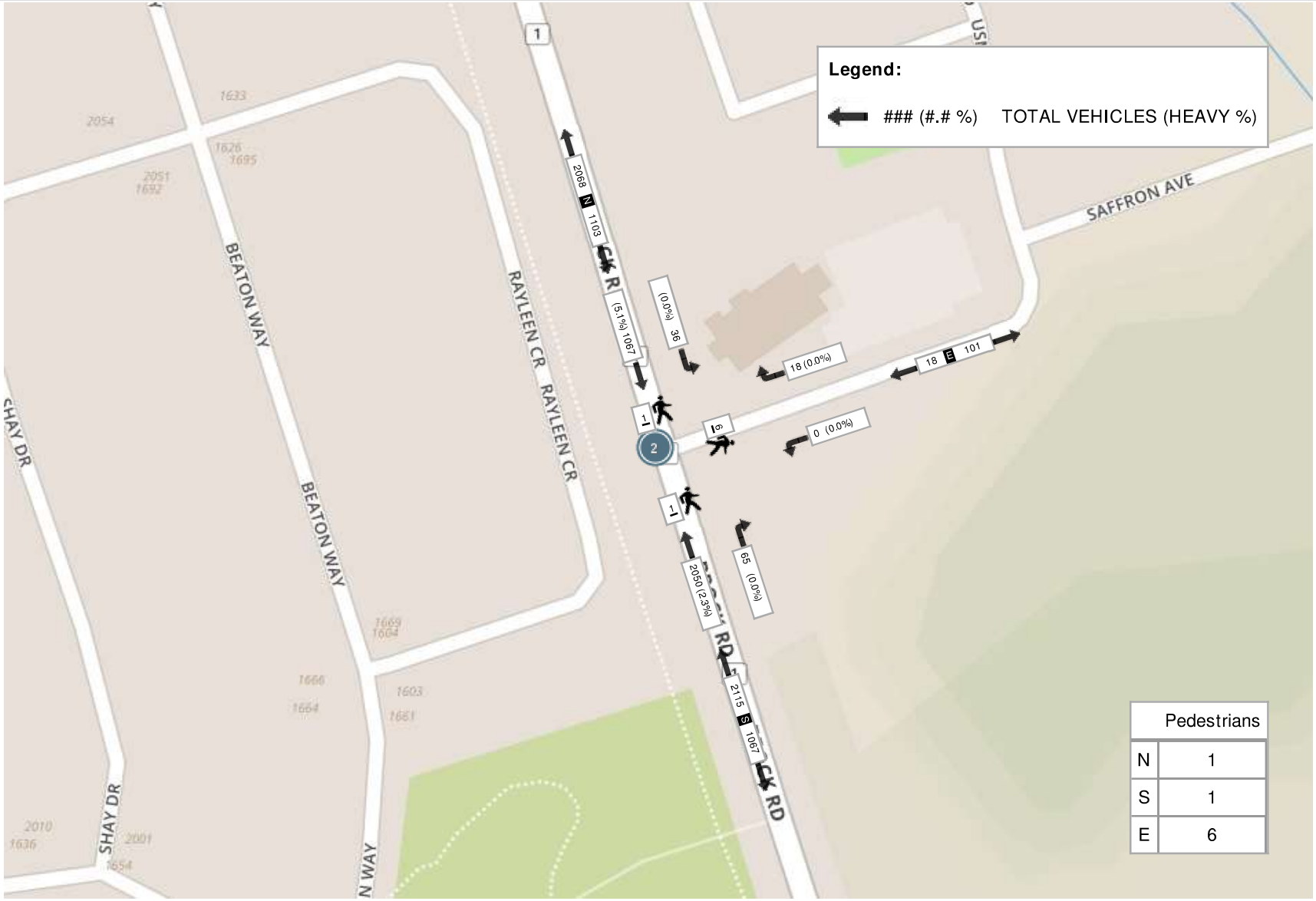
Peak Hour: 04:45 PM - 05:45 PM Weather: Clear Sky (16.41 °C)

Start Time	N Approach					E Approach					S Approach					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
16:45:00	236	1	1	0	238	0	0	0	2	0	8	505	0	0	513	751
17:00:00	279	2	0	0	281	1	0	0	0	1	10	530	0	0	540	822
17:15:00	271	21	0	0	292	4	0	0	2	4	25	521	0	0	546	842
17:30:00	281	12	0	1	293	13	0	0	2	13	22	494	0	1	516	822
Grand Total	1067	36	1	1	1104	18	0	0	6	18	65	2050	0	1	2115	**3237**
Approach%	96.6%	3.3%	0.1%		-	100%	0%	0%		-	3.1%	96.9%	0%		-	-
Totals %	33%	1.1%	0%		34.1%	0.6%	0%	0%		0.6%	2%	63.3%	0%		65.3%	-
PHF	0.95	0.43	0.25		0.94	0.35	0	0		0.35	0.65	0.97	0		0.97	-
Heavy	54	0	0		54	0	0	0		0	0	47	0		47	-
Heavy %	5.1%	0%	0%		4.9%	0%	0%	0%		0%	0%	2.3%	0%		2.2%	-
Lights	1013	36	1		1050	18	0	0		18	65	2003	0		2068	-
Lights %	94.9%	100%	100%		95.1%	100%	0%	0%		100%	100%	97.7%	0%		97.8%	-
Single-Unit Trucks	31	0	0		31	0	0	0		0	0	30	0		30	-
Single-Unit Trucks %	2.9%	0%	0%		2.8%	0%	0%	0%		0%	0%	1.5%	0%		1.4%	-
Buses	11	0	0		11	0	0	0		0	0	9	0		9	-
Buses %	1%	0%	0%		1%	0%	0%	0%		0%	0%	0.4%	0%		0.4%	-
Articulated Trucks	12	0	0		12	0	0	0		0	0	8	0		8	-
Articulated Trucks %	1.1%	0%	0%		1.1%	0%	0%	0%		0%	0%	0.4%	0%		0.4%	-
Pedestrians	-	-	-	1	-	-	-	-	6	-	-	-	-	1	-	-
Pedestrians%	-	-	-	12.5%		-	-	-	75%		-	-	-	12.5%		-

Peak Hour: 07:30 AM - 08:30 AM Weather: Clear Sky (6.1 °C)



Peak Hour: 04:45 PM - 05:45 PM Weather: Clear Sky (16.41 °C)



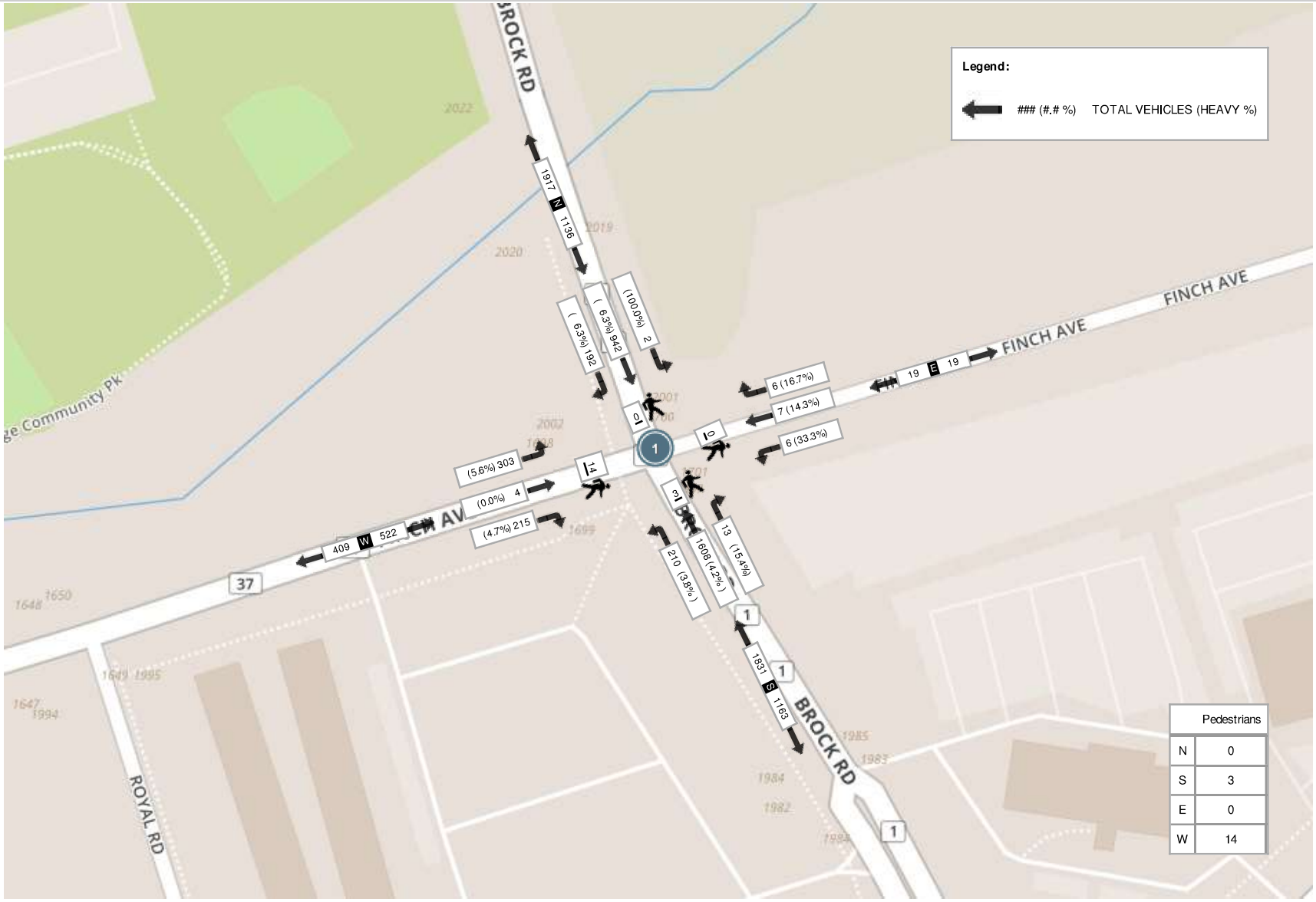
Turning Movement Count (1 . BROCK RD & FINCH AVE)

Start Time	N Approach						E Approach						S Approach						W Approach						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
12:00:00	14	173	0	0	0	187	1	2	3	0	0	6	3	214	53	2	2	272	49	0	33	0	1	82	547	
12:15:00	23	207	0	0	0	230	1	0	1	0	0	2	4	215	41	1	0	261	65	0	47	0	1	112	605	
12:30:00	23	132	0	0	0	155	2	2	5	0	0	9	6	207	65	0	0	278	63	2	45	0	0	110	552	
12:45:00	21	158	0	0	0	179	0	0	6	0	0	6	7	216	60	0	0	283	52	0	42	0	0	94	562	2266
13:00:00	16	214	0	0	0	230	1	0	4	0	0	5	3	242	51	0	0	296	48	0	64	0	0	112	643	2362
13:15:00	24	220	0	0	0	244	0	1	1	0	2	2	4	267	54	0	0	325	48	1	55	0	1	104	675	2432
13:30:00	20	192	0	0	0	212	1	1	5	0	0	7	1	242	51	0	1	294	57	3	54	0	2	114	627	2507
13:45:00	30	188	0	0	0	218	0	1	1	0	1	2	2	273	50	0	2	325	54	0	74	0	3	128	673	2618
14:00:00	21	182	0	0	0	203	2	0	3	0	1	5	4	284	56	0	0	344	68	4	55	0	2	127	679	2654
14:15:00	34	229	3	0	0	266	1	0	0	0	2	1	3	241	62	0	0	306	54	0	56	0	3	110	683	2662
14:30:00	67	324	3	0	0	394	2	1	6	0	2	9	4	330	53	0	8	387	61	1	66	0	10	128	918	2953
14:45:00	60	244	2	0	0	306	1	1	4	0	3	6	1	338	61	0	0	400	48	1	82	0	2	131	843	3123
15:00:00	40	208	0	0	0	248	3	1	1	0	0	5	2	385	46	0	1	433	40	3	91	0	5	134	820	3264
15:15:00	49	204	0	0	0	253	0	1	3	0	0	4	3	396	51	0	0	450	54	0	70	0	2	124	831	3412
15:30:00	41	232	0	0	0	273	1	2	1	0	0	4	6	417	59	0	2	482	49	1	63	0	6	113	872	3366
15:45:00	62	298	2	0	0	362	2	3	1	0	0	6	2	410	54	0	0	466	72	0	79	0	1	151	985	3508
Grand Total	545	3405	10	0	0	3960	18	16	45	0	11	79	55	4677	867	3	16	5602	882	16	976	0	39	1874	**11515**	-
Approach%	13.8%	86%	0.3%	0%		-	22.8%	20.3%	57%	0%		-	1%	83.5%	15.5%	0.1%		-	47.1%	0.9%	52.1%	0%		-	-	-
Totals %	4.7%	29.6%	0.1%	0%		34.4%	0.2%	0.1%	0.4%	0%		0.7%	0.5%	40.6%	7.5%	0%		48.6%	7.7%	0.1%	8.5%	0%		16.3%	-	-
Heavy	26	227	3	0		-	1	1	4	0		-	4	259	26	0		-	26	0	33	0		-	-	-
Heavy %	4.8%	6.7%	30%	0%		-	5.6%	6.3%	8.9%	0%		-	7.3%	5.5%	3%	0%		-	2.9%	0%	3.4%	0%		-	-	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-

Peak Hour: 03:00 PM - 04:00 PM Weather: Broken Clouds (8.01 °C)

Start Time	N Approach						E Approach						S Approach						W Approach						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
15:00:00	40	208	0	0	0	248	3	1	1	0	0	5	2	385	46	0	1	433	40	3	91	0	5	134	820
15:15:00	49	204	0	0	0	253	0	1	3	0	0	4	3	396	51	0	0	450	54	0	70	0	2	124	831
15:30:00	41	232	0	0	0	273	1	2	1	0	0	4	6	417	59	0	2	482	49	1	63	0	6	113	872
15:45:00	62	298	2	0	0	362	2	3	1	0	0	6	2	410	54	0	0	466	72	0	79	0	1	151	985
Grand Total	192	942	2	0	0	1136	6	7	6	0	0	19	13	1608	210	0	3	1831	215	4	303	0	14	522	**3508**
Approach%	16.9%	82.9%	0.2%	0%		-	31.6%	36.8%	31.6%	0%		-	0.7%	87.8%	11.5%	0%		-	41.2%	0.8%	58%	0%		-	-
Totals %	5.5%	26.9%	0.1%	0%		32.4%	0.2%	0.2%	0.2%	0%		0.5%	0.4%	45.8%	6%	0%		52.2%	6.1%	0.1%	8.6%	0%		14.9%	-
PHF	0.77	0.79	0.25	0		0.78	0.5	0.58	0.5	0		0.79	0.54	0.96	0.89	0		0.95	0.75	0.33	0.83	0		0.86	-
Heavy	12	59	2	0		73	1	1	2	0		4	2	67	8	0		77	10	0	17	0		27	-
Heavy %	6.3%	6.3%	100%	0%		6.4%	16.7%	14.3%	33.3%	0%		21.1%	15.4%	4.2%	3.8%	0%		4.2%	4.7%	0%	5.6%	0%		5.2%	-
Lights	180	883	0	0		1063	5	6	4	0		15	11	1541	202	0		1754	205	4	286	0		495	-
Lights %	93.8%	93.7%	0%	0%		93.6%	83.3%	85.7%	66.7%	0%		78.9%	84.6%	95.8%	96.2%	0%		95.8%	95.3%	100%	94.4%	0%		94.8%	-
Single-Unit Trucks	1	24	0	0		25	0	0	0	0		0	0	25	3	0		28	5	0	5	0		10	-
Single-Unit Trucks %	0.5%	2.5%	0%	0%		2.2%	0%	0%	0%	0%		0%	0%	1.6%	1.4%	0%		1.5%	2.3%	0%	1.7%	0%		1.9%	-
Buses	11	19	2	0		32	1	1	2	0		4	2	24	4	0		30	5	0	12	0		17	-
Buses %	5.7%	2%	100%	0%		2.8%	16.7%	14.3%	33.3%	0%		21.1%	15.4%	1.5%	1.9%	0%		1.6%	2.3%	0%	4%	0%		3.3%	-
Articulated Trucks	0	16	0	0		16	0	0	0	0		0	0	18	1	0		19	0	0	0	0		0	-
Articulated Trucks %	0%	1.7%	0%	0%		1.4%	0%	0%	0%	0%		0%	0%	1.1%	0.5%	0%		1%	0%	0%	0%	0%		0%	-
Bicycles on Road	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	3	-	-	-	-	-	14	-	-
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	17.6%		-	-	-	-	82.4%		-

Peak Hour: 03:00 PM - 04:00 PM Weather: Broken Clouds (8.01 °C)



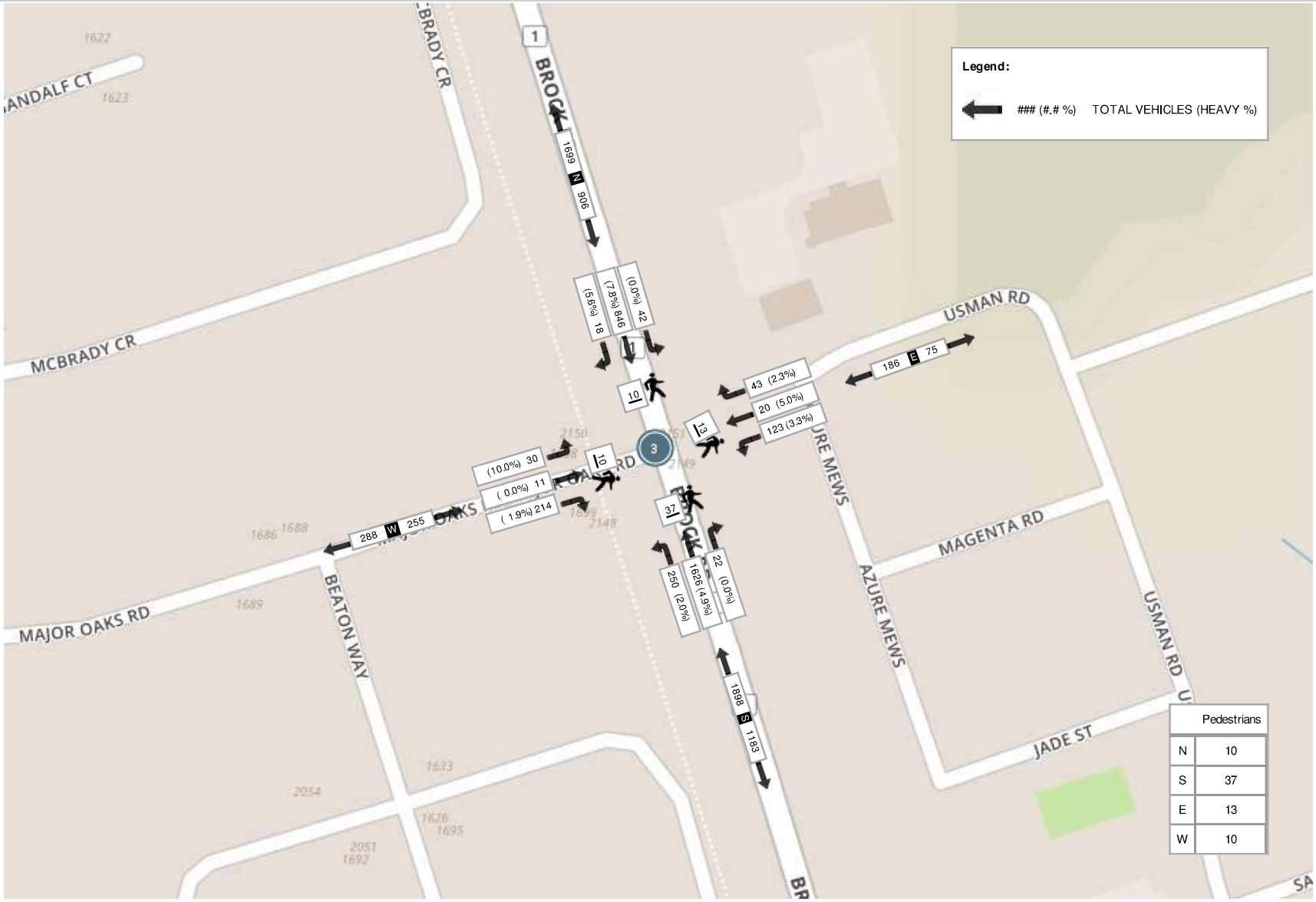
Turning Movement Count (3 . BROCK RD & USMAN RD / MAJOR OAKS RD)

Start Time	N Approach						E Approach						S Approach						W Approach						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
12:00:00	6	158	2	0	4	166	3	0	6	0	0	9	4	182	45	0	1	231	43	0	4	0	1	47	453	
12:15:00	2	175	1	0	1	178	3	1	11	0	0	15	4	208	47	0	1	259	36	3	5	0	1	44	496	
12:30:00	4	212	1	0	0	217	4	0	5	0	0	9	1	180	44	0	1	225	43	0	3	0	0	46	497	
12:45:00	6	183	7	0	3	196	4	0	6	0	1	10	3	198	37	0	6	238	32	2	3	0	0	37	481	1927
13:00:00	2	200	1	0	1	203	4	2	15	0	3	21	3	210	47	0	7	260	42	1	8	0	1	51	535	2009
13:15:00	2	171	11	0	2	184	3	0	7	0	5	10	4	234	46	0	9	284	64	1	5	0	1	70	548	2061
13:30:00	7	172	7	0	1	186	3	0	10	0	8	13	4	191	36	0	16	231	44	1	3	0	5	48	478	2042
13:45:00	9	183	10	0	1	202	4	4	10	0	9	18	7	217	41	0	10	265	43	1	9	0	1	53	538	2099
14:00:00	2	150	9	0	2	161	0	5	10	0	3	15	8	248	45	0	4	301	42	3	2	0	0	47	524	2088
14:15:00	1	188	2	0	4	191	9	3	24	0	11	36	5	292	45	0	14	342	52	0	7	0	4	59	628	2168
14:30:00	10	230	4	0	9	244	25	3	56	0	22	84	7	401	83	0	42	491	92	5	13	0	3	110	929	2619
14:45:00	6	197	15	0	2	218	13	4	43	0	6	60	6	344	83	0	7	433	59	4	5	0	4	68	779	2860
15:00:00	6	226	21	0	0	253	8	1	14	0	1	23	3	347	49	0	8	399	52	7	7	0	5	66	741	3077
15:15:00	7	209	16	0	1	232	4	6	8	0	1	18	6	368	58	0	4	432	50	3	6	0	3	59	741	3190
15:30:00	3	181	1	0	6	185	10	5	30	0	10	45	5	443	64	1	18	513	45	0	9	0	0	54	797	3058
15:45:00	2	230	4	0	3	236	21	8	71	0	1	100	8	468	79	1	7	556	67	1	8	0	2	76	968	3247
Grand Total	75	3065	112	0	40	3252	118	42	326	0	81	486	78	4531	849	2	155	5460	806	32	97	0	31	935	**10133**	-
Approach%	2.3%	94.2%	3.4%	0%		-	24.3%	8.6%	67.1%	0%		-	1.4%	83%	15.5%	0%		-	86.2%	3.4%	10.4%	0%		-	-	-
Totals %	0.7%	30.2%	1.1%	0%		32.1%	1.2%	0.4%	3.2%	0%		4.8%	0.8%	44.7%	8.4%	0%		53.9%	8%	0.3%	1%	0%		9.2%	-	-
Heavy	3	241	5	0		-	2	3	5	0		-	0	266	20	0		-	21	2	4	0		-	-	-
Heavy %	4%	7.9%	4.5%	0%		-	1.7%	7.1%	1.5%	0%		-	0%	5.9%	2.4%	0%		-	2.6%	6.3%	4.1%	0%		-	-	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-

Peak Hour: 03:00 PM - 04:00 PM Weather: Broken Clouds (8.01 °C)

Start Time	N Approach						E Approach						S Approach						W Approach						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
15:00:00	6	226	21	0	0	253	8	1	14	0	1	23	3	347	49	0	8	399	52	7	7	0	5	66	741
15:15:00	7	209	16	0	1	232	4	6	8	0	1	18	6	368	58	0	4	432	50	3	6	0	3	59	741
15:30:00	3	181	1	0	6	185	10	5	30	0	10	45	5	443	64	1	18	513	45	0	9	0	0	54	797
15:45:00	2	230	4	0	3	236	21	8	71	0	1	100	8	468	79	1	7	556	67	1	8	0	2	76	968
Grand Total	18	846	42	0	10	906	43	20	123	0	13	186	22	1626	250	2	37	1900	214	11	30	0	10	255	**3247**
Approach%	2%	93.4%	4.6%	0%		-	23.1%	10.8%	66.1%	0%		-	1.2%	85.6%	13.2%	0.1%		-	83.9%	4.3%	11.8%	0%		-	-
Totals %	0.6%	26.1%	1.3%	0%		27.9%	1.3%	0.6%	3.8%	0%		5.7%	0.7%	50.1%	7.7%	0.1%		58.5%	6.6%	0.3%	0.9%	0%		7.9%	-
PHF	0.64	0.92	0.5	0		0.9	0.51	0.63	0.43	0		0.47	0.69	0.87	0.79	0.5		0.85	0.8	0.39	0.83	0		0.84	-
Heavy	1	66	0	0		67	1	1	4	0		6	0	80	5	0		85	4	0	3	0		7	-
Heavy %	5.6%	7.8%	0%	0%		7.4%	2.3%	5%	3.3%	0%		3.2%	0%	4.9%	2%	0%		4.5%	1.9%	0%	10%	0%		2.7%	-
Lights	17	780	42	0		839	42	19	119	0		180	22	1546	245	2		1815	210	11	27	0		248	-
Lights %	94.4%	92.2%	100%	0%		92.6%	97.7%	95%	96.7%	0%		96.8%	100%	95.1%	98%	100%		95.5%	98.1%	100%	90%	0%		97.3%	-
Single-Unit Trucks	0	30	0	0		30	0	0	0	0		0	0	34	1	0		35	1	0	1	0		2	-
Single-Unit Trucks %	0%	3.5%	0%	0%		3.3%	0%	0%	0%	0%		0%	0%	2.1%	0.4%	0%		1.8%	0.5%	0%	3.3%	0%		0.8%	-
Buses	1	23	0	0		24	0	1	4	0		5	0	31	4	0		35	3	0	2	0		5	-
Buses %	5.6%	2.7%	0%	0%		2.6%	0%	5%	3.3%	0%		2.7%	0%	1.9%	1.6%	0%		1.8%	1.4%	0%	6.7%	0%		2%	-
Articulated Trucks	0	13	0	0		13	1	0	0	0		1	0	15	0	0		15	0	0	0	0		0	-
Articulated Trucks %	0%	1.5%	0%	0%		1.4%	2.3%	0%	0%	0%		0.5%	0%	0.9%	0%	0%		0.8%	0%	0%	0%	0%		0%	-
Bicycles on Road	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	10	-	-	-	-	-	13	-	-	-	-	-	37	-	-	-	-	-	10	-	-
Pedestrians%	-	-	-	-	14.3%		-	-	-	-	18.6%		-	-	-	-	52.9%		-	-	-	-	14.3%		-

Peak Hour: 03:00 PM - 04:00 PM Weather: Broken Clouds (8.01 °C)



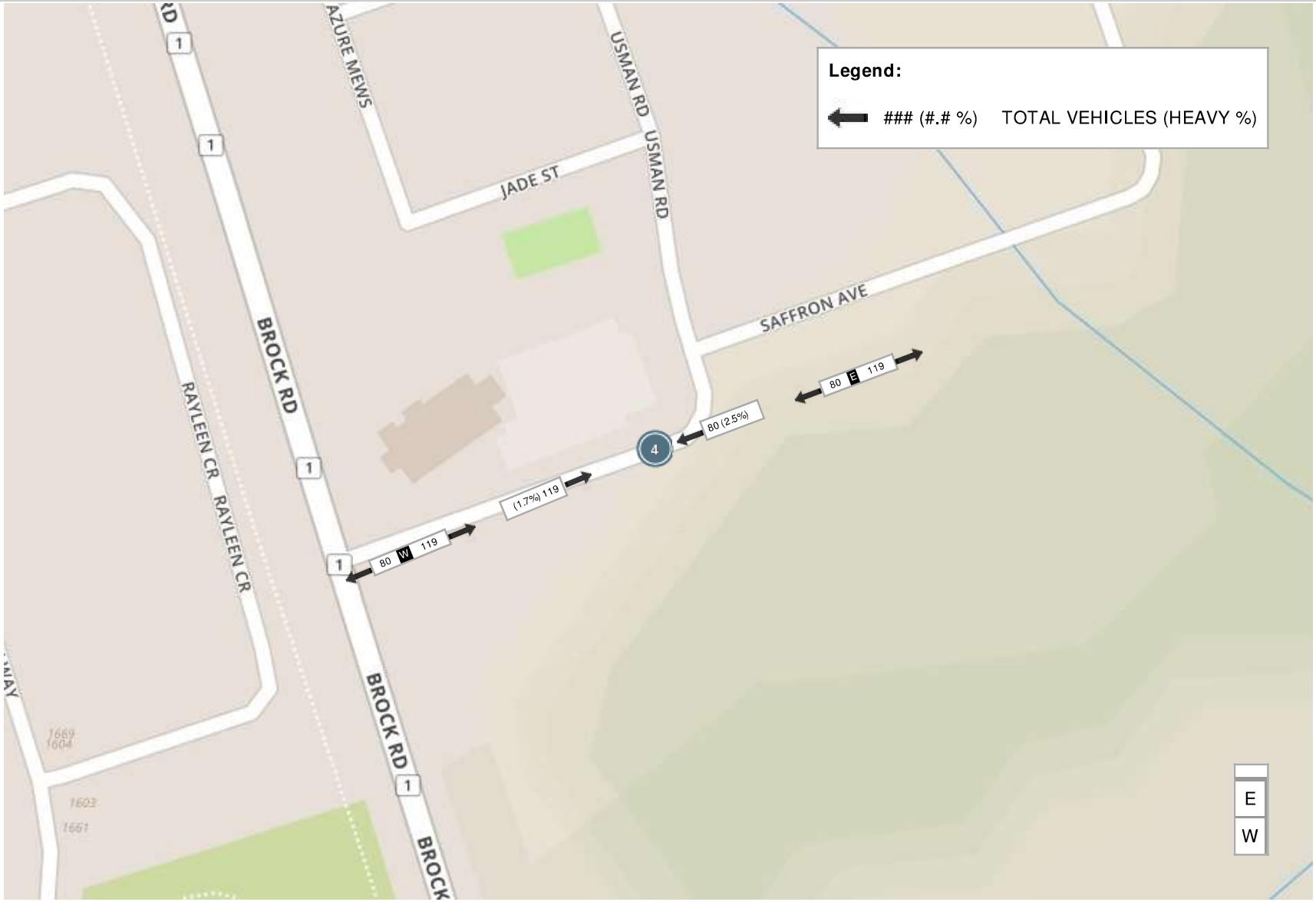
Turning Movement Count (4 . BROCK RD & USMAN RD (ATR))

Start Time	W Approach			E Approach			Int. Total (15 min)	Int. Total (1 hr)
	Thru W:E	UTurn W:W	Approach Total	Thru E:W	UTurn E:E	Approach Total		
12:00:00	6	0	6	1	0	1	7	
12:15:00	4	0	4	3	0	3	7	
12:30:00	9	0	9	3	0	3	12	
12:45:00	14	0	14	4	0	4	18	44
13:00:00	24	0	24	1	0	1	25	62
13:15:00	19	0	19	4	0	4	23	78
13:30:00	28	0	28	1	0	1	29	95
13:45:00	44	0	44	5	0	5	49	126
14:00:00	19	0	19	5	0	5	24	125
14:15:00	20	0	20	19	0	19	39	141
14:30:00	43	1	44	31	0	31	75	187
14:45:00	20	0	20	19	0	19	39	177
15:00:00	36	0	36	11	0	11	47	200
15:15:00	20	0	20	8	0	8	28	189
15:30:00	42	0	42	13	0	13	55	169
15:45:00	48	0	48	20	0	20	68	198
Grand Total	396	1	397	148	0	148	**545**	-
Approach%	99.7%	0.3%	-	100%	0%	-	-	-
Totals %	72.7%	0.2%	72.8%	27.2%	0%	27.2%	-	-
Heavy	7	0	-	2	0	-	-	-
Heavy %	1.8%	0%	-	1.4%	0%	-	-	-
Bicycles	-	-	-	-	-	-	-	-
Bicycle %	-	-	-	-	-	-	-	-

Peak Hour: 02:15 PM - 03:15 PM Weather: Broken Clouds (8.01 °C)

Start Time	W Approach			E Approach			Int. Total (15 min)
	Thru	UTurn	Approach Total	Thru	UTurn	Approach Total	
14:15:00	20	0	20	19	0	19	39
14:30:00	43	1	44	31	0	31	75
14:45:00	20	0	20	19	0	19	39
15:00:00	36	0	36	11	0	11	47
Grand Total	119	1	120	80	0	80	**200**
Approach%	99.2%	0.8%	-	100%	0%	-	-
Totals %	59.5%	0.5%	60%	40%	0%	40%	-
PHF	0.69	0.25	0.68	0.65	0	0.65	-
Heavy	2	0	2	2	0	2	-
Heavy %	1.7%	0%	1.7%	2.5%	0%	2.5%	-
Lights	117	1	118	78	0	78	-
Lights %	98.3%	100%	98.3%	97.5%	0%	97.5%	-
Single-Unit Trucks	1	0	1	2	0	2	-
Single-Unit Trucks %	0.8%	0%	0.8%	2.5%	0%	2.5%	-
Buses	1	0	1	0	0	0	-
Buses %	0.8%	0%	0.8%	0%	0%	0%	-

Peak Hour: 02:15 PM - 03:15 PM Weather: Broken Clouds (8.01 °C)



Turning Movement Count (2 . BROCK RD & USMAN RD)

Start Time	N Approach					E Approach					S Approach					Int. Total (15 min)	Int. Total (1 hr)
	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	UTurn S:S	Peds S:	Approach Total		
12:00:00	208	1	0	0	209	0	0	0	2	0	7	314	0	0	321	530	
12:15:00	220	3	0	1	223	3	0	0	3	3	10	250	0	0	260	486	
12:30:00	248	9	1	2	258	1	0	0	1	1	17	221	0	0	238	497	
12:45:00	199	9	0	0	208	3	0	0	0	3	24	235	0	0	259	470	1983
13:00:00	230	16	0	1	246	5	0	0	5	5	44	259	0	0	303	554	2007
13:15:00	233	10	0	1	243	5	0	0	4	5	43	268	0	0	311	559	2080
13:30:00	194	14	1	3	209	1	0	0	20	1	62	233	0	6	295	505	2088
13:45:00	216	17	0	0	233	1	0	0	30	1	75	256	0	13	331	565	2183
14:00:00	194	7	0	2	201	5	0	0	30	5	27	298	0	0	325	531	2160
14:15:00	243	0	0	0	243	28	0	0	58	28	63	235	0	23	298	569	2170
14:30:00	334	2	0	0	336	73	0	0	24	73	16	435	0	3	451	860	2525
14:45:00	261	12	0	0	273	24	0	0	6	24	52	369	0	3	421	718	2678
15:00:00	228	25	0	0	253	2	0	0	12	2	74	401	0	0	475	730	2877
15:15:00	231	21	0	1	252	5	0	0	12	5	40	419	0	3	459	716	3024
15:30:00	233	0	0	0	233	37	0	0	27	37	16	462	0	3	478	748	2912
15:45:00	319	8	0	0	327	30	0	0	4	30	10	471	0	1	481	838	3032
Grand Total	3791	154	2	11	3947	223	0	0	238	223	580	5126	0	55	5706	**9876**	-
Approach%	96%	3.9%	0.1%		-	100%	0%	0%		-	10.2%	89.8%	0%		-	-	-
Totals %	38.4%	1.6%	0%		40%	2.3%	0%	0%		2.3%	5.9%	51.9%	0%		57.8%	-	-
Heavy	280	2	0		-	3	0	0		-	9	311	0		-	-	-
Heavy %	7.4%	1.3%	0%		-	1.3%	0%	0%		-	1.6%	6.1%	0%		-	-	-
Bicycles	-	-	-		-	-	-	-		-	-	-	-		-	-	-
Bicycle %	-	-	-		-	-	-	-		-	-	-	-		-	-	-

Peak Hour: 03:00 PM - 04:00 PM Weather: Broken Clouds (8.01 °C)

Start Time	N Approach					E Approach					S Approach					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
15:00:00	228	25	0	0	253	2	0	0	12	2	74	401	0	0	475	730
15:15:00	231	21	0	1	252	5	0	0	12	5	40	419	0	3	459	716
15:30:00	233	0	0	0	233	37	0	0	27	37	16	462	0	3	478	748
15:45:00	319	8	0	0	327	30	0	0	4	30	10	471	0	1	481	838
Grand Total	1011	54	0	1	1065	74	0	0	55	74	140	1753	0	7	1893	**3032**
Approach%	94.9%	5.1%	0%		-	100%	0%	0%		-	7.4%	92.6%	0%		-	-
Totals %	33.3%	1.8%	0%		35.1%	2.4%	0%	0%		2.4%	4.6%	57.8%	0%		62.4%	-
PHF	0.79	0.54	0		0.81	0.5	0	0		0.5	0.47	0.93	0		0.98	-
Heavy	73	1	0		74	1	0	0		1	4	84	0		88	-
Heavy %	7.2%	1.9%	0%		6.9%	1.4%	0%	0%		1.4%	2.9%	4.8%	0%		4.6%	-
Lights	938	53	0		991	73	0	0		73	136	1669	0		1805	-
Lights %	92.8%	98.1%	0%		93.1%	98.6%	0%	0%		98.6%	97.1%	95.2%	0%		95.4%	-
Single-Unit Trucks	32	1	0		33	1	0	0		1	0	33	0		33	-
Single-Unit Trucks %	3.2%	1.9%	0%		3.1%	1.4%	0%	0%		1.4%	0%	1.9%	0%		1.7%	-
Buses	31	0	0		31	0	0	0		0	4	34	0		38	-
Buses %	3.1%	0%	0%		2.9%	0%	0%	0%		0%	2.9%	1.9%	0%		2%	-
Articulated Trucks	10	0	0		10	0	0	0		0	0	17	0		17	-
Articulated Trucks %	1%	0%	0%		0.9%	0%	0%	0%		0%	0%	1%	0%		0.9%	-
Bicycles on Road	0	0	0		0	0	0	0		0	0	0	0		0	-
Bicycles on Road %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	1	-	-	-	-	55	-	-	-	-	7	-	-
Pedestrians%	-	-	-	1.6%		-	-	-	87.3%		-	-	-	11.1%		-

Peak Hour: 03:00 PM - 04:00 PM Weather: Broken Clouds (8.01 °C)



Fri Nov 01 2019 11:46:00 GMT-0400 (Eastern Daylight Time) - Run Time: 2452ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: Planning district of origin - pd_orig
Column: Primary travel mode of trip - mode_prime

Filters:
(Planning dis)

Trip 2016
Table:

Primary Mod	Transit (	Cycle		Auto driver	GO rail only		Joint GO rail and local trar	Motorcycle	Other		Auto passenger		School bus	Taxi passenger		Paid rideshare	Walk		Total
Pickering	4506	392		120454	3163		1933	149	25		22438		5857	116		51	5949		165033
	2.7%	0.2%		73.0%	1.9%		1.2%	0.1%	0.0%		13.6%		3.5%	0.1%		0.0%	3.6%		

Fri Nov 01 2019 11:55:25 GMT-0400 (Eastern Daylight Time) - Run Time: 2146ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: Planning district of destination - pd_dest
Column: Primary travel mode of trip - mode_prime

Filters:
(Planning dis)

Trip 2016
Table:

	Transit (	Cycle		Auto driver	GO rail only		Joint GO rail and local trar	Motorcycle	Other		Auto passenger		School bus	Taxi passenger		Paid rideshare	Walk		Total
Pickering	4447	392		120162	3180		1742	149	25		22641		5816	85		59	5933		164631
	2.70%	0.24%		72.99%	1.93%		1.06%	0.09%	0.02%		13.75%		3.53%	0.05%		0.04%	3.60%		

Sum of Total
164631

Mon Oct 07 2019 12:36:20 GMT-0400 (Eastern Daylight Time) - Wed Oct 09 2019 18:04:44 GMT-0400 (Eastern Daylight Time) - Run Time: 2602ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of destination - gta06_dest
Column: Primary travel mode of trip - mode_prime

Filters:
(2006 GTA zone of origin - gta06_orig In 1033
and
Start time of trip - start_time In 0600-0900
and
Primary travel n)

Trip 2016
Table:

	Auto driver
32	23
202	16
345	17
371	23
405	23
430	11
493	16
521	10
1029	26
1040	45
1042	37
1046	32
1047	31
1048	44
1051	16
1056	26
1068	10
1075	12
1076	25
1134	11
1155	37
1184	16
1187	40
1205	23
2083	13
2249	10
2384	28
2390	12
2396	23
2454	37
3699	15
Total	708

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: Planning district of destination - pd_dest
Column: Primary travel mode of trip - mode_prime

Filters:
(2006 GTA zone of origin - gta06_orig In 1033
and
Start time of trip - start_time In 0600-0900)

Trip 2016
Table:

	Auto driver	GO rail only	Joint GO rail and local tr	Auto passenger	School bus	Walk
PD 1 of Toronto	23	21	48	0	0	0
PD 4 of Toronto	16	0	0	0	0	0
PD 6 of Toronto	0	0	0	0	37	0
PD 8 of Toronto	17	0	0	0	0	0
PD 9 of Toronto	23	0	0	0	0	0
PD 10 of Toron	23	0	0	0	0	0
PD 11 of Toron	11	0	0	0	0	0
PD 13 of Toron	26	0	0	0	0	0
Pickering	258	0	0	65	47	78
Ajax	46	0	0	0	16	0
Whitby	48	0	0	0	0	0
Oshawa	79	0	0	16	0	0
Richmond Hill	10	0	0	0	0	0
Markham	100	0	0	0	0	0
Vaughan	13	0	0	0	0	0
Mississauga	15	0	0	0	0	0

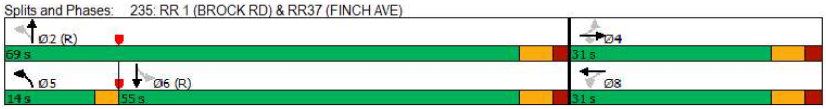
INTERSECTION SIGNAL TIMING REPORT

Location	Brock Rd. (RR 1) and Finch Ave. (RR 37)				
Date	10/23/2019	C&E No.	27292906	Prepared by	K.Patel
Prepared for	C.F.Crozier				

AM Peak 05:30-09:00

Phase Number	2	4	5	6	8
Movement	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag			Lead	Lag	
Lead-Lag Optimize			Yes	Yes	
Recall Mode	C-Max	None	None	C-Max	None
Maximum Split (s)	69	31	14	55	31
Maximum Split (%)	69.0%	31.0%	14.0%	55.0%	31.0%
Minimum Split (s)	28	29	9	28	29
Yellow Time (s)	4.2	4.2	3	4.2	4.2
All-Red Time (s)	2	2.2	0	2	2.2
Minimum Initial (s)	20	8	5	20	8
Vehicle Extension (s)	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	14	16		14	16
Flash Dont Walk (s)	5	5		5	5
Intersection Summary					
Cycle Length			100		
Control Type			Actuated-Coordinated		
Natural Cycle			75		
Offset: 2 (2%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green					

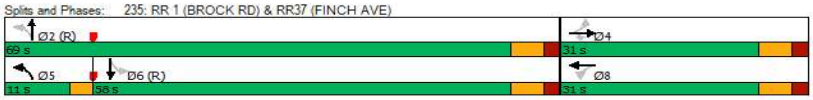
Splits and Phases: 235: RR 1 (BROCK RD) & RR37 (FINCH AVE)



PM Peak 14:30-21:00

Phase Number	2	4	5	6	8
Movement	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag			Lead	Lag	
Lead-Lag Optimize			Yes	Yes	
Recall Mode	C-Max	None	None	C-Max	None
Maximum Split (s)	69	31	11	58	31
Maximum Split (%)	69.0%	31.0%	11.0%	58.0%	31.0%
Minimum Split (s)	28	29	9	28	29
Yellow Time (s)	4.2	4.2	3	4.2	4.2
All-Red Time (s)	2	2.2	0	2	2.2
Minimum Initial (s)	20	8	5	20	8
Vehicle Extension (s)	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	14	16		14	16
Flash Dont Walk (s)	5	5		5	5
Intersection Summary					
Cycle Length			100		
Control Type			Actuated-Coordinated		
Natural Cycle			70		
Offset: 40 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green					

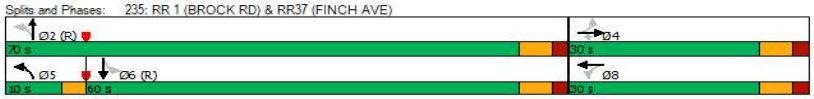
Splits and Phases: 235: RR 1 (BROCK RD) & RR37 (FINCH AVE)



Weekend Peak 09:00-21:00

Phase Number	2	4	5	6	8
Movement	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag			Lead	Lag	
Lead-Lag Optimize			Yes	Yes	
Recall Mode	C-Max	None	None	C-Max	None
Maximum Split (s)	70	30	10	60	30
Maximum Split (%)	70.0%	30.0%	10.0%	60.0%	30.0%
Minimum Split (s)	28	29	9	28	29
Yellow Time (s)	4.2	4.2	3	4.2	4.2
All-Red Time (s)	2	2.2	0	2	2.2
Minimum Initial (s)	20	8	5	20	8
Vehicle Extension (s)	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	14	16		14	16
Flash Dont Walk (s)	5	5		5	5
Intersection Summary					
Cycle Length			100		
Control Type			Actuated-Coordinated		
Natural Cycle			80		
Offset: 92.5 (93%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green					

Splits and Phases: 235: RR 1 (BROCK RD) & RR37 (FINCH AVE)



*Please note a concerted effort has been made to ensure the accuracy and completeness of the data provided, however, inadvertent errors or omissions can still occur. Please bring any errors or omissions to the Region's attention.

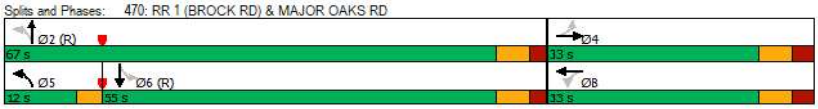
INTERSECTION SIGNAL TIMING REPORT

Location	Brock Rd. (RR 1) and Major Oaks Dr./Usman Rd.				
Date	10/23/2019	C&E No.	27292906	Prepared by	K Patel
Prepared for	C F Crozier				

AM Peak 05:30-09:00

Phase Number	2	4	5	6	8
Movement	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag			Lead	Lag	
Lead-Lag Optimize			Yes	Yes	
Recall Mode	C-Max	None	None	C-Max	None
Maximum Split (s)	67	33	12	55	33
Maximum Split (%)	67.0%	33.0%	12.0%	55.0%	33.0%
Minimum Split (s)	29	32	8	29	32
Yellow Time (s)	4.2	4.1	3	4.2	4.1
All-Red Time (s)	2.2	2.9	0	2.2	2.9
Minimum Initial (s)	20	8	5	20	8
Vehicle Extension (s)	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	7	7		7	7
Flash Dont Walk (s)	14	18		14	18
Intersection Summary					
Cycle Length			100		
Control Type			Actuated-Coordinated		
Natural Cycle			90		
Offset: 59 (59%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green					

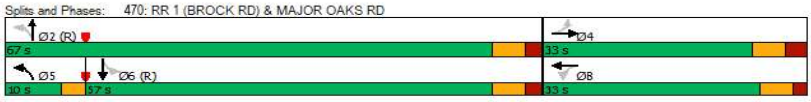
Splits and Phases: 470: RR 1 (BROCK RD) & MAJOR OAKS RD



PM Peak 14:30-21:00

Phase Number	2	4	5	6	8
Movement	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag			Lead	Lag	
Lead-Lag Optimize			Yes	Yes	
Recall Mode	C-Max	None	None	C-Max	None
Maximum Split (s)	67	33	10	57	33
Maximum Split (%)	67.0%	33.0%	10.0%	57.0%	33.0%
Minimum Split (s)	29	32	8	29	32
Yellow Time (s)	4.2	4.1	3	4.2	4
All-Red Time (s)	2.2	2.9	0	2.2	2
Minimum Initial (s)	20	8	5	20	4
Vehicle Extension (s)	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	7	7		7	7
Flash Dont Walk (s)	14	18		14	18
Intersection Summary					
Cycle Length			100		
Control Type			Actuated-Coordinated		
Natural Cycle			80		
Offset: 80 (80%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green					

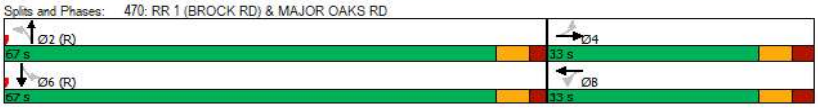
Splits and Phases: 470: RR 1 (BROCK RD) & MAJOR OAKS RD



Weekend Peak 08:00-19:00

Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	67	33	67	33
Maximum Split (%)	67.0%	33.0%	67.0%	33.0%
Minimum Split (s)	29	32	29	32
Yellow Time (s)	4.2	4.1	4.2	4.1
All-Red Time (s)	2.2	2.9	2.2	2.9
Minimum Initial (s)	20	8	20	4
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	14	18	14	18
Intersection Summary				
Cycle Length			100	
Control Type			Actuated-Coordinated	
Natural Cycle			65	
Offset: 55 (55%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green				

Splits and Phases: 470: RR 1 (BROCK RD) & MAJOR OAKS RD

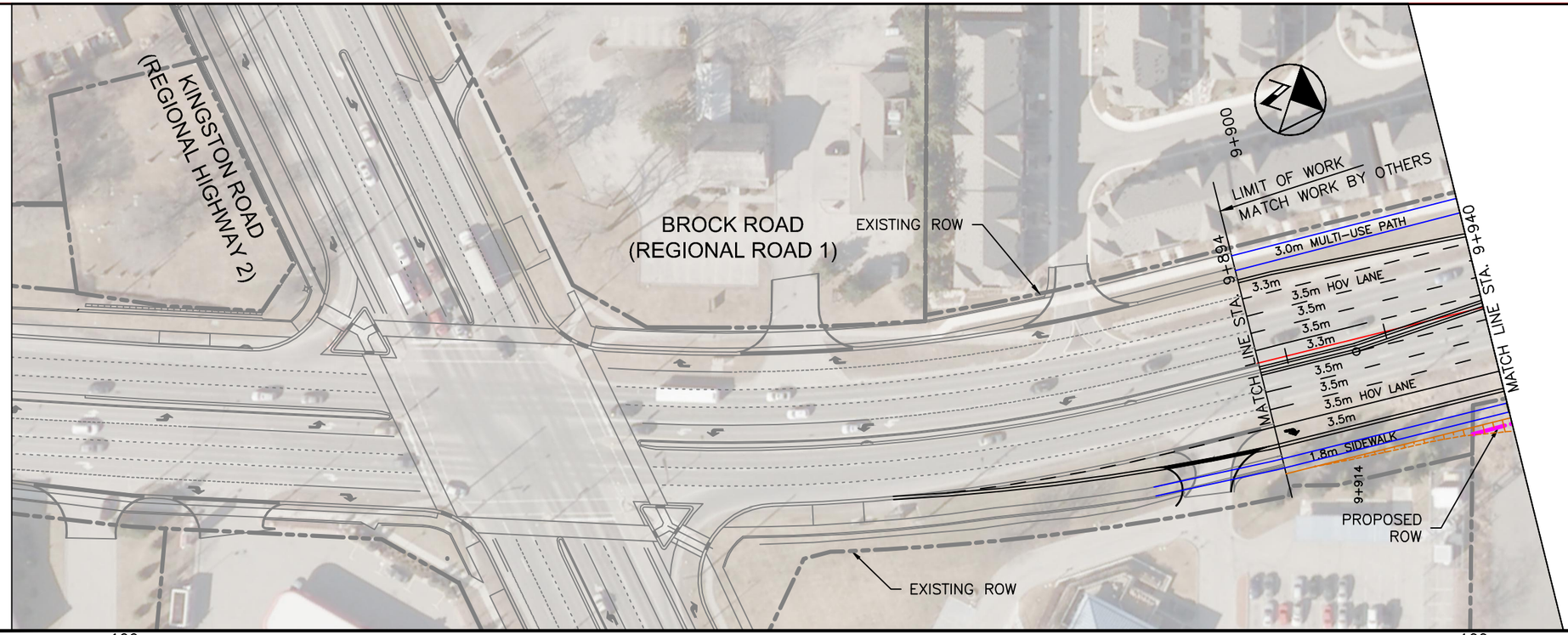


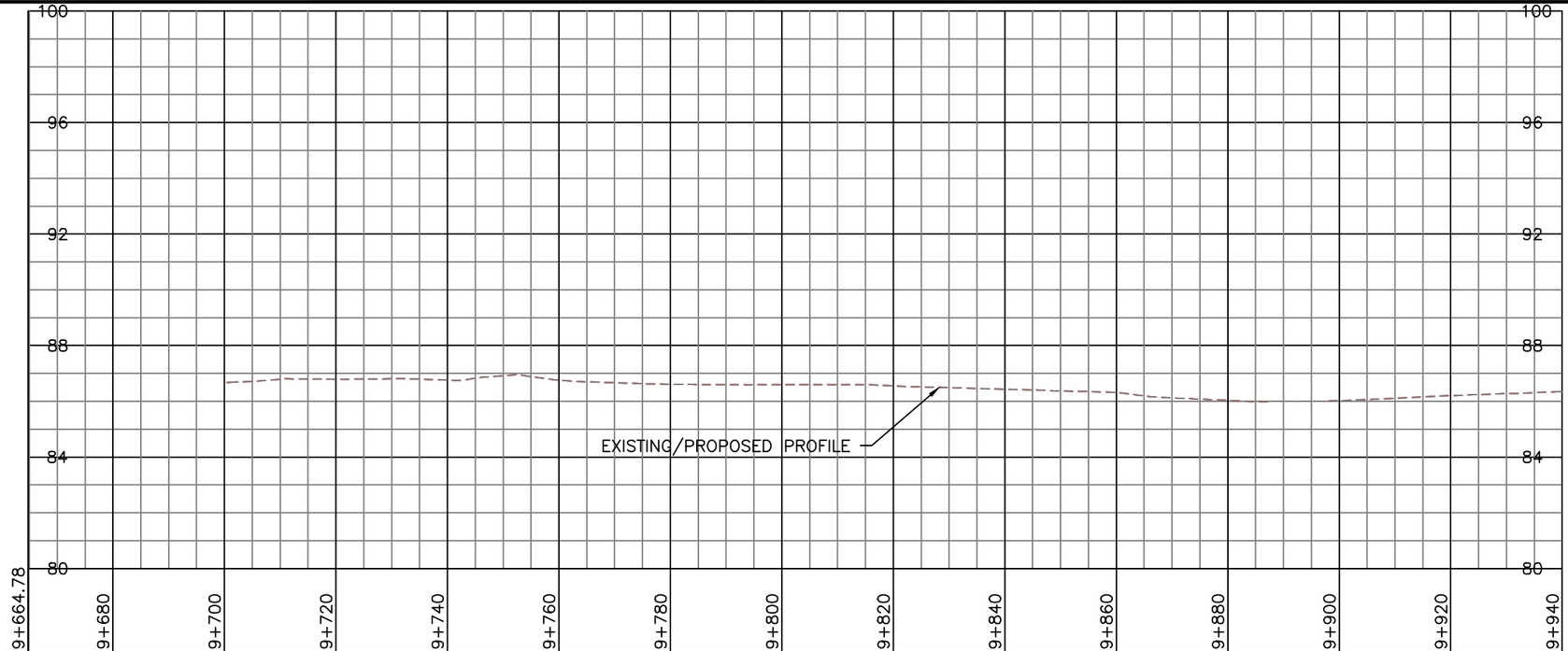
*Please note a concerted effort has been made to ensure the accuracy and completeness of the data provided, however, inadvertent errors or omissions can still occur. Please bring any errors or omissions to the Region's attention.

Brock Road Widening Design Plates

Appendix B.11

ROAD DESIGN PLATES





CENTRAL PICKERING DEVELOPMENT PLAN
CLASS ENVIRONMENTAL ASSESSMENT
FOR REGIONAL SERVICES IN
THE CITY OF PICKERING

NATURAL HERITAGE SYSTEM (NHS)
PROPOSED RIGHT OF WAY
EXISTING RIGHT OF WAY
LIMIT OF CUT
LIMIT OF FILL
CENTRE ALIGNMENT
WATER COURSE
EXISTING PROFILE
PROPOSED PROFILE

HDR

THE REGIONAL MUNICIPALITY OF DURHAM

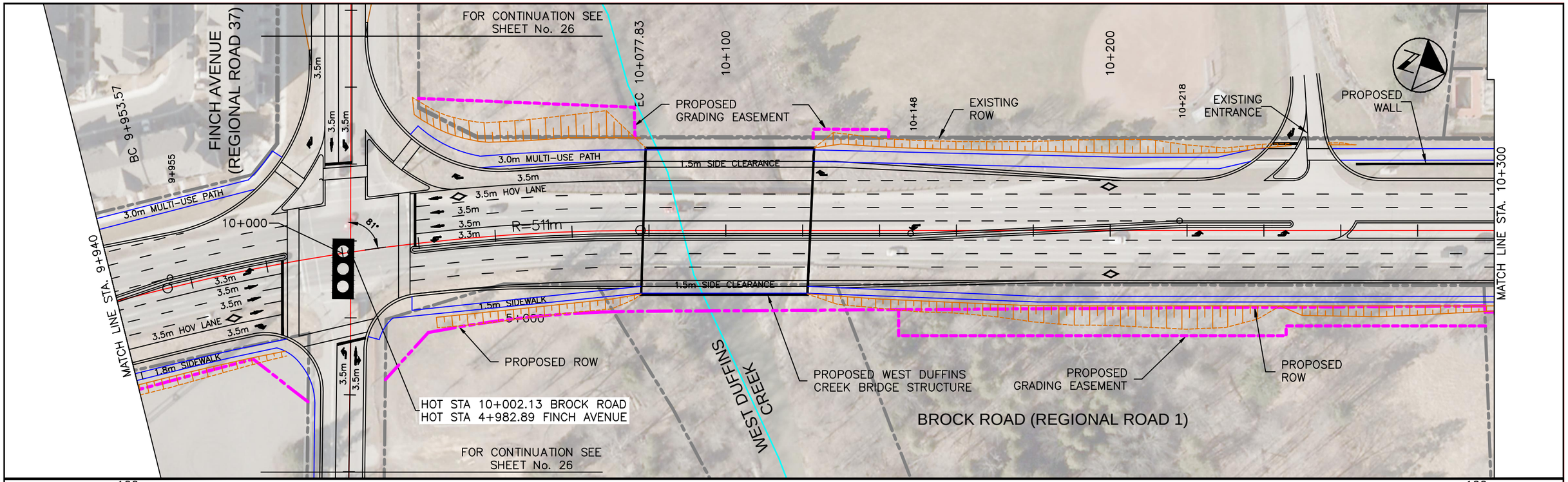
JUNE 26, 2014

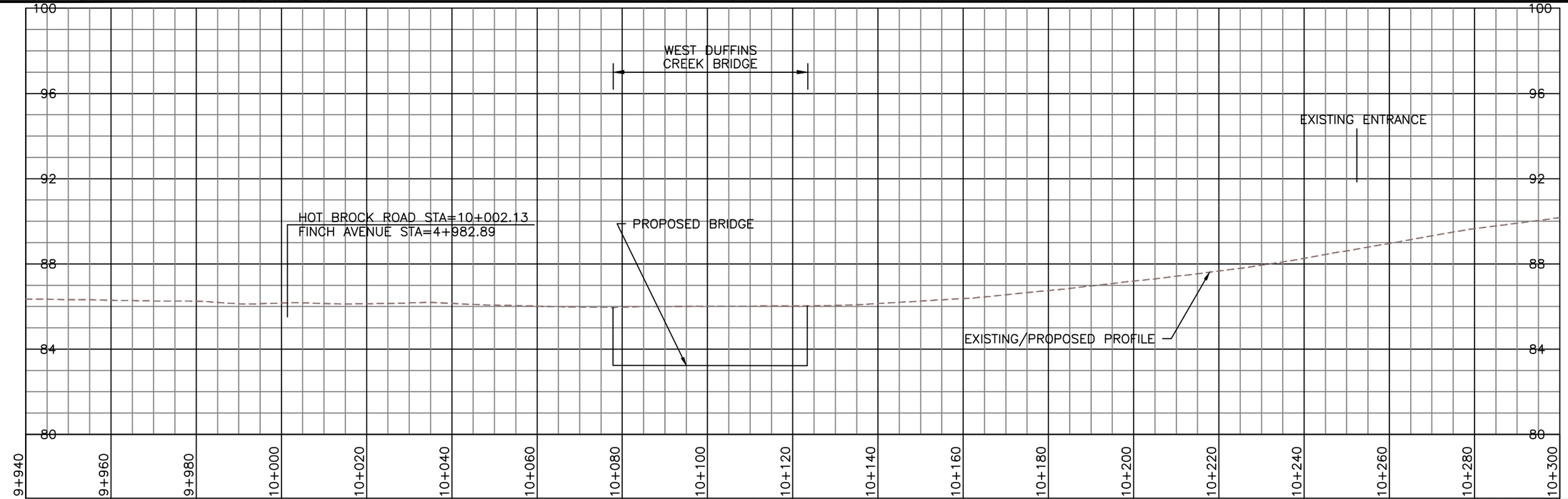
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VERTICAL 2m 0 2m

BROCK ROAD (REGIONAL ROAD 1)

STATION 9+894 TO 9+940

SHEET NO.
01





CENTRAL PICKERING DEVELOPMENT PLAN
CLASS ENVIRONMENTAL ASSESSMENT
FOR REGIONAL SERVICES IN
THE CITY OF PICKERING

NATURAL HERITAGE SYSTEM (NHS)
PROPOSED RIGHT OF WAY
EXISTING RIGHT OF WAY
LIMIT OF CUT
LIMIT OF FILL
CENTRE ALIGNMENT
WATER COURSE
EXISTING PROFILE
PROPOSED PROFILE

HDR

THE REGIONAL MUNICIPALITY OF DURHAM

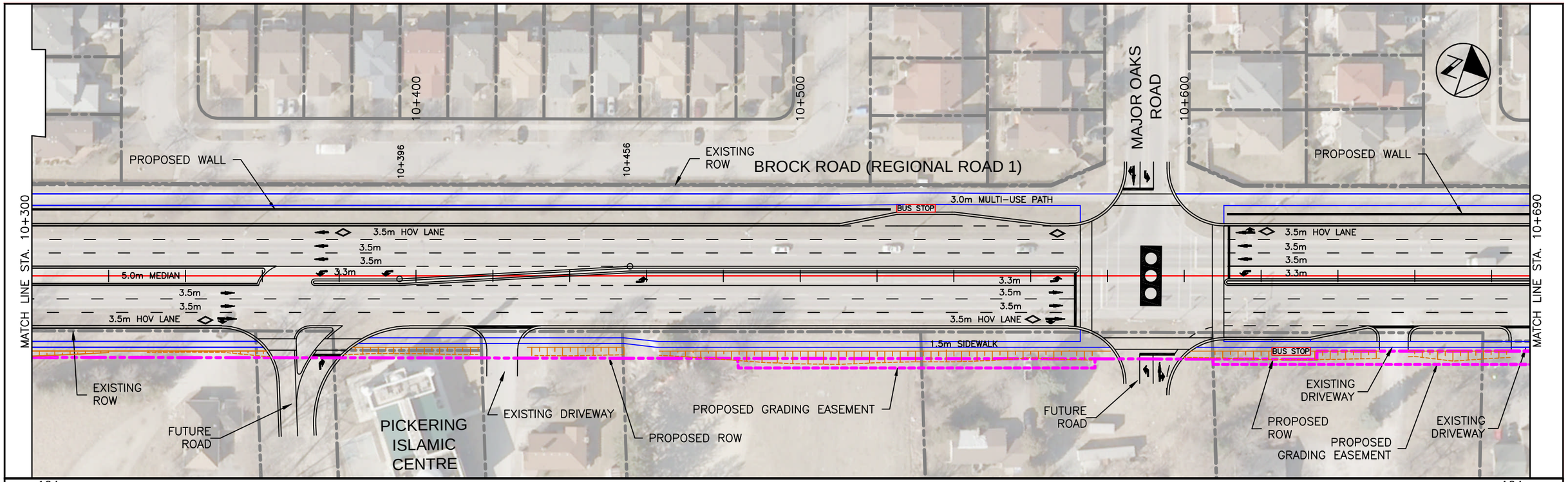
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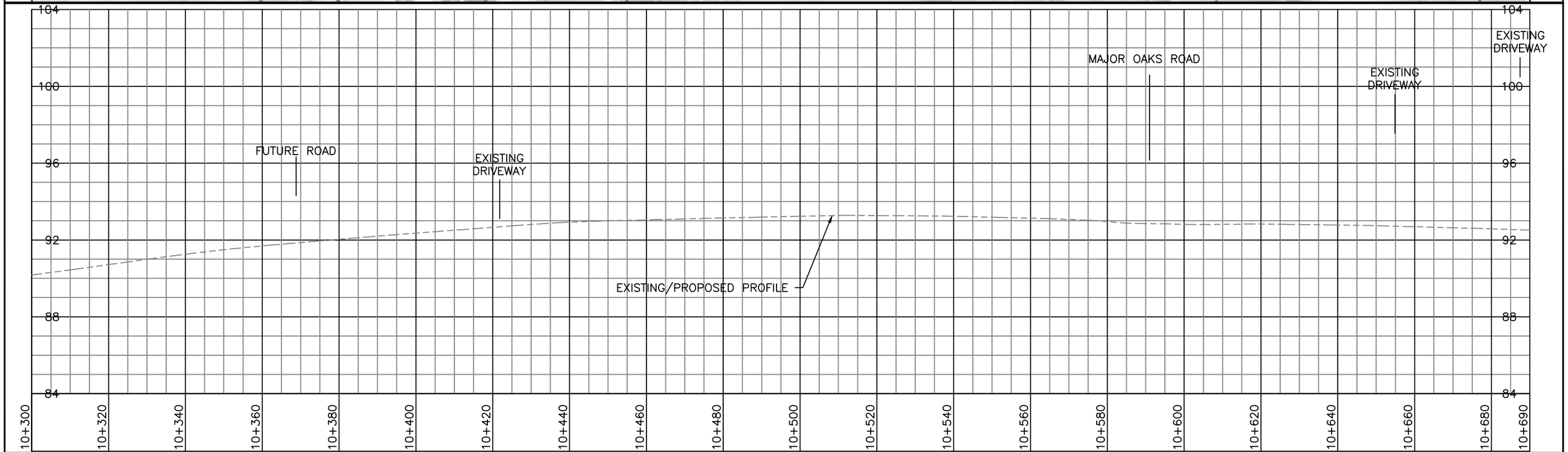
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VERTICAL 2m 0 2m

BROCK ROAD (REGIONAL ROAD 1)

STATION 9+940 TO 10+300

SHEET NO.
02





CENTRAL PICKERING DEVELOPMENT PLAN
CLASS ENVIRONMENTAL ASSESSMENT
FOR REGIONAL SERVICES IN
THE CITY OF PICKERING

- NATURAL HERITAGE SYSTEM (NHS)
- PROPOSED RIGHT OF WAY
- EXISTING RIGHT OF WAY
- LIMIT OF CUT
- LIMIT OF FILL
- CENTRE ALIGNMENT
- WATER COURSE
- EXISTING PROFILE
- PROPOSED PROFILE

HDR

THE REGIONAL MUNICIPALITY OF DURHAM

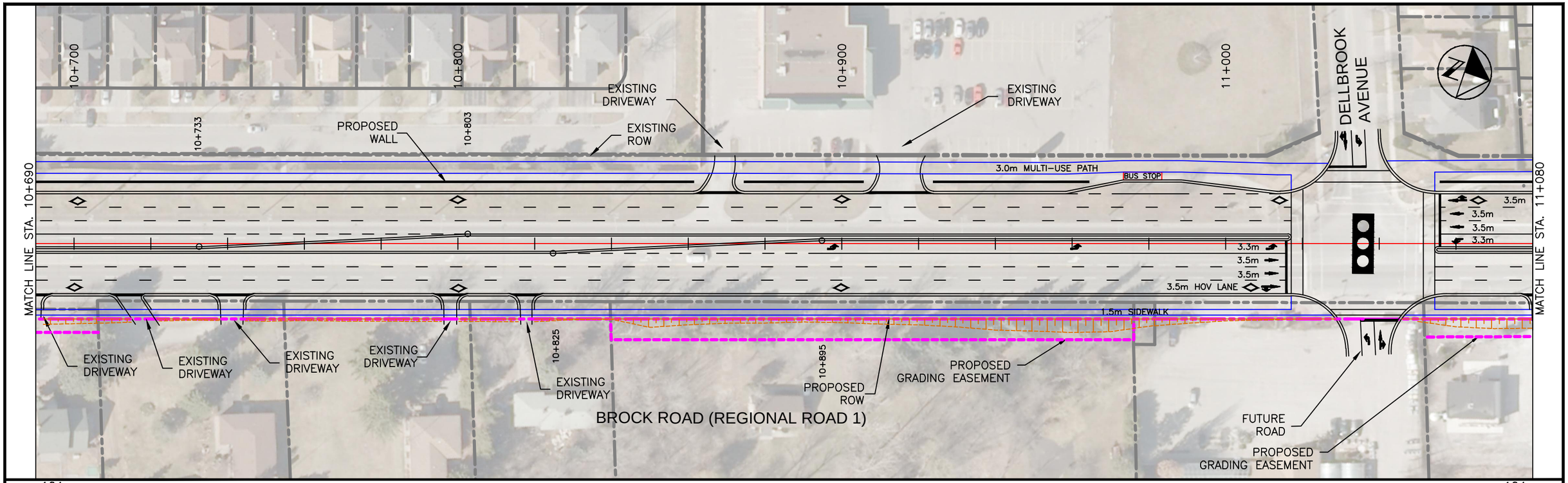
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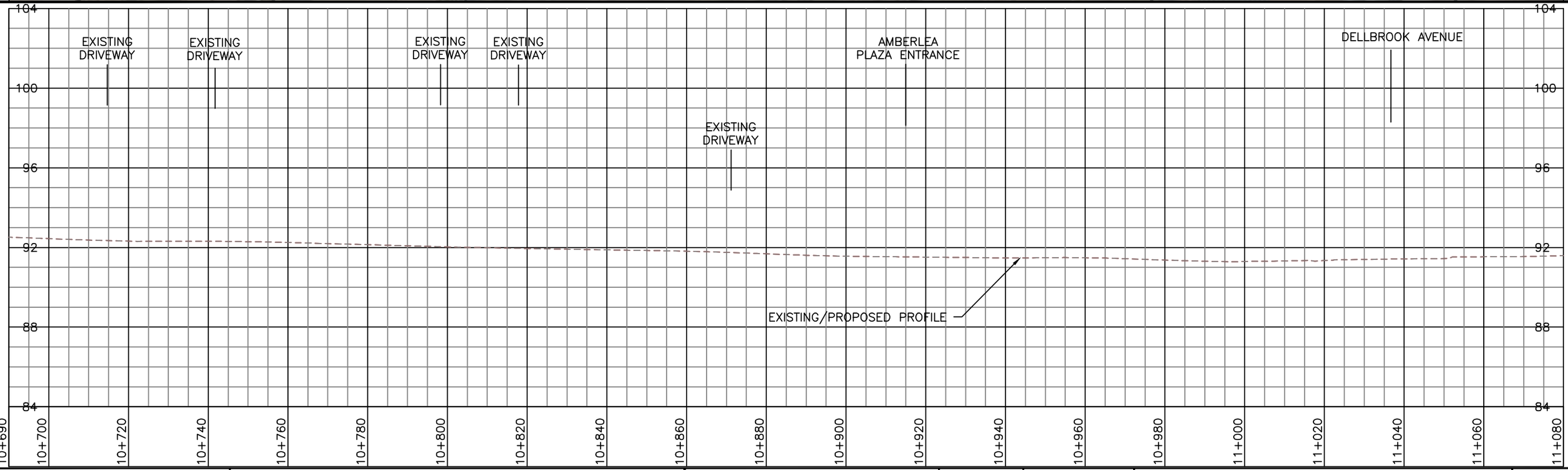
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VERTICAL 2m 0 2m

BROCK ROAD (REGIONAL ROAD 1)

STATION 10+300 TO 10+690

SHEET NO. 03





CENTRAL PICKERING DEVELOPMENT PLAN
CLASS ENVIRONMENTAL ASSESSMENT
FOR REGIONAL SERVICES IN
THE CITY OF PICKERING

NATURAL HERITAGE SYSTEM (NHS)
PROPOSED RIGHT OF WAY
EXISTING RIGHT OF WAY
LIMIT OF CUT
LIMIT OF FILL
CENTRE ALIGNMENT
WATER COURSE
EXISTING PROFILE
PROPOSED PROFILE

HDR
THE REGIONAL MUNICIPALITY OF DURHAM

JUNE 26, 2014

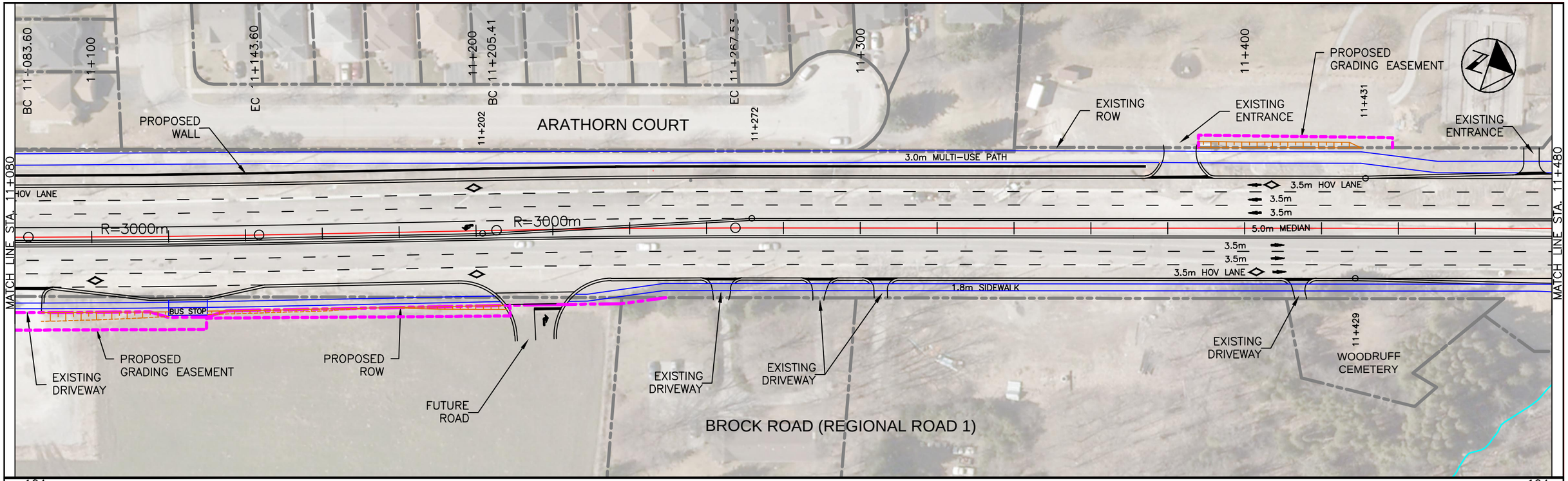
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VERTICAL 2m 0 2m

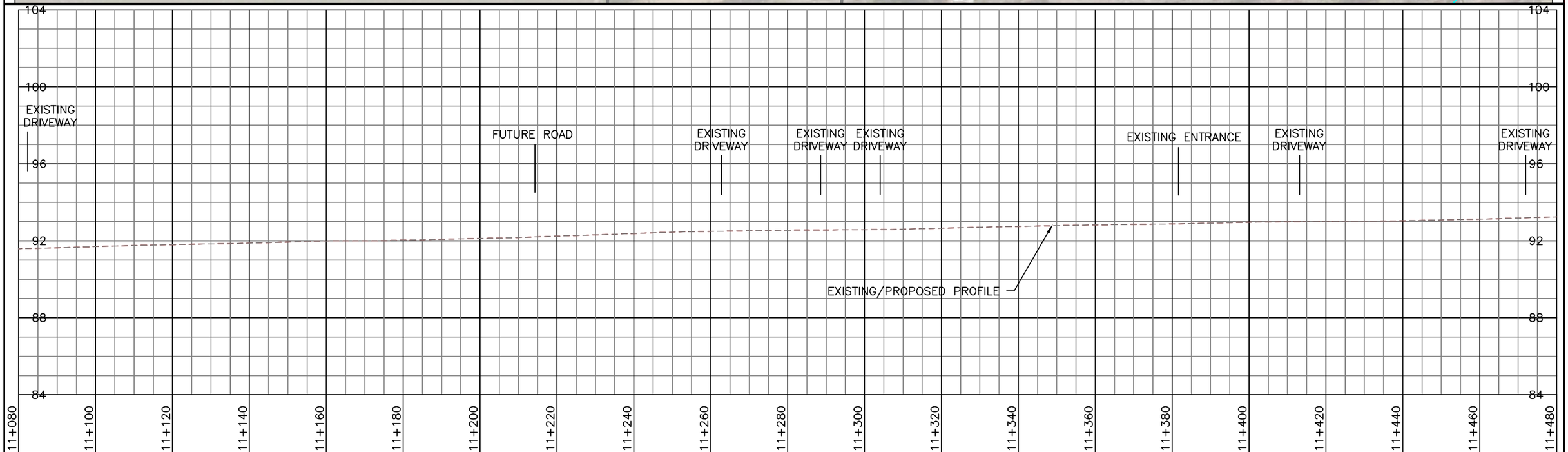
BROCK ROAD (REGIONAL ROAD 1)

STATION 10+690 TO 11+080

SHEET NO. 04

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PLOTTED: Jun 20, 2014 – 1:24pm
PLOTTED BY: Hidalgo





CENTRAL PICKERING DEVELOPMENT PLAN
CLASS ENVIRONMENTAL ASSESSMENT
FOR REGIONAL SERVICES IN
THE CITY OF PICKERING

- NATURAL HERITAGE SYSTEM (NHS)
- PROPOSED RIGHT OF WAY
- EXISTING RIGHT OF WAY
- LIMIT OF CUT
- LIMIT OF FILL
- CENTRE ALIGNMENT
- WATER COURSE
- EXISTING PROFILE
- PROPOSED PROFILE

HDR

THE REGIONAL MUNICIPALITY OF DURHAM

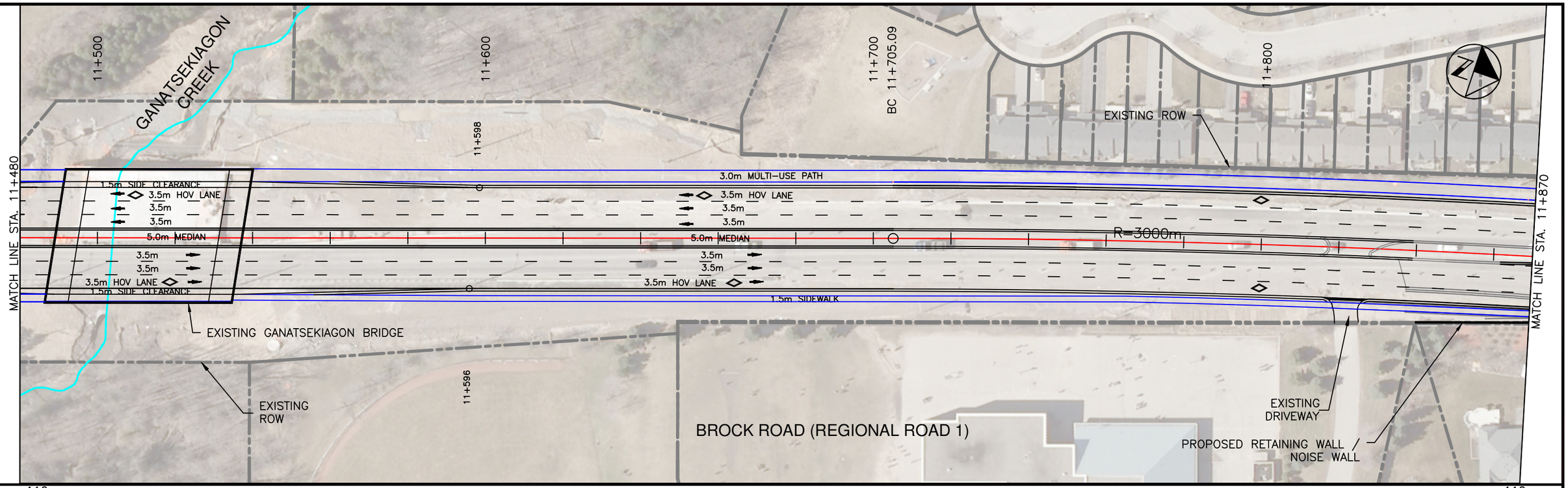
JUNE 26, 2014

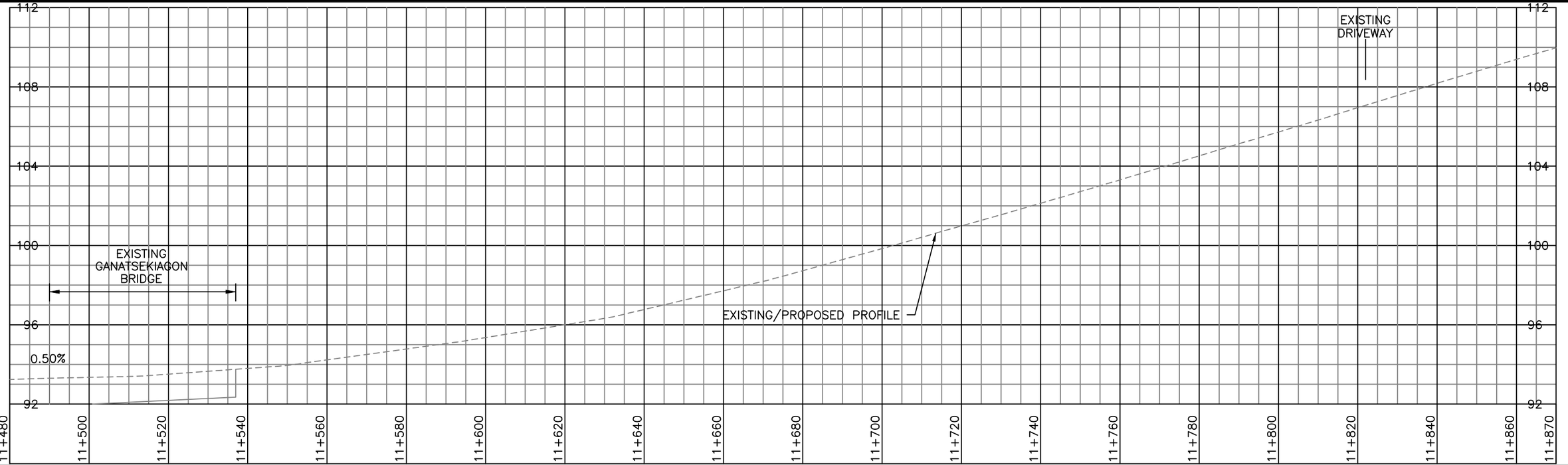
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VERTICAL 2m 0 2m

BROCK ROAD (REGIONAL ROAD 1)

STATION 11+080 TO 11+480

SHEET NO. 05





CENTRAL PICKERING DEVELOPMENT PLAN
CLASS ENVIRONMENTAL ASSESSMENT
FOR REGIONAL SERVICES IN
THE CITY OF PICKERING

NATURAL HERITAGE SYSTEM (NHS)
PROPOSED RIGHT OF WAY
EXISTING RIGHT OF WAY
LIMIT OF CUT
LIMIT OF FILL
CENTRE ALIGNMENT
WATER COURSE
EXISTING PROFILE
PROPOSED PROFILE

HDR
THE REGIONAL MUNICIPALITY OF DURHAM

JUNE 26, 2014

SCALE
HORIZONTAL 10m 0 10m
VERTICAL 2m 0 2m

BROCK ROAD (REGIONAL ROAD 1)

STATION 11+480 TO 11+870

SHEET NO. 06

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PLOTDATE: Jun 22, 2014 - 2:14pm
PLOTTED BY: mhall

FOR CONTINUATION SEE ROSSLAND ROAD EXTENSION PLATES

MATCH LINE STA. 11+870

MATCH LINE STA. 12+270

11+900

12+000

EC 12+006.12

9+940

ROSSLAND ROAD EXTENSION

12+100

PROPOSED CONTRACT BY OTHERS (2015 CONTRACTS)

PROPOSED RETAINING WALL

PROPOSED RETAINING WALL

HYDRO CORRIDOR

BROCK ROAD (REGIONAL ROAD 1)

BC 12+175.90

12+200

EXISTING ROW

12+248

3.87

3.0m MULTI-USE PATH

BUS STOP

2.0m SIDEWALK

2.5m CYCLE TRACK

3.5m

3.5m HOV

3.3m

R=3000m

R=1000m

9+900

99°

11+878

11+932

11+953

PROPOSED RETAINING WALL/ NOISE WALL

EXISTING ROW

PROPOSED ROW

LIMIT OF WORK MATCH EXISTING

HOT STA 12+063.69 BROCK ROAD
HOT STA 9+916.86 ROSSLAND ROAD EXTENSION

HOT BROCK ROAD STA=12+063.69
HOT ROSSLAND ROAD EXTENSION STA=9+916.86

GRADE BREAK STA = 12+006.12
ELEV = 117.579

4.10%

GRADE BREAK STA = 11+899.27
ELEV = 111.641

PROPOSED PROFILE BY OTHERS
(2015 CONSTRUCTION)

BVCS: 12+086.20
BVCE 121.02

PVI STA:12+177.45
PVI ELEV:124.76
K:50.00
LVC:182.50

EVCS: 12+268.70
EVCE 125.17

EXISTING/ PROPOSED PROFILE

PROPOSED PROFILE BY OTHERS
(2015 CONSTRUCTION)

128
124
120
116
112
108

11+870 11+880 11+900 11+920 11+940 11+960 11+980 12+000 12+020 12+040 12+060 12+080 12+100 12+120 12+140 12+160 12+180 12+200 12+220 12+240 12+260 12+270

CENTRAL PICKERING DEVELOPMENT PLAN
CLASS ENVIRONMENTAL ASSESSMENT
FOR REGIONAL SERVICES IN
THE CITY OF PICKERING

NATURAL HERITAGE SYSTEM (NHS)
PROPOSED RIGHT OF WAY
EXISTING RIGHT OF WAY
LIMIT OF CUT
LIMIT OF FILL
CENTRE ALIGNMENT
WATER COURSE
EXISTING PROFILE
PROPOSED PROFILE

THE REGIONAL MUNICIPALITY OF DURHAM

JUNE 26, 2014

SCALE
HORIZONTAL 10m 0 10m
VERTICAL 2m 0 2m

BROCK ROAD (REGIONAL ROAD 1)

STATION 11+870 TO 12+270

SHEET NO. 07

FILENAME: C:\pwworking\pitt\d0084340\HDR-PP Brock.dwg
PLOTDATE: Jun 22, 2014 - 2:16pm
PLOTTED BY: mhall

BROCK ROAD (REGIONAL ROAD 1)

VALLEY FARM ROAD

NOTE:
LOCATION OF MUP AND EXTENT OF DRIVEWAY GRADING ON PRIVATE PROPERTY TO BE REVIEWED IN DETAILED DESIGN.

EC 12+275.30

12+300

12+318

12+400

12+500

12+600

MATCH LINE STA. 12+270

MATCH LINE STA. 12+660

EXISTING DRIVEWAY

EXISTING DRIVEWAY

PROPOSED GRADING EASEMENT

2.0m SIDEWALK

2.5m CYCLE TRACK

BUS STOP

EXISTING ROW

EXISTING ENTRANCE

3.5m HOV LANE

3.5m

3.5m

5.0m MEDIAN

3.3m

3.5m

3.5m

3.5m HOV LANE

BUS STOP

3.0m MULTI-USE PATH

MATCH EXISTING MULTI-USE PATH

EXISTING DRIVEWAY (SEE NOTE)

EXISTING DRIVEWAY (SEE NOTE)

PROPOSED WALL

EXISTING DRIVEWAY (SEE NOTE)

PROPOSED GRADING EASEMENT

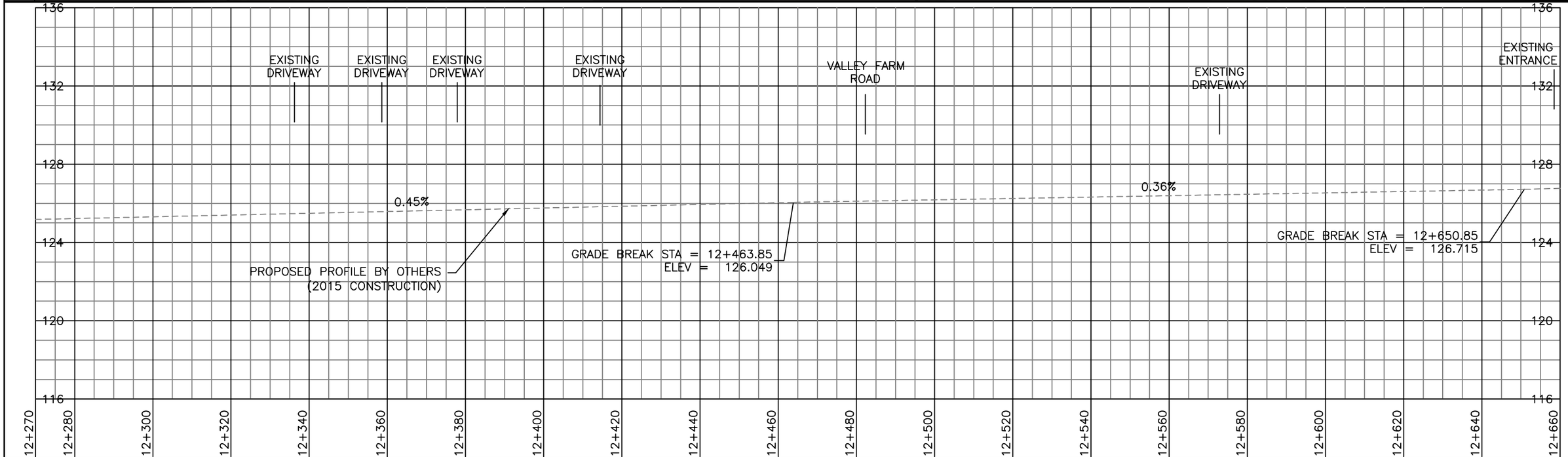
EXISTING DRIVEWAY (SEE NOTE)

PROPOSED WALL

EXISTING DRIVEWAY (SEE NOTE)

EXISTING ROW

DUFFINS MEADOW CEMETERY



CENTRAL PICKERING DEVELOPMENT PLAN
CLASS ENVIRONMENTAL ASSESSMENT
FOR REGIONAL SERVICES IN
THE CITY OF PICKERING

NATURAL HERITAGE SYSTEM (NHS)
PROPOSED RIGHT OF WAY
EXISTING RIGHT OF WAY
LIMIT OF CUT
LIMIT OF FILL
CENTRE ALIGNMENT
WATER COURSE
EXISTING PROFILE
PROPOSED PROFILE

HDR

THE REGIONAL MUNICIPALITY OF DURHAM

JUNE 26, 2014

SCALE
HORIZONTAL 10m 0 10m
VERTICAL 2m 0 2m

BROCK ROAD (REGIONAL ROAD 1)

STATION 12+270 TO 12+660

SHEET NO.
08

NOTE:
LOCATION OF MUP AND EXTENT OF DRIVEWAY GRADING ON PRIVATE PROPERTY TO BE REVIEWED IN DETAILED DESIGN.

BROCK ROAD (REGIONAL ROAD 1)

MATCH LINE STA. 12+660

MATCH LINE STA. 13+060

12+700

12+800

12+900

13+000

DERSAN STREET

EXISTING ENTRANCE

EXISTING ROW

2.0m SIDEWALK

2.5m CYCLE TRACK

EXISTING DRIVEWAY

PROPOSED GRADING EASEMENT

BUS STOP

EXISTING CULVERT TO BE EXTENDED

3.5m HOV LANE

3.5m

3.5m

3.3m

3.5m

3.5m

3.5m HOV LANE

3.3m

3.5m

3.5m

3.5m HOV LANE

3.0m MULTI-USE PATH

BUS STOP

2.5m CYCLE TRACK

2.0m SIDEWALK

DUFFINS MEADOW CEMETERY

12+712

EXISTING ROW

12+782

EXISTING DRIVEWAY (SEE NOTE)

EXISTING CULVERT TO BE EXTENDED

PROPOSED ROW

WILLIAM JACKSON DRIVE

EXISTING DRIVEWAY

PROPOSED GRADING EASEMENT

EXISTING CULVERT TO BE EXTENDED

PROPOSED WALL

140

136

132

128

124

120

EXISTING DRIVEWAY

EXISTING DRIVEWAY

DERSAN STREET/ WILLIAM JACKSON DRIVE

EXISTING DRIVEWAY

EXISTING DRIVEWAY

GRADE BREAK STA = 12+778.85
ELEV = 127.421

0.55%

0.50%

GRADE BREAK STA = 12+978.85
ELEV = 128.421

EXISTING CULVERT TO BE EXTENDED

PROPOSED PROFILE BY OTHERS (2015 CONSTRUCTION)

EXISTING CULVERT TO BE EXTENDED

12+660 12+680 12+700 12+720 12+740 12+760 12+780 12+800 12+820 12+840 12+860 12+880 12+900 12+920 12+940 12+960 12+980 13+000 13+020 13+040 13+060

CENTRAL PICKERING DEVELOPMENT PLAN
CLASS ENVIRONMENTAL ASSESSMENT
FOR REGIONAL SERVICES IN
THE CITY OF PICKERING

NATURAL HERITAGE SYSTEM (NHS)
PROPOSED RIGHT OF WAY
EXISTING RIGHT OF WAY
LIMIT OF CUT
LIMIT OF FILL
CENTRE ALIGNMENT
WATER COURSE
EXISTING PROFILE
PROPOSED PROFILE

HDR

THE REGIONAL MUNICIPALITY OF DURHAM

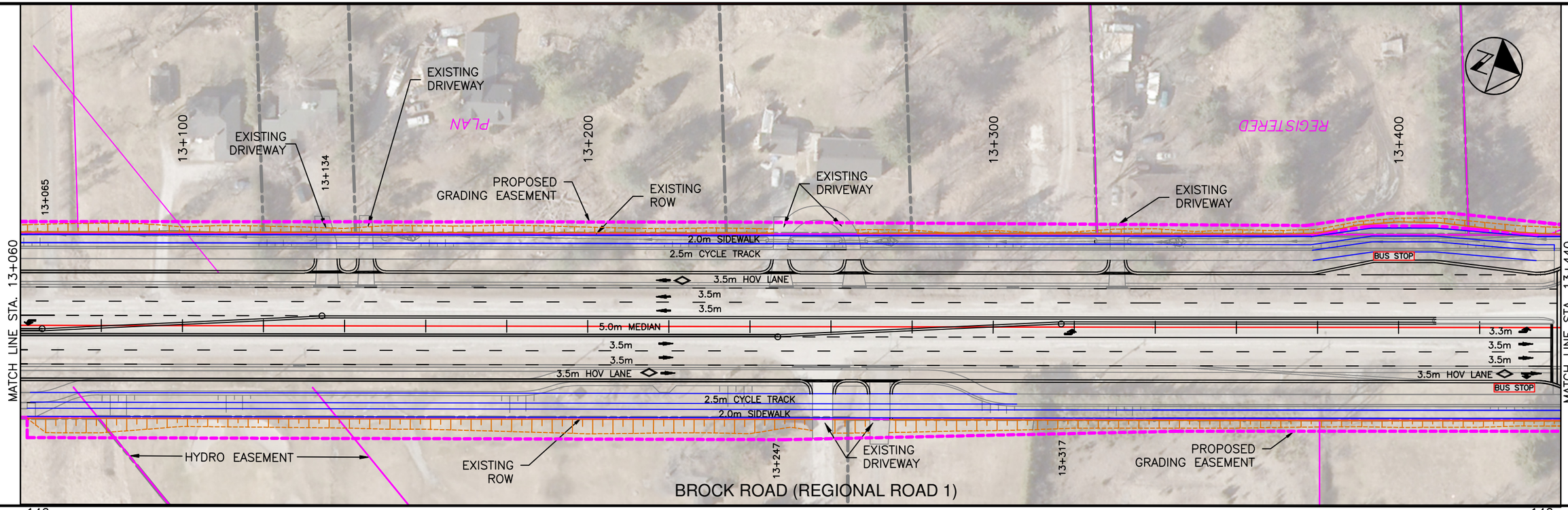
JUNE 26, 2014

SCALE
HORIZONTAL 10m 0 10m
VERTICAL 2m 0 2m

BROCK ROAD (REGIONAL ROAD 1)

STATION 12+660 TO 13+060

SHEET NO. 09



CENTRAL PICKERING DEVELOPMENT PLAN
CLASS ENVIRONMENTAL ASSESSMENT
FOR REGIONAL SERVICES IN
THE CITY OF PICKERING

NATURAL HERITAGE SYSTEM (NHS)
PROPOSED RIGHT OF WAY
EXISTING RIGHT OF WAY
LIMIT OF CUT
LIMIT OF FILL
CENTRE ALIGNMENT
WATER COURSE
EXISTING PROFILE
PROPOSED PROFILE

HDR
THE REGIONAL MUNICIPALITY OF DURHAM

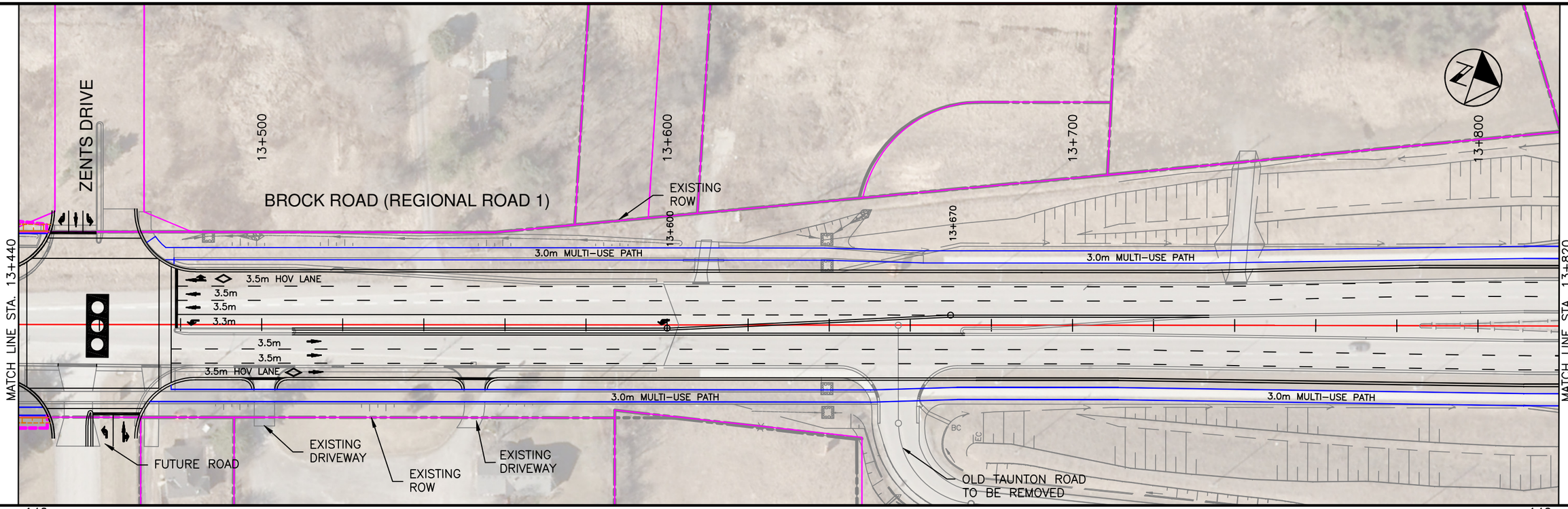
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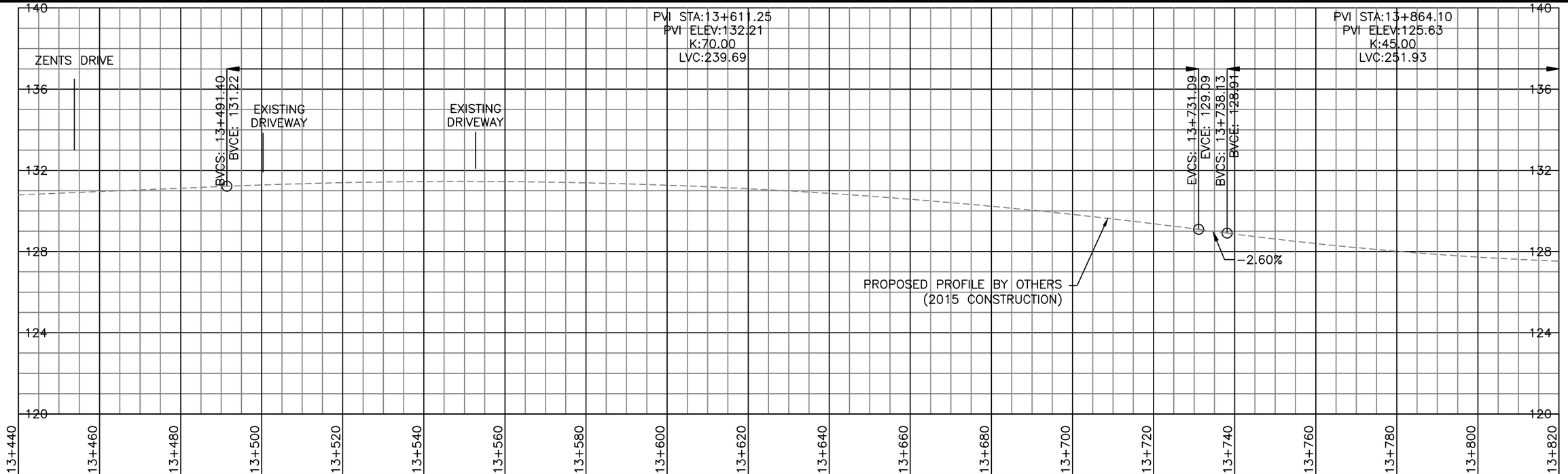
SCALE
HORIZONTAL 10m 0 10m
VERTICAL 2m 0 2m

BROCK ROAD (REGIONAL ROAD 1)
STATION 13+060 TO 13+440

SHEET NO.
10

FILENAME: C:\pwworking\pitt\d0084349\HDR-PP Brock.dwg
PLOTDATE: Jun 22, 2014 - 2:18pm
PLOTTED BY: mhall





CENTRAL PICKERING DEVELOPMENT PLAN
CLASS ENVIRONMENTAL ASSESSMENT
FOR REGIONAL SERVICES IN
THE CITY OF PICKERING

NATURAL HERITAGE SYSTEM (NHS)
PROPOSED RIGHT OF WAY
EXISTING RIGHT OF WAY
LIMIT OF CUT
LIMIT OF FILL
CENTRE ALIGNMENT
WATER COURSE
EXISTING PROFILE
PROPOSED PROFILE

HDR
THE REGIONAL MUNICIPALITY OF DURHAM

JUNE 26, 2014

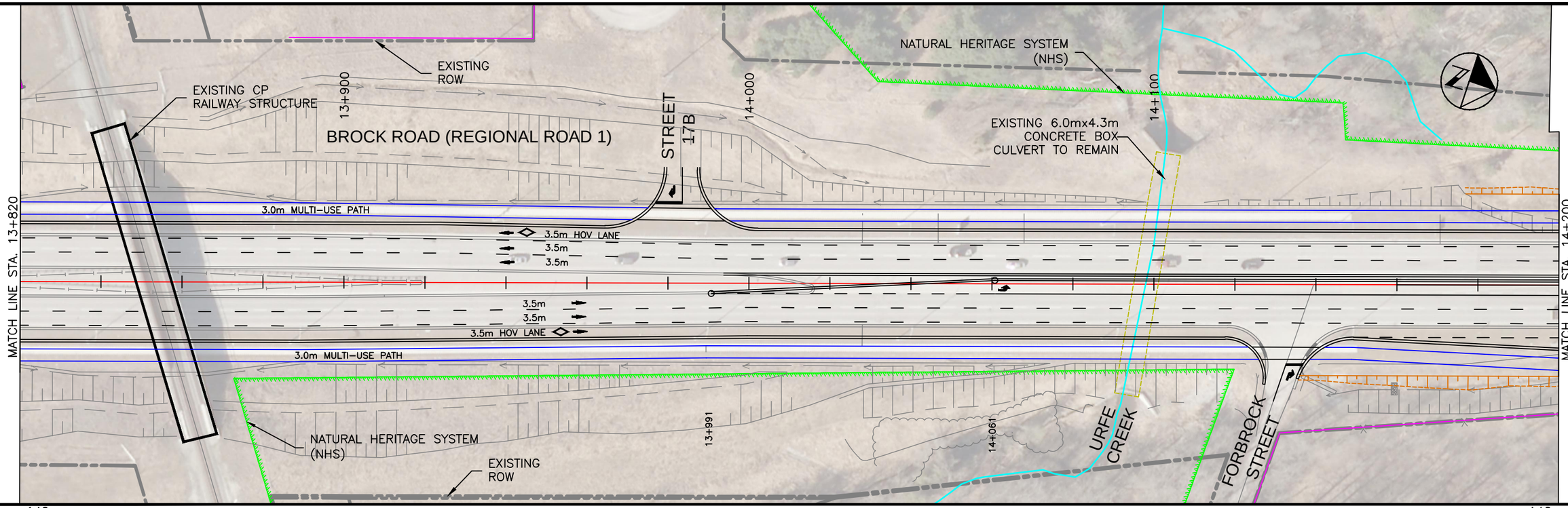
SCALE
HORIZONTAL 10m 0 10m
VERTICAL 2m 0 2m

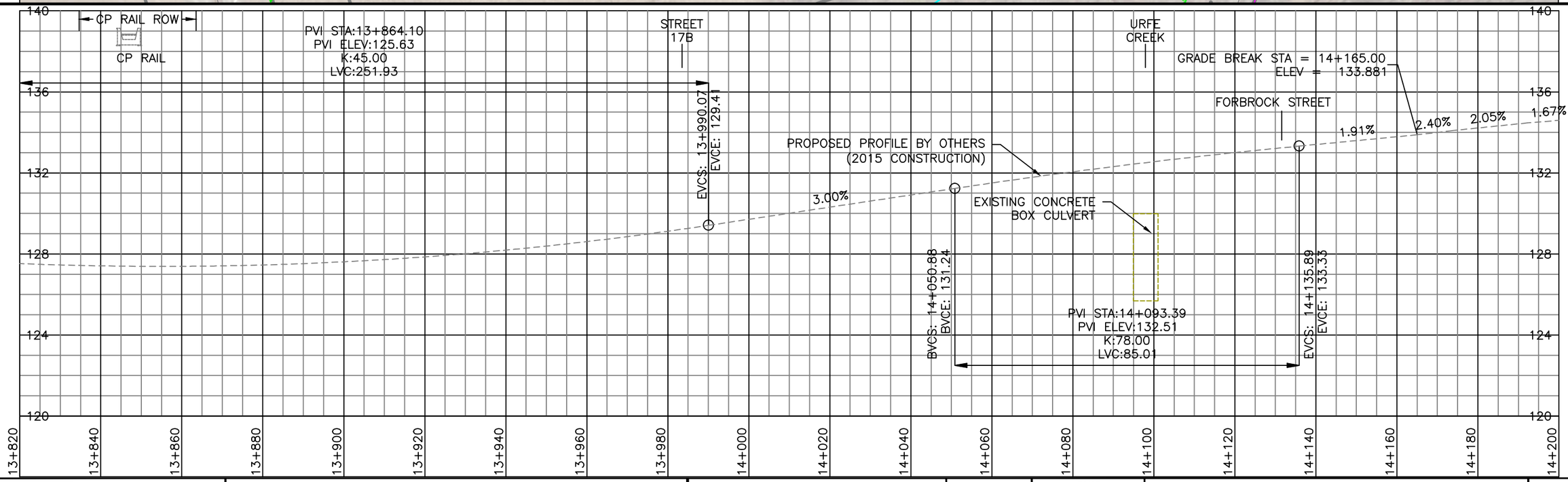
BROCK ROAD (REGIONAL ROAD 1)

STATION 13+440 TO 13+820

SHEET NO. 11

FILENAME: C:\pwworking\pitt\d0084340\MDR-PP Brock.dwg
PLOTDATE: Jun 22, 2014 - 2:21pm
PLOTTED BY: mhall





CENTRAL PICKERING DEVELOPMENT PLAN
CLASS ENVIRONMENTAL ASSESSMENT
FOR REGIONAL SERVICES IN
THE CITY OF PICKERING

NATURAL HERITAGE SYSTEM (NHS)
PROPOSED RIGHT OF WAY
EXISTING RIGHT OF WAY
LIMIT OF CUT
LIMIT OF FILL
CENTRE ALIGNMENT
WATER COURSE
EXISTING PROFILE
PROPOSED PROFILE

HDR

THE REGIONAL MUNICIPALITY OF DURHAM

JUNE 26, 2014

SCALE
HORIZONTAL 10m 0 10m
VERTICAL 2m 0 2m

BROCK ROAD (REGIONAL ROAD 1)

STATION 13+820 TO 14+200

SHEET NO. 12

FILENAME: C:\pwworking\pltt\d0684349\HDR-PP Brock.dwg
PLOTDATE: Jun 22, 2014 - 3:40pm
PLOTTED BY: mmui

HOT STA 14+314.81 BROCK ROAD
HOT STA 17+537.91 TAUNTON ROAD

NATURAL HERITAGE SYSTEM (NHS)

3.0m MULTI-USE PATH
BUS STOP

3.5m HOV LANE
3.5m
3.5m
3.3m

92°

3.3m
3.5m
3.5m
3.5m HOV LANE
3.5m

3.0m MULTI-USE PATH

PROPOSED CONTRACT BY OTHERS (2015 CONTRACTS)

MATCH LINE STA. 14+200

14+300

TAUNTON ROAD (REGIONAL ROAD 4)
17+500

FOR CONTINUATION SEE TAUNTON ROAD PLATES

PROPOSED ROW (SEE NOTE)

14+400

HYDRO AND TRANS-NORTHERN EASEMENT

TRANS-NORTHERN PIPELINE

OIL

14+470

14+500

EXISTING 1200mm ø CSP TO REMAIN

NATURAL HERITAGE SYSTEM (NHS)

14+540

STREET 17C

BC 14+556.43

3.0m MULTI-USE PATH

3.5m
3.5m HOV LANE
3.5m
3.5m
3.3m

OIL

BUS STOP

1.5m SIDEWALK

OIL

STREET 17D

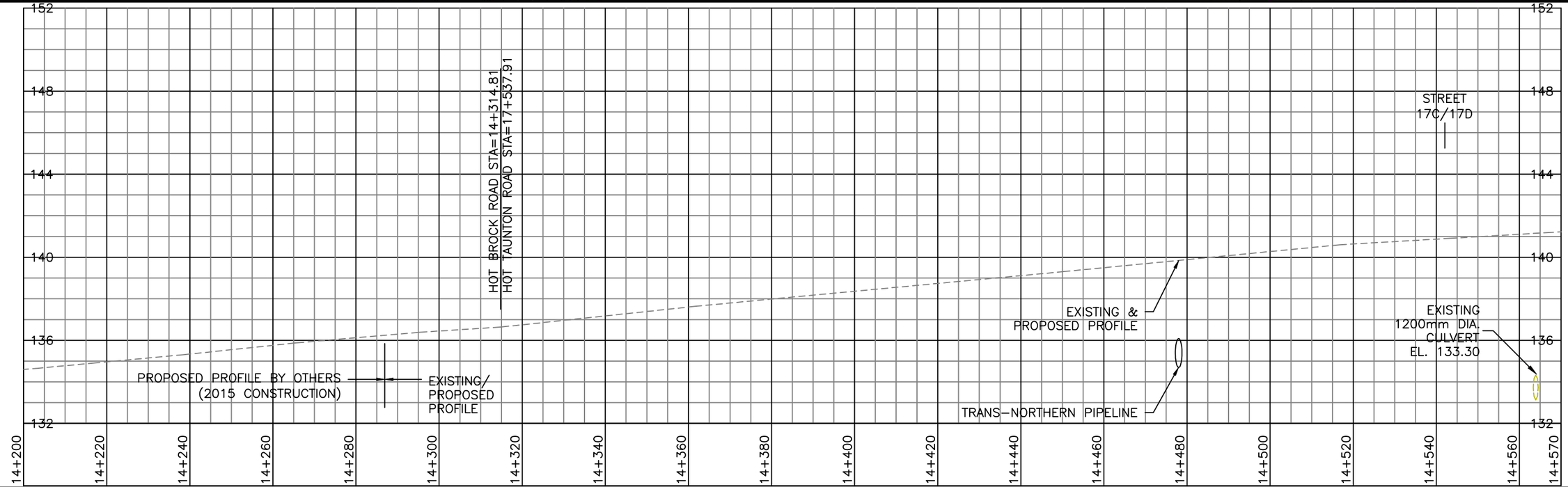
NATURAL HERITAGE SYSTEM (NHS)

MATCH LINE STA. 14+570

BROCK ROAD (REGIONAL ROAD 1)

NOTE:
ADDITIONAL ROW THRU INTERSECTIONS ARE SHOWN TO PROVIDE FOR OFFSET LEFT TURN LANES. TO BE CONFIRMED DURING DETAIL DESIGN. SUBJECT TO CONFIRM INTERSECTION LOCATION.

FOR CONTINUATION SEE TAUNTON ROAD PLATES



CENTRAL PICKERING DEVELOPMENT PLAN
CLASS ENVIRONMENTAL ASSESSMENT
FOR REGIONAL SERVICES IN
THE CITY OF PICKERING

NATURAL HERITAGE SYSTEM (NHS)
PROPOSED RIGHT OF WAY
EXISTING RIGHT OF WAY
LIMIT OF CUT
LIMIT OF FILL
CENTRE ALIGNMENT
WATER COURSE
EXISTING PROFILE
PROPOSED PROFILE

HDR
THE REGIONAL MUNICIPALITY OF DURHAM

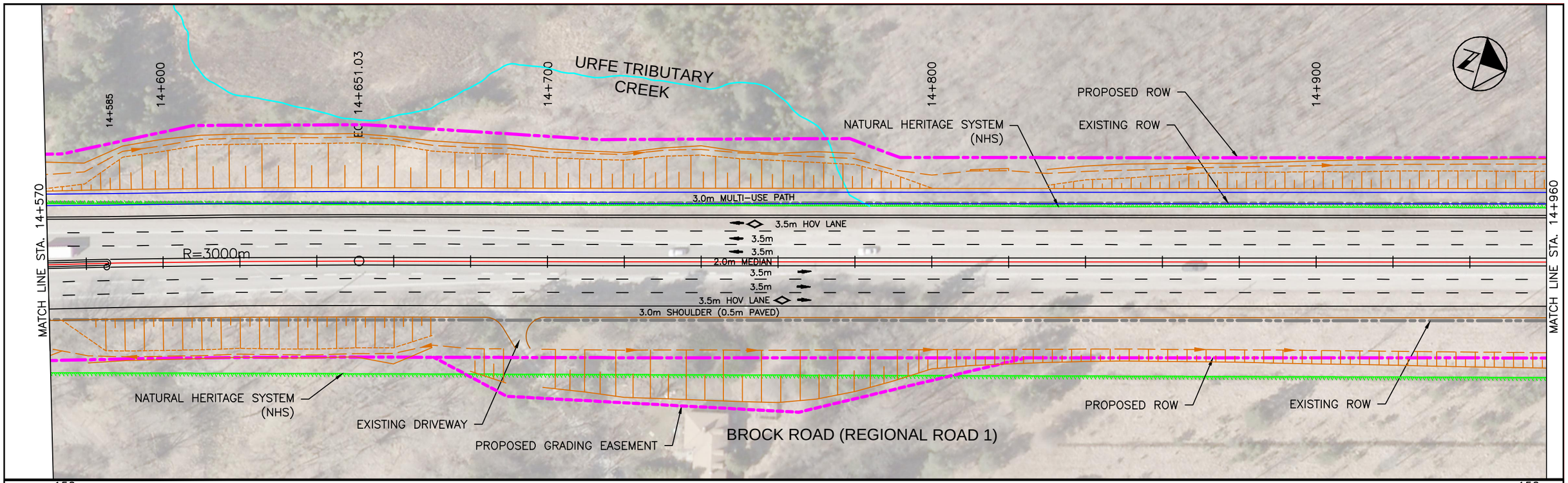
JUNE 26, 2014

SCALE
HORIZONTAL 10m 0 10m
VERTICAL 2m 0 2m

BROCK ROAD (REGIONAL ROAD 1)
STATION 14+200 TO 14+570

SHEET NO.
13

FILENAME: C:\pwworking\pitt\d0084340\HDR-PP Brock.dwg
PLOTDATE: Jun 22, 2014 - 2:26pm
PLOTTED BY: mhall



CENTRAL PICKERING DEVELOPMENT PLAN
CLASS ENVIRONMENTAL ASSESSMENT
FOR REGIONAL SERVICES IN
THE CITY OF PICKERING

NATURAL HERITAGE SYSTEM (NHS)
PROPOSED RIGHT OF WAY
EXISTING RIGHT OF WAY
LIMIT OF CUT
LIMIT OF FILL
CENTRE ALIGNMENT
WATER COURSE
EXISTING PROFILE
PROPOSED PROFILE

HDR

THE REGIONAL MUNICIPALITY OF DURHAM

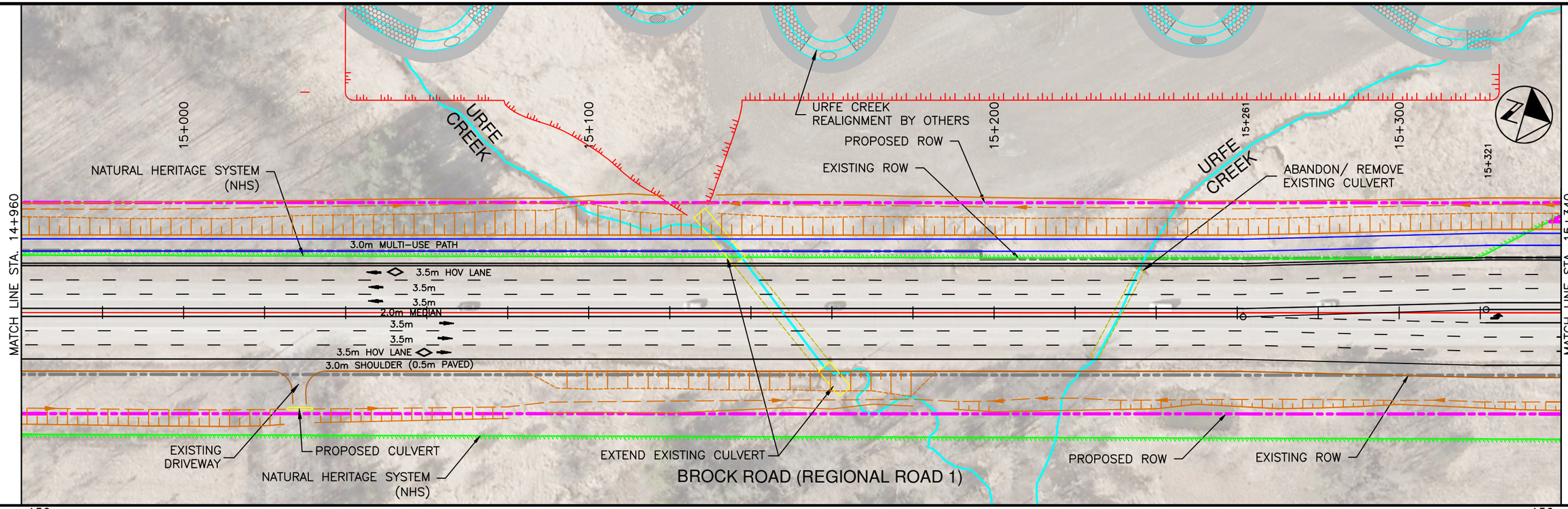
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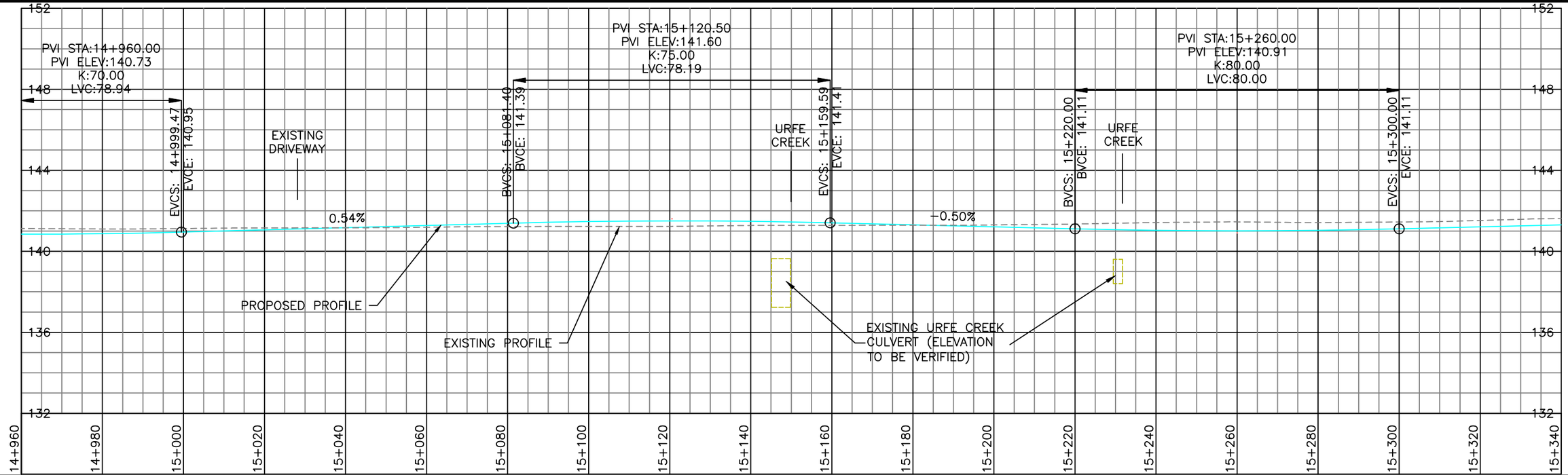
SCALE
HORIZONTAL 10m 0 10m
VERTICAL 2m 0 2m

BROCK ROAD (REGIONAL ROAD 1)

STATION 14+570 TO 14+960

SHEET NO.
14





CENTRAL PICKERING DEVELOPMENT PLAN
CLASS ENVIRONMENTAL ASSESSMENT
FOR REGIONAL SERVICES IN
THE CITY OF PICKERING

NATURAL HERITAGE SYSTEM (NHS)
PROPOSED RIGHT OF WAY
EXISTING RIGHT OF WAY
LIMIT OF CUT
LIMIT OF FILL
CENTRE ALIGNMENT
WATER COURSE
EXISTING PROFILE
PROPOSED PROFILE

HDR
THE REGIONAL MUNICIPALITY OF DURHAM

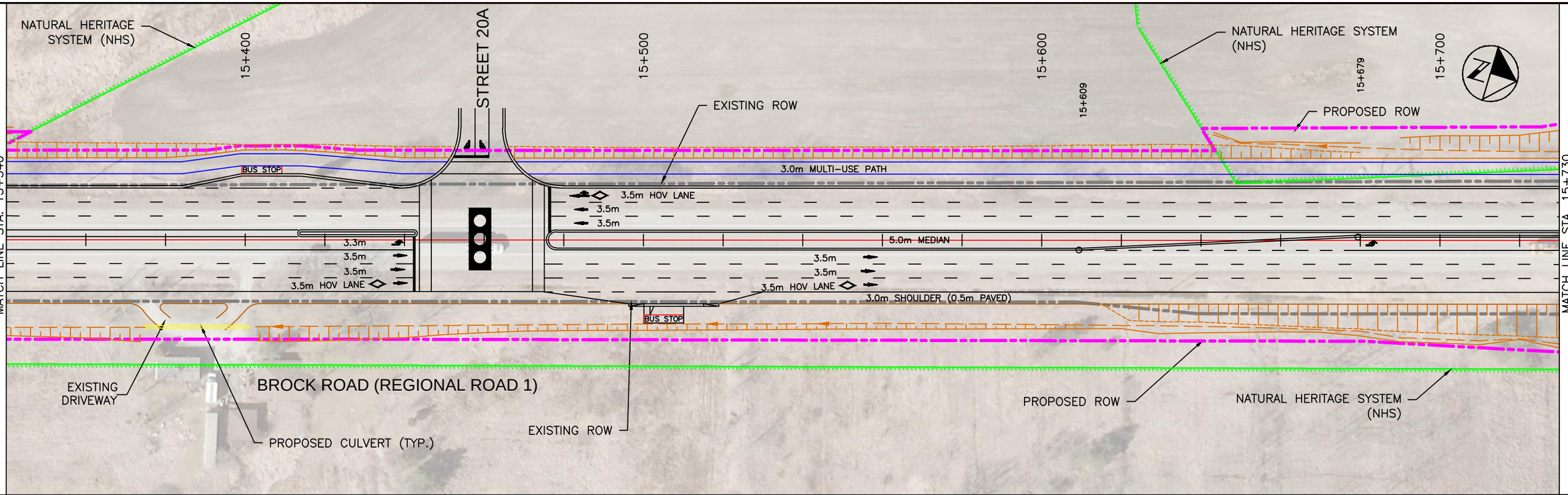
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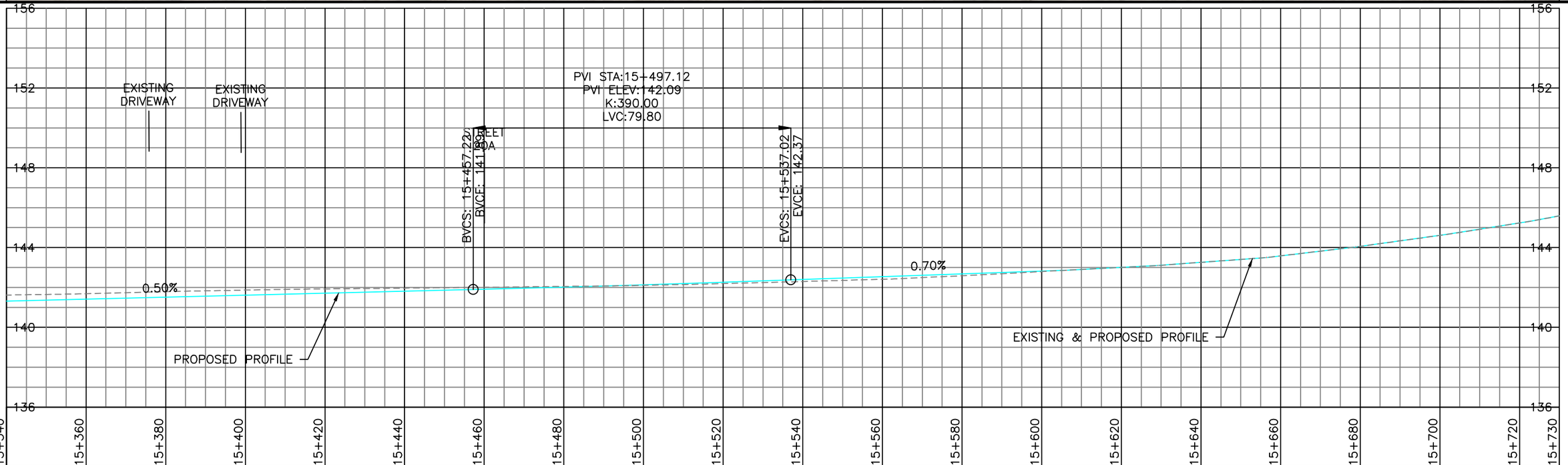
SCALE
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VERTICAL 2m 0 2m

BROCK ROAD (REGIONAL ROAD 1)
STATION 14+960 TO 15+340

SHEET NO. 15

FILENAME: C:\pwworking\pitt\d0084346\HDR-PP Brock.dwg
PLOTDATE: Jun 22, 2014 - 2:30pm
PLOTTED BY: mhall





CENTRAL PICKERING DEVELOPMENT PLAN
CLASS ENVIRONMENTAL ASSESSMENT
FOR REGIONAL SERVICES IN
THE CITY OF PICKERING

NATURAL HERITAGE SYSTEM (NHS)
PROPOSED RIGHT OF WAY
EXISTING RIGHT OF WAY
LIMIT OF CUT
LIMIT OF FILL
CENTRE ALIGNMENT
WATER COURSE
EXISTING PROFILE
PROPOSED PROFILE

HDR

THE REGIONAL MUNICIPALITY OF DURHAM

JUNE 26, 2014

SCALE
HORIZONTAL 10m 0 10m
VERTICAL 2m 0 2m

BROCK ROAD (REGIONAL ROAD 1)

STATION 15+340 TO 15+730

SHEET NO. 16

NOTE:
ADDITIONAL ROW THRU INTERSECTIONS ARE SHOWN TO PROVIDE FOR OFFSET LEFT TURN LANES. TO BE CONFIRMED DURING DETAIL DESIGN. SUBJECT TO CONFIRM INTERSECTION LOCATION.

NATURAL HERITAGE SYSTEM (NHS)

BC 15+767.58

STREET 20D

15+800

15+817

EC 15+833.42

15+887

15+900

16+000

WHITEVALE BYPASS

FOR CONTINUATION SEE WHITEVALE BYPASS PLATES

16+100

PROPOSED ROW (SEE NOTE)

EXISTING ROW

MATCH LINE STA. 15+730

3.0m MULTI-USE PATH

BUS STOP

R=5000m

3.3m

3.5m HOV LANE

3.5m

3.5m

3.3m

3.3m

3.5m

3.5m

3.5m HOV LANE

3.5m

3.0m SHOULDER (0.5m PAVED)

MATCH LINE STA. 16+120

17+400

NATURAL HERITAGE SYSTEM (NHS)

PI 17+422.36

EXISTING ROW

NATURAL HERITAGE SYSTEM (NHS)

EXISTING DRIVEWAY

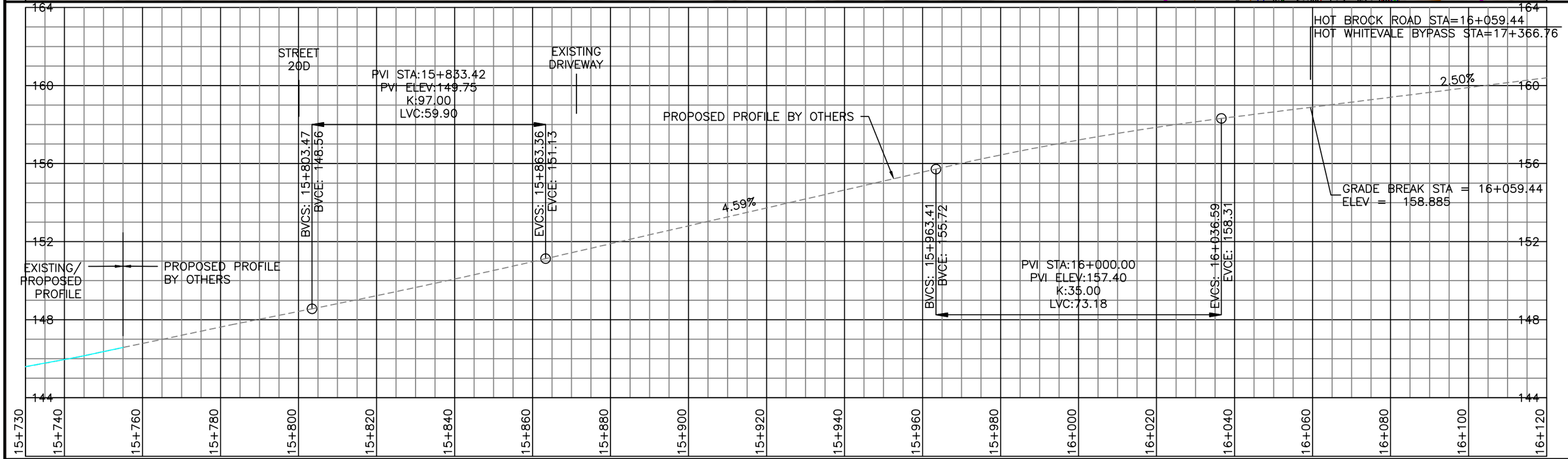
PROPOSED CULVERT (TYP.)

BROCK ROAD
(REGIONAL ROAD 1)

PROPOSED ROW (SEE NOTE)

HOT STA 16+059.44 BROCK ROAD
HOT STA 17+366.76 WHITEVALE BYPASS

FOR CONTINUATION SEE WHITEVALE BYPASS PLATES



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PLOTDATE: Jun 22, 2014 - 2:33pm
PLOTTED BY: mhill

CENTRAL PICKERING DEVELOPMENT PLAN
CLASS ENVIRONMENTAL ASSESSMENT
FOR REGIONAL SERVICES IN
THE CITY OF PICKERING

NATURAL HERITAGE SYSTEM (NHS)
PROPOSED RIGHT OF WAY
EXISTING RIGHT OF WAY
LIMIT OF CUT
LIMIT OF FILL
CENTRE ALIGNMENT
WATER COURSE
EXISTING PROFILE
PROPOSED PROFILE

HDR

THE REGIONAL MUNICIPALITY OF DURHAM

JUNE 26, 2014

SCALE
HORIZONTAL 10m 0 10m
VERTICAL 2m 0 2m

BROCK ROAD (REGIONAL ROAD 1)

STATION 15+730 TO 16+120

SHEET NO. 17

EXISTING ROW

PROPOSED ROW

TS 16+176.53

16+200

16+211

SC 16+258.16

16+276

16+300

N/S RESIDENTIAL COLLECTOR 3

16+400

CS 16+465.97

PROPOSED ROW

2.0m SIDEWALK

2.5m CYCLE TRACK

3.5m HOV LANE

3.5m

3.5m

3.3m

3.5m

3.5m

3.5m HOV LANE

2.5m CYCLE TRACK

2.0m SIDEWALK

A=208

R=530m

MATCH LINE STA. 16+120

MATCH LINE STA. 16+480

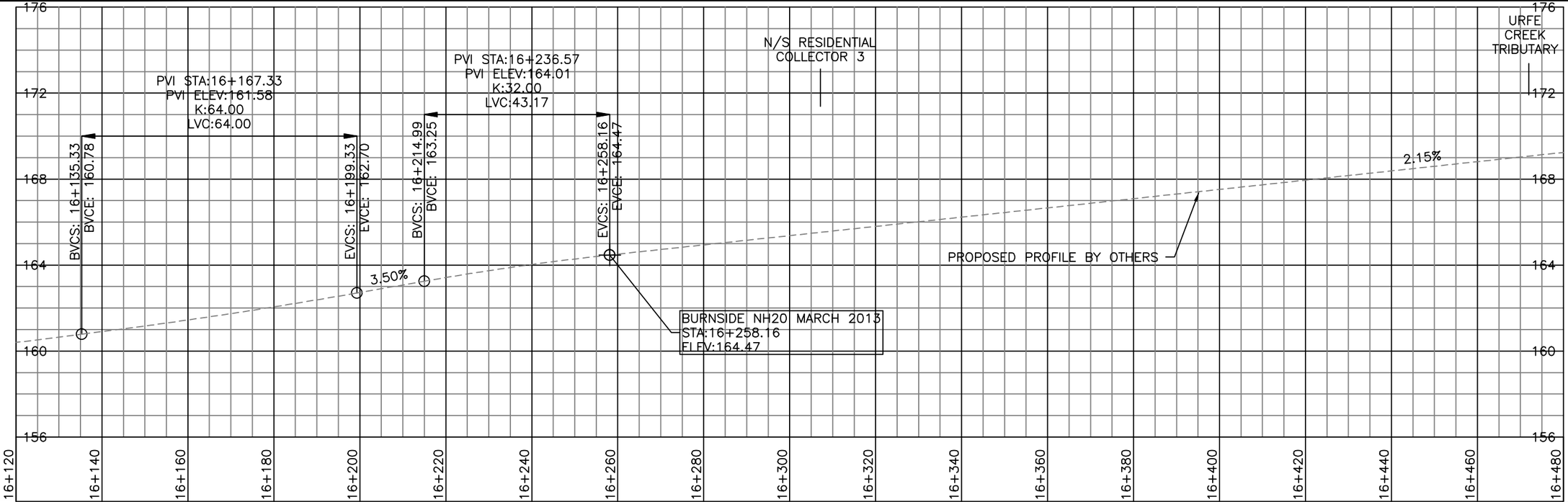
BUS STOP

NATURAL HERITAGE SYSTEM (NHS)

BROCK ROAD (REGIONAL ROAD 1)

URFE CREEK

EXTEND CULVERT



CENTRAL PICKERING DEVELOPMENT PLAN
CLASS ENVIRONMENTAL ASSESSMENT
FOR REGIONAL SERVICES IN
THE CITY OF PICKERING

NATURAL HERITAGE SYSTEM (NHS)
PROPOSED RIGHT OF WAY
EXISTING RIGHT OF WAY
LIMIT OF CUT
LIMIT OF FILL
CENTRE ALIGNMENT
WATER COURSE
EXISTING PROFILE
PROPOSED PROFILE

HDR

THE REGIONAL MUNICIPALITY OF DURHAM

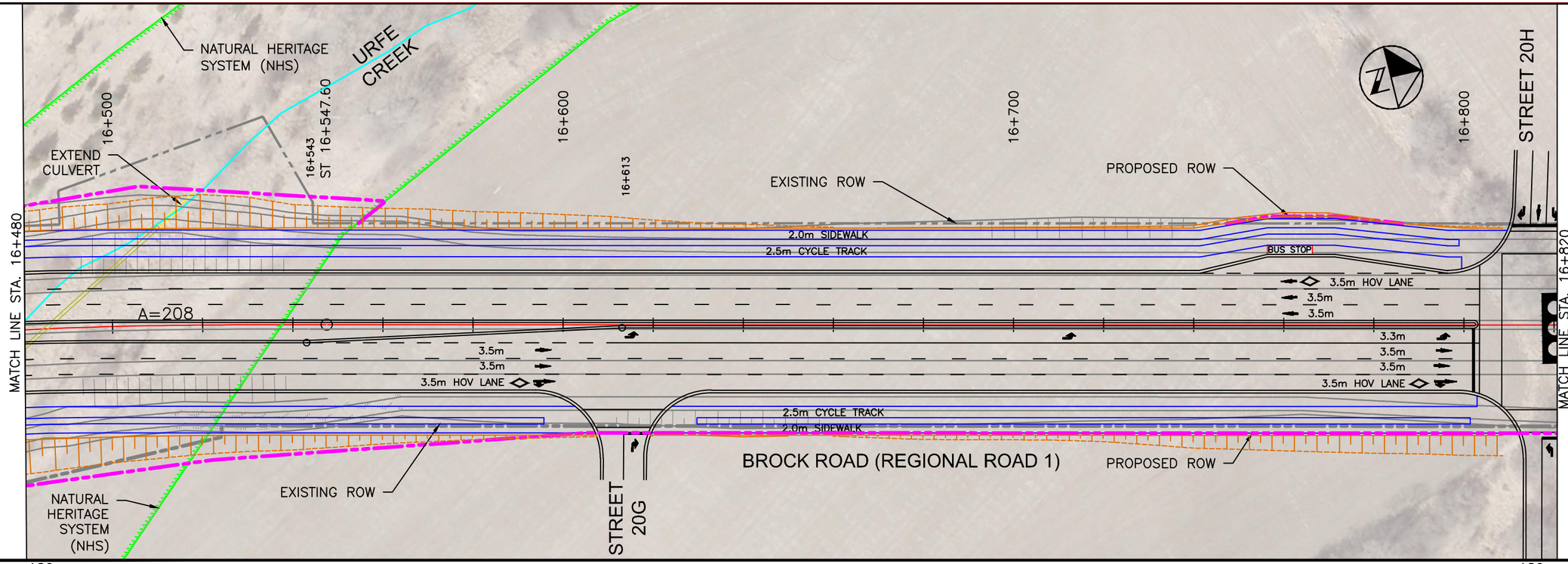
JUNE 26, 2014

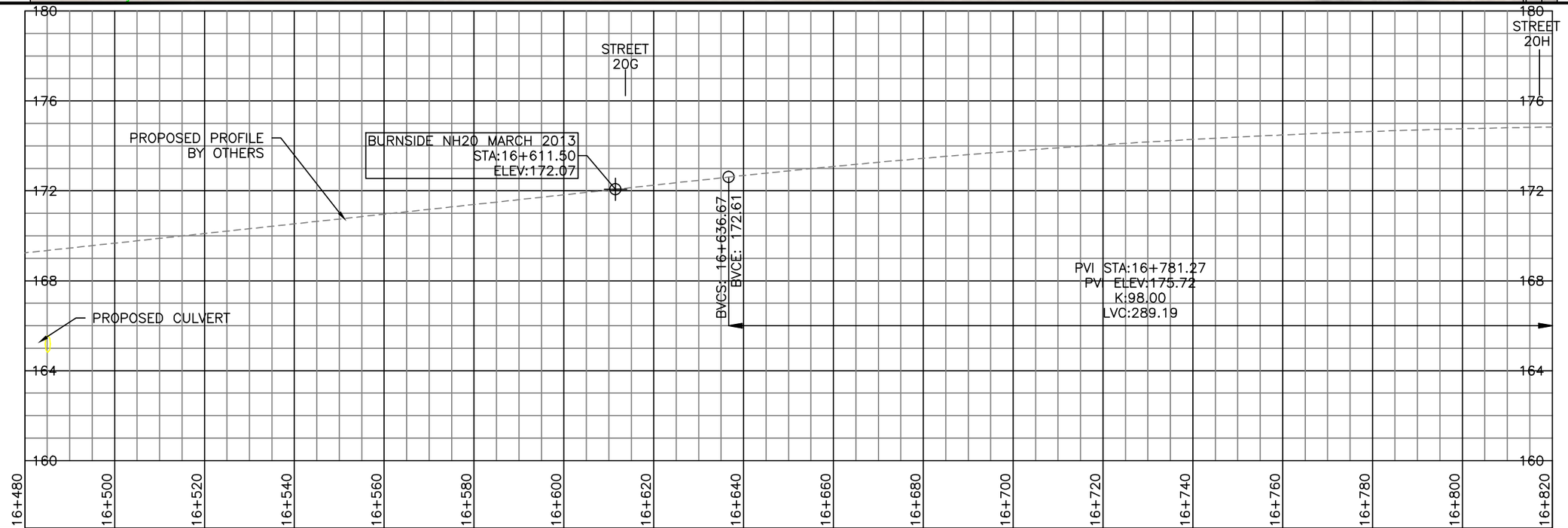
SCALE
HORIZONTAL 10m 0 10m
VERTICAL 2m 0 2m

BROCK ROAD (REGIONAL ROAD 1)

STATION 16+120 TO 16+480

SHEET NO.
18





CENTRAL PICKERING DEVELOPMENT PLAN
CLASS ENVIRONMENTAL ASSESSMENT
FOR REGIONAL SERVICES IN
THE CITY OF PICKERING

NATURAL HERITAGE SYSTEM (NHS)
PROPOSED RIGHT OF WAY
EXISTING RIGHT OF WAY
LIMIT OF CUT
LIMIT OF FILL
CENTRE ALIGNMENT
WATER COURSE
EXISTING PROFILE
PROPOSED PROFILE

HDR

THE REGIONAL MUNICIPALITY OF DURHAM

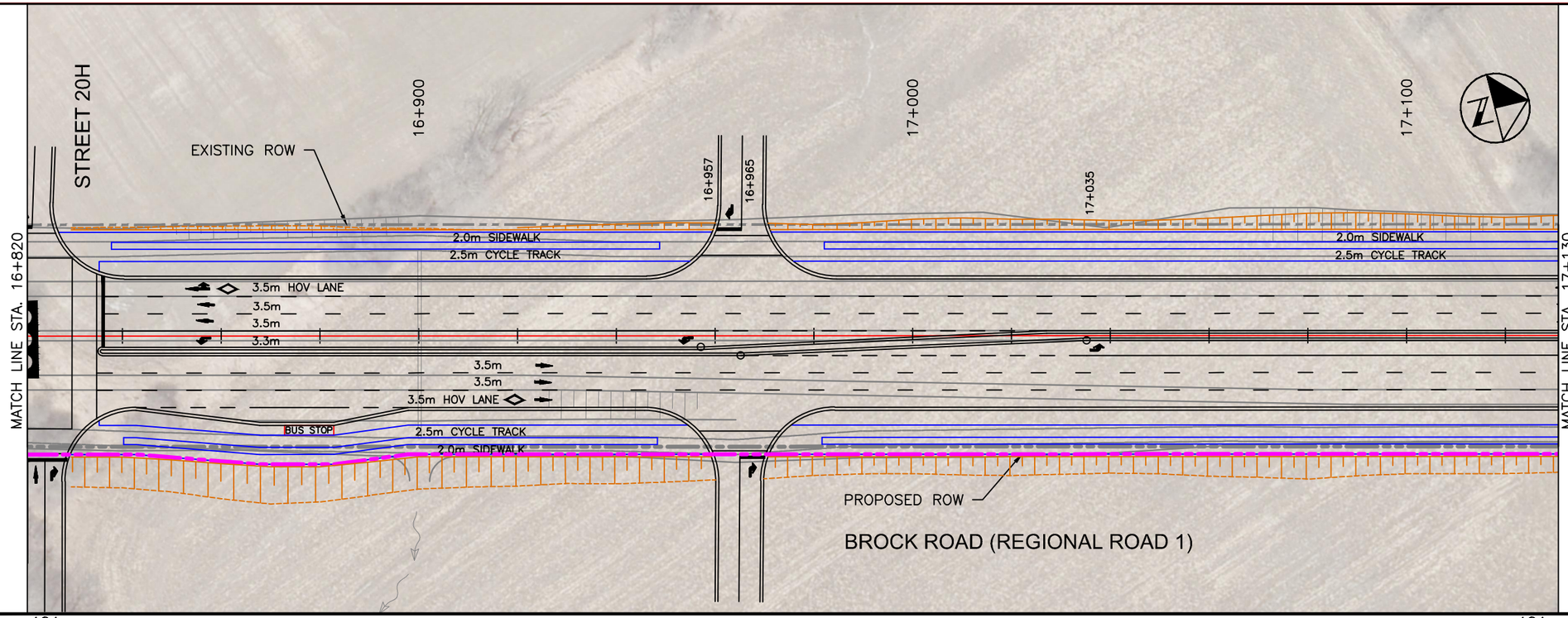
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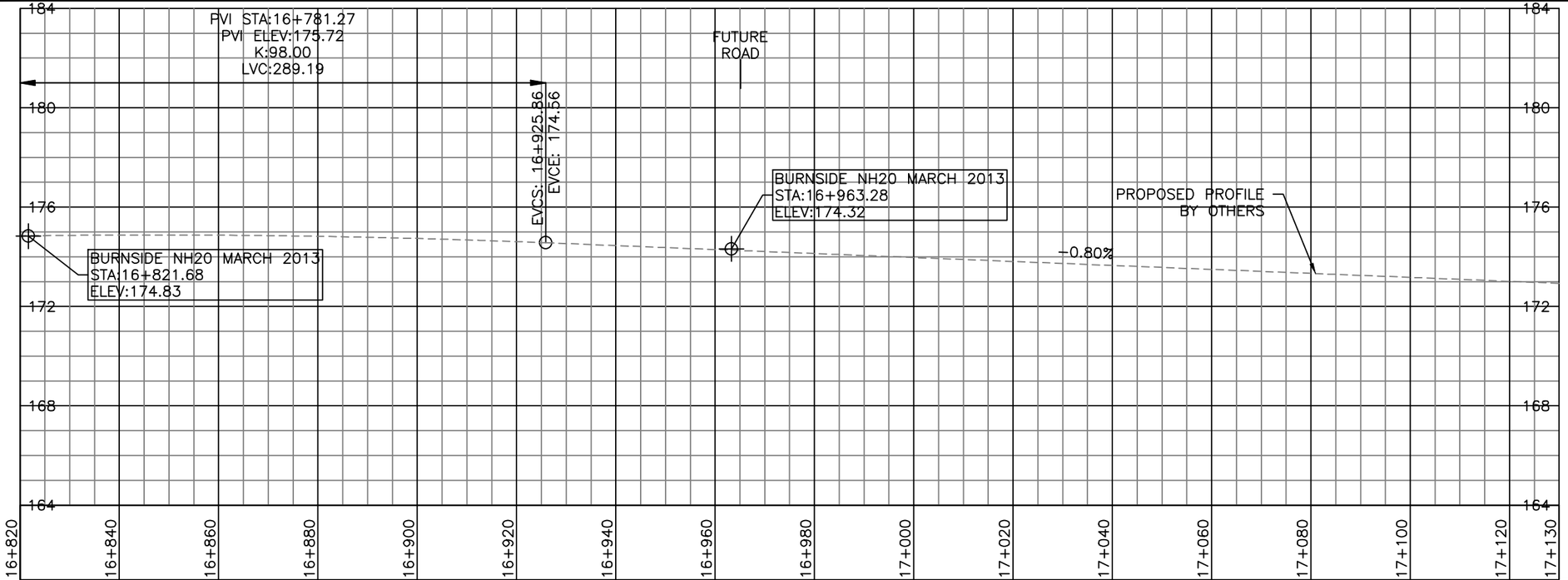
SCALE
HORIZONTAL 10m 0 10m
VERTICAL 2m 0 2m

BROCK ROAD (REGIONAL ROAD 1)

STATION 16+480 TO 16+820

SHEET NO.
19





CENTRAL PICKERING DEVELOPMENT PLAN
CLASS ENVIRONMENTAL ASSESSMENT
FOR REGIONAL SERVICES IN
THE CITY OF PICKERING

NATURAL HERITAGE SYSTEM (NHS)
PROPOSED RIGHT OF WAY
EXISTING RIGHT OF WAY
LIMIT OF CUT
LIMIT OF FILL
CENTRE ALIGNMENT
WATER COURSE
EXISTING PROFILE
PROPOSED PROFILE

HDR

THE REGIONAL MUNICIPALITY OF DURHAM

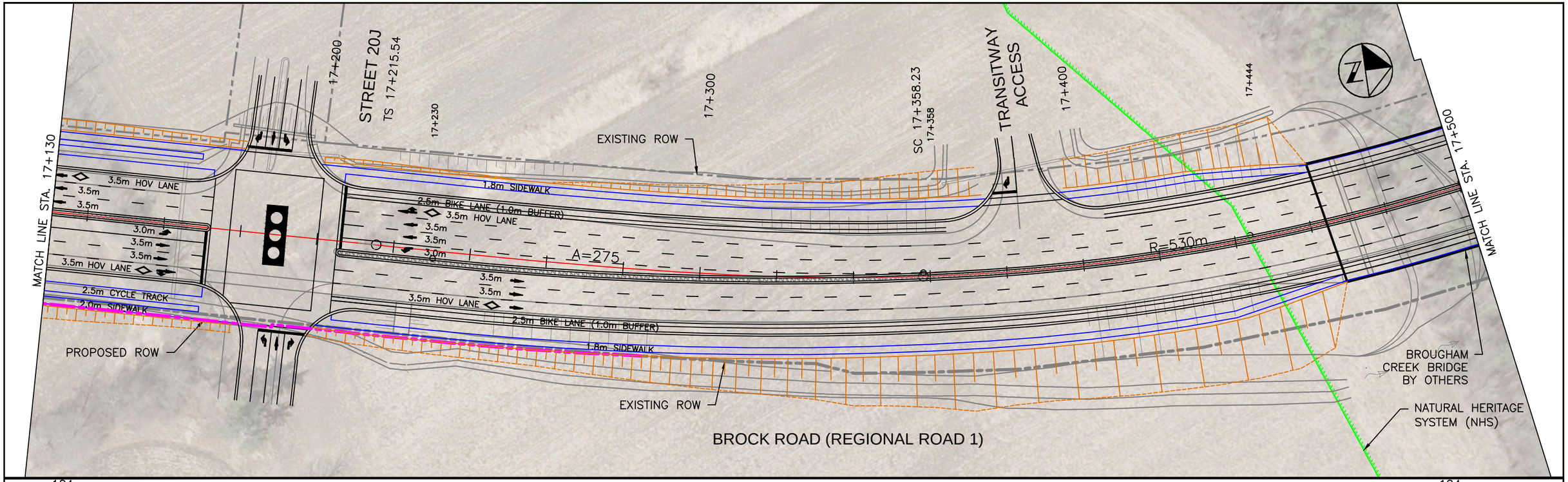
JUNE 26, 2014

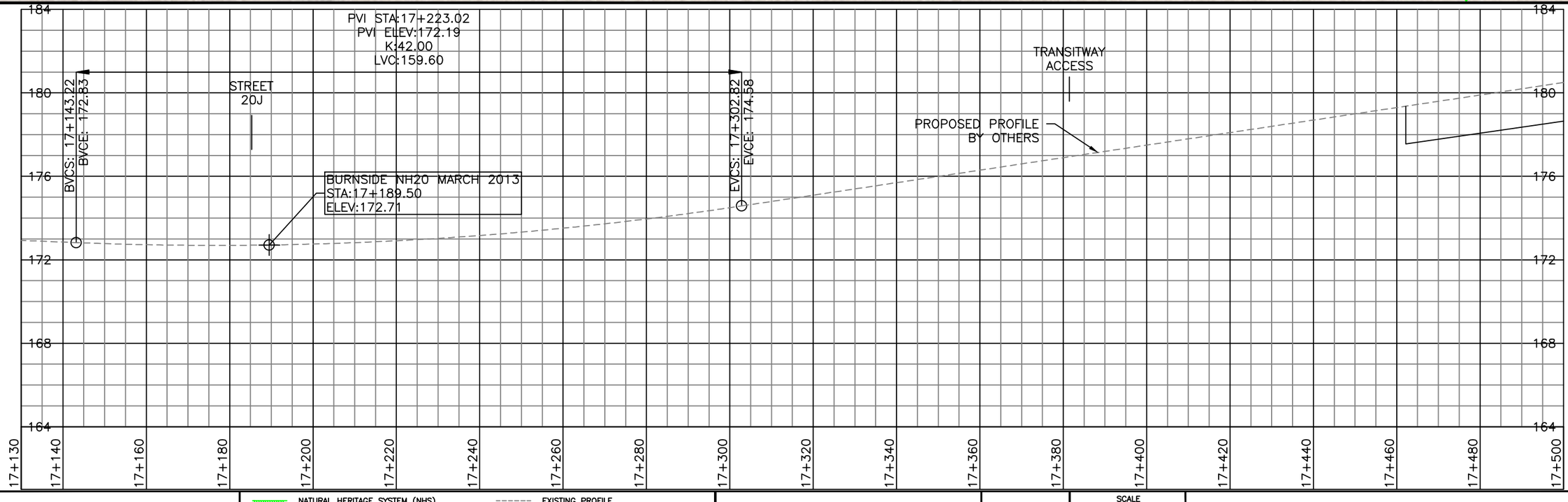
SCALE
HORIZONTAL 10m 0 10m
VERTICAL 2m 0 2m

BROCK ROAD (REGIONAL ROAD 1)

STATION 16+820 TO 17+130

SHEET NO.
20





CENTRAL PICKERING DEVELOPMENT PLAN
CLASS ENVIRONMENTAL ASSESSMENT
FOR REGIONAL SERVICES IN
THE CITY OF PICKERING

NATURAL HERITAGE SYSTEM (NHS)
PROPOSED RIGHT OF WAY
EXISTING RIGHT OF WAY
LIMIT OF CUT
LIMIT OF FILL
CENTRE ALIGNMENT
WATER COURSE
EXISTING PROFILE
PROPOSED PROFILE

HDR

THE REGIONAL MUNICIPALITY OF DURHAM

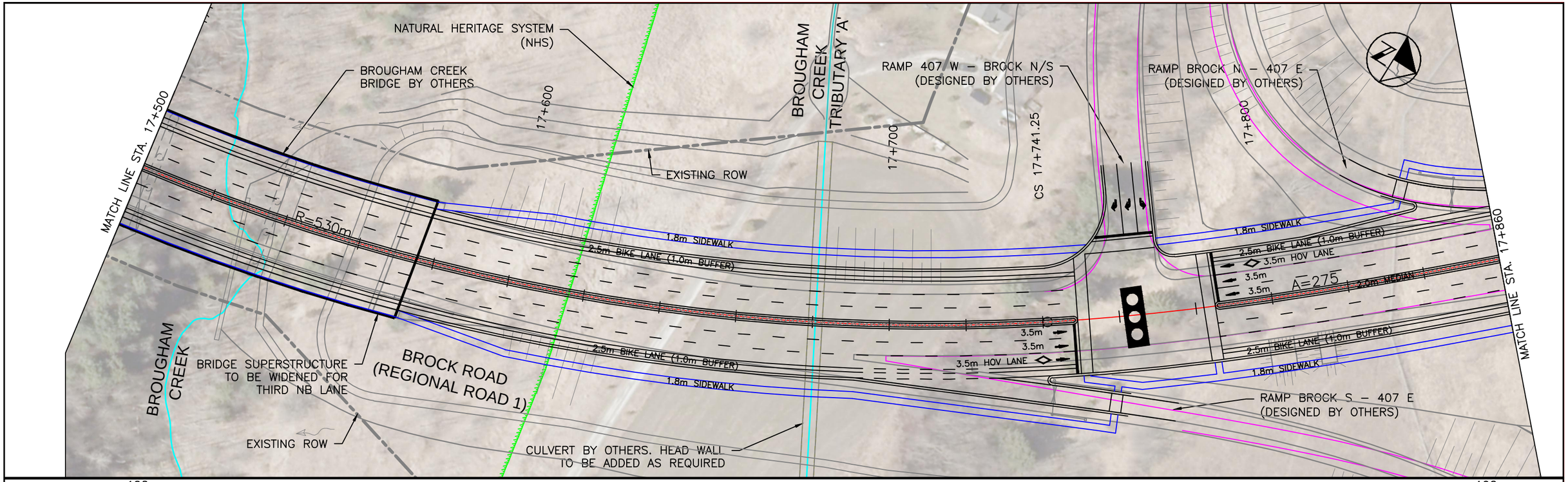
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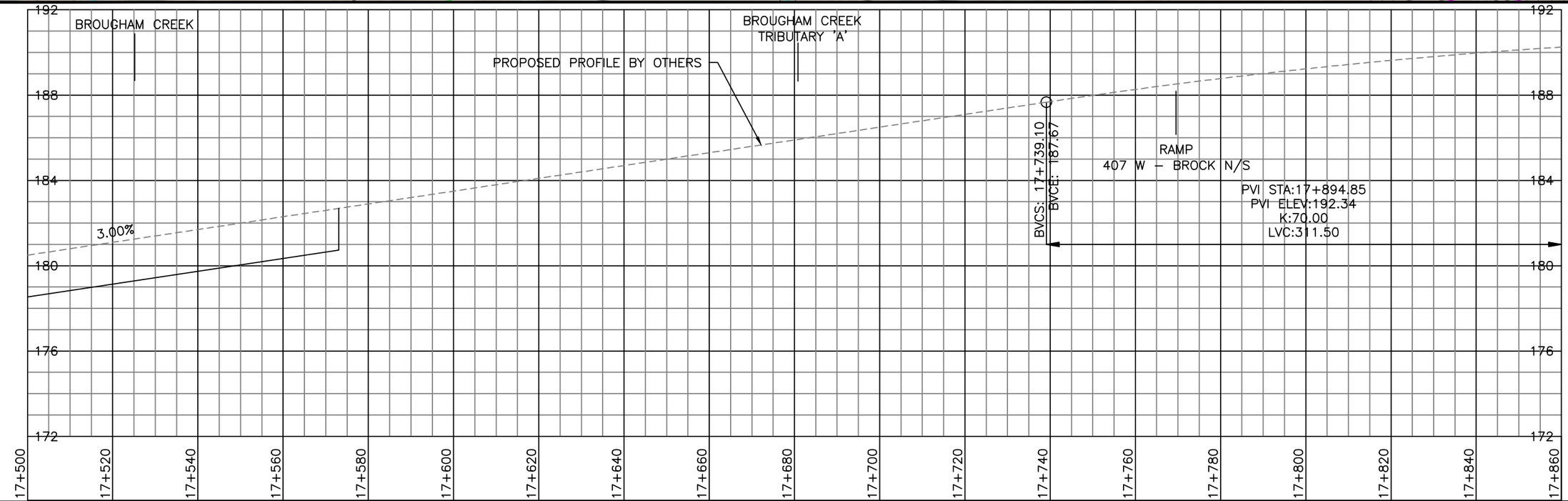
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VERTICAL 2m 0 2m

BROCK ROAD (REGIONAL ROAD 1)

STATION 17+130 TO 17+500

SHEET NO.
21





CENTRAL PICKERING DEVELOPMENT PLAN
CLASS ENVIRONMENTAL ASSESSMENT
FOR REGIONAL SERVICES IN
THE CITY OF PICKERING

NATURAL HERITAGE SYSTEM (NHS)
PROPOSED RIGHT OF WAY
EXISTING RIGHT OF WAY
LIMIT OF CUT
LIMIT OF FILL
CENTRE ALIGNMENT
WATER COURSE
EXISTING PROFILE
PROPOSED PROFILE

HDR

THE REGIONAL MUNICIPALITY OF DURHAM

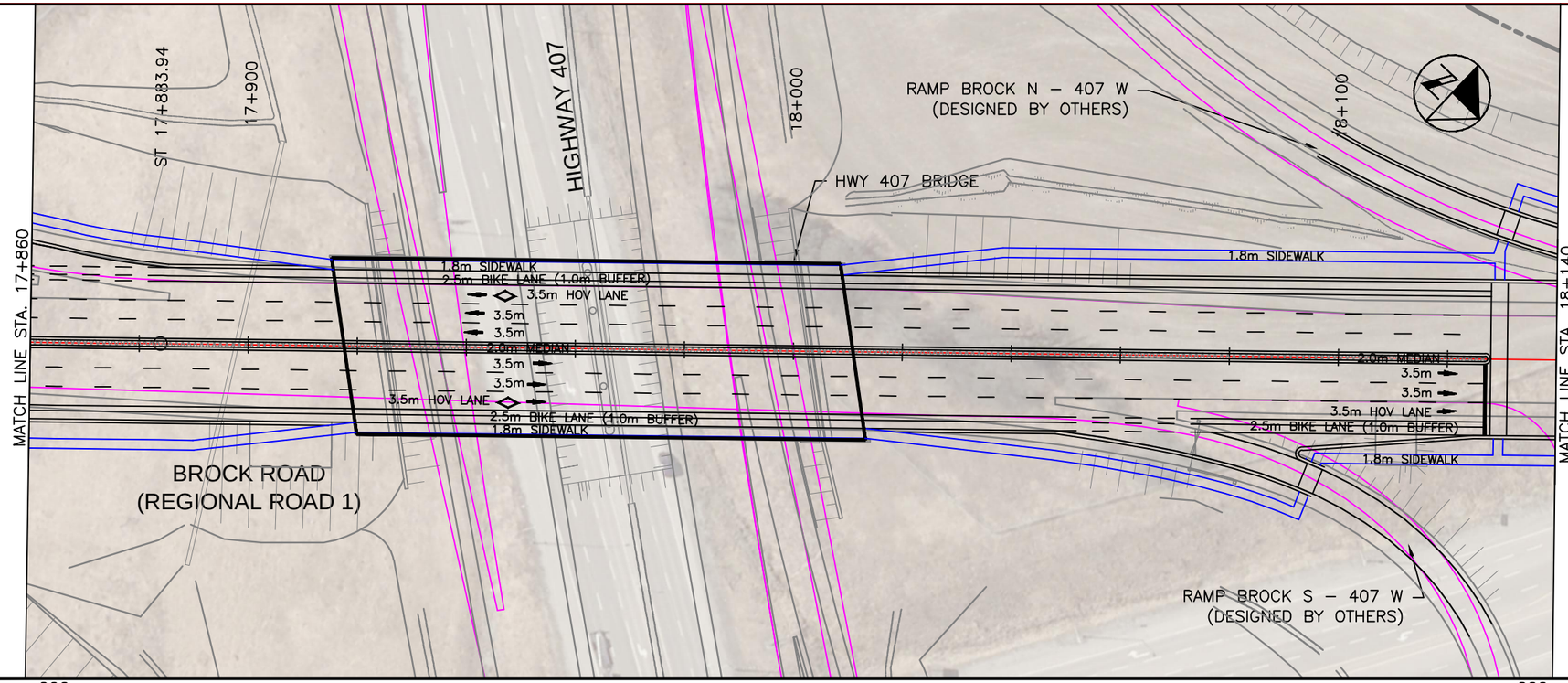
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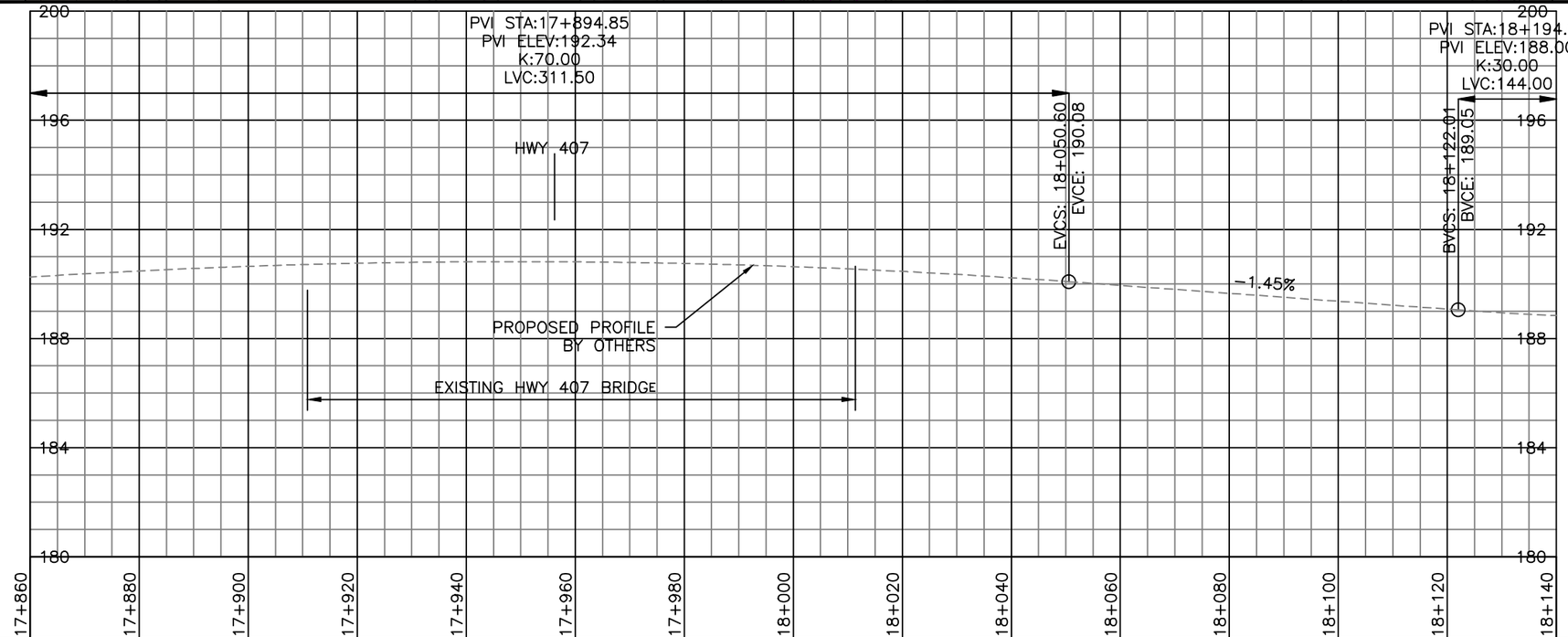
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VERTICAL 2m 0 2m

BROCK ROAD (REGIONAL ROAD 1)

STATION 17+500 TO 17+860

SHEET NO.
22





CENTRAL PICKERING DEVELOPMENT PLAN
CLASS ENVIRONMENTAL ASSESSMENT
FOR REGIONAL SERVICES IN
THE CITY OF PICKERING

NATURAL HERITAGE SYSTEM (NHS)
PROPOSED RIGHT OF WAY
EXISTING RIGHT OF WAY
LIMIT OF CUT
LIMIT OF FILL
CENTRE ALIGNMENT
WATER COURSE
EXISTING PROFILE
PROPOSED PROFILE

HDR

THE REGIONAL MUNICIPALITY OF DURHAM

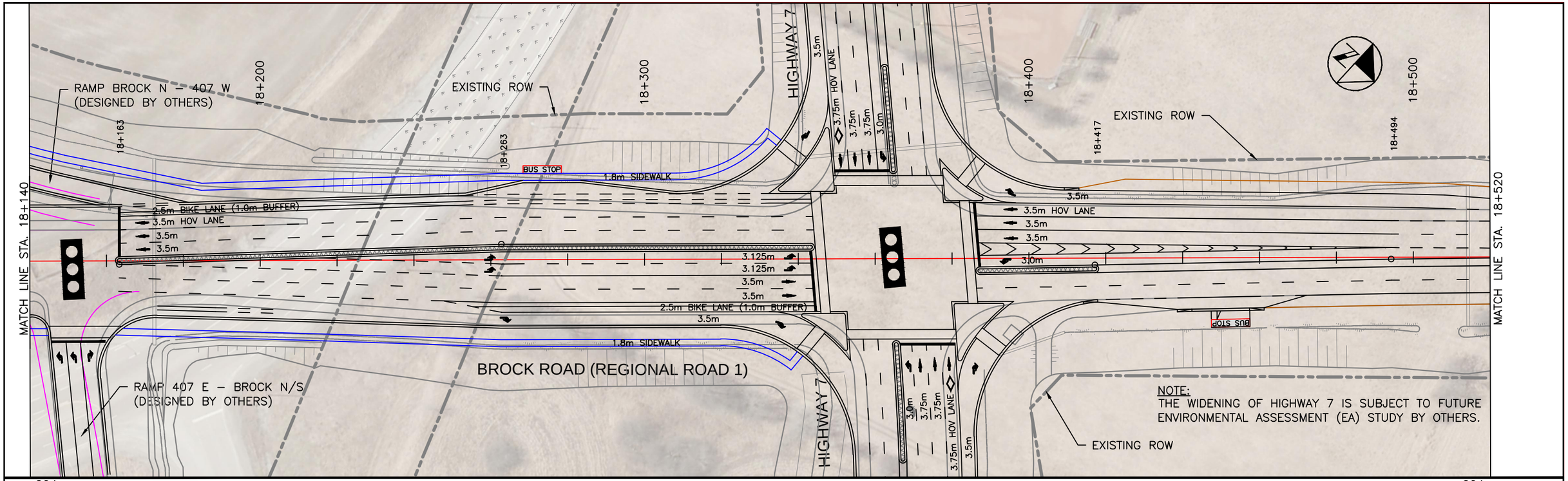
JUNE 26, 2014

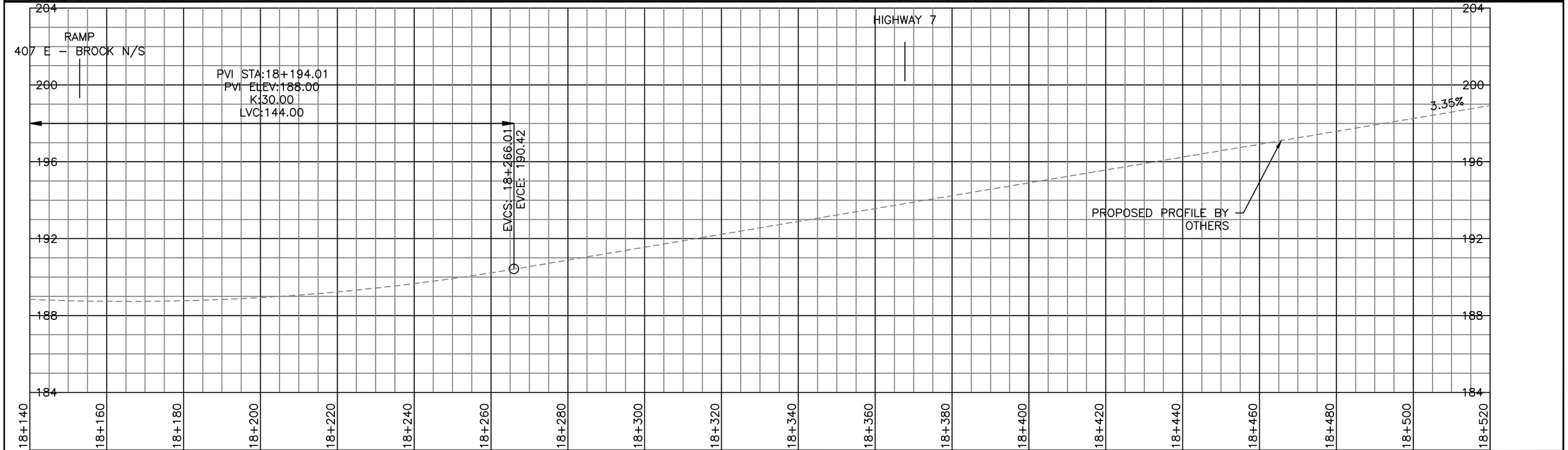
SCALE
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VERTICAL 2m 0 2m

BROCK ROAD (REGIONAL ROAD 1)

STATION 17+860 TO 18+140

SHEET NO.
23





CENTRAL PICKERING DEVELOPMENT PLAN
CLASS ENVIRONMENTAL ASSESSMENT
FOR REGIONAL SERVICES IN
THE CITY OF PICKERING

NATURAL HERITAGE SYSTEM (NHS)
PROPOSED RIGHT OF WAY
EXISTING RIGHT OF WAY
LIMIT OF CUT
LIMIT OF FILL
CENTRE ALIGNMENT
WATER COURSE
EXISTING PROFILE
PROPOSED PROFILE

HDR

THE REGIONAL MUNICIPALITY OF DURHAM

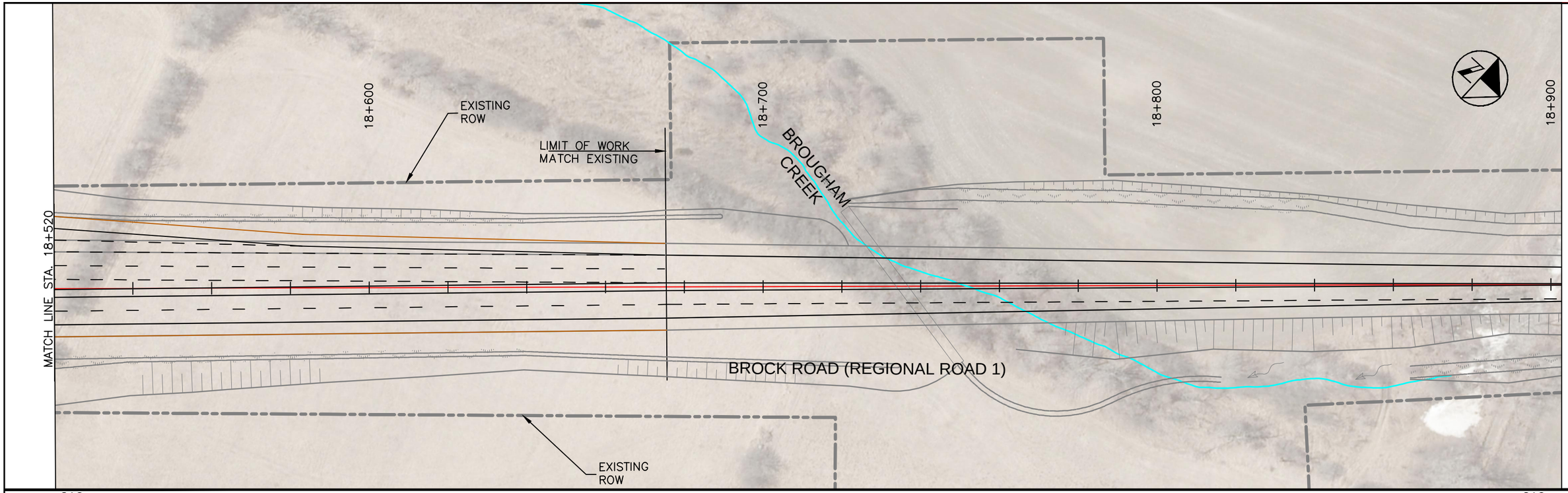
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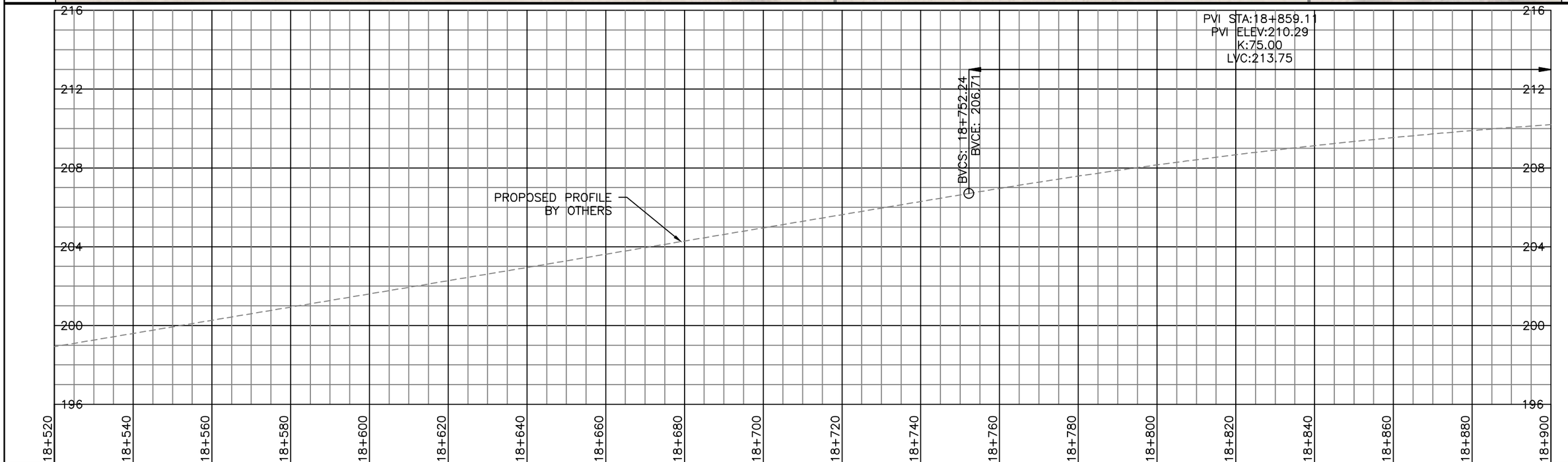
SCALE
HORIZONTAL 10m 0 10m
VERTICAL 2m 0 2m

BROCK ROAD (REGIONAL ROAD 1)

STATION 18+140 TO 18+520

SHEET NO.
24





CENTRAL PICKERING DEVELOPMENT PLAN
CLASS ENVIRONMENTAL ASSESSMENT
FOR REGIONAL SERVICES IN
THE CITY OF PICKERING

NATURAL HERITAGE SYSTEM (NHS)
PROPOSED RIGHT OF WAY
EXISTING RIGHT OF WAY
LIMIT OF CUT
LIMIT OF FILL
CENTRE ALIGNMENT
WATER COURSE
EXISTING PROFILE
PROPOSED PROFILE

HDR

THE REGIONAL MUNICIPALITY OF DURHAM

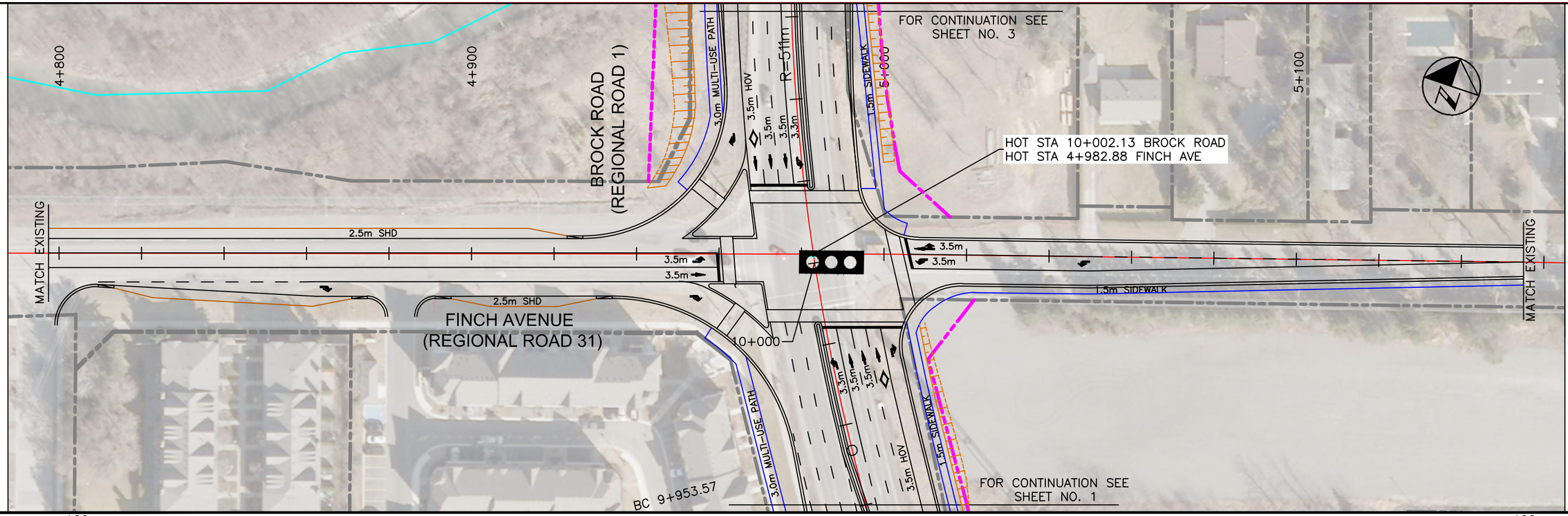
JUNE 26, 2014

SCALE
HORIZONTAL 10m 0 10m
VERTICAL 2m 0 2m

BROCK ROAD (REGIONAL ROAD 1)

STATION 18+520 TO 18+675

SHEET NO.
25



CENTRAL PICKERING DEVELOPMENT PLAN
CLASS ENVIRONMENTAL ASSESSMENT
FOR REGIONAL SERVICES IN
THE CITY OF PICKERING

NATURAL HERITAGE SYSTEM (NHS)
PROPOSED RIGHT OF WAY
EXISTING RIGHT OF WAY
LIMIT OF CUT
LIMIT OF FILL
CENTRE ALIGNMENT
WATER COURSE
EXISTING PROFILE
PROPOSED PROFILE

HDR

THE REGIONAL MUNICIPALITY OF DURHAM

JUNE 26, 2014

SCALE
HORIZONTAL 10m 0 10m
VERTICAL 2m 0 2m

FINCH AVENUE (REGIONAL ROAD 37)

STATION 4+800 TO 5+160

SHEET NO.
26

APPENDIX E

Level of Service Definitions

Level of Service Definitions

Two-Way Stop Controlled Intersections

Level of Service	Control Delay per Vehicle (seconds)	Interpretation
A	≤ 10	EXCELLENT. Large and frequent gaps in traffic on the main roadway. Queuing on the minor street is rare.
B	> 10 and ≤ 15	VERY GOOD. Many gaps exist in traffic on the main roadway. Queuing on the minor street is minimal.
C	> 15 and ≤ 25	GOOD. Fewer gaps exist in traffic on the main roadway. Delay on minor approach becomes more noticeable.
D	> 25 and ≤ 35	FAIR. Infrequent and shorter gaps in traffic on the main roadway. Queue lengths develop on the minor street.
E	> 35 and ≤ 50	POOR. Very infrequent gaps in traffic on the main roadway. Queue lengths become noticeable.
F	> 50	UNSATISFACTORY. Very few gaps in traffic on the main roadway. Excessive delay with significant queue lengths on the minor street.

Adapted from Highway Capacity Manual 2000, Transportation Research Board

Signalized Intersections

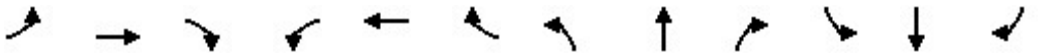
Level of Service	Control Delay per Vehicle (seconds)	Interpretation
A	≤ 10	EXCELLENT. Extremely favourable progression with most vehicles arriving during the green phase. Most vehicles do not stop and short cycle lengths may contribute to low delay.
B	> 10 and ≤ 20	VERY GOOD. Very good progression and/or short cycle lengths with slightly more vehicles stopping than LOS "A" causing slightly higher levels of average delay.
C	> 20 and ≤ 35	GOOD. Fair progression and longer cycle lengths lead to a greater number of vehicles stopping than LOS "B".
D	> 35 and ≤ 55	FAIR. Congestion becomes noticeable with higher average delays resulting from a combination of long cycle lengths, high volume-to-capacity ratios and unfavourable progression.
E	> 55 and ≤ 80	POOR. Lengthy delays values are indicative of poor progression, long cycle lengths and high volume-to-capacity ratios. Individual cycle failures are common with individual movement failures also common.
F	> 80	UNSATISFACTORY. Indicative of oversaturated conditions with vehicular demand greater than the capacity of the intersection.

Adapted from Highway Capacity Manual 2000, Transportation Research Board

APPENDIX F

Detailed Capacity Analysis

Without Road Widening



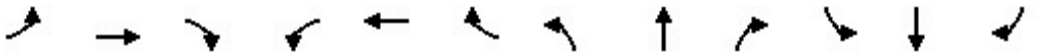
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	3	224	19	4	5	119	672	3	1	1777	179
Future Volume (vph)	140	3	224	19	4	5	119	672	3	1	1777	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5	3.5
Storage Length (m)	0.0		0.0	0.0		0.0	63.0		0.0	13.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			20.0			41.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		1.00	0.99		1.00			1.00		1.00	1.00	
Frt			0.850		0.977			0.999			0.986	
Flt Protected		0.953			0.967		0.950			0.950		
Satd. Flow (prot)	0	1696	1568	0	1519	0	1574	3072	0	852	3339	0
Flt Permitted		0.709			0.755		0.064			0.387		
Satd. Flow (perm)	0	1260	1545	0	1184	0	106	3072	0	346	3339	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			205		5			1			15	
Link Speed (k/h)		60			40			60			60	
Link Distance (m)		416.8			328.7			124.4			367.1	
Travel Time (s)		25.0			29.6			7.5			22.0	
Confl. Peds. (#/hr)	1		2	2		1	9		3	3		9
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	7%	16%	33%	100%	5%	5%
Adj. Flow (vph)	144	3	231	20	4	5	123	693	3	1	1832	185
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	147	231	0	29	0	123	696	0	1	2017	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.1			3.1	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.00	1.00	1.00	1.00	1.09	1.01	1.01	1.08	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		5.0	20.0		20.0	20.0	
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0		9.0	28.0		28.0	28.0	
Total Split (s)	31.0	31.0	31.0	31.0	31.0		14.0	69.0		55.0	55.0	
Total Split (%)	31.0%	31.0%	31.0%	31.0%	31.0%		14.0%	69.0%		55.0%	55.0%	
Maximum Green (s)	24.6	24.6	24.6	24.6	24.6		11.0	62.8		48.8	48.8	
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2		3.0	4.2		4.2	4.2	
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.4	6.4		6.4		3.0	6.2		6.2	6.2	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	16.0	16.0	16.0	16.0	16.0			14.0		14.0	14.0	
Flash Dont Walk (s)	5.0	5.0	5.0	5.0	5.0			5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0	0	0	0			0		0	0	
Act Effct Green (s)		16.8	16.8		16.8		73.8	70.6		59.1	59.1	
Actuated g/C Ratio		0.17	0.17		0.17		0.74	0.71		0.59	0.59	
v/c Ratio		0.69	0.54		0.14		0.61	0.32		0.00	1.02	
Control Delay		55.3	11.7		29.9		28.3	6.7		6.0	37.4	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		55.3	11.7		29.9		28.3	6.7		6.0	37.4	
LOS		E	B		C		C	A		A	D	
Approach Delay		28.7			29.9			10.0			37.4	
Approach LOS		C			C			A			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 2 (2%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.02			
Intersection Signal Delay: 29.4		Intersection LOS: C	
Intersection Capacity Utilization 92.1%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Brock Road & Finch Avenue





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	3	224	19	4	5	119	672	3	1	1777	179
Future Volume (vph)	140	3	224	19	4	5	119	672	3	1	1777	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5	3.5
Total Lost time (s)		6.4	6.4		6.4		3.0	6.2		6.2	6.2	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.98		1.00	1.00		1.00	0.99	
Flt Protected		0.95	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1694	1545		1515		1574	3073		850	3340	
Flt Permitted		0.71	1.00		0.76		0.06	1.00		0.39	1.00	
Satd. Flow (perm)		1260	1545		1184		107	3073		346	3340	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	144	3	231	20	4	5	123	693	3	1	1832	185
RTOR Reduction (vph)	0	0	171	0	4	0	0	0	0	0	6	0
Lane Group Flow (vph)	0	147	60	0	25	0	123	696	0	1	2011	0
Confl. Peds. (#/hr)	1		2	2		1	9		3	3		9
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	7%	16%	33%	100%	5%	5%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		16.8	16.8		16.8		70.6	70.6		59.2	59.2	
Effective Green, g (s)		16.8	16.8		16.8		70.6	70.6		59.2	59.2	
Actuated g/C Ratio		0.17	0.17		0.17		0.71	0.71		0.59	0.59	
Clearance Time (s)		6.4	6.4		6.4		3.0	6.2		6.2	6.2	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		211	259		198		198	2169		204	1977	
v/s Ratio Prot							c0.05	0.23			c0.60	
v/s Ratio Perm		c0.12	0.04		0.02		0.39			0.00		
v/c Ratio		0.70	0.23		0.13		0.62	0.32		0.00	1.02	
Uniform Delay, d1		39.2	36.0		35.4		24.9	5.6		8.3	20.4	
Progression Factor		1.00	1.00		1.00		1.00	1.00		0.48	0.70	
Incremental Delay, d2		9.6	0.5		0.3		5.9	0.4		0.0	19.4	
Delay (s)		48.8	36.5		35.6		30.8	6.0		4.0	33.7	
Level of Service		D	D		D		C	A		A	C	
Approach Delay (s)		41.3			35.6			9.7			33.7	
Approach LOS		D			D			A			C	

Intersection Summary			
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	0	5	829	28	1	17	1961
Future Volume (vph)	0	5	829	28	1	17	1961
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	4.5	3.5	3.3	3.3	3.3	3.5
Storage Length (m)	0.0	0.0		38.0		60.0	
Storage Lanes	0	1		1		1	
Taper Length (m)	7.5					75.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Ped Bike Factor							
Frt		0.865		0.850			
Flt Protected						0.950	
Satd. Flow (prot)	0	1808	3131	1459	0	1651	3400
Flt Permitted						0.950	
Satd. Flow (perm)	0	1808	3131	1459	0	1651	3400
Link Speed (k/h)	40		60				60
Link Distance (m)	119.8		367.1				224.5
Travel Time (s)	10.8		22.0				13.5
Confl. Peds. (#/hr)				4		4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	14%	7%	0%	6%	5%
Adj. Flow (vph)	0	5	855	29	1	18	2022
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	5	855	29	0	19	2022
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	R NA	Left	Left
Median Width(m)	0.0		3.3				3.3
Link Offset(m)	0.0		0.0				0.0
Crosswalk Width(m)	4.8		4.8				4.8
Two way Left Turn Lane							
Headway Factor	1.00	0.88	1.01	1.04	1.04	1.04	1.01
Turning Speed (k/h)	25	15		15	15	25	
Sign Control	Stop		Free				Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 57.5%		ICU Level of Service B	
Analysis Period (min) 15			



Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	0	5	829	28	1	17	1961
Future Volume (Veh/h)	0	5	829	28	1	17	1961
Sign Control	Stop		Free				Free
Grade	0%		0%				0%
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	5	855	29	0	18	2022
Pedestrians	4						
Lane Width (m)	4.5						
Walking Speed (m/s)	1.2						
Percent Blockage	0						
Right turn flare (veh)							
Median type			None				None
Median storage veh)							
Upstream signal (m)			367				225
pX, platoon unblocked	0.55	0.97			0.00	0.97	
vC, conflicting volume	1906	432			0	888	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	793	363			0	832	
tC, single (s)	6.8	6.9			0.0	4.2	
tC, 2 stage (s)							
tF (s)	3.5	3.3			0.0	2.3	
p0 queue free %	100	99			0	98	
cM capacity (veh/h)	176	620			0	748	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	5	428	428	29	18	1011	1011
Volume Left	0	0	0	0	18	0	0
Volume Right	5	0	0	29	0	0	0
cSH	620	1700	1700	1700	748	1700	1700
Volume to Capacity	0.01	0.25	0.25	0.02	0.02	0.59	0.59
Queue Length 95th (m)	0.2	0.0	0.0	0.0	0.6	0.0	0.0
Control Delay (s)	10.9	0.0	0.0	0.0	9.9	0.0	0.0
Lane LOS	B				A		
Approach Delay (s)	10.9	0.0			0.1		
Approach LOS	B						

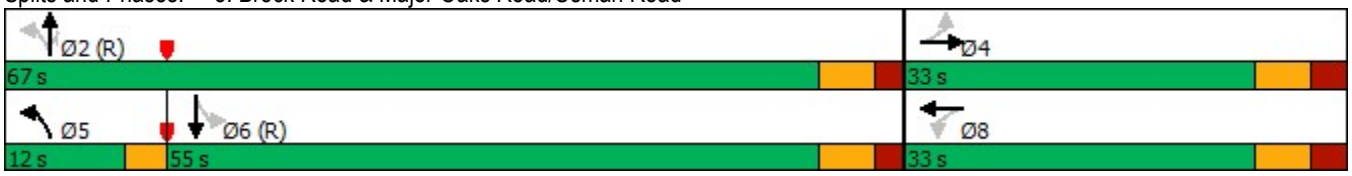
Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	4	238	86	5	7	110	696	9	2	1660	17
Future Volume (vph)	35	4	238	86	5	7	110	696	9	2	1660	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	4.8	4.8	4.8	3.5	3.7	3.7	3.0	3.5	3.5	3.0	3.5	3.5
Storage Length (m)	0.0		9.0	20.0		0.0	72.0		70.0	60.0		0.0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (m)	7.5			48.0			72.0			92.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor		0.99		1.00	0.99				0.98	1.00	1.00	
Frt		0.884			0.912				0.850		0.998	
Flt Protected		0.994		0.950			0.950			0.950		
Satd. Flow (prot)	0	1789	0	1733	1487	0	1589	3077	1439	1685	3388	0
Flt Permitted		0.953		0.295			0.064			0.373		
Satd. Flow (perm)	0	1714	0	538	1487	0	107	3077	1407	661	3388	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		177			7				44		1	
Link Speed (k/h)		50			40			60			60	
Link Distance (m)		292.9			123.2			224.5			180.3	
Travel Time (s)		21.1			11.1			13.5			10.8	
Confl. Peds. (#/hr)	6		1	1		6	3		1	1		3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	6%	25%	4%	3%	20%	14%	6%	16%	11%	0%	5%	18%
Adj. Flow (vph)	37	4	251	91	5	7	116	733	9	2	1747	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	292	0	91	12	0	116	733	9	2	1765	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.85	0.85	0.85	1.01	0.99	0.99	1.09	1.01	1.01	1.09	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	1		1	1		1	0	0	1	0	
Detector Template	Left											
Leading Detector (m)	2.0	12.0		12.0	12.0		24.0	0.0	0.0	24.0	0.0	
Trailing Detector (m)	0.0	-3.0		-3.0	-3.0		14.0	0.0	0.0	14.0	0.0	
Detector 1 Position(m)	0.0	-3.0		-3.0	-3.0		14.0	0.0	0.0	14.0	0.0	
Detector 1 Size(m)	2.0	15.0		15.0	15.0		10.0	0.6	2.0	10.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		5	2	2	6	6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		5.0	20.0	20.0	20.0	20.0	
Minimum Split (s)	32.0	32.0		32.0	32.0		8.0	29.0	29.0	29.0	29.0	
Total Split (s)	33.0	33.0		33.0	33.0		12.0	67.0	67.0	55.0	55.0	
Total Split (%)	33.0%	33.0%		33.0%	33.0%		12.0%	67.0%	67.0%	55.0%	55.0%	
Maximum Green (s)	26.0	26.0		26.0	26.0		9.0	60.6	60.6	48.6	48.6	
Yellow Time (s)	4.1	4.1		4.1	4.1		3.0	4.2	4.2	4.2	4.2	
All-Red Time (s)	2.9	2.9		2.9	2.9		0.0	2.2	2.2	2.2	2.2	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		7.0		7.0	7.0		3.0	6.4	6.4	6.4	6.4	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None		None	C-Max	C-Max	C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0			14.0	14.0	14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0			0	0	0	0	
Act Effct Green (s)		16.7		16.7	16.7		73.3	69.9	69.9	59.7	59.7	
Actuated g/C Ratio		0.17		0.17	0.17		0.73	0.70	0.70	0.60	0.60	
v/c Ratio		0.67		1.01	0.05		0.63	0.34	0.01	0.01	0.87	
Control Delay		22.4		140.8	23.7		26.3	10.3	1.9	12.0	25.3	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		22.4		140.8	23.7		26.3	10.3	1.9	12.0	25.3	
LOS		C		F	C		C	B	A	B	C	
Approach Delay		22.4			127.1			12.4			25.3	
Approach LOS		C			F			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 59 (59%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.01			
Intersection Signal Delay: 24.8		Intersection LOS: C	
Intersection Capacity Utilization 91.7%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 3: Brock Road & Major Oaks Road/Usman Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	4	238	86	5	7	110	696	9	2	1660	17
Future Volume (vph)	35	4	238	86	5	7	110	696	9	2	1660	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	4.8	4.8	4.8	3.5	3.7	3.7	3.0	3.5	3.5	3.0	3.5	3.5
Total Lost time (s)		7.0		7.0	7.0		3.0	6.4	6.4	6.4	6.4	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		0.99		1.00	0.99		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		0.88		1.00	0.91		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.99		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1787		1732	1488		1589	3077	1407	1683	3389	
Flt Permitted		0.95		0.30	1.00		0.06	1.00	1.00	0.37	1.00	
Satd. Flow (perm)		1713		538	1488		107	3077	1407	661	3389	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	37	4	251	91	5	7	116	733	9	2	1747	18
RTOR Reduction (vph)	0	147	0	0	6	0	0	0	3	0	0	0
Lane Group Flow (vph)	0	145	0	91	6	0	116	733	6	2	1765	0
Confl. Peds. (#/hr)	6		1	1		6	3		1	1		3
Heavy Vehicles (%)	6%	25%	4%	3%	20%	14%	6%	16%	11%	0%	5%	18%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)		16.7		16.7	16.7		69.9	69.9	69.9	59.7	59.7	
Effective Green, g (s)		16.7		16.7	16.7		69.9	69.9	69.9	59.7	59.7	
Actuated g/C Ratio		0.17		0.17	0.17		0.70	0.70	0.70	0.60	0.60	
Clearance Time (s)		7.0		7.0	7.0		3.0	6.4	6.4	6.4	6.4	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		286		89	248		181	2150	983	394	2023	
v/s Ratio Prot					0.00		c0.05	0.24			c0.52	
v/s Ratio Perm		0.08		c0.17			0.40		0.00	0.00		
v/c Ratio		0.51		1.02	0.02		0.64	0.34	0.01	0.01	0.87	
Uniform Delay, d1		37.9		41.6	34.8		19.5	5.9	4.6	8.1	16.9	
Progression Factor		1.00		1.03	1.10		0.80	1.44	1.00	1.00	1.00	
Incremental Delay, d2		1.4		100.9	0.0		7.2	0.4	0.0	0.0	5.5	
Delay (s)		39.3		143.8	38.4		22.8	9.0	4.6	8.2	22.5	
Level of Service		D		F	D		C	A	A	A	C	
Approach Delay (s)		39.3			131.5			10.8			22.5	
Approach LOS		D			F			B			C	

Intersection Summary			
HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	91.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	382	15	239	14	4	7	1	225	1687	20	5	892
Future Volume (vph)	382	15	239	14	4	7	1	225	1687	20	5	892
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.6	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5
Storage Length (m)	0.0		0.0	0.0		0.0		63.0		0.0	13.0	
Storage Lanes	0		1	0		0		1		0	1	
Taper Length (m)	7.5			7.5				20.0			41.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor		1.00			1.00			1.00	1.00			0.99
Frt			0.850		0.962				0.998			0.978
Flt Protected		0.954			0.973			0.950			0.950	
Satd. Flow (prot)	0	1771	1568	0	1704	0	0	1668	3459	0	1705	3302
Flt Permitted		0.716			0.592			0.176			0.080	
Satd. Flow (perm)	0	1326	1568	0	1037	0	0	308	3459	0	144	3302
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			201		7				2			30
Link Speed (k/h)		60			40				60			60
Link Distance (m)		416.8			328.7				124.4			367.1
Travel Time (s)		25.0			29.6				7.5			22.0
Confl. Peds. (#/hr)	2					2		8		6	6	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	1%	7%	3%	0%	0%	14%	0%	1%	3%	0%	0%	6%
Adj. Flow (vph)	390	15	244	14	4	7	1	230	1721	20	5	910
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	405	244	0	25	0	0	231	1741	0	5	1070
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	Left	Left
Median Width(m)		0.0			0.0				3.1			3.1
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		4.8			4.8				4.8			4.8
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.00	1.00	1.00	1.00	1.00	1.09	1.01	1.01	1.08	1.01
Turning Speed (k/h)	25		15	25		15	15	25		15	25	
Number of Detectors	1	2	1	1	2		1	1	2		1	2
Detector Template	Left	Thru	Right	Left	Thru		Left	Left	Thru		Left	Thru
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	2.0	10.0		2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	2.0	0.6		2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4			9.4				9.4			9.4
Detector 2 Size(m)		0.6			0.6				0.6			0.6
Detector 2 Type		Cl+Ex			Cl+Ex				Cl+Ex			Cl+Ex
Detector 2 Channel												



Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	157
Future Volume (vph)	157
Ideal Flow (vphpl)	1900
Lane Width (m)	3.5
Storage Length (m)	0.0
Storage Lanes	0
Taper Length (m)	
Lane Util. Factor	0.95
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	Yes
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	8
Peak Hour Factor	0.98
Heavy Vehicles (%)	0%
Adj. Flow (vph)	160
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	1.01
Turning Speed (k/h)	15
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Detector 2 Extend (s)		0.0			0.0				0.0			0.0
Turn Type	Perm	NA	Perm	Perm	NA		custom	pm+pt	NA		Perm	NA
Protected Phases		4			8			5	2			6
Permitted Phases	4		4	8			5	2			6	
Detector Phase	4	4	4	8	8		5	5	2		6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		5.0	5.0	20.0		20.0	20.0
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0		9.0	9.0	28.0		28.0	28.0
Total Split (s)	31.0	31.0	31.0	31.0	31.0		11.0	11.0	69.0		58.0	58.0
Total Split (%)	31.0%	31.0%	31.0%	31.0%	31.0%		11.0%	11.0%	69.0%		58.0%	58.0%
Maximum Green (s)	24.6	24.6	24.6	24.6	24.6		8.0	8.0	62.8		51.8	51.8
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2		3.0	3.0	4.2		4.2	4.2
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2		0.0	0.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)		6.4	6.4		6.4			3.0	6.2		6.2	6.2
Lead/Lag							Lead	Lead			Lag	Lag
Lead-Lag Optimize?							Yes	Yes			Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	None	None	None		None	None	C-Max		C-Max	C-Max
Walk Time (s)	16.0	16.0	16.0	16.0	16.0				14.0		14.0	14.0
Flash Dont Walk (s)	5.0	5.0	5.0	5.0	5.0				5.0		5.0	5.0
Pedestrian Calls (#/hr)	2	2	2	2	2				0		0	0
Act Effct Green (s)		24.6	24.6		24.6			66.0	62.8		51.8	51.8
Actuated g/C Ratio		0.25	0.25		0.25			0.66	0.63		0.52	0.52
v/c Ratio		1.24	0.45		0.10			0.74	0.80		0.07	0.62
Control Delay		166.6	10.4		24.3			23.2	17.6		15.8	24.7
Queue Delay		0.0	0.0		0.0			0.0	0.0		0.0	0.0
Total Delay		166.6	10.4		24.3			23.2	17.6		15.8	24.7
LOS		F	B		C			C	B		B	C
Approach Delay		107.9			24.3				18.2			24.7
Approach LOS		F			C				B			C

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 40 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.24			
Intersection Signal Delay: 35.8		Intersection LOS: D	
Intersection Capacity Utilization 108.2%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 1: Brock Road & Finch Avenue





Lane Group	SBR
Detector 2 Extend (s)	
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	382	15	239	14	4	7	1	225	1687	20	5	892
Future Volume (vph)	382	15	239	14	4	7	1	225	1687	20	5	892
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.6	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5
Total Lost time (s)		6.4	6.4		6.4			3.0	6.2		6.2	6.2
Lane Util. Factor		1.00	1.00		1.00			1.00	0.95		1.00	0.95
Frpb, ped/bikes		1.00	1.00		1.00			1.00	1.00		1.00	0.99
Flpb, ped/bikes		1.00	1.00		1.00			1.00	1.00		1.00	1.00
Frt		1.00	0.85		0.96			1.00	1.00		1.00	0.98
Flt Protected		0.95	1.00		0.97			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1766	1568		1704			1668	3460		1705	3300
Flt Permitted		0.72	1.00		0.59			0.18	1.00		0.08	1.00
Satd. Flow (perm)		1325	1568		1037			309	3460		143	3300
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	390	15	244	14	4	7	1	230	1721	20	5	910
RTOR Reduction (vph)	0	0	152	0	5	0	0	0	1	0	0	14
Lane Group Flow (vph)	0	405	92	0	20	0	0	231	1740	0	5	1056
Confl. Peds. (#/hr)	2					2		8		6	6	
Heavy Vehicles (%)	1%	7%	3%	0%	0%	14%	0%	1%	3%	0%	0%	6%
Turn Type	Perm	NA	Perm	Perm	NA		custom	pm+pt	NA		Perm	NA
Protected Phases		4			8			5	2			6
Permitted Phases	4		4	8			5	2			6	
Actuated Green, G (s)		24.6	24.6		24.6			62.8	62.8		51.8	51.8
Effective Green, g (s)		24.6	24.6		24.6			62.8	62.8		51.8	51.8
Actuated g/C Ratio		0.25	0.25		0.25			0.63	0.63		0.52	0.52
Clearance Time (s)		6.4	6.4		6.4			3.0	6.2		6.2	6.2
Vehicle Extension (s)		3.0	3.0		3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		325	385		255			302	2172		74	1709
v/s Ratio Prot								0.06	c0.50			0.32
v/s Ratio Perm		c0.31	0.06		0.02			0.42			0.03	
v/c Ratio		1.25	0.24		0.08			0.76	0.80		0.07	0.62
Uniform Delay, d1		37.7	30.2		29.0			11.5	13.9		12.0	17.1
Progression Factor		1.00	1.00		1.00			1.00	1.00		1.08	1.38
Incremental Delay, d2		134.0	0.3		0.1			11.0	3.2		1.6	1.6
Delay (s)		171.7	30.5		29.1			22.5	17.2		14.6	25.1
Level of Service		F	C		C			C	B		B	C
Approach Delay (s)		118.6			29.1				17.8			25.0
Approach LOS		F			C				B			C

Intersection Summary			
HCM 2000 Control Delay	37.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	108.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	157
Future Volume (vph)	157
Ideal Flow (vphpl)	1900
Lane Width	3.5
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.98
Adj. Flow (vph)	160
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	8
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary



Lane Group	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	0	18	2050	65	1	36	1067
Future Volume (vph)	0	18	2050	65	1	36	1067
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	4.5	3.5	3.3	3.3	3.3	3.5
Storage Length (m)	0.0	0.0		38.0		60.0	
Storage Lanes	0	1		1		1	
Taper Length (m)	7.5					75.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Ped Bike Factor							
Frt		0.865		0.850			
Flt Protected						0.950	
Satd. Flow (prot)	0	1808	3500	1561	0	1745	3400
Flt Permitted						0.950	
Satd. Flow (perm)	0	1808	3500	1561	0	1745	3400
Link Speed (k/h)	40		60				60
Link Distance (m)	119.8		367.1				224.5
Travel Time (s)	10.8		22.0				13.5
Confl. Peds. (#/hr)	1	1		6		6	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	5%
Adj. Flow (vph)	0	19	2135	68	1	38	1111
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	19	2135	68	0	39	1111
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	R NA	Left	Left
Median Width(m)	0.0		3.3				3.3
Link Offset(m)	0.0		0.0				0.0
Crosswalk Width(m)	4.8		4.8				4.8
Two way Left Turn Lane							
Headway Factor	1.00	0.88	1.01	1.04	1.04	1.04	1.01
Turning Speed (k/h)	25	15		15	15	25	
Sign Control	Stop		Free				Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 67.0%		ICU Level of Service C	
Analysis Period (min) 15			



Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	0	18	2050	65	1	36	1067
Future Volume (Veh/h)	0	18	2050	65	1	36	1067
Sign Control	Stop		Free				Free
Grade	0%		0%				0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	19	2135	68	0	38	1111
Pedestrians	6		1				1
Lane Width (m)	4.5		3.4				3.4
Walking Speed (m/s)	1.2		1.2				1.2
Percent Blockage	1		0				0
Right turn flare (veh)							
Median type			None				None
Median storage veh)							
Upstream signal (m)			367				225
pX, platoon unblocked	0.65	0.58			0.00	0.58	
vC, conflicting volume	2774	1074			0	2209	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1743	0			0	1640	
tC, single (s)	6.8	6.9			0.0	4.1	
tC, 2 stage (s)							
tF (s)	3.5	3.3			0.0	2.2	
p0 queue free %	100	97			0	84	
cM capacity (veh/h)	43	630			0	231	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	19	1068	1068	68	38	556	556
Volume Left	0	0	0	0	38	0	0
Volume Right	19	0	0	68	0	0	0
cSH	630	1700	1700	1700	231	1700	1700
Volume to Capacity	0.03	0.63	0.63	0.04	0.16	0.33	0.33
Queue Length 95th (m)	0.7	0.0	0.0	0.0	4.6	0.0	0.0
Control Delay (s)	10.9	0.0	0.0	0.0	23.6	0.0	0.0
Lane LOS	B				C		
Approach Delay (s)	10.9	0.0			0.8		
Approach LOS	B						

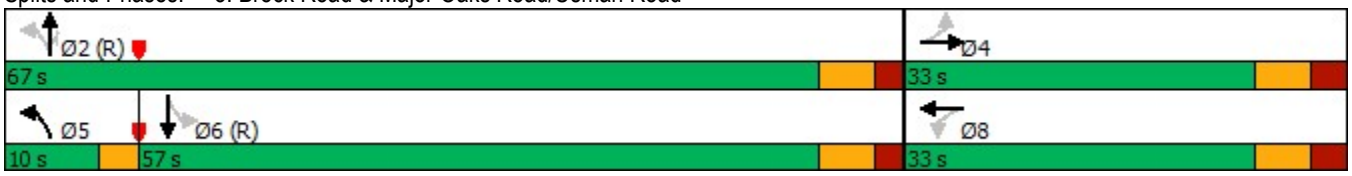
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	10	171	59	6	16	259	1789	25	21	859	31
Future Volume (vph)	20	10	171	59	6	16	259	1789	25	21	859	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	4.8	4.8	4.8	3.5	3.7	3.7	3.0	3.5	3.5	3.0	3.5	3.5
Storage Length (m)	0.0		9.0	20.0		0.0	72.0		70.0	60.0		0.0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (m)	7.5			48.0			72.0			92.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor		0.97		0.99	0.99		1.00		0.98		1.00	
Frt		0.885			0.891				0.850		0.995	
Flt Protected		0.995		0.950			0.950			0.950		
Satd. Flow (prot)	0	1807	0	1785	1617	0	1652	3466	1597	1685	3353	0
Flt Permitted		0.960		0.339			0.259			0.102		
Satd. Flow (perm)	0	1743	0	629	1617	0	448	3466	1561	181	3353	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		176			16				44		5	
Link Speed (k/h)		50			40			60			60	
Link Distance (m)		292.9			123.2			224.5			180.3	
Travel Time (s)		21.1			11.1			13.5			10.8	
Confl. Peds. (#/hr)	3		16	16		3	10		1	1		10
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	10%	2%	0%	17%	0%	2%	3%	0%	0%	6%	0%
Adj. Flow (vph)	21	10	176	61	6	16	267	1844	26	22	886	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	207	0	61	22	0	267	1844	26	22	918	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.85	0.85	0.85	1.01	0.99	0.99	1.09	1.01	1.01	1.09	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	1		1	1		1	0	0	1	0	
Detector Template	Left											
Leading Detector (m)	2.0	12.0		12.0	12.0		24.0	0.0	0.0	24.0	0.0	
Trailing Detector (m)	0.0	-3.0		-3.0	-3.0		14.0	0.0	0.0	14.0	0.0	
Detector 1 Position(m)	0.0	-3.0		-3.0	-3.0		14.0	0.0	0.0	14.0	0.0	
Detector 1 Size(m)	2.0	15.0		15.0	15.0		10.0	0.6	2.0	10.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		5	2	2	6	6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	8.0	8.0		4.0	4.0		5.0	20.0	20.0	20.0	20.0	
Minimum Split (s)	32.0	32.0		32.0	32.0		8.0	29.0	29.0	29.0	29.0	
Total Split (s)	33.0	33.0		33.0	33.0		10.0	67.0	67.0	57.0	57.0	
Total Split (%)	33.0%	33.0%		33.0%	33.0%		10.0%	67.0%	67.0%	57.0%	57.0%	
Maximum Green (s)	26.0	26.0		26.0	26.0		7.0	60.6	60.6	50.6	50.6	
Yellow Time (s)	4.1	4.1		4.1	4.1		3.0	4.2	4.2	4.2	4.2	
All-Red Time (s)	2.9	2.9		2.9	2.9		0.0	2.2	2.2	2.2	2.2	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		7.0		7.0	7.0		3.0	6.4	6.4	6.4	6.4	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None		None	C-Max	C-Max	C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0			14.0	14.0	14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0			0	0	0	0	
Act Effct Green (s)		12.0		12.0	12.0		78.0	74.6	74.6	61.5	61.5	
Actuated g/C Ratio		0.12		0.12	0.12		0.78	0.75	0.75	0.62	0.62	
v/c Ratio		0.57		0.81	0.11		0.57	0.71	0.02	0.20	0.44	
Control Delay		15.6		84.4	14.2		6.0	5.0	0.2	16.7	11.9	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		15.6		84.4	14.2		6.0	5.0	0.2	16.7	11.9	
LOS		B		F	B		A	A	A	B	B	
Approach Delay		15.6			65.8			5.1			12.0	
Approach LOS		B			E			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 80 (80%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 9.2		Intersection LOS: A	
Intersection Capacity Utilization 103.1%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 3: Brock Road & Major Oaks Road/Usman Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	10	171	59	6	16	259	1789	25	21	859	31
Future Volume (vph)	20	10	171	59	6	16	259	1789	25	21	859	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	4.8	4.8	4.8	3.5	3.7	3.7	3.0	3.5	3.5	3.0	3.5	3.5
Total Lost time (s)		7.0		7.0	7.0		3.0	6.4	6.4	6.4	6.4	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		0.97		1.00	0.99		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00		0.99	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		0.89		1.00	0.89		1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.99		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1807		1764	1617		1650	3466	1561	1684	3352	
Flt Permitted		0.96		0.34	1.00		0.26	1.00	1.00	0.10	1.00	
Satd. Flow (perm)		1744		629	1617		450	3466	1561	180	3352	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	21	10	176	61	6	16	267	1844	26	22	886	32
RTOR Reduction (vph)	0	155	0	0	14	0	0	0	7	0	2	0
Lane Group Flow (vph)	0	52	0	61	8	0	267	1844	19	22	916	0
Confl. Peds. (#/hr)	3		16	16		3	10		1	1		10
Heavy Vehicles (%)	0%	10%	2%	0%	17%	0%	2%	3%	0%	0%	6%	0%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)		12.0		12.0	12.0		74.6	74.6	74.6	61.5	61.5	
Effective Green, g (s)		12.0		12.0	12.0		74.6	74.6	74.6	61.5	61.5	
Actuated g/C Ratio		0.12		0.12	0.12		0.75	0.75	0.75	0.62	0.62	
Clearance Time (s)		7.0		7.0	7.0		3.0	6.4	6.4	6.4	6.4	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		209		75	194		456	2585	1164	110	2061	
v/s Ratio Prot					0.00		0.06	c0.53			0.27	
v/s Ratio Perm		0.03		c0.10			0.38		0.01	0.12		
v/c Ratio		0.25		0.81	0.04		0.59	0.71	0.02	0.20	0.44	
Uniform Delay, d1		39.9		42.9	38.9		5.0	6.9	3.3	8.5	10.2	
Progression Factor		1.00		0.84	0.67		1.02	0.53	0.21	1.00	1.00	
Incremental Delay, d2		0.6		36.2	0.1		1.0	0.9	0.0	4.0	0.7	
Delay (s)		40.5		72.0	26.2		6.1	4.6	0.7	12.5	10.9	
Level of Service		D		E	C		A	A	A	B	B	
Approach Delay (s)		40.5			59.9			4.7			10.9	
Approach LOS		D			E			A			B	

Intersection Summary			
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	103.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

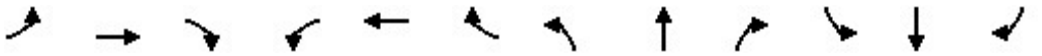
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	303	4	215	6	7	6	210	1608	13	2	942	192
Future Volume (vph)	303	4	215	6	7	6	210	1608	13	2	942	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5	3.5
Storage Length (m)	0.0		0.0	0.0		0.0	63.0		0.0	13.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			20.0			41.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor			0.98		1.00						0.99	
Frt			0.850		0.957			0.999			0.975	
Flt Protected		0.953			0.984		0.950			0.950		
Satd. Flow (prot)	0	1690	1538	0	1479	0	1620	3426	0	852	3252	0
Flt Permitted		0.713			0.877		0.117			0.077		
Satd. Flow (perm)	0	1265	1513	0	1317	0	199	3426	0	69	3252	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			203		7			2			35	
Link Speed (k/h)		60			40			60			60	
Link Distance (m)		416.8			328.7			124.4			367.1	
Travel Time (s)		25.0			29.6			7.5			22.0	
Confl. Peds. (#/hr)			3	3			14					14
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	6%	0%	5%	33%	14%	17%	4%	4%	15%	100%	6%	6%
Adj. Flow (vph)	340	4	242	7	8	7	236	1807	15	2	1058	216
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	344	242	0	22	0	236	1822	0	2	1274	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.1			3.1	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.00	1.00	1.00	1.00	1.09	1.01	1.01	1.08	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		5.0	20.0		20.0	20.0	
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0		9.0	28.0		28.0	28.0	
Total Split (s)	31.0	31.0	31.0	31.0	31.0		11.0	69.0		58.0	58.0	
Total Split (%)	31.0%	31.0%	31.0%	31.0%	31.0%		11.0%	69.0%		58.0%	58.0%	
Maximum Green (s)	24.6	24.6	24.6	24.6	24.6		8.0	62.8		51.8	51.8	
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2		3.0	4.2		4.2	4.2	
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.4	6.4		6.4		3.0	6.2		6.2	6.2	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	16.0	16.0	16.0	16.0	16.0			14.0		14.0	14.0	
Flash Dont Walk (s)	5.0	5.0	5.0	5.0	5.0			5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0	0	0	0			0		0	0	
Act Effct Green (s)		24.6	24.6		24.6		66.0	62.8		51.8	51.8	
Actuated g/C Ratio		0.25	0.25		0.25		0.66	0.63		0.52	0.52	
v/c Ratio		1.11	0.46		0.07		0.96	0.85		0.06	0.75	
Control Delay		119.6	10.3		23.1		66.6	19.7		15.5	23.0	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		119.6	10.3		23.1		66.6	19.7		15.5	23.0	
LOS		F	B		C		E	B		B	C	
Approach Delay		74.5			23.1			25.0			23.0	
Approach LOS		E			C			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 40 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.11			
Intersection Signal Delay: 31.7		Intersection LOS: C	
Intersection Capacity Utilization 100.9%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 1: Brock Road & Finch Avenue





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	303	4	215	6	7	6	210	1608	13	2	942	192
Future Volume (vph)	303	4	215	6	7	6	210	1608	13	2	942	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5	3.5
Total Lost time (s)		6.4	6.4		6.4		3.0	6.2		6.2	6.2	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.98		1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.96		1.00	1.00		1.00	0.97	
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1690	1513		1478		1620	3425		852	3251	
Flt Permitted		0.71	1.00		0.88		0.12	1.00		0.08	1.00	
Satd. Flow (perm)		1264	1513		1316		199	3425		69	3251	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	340	4	242	7	8	7	236	1807	15	2	1058	216
RTOR Reduction (vph)	0	0	153	0	5	0	0	1	0	0	17	0
Lane Group Flow (vph)	0	344	89	0	17	0	236	1821	0	2	1257	0
Confl. Peds. (#/hr)			3	3			14					14
Heavy Vehicles (%)	6%	0%	5%	33%	14%	17%	4%	4%	15%	100%	6%	6%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		24.6	24.6		24.6		62.8	62.8		51.8	51.8	
Effective Green, g (s)		24.6	24.6		24.6		62.8	62.8		51.8	51.8	
Actuated g/C Ratio		0.25	0.25		0.25		0.63	0.63		0.52	0.52	
Clearance Time (s)		6.4	6.4		6.4		3.0	6.2		6.2	6.2	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		310	372		323		238	2150		35	1684	
v/s Ratio Prot							c0.08	0.53			0.39	
v/s Ratio Perm		c0.27	0.06		0.01		c0.54			0.03		
v/c Ratio		1.11	0.24		0.05		0.99	0.85		0.06	0.75	
Uniform Delay, d1		37.7	30.2		28.8		20.1	14.8		12.0	18.9	
Progression Factor		1.00	1.00		1.00		1.00	1.00		0.95	1.08	
Incremental Delay, d2		83.9	0.3		0.1		55.8	4.4		2.7	2.7	
Delay (s)		121.6	30.5		28.9		75.9	19.1		14.0	23.1	
Level of Service		F	C		C		E	B		B	C	
Approach Delay (s)		84.0			28.9			25.6			23.1	
Approach LOS		F			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	100.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	74	1753	140	54	1011
Future Volume (vph)	0	74	1753	140	54	1011
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	4.5	3.5	3.3	3.3	3.5
Storage Length (m)	0.0	0.0		38.0	60.0	
Storage Lanes	0	1		1	1	
Taper Length (m)	7.5				75.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.865		0.850		
Flt Protected					0.950	
Satd. Flow (prot)	0	1790	3400	1516	1711	3336
Flt Permitted					0.950	
Satd. Flow (perm)	0	1790	3400	1516	1711	3336
Link Speed (k/h)	40		60			60
Link Distance (m)	119.8		367.1			224.5
Travel Time (s)	10.8		22.0			13.5
Confl. Peds. (#/hr)	7	1		55	55	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	1%	5%	3%	2%	7%
Adj. Flow (vph)	0	88	2087	167	64	1204
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	88	2087	167	64	1204
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.3			3.3
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	0.88	1.01	1.04	1.04	1.01
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 60.1%		ICU Level of Service B	
Analysis Period (min) 15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	74	1753	140	54	1011
Future Volume (Veh/h)	0	74	1753	140	54	1011
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	0	88	2087	167	64	1204
Pedestrians	55		7			1
Lane Width (m)	4.5		3.4			3.4
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	6		1			0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			367			225
pX, platoon unblocked	0.63	0.55			0.55	
vC, conflicting volume	2879	1100			2309	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1602	0			1737	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	84			65	
cM capacity (veh/h)	38	560			185	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	88	1044	1044	167	64	602	602
Volume Left	0	0	0	0	64	0	0
Volume Right	88	0	0	167	0	0	0
cSH	560	1700	1700	1700	185	1700	1700
Volume to Capacity	0.16	0.61	0.61	0.10	0.35	0.35	0.35
Queue Length 95th (m)	4.4	0.0	0.0	0.0	11.6	0.0	0.0
Control Delay (s)	12.6	0.0	0.0	0.0	34.4	0.0	0.0
Lane LOS	B				D		
Approach Delay (s)	12.6	0.0			1.7		
Approach LOS	B						

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	30	11	214	123	20	43	2	250	1626	22	42	846
Future Volume (vph)	30	11	214	123	20	43	2	250	1626	22	42	846
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	4.8	4.8	4.8	3.5	3.7	3.7	3.6	3.0	3.5	3.5	3.0	3.5
Storage Length (m)	0.0		9.0	20.0		0.0		72.0		70.0	60.0	
Storage Lanes	0		0	1		0		1		1	1	
Taper Length (m)	7.5			48.0				72.0			92.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor		0.95		0.98	0.98			1.00		0.95		1.00
Frt		0.886			0.897					0.850		0.997
Flt Protected		0.994		0.950				0.950			0.950	
Satd. Flow (prot)	0	1758	0	1733	1647	0	0	1652	3400	1597	1685	3294
Flt Permitted		0.953		0.391				0.221			0.079	
Satd. Flow (perm)	0	1683	0	696	1647	0	0	383	3400	1517	140	3294
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		208			18					44		3
Link Speed (k/h)		50			40				60			60
Link Distance (m)		292.9			123.2				224.5			180.3
Travel Time (s)		21.1			11.1				13.5			10.8
Confl. Peds. (#/hr)	10		37	37		10		10		13	13	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	10%	0%	2%	3%	5%	2%	0%	2%	5%	0%	0%	8%
Adj. Flow (vph)	33	12	238	137	22	48	2	278	1807	24	47	940
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	283	0	137	70	0	0	280	1807	24	47	960
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	Left	Left
Median Width(m)		3.5			3.5				3.3			3.3
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		4.8			4.8				4.8			4.8
Two way Left Turn Lane												
Headway Factor	0.85	0.85	0.85	1.01	0.99	0.99	1.00	1.09	1.01	1.01	1.09	1.01
Turning Speed (k/h)	25		15	25		15	15	25		15	25	
Number of Detectors	1	1		1	1		1	1	0	0	1	0
Detector Template	Left						Left					
Leading Detector (m)	2.0	12.0		12.0	12.0		2.0	24.0	0.0	0.0	24.0	0.0
Trailing Detector (m)	0.0	-3.0		-3.0	-3.0		0.0	14.0	0.0	0.0	14.0	0.0
Detector 1 Position(m)	0.0	-3.0		-3.0	-3.0		0.0	14.0	0.0	0.0	14.0	0.0
Detector 1 Size(m)	2.0	15.0		15.0	15.0		2.0	10.0	0.6	2.0	10.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Perm	NA		Perm	NA			pm+pt	NA	Perm	Perm	NA
Protected Phases		4			8			5	2			6
Permitted Phases	4			8				2		2	6	
Detector Phase	4	4		8	8			5	2	2	6	6

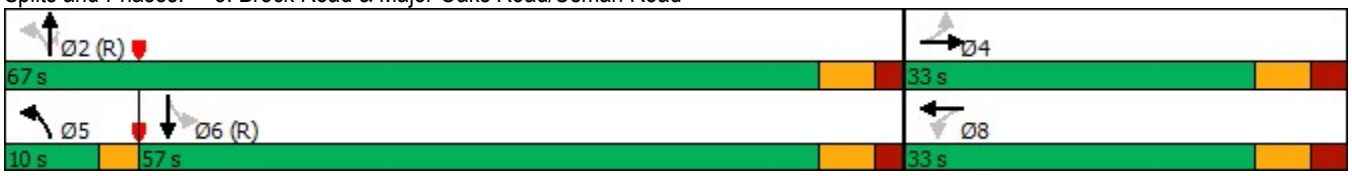


Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	18
Future Volume (vph)	18
Ideal Flow (vphpl)	1900
Lane Width (m)	3.5
Storage Length (m)	0.0
Storage Lanes	0
Taper Length (m)	
Lane Util. Factor	0.95
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	Yes
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	10
Peak Hour Factor	0.90
Heavy Vehicles (%)	6%
Adj. Flow (vph)	20
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	1.01
Turning Speed (k/h)	15
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Switch Phase												
Minimum Initial (s)	8.0	8.0		4.0	4.0			5.0	20.0	20.0	20.0	20.0
Minimum Split (s)	32.0	32.0		32.0	32.0			8.0	29.0	29.0	29.0	29.0
Total Split (s)	33.0	33.0		33.0	33.0			10.0	67.0	67.0	57.0	57.0
Total Split (%)	33.0%	33.0%		33.0%	33.0%			10.0%	67.0%	67.0%	57.0%	57.0%
Maximum Green (s)	26.0	26.0		26.0	26.0			7.0	60.6	60.6	50.6	50.6
Yellow Time (s)	4.1	4.1		4.1	4.1			3.0	4.2	4.2	4.2	4.2
All-Red Time (s)	2.9	2.9		2.9	2.9			0.0	2.2	2.2	2.2	2.2
Lost Time Adjust (s)		0.0		0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.0		7.0	7.0			3.0	6.4	6.4	6.4	6.4
Lead/Lag								Lead			Lag	Lag
Lead-Lag Optimize?								Yes			Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None			None	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0				7.0	7.0	7.0	7.0
Flash Dont Walk (s)	18.0	18.0		18.0	18.0				14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)	0	0		0	0				0	0	0	0
Act Effct Green (s)		21.1		21.1	21.1			68.9	65.5	65.5	53.6	53.6
Actuated g/C Ratio		0.21		0.21	0.21			0.69	0.66	0.66	0.54	0.54
v/c Ratio		0.55		0.94	0.19			0.74	0.81	0.02	0.64	0.54
Control Delay		13.6		78.8	18.8			16.1	11.6	0.1	60.7	17.3
Queue Delay		0.0		0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Delay		13.6		78.8	18.8			16.1	11.6	0.1	60.7	17.3
LOS		B		E	B			B	B	A	E	B
Approach Delay		13.6			58.5				12.1			19.3
Approach LOS		B			E				B			B

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 80 (80%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 16.9		Intersection LOS: B	
Intersection Capacity Utilization 114.8%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 3: Brock Road & Major Oaks Road/Usman Road





Lane Group	SBR
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	30	11	214	123	20	43	2	250	1626	22	42	846
Future Volume (vph)	30	11	214	123	20	43	2	250	1626	22	42	846
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	4.8	4.8	4.8	3.5	3.7	3.7	3.6	3.0	3.5	3.5	3.0	3.5
Total Lost time (s)		7.0		7.0	7.0			3.0	6.4	6.4	6.4	6.4
Lane Util. Factor		1.00		1.00	1.00			1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes		0.95		1.00	0.98			1.00	1.00	0.95	1.00	1.00
Flpb, ped/bikes		1.00		0.98	1.00			1.00	1.00	1.00	1.00	1.00
Frt		0.89		1.00	0.90			1.00	1.00	0.85	1.00	1.00
Flt Protected		0.99		0.95	1.00			0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1757		1693	1647			1651	3400	1517	1682	3293
Flt Permitted		0.95		0.39	1.00			0.22	1.00	1.00	0.08	1.00
Satd. Flow (perm)		1684		697	1647			384	3400	1517	139	3293
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	33	12	238	137	22	48	2	278	1807	24	47	940
RTOR Reduction (vph)	0	164	0	0	14	0	0	0	0	8	0	1
Lane Group Flow (vph)	0	119	0	137	56	0	0	280	1807	16	47	959
Confl. Peds. (#/hr)	10		37	37		10		10		13	13	
Heavy Vehicles (%)	10%	0%	2%	3%	5%	2%	0%	2%	5%	0%	0%	8%
Turn Type	Perm	NA		Perm	NA			pm+pt	NA	Perm	Perm	NA
Protected Phases		4			8			5	2			6
Permitted Phases	4			8				2		2	6	
Actuated Green, G (s)		21.1		21.1	21.1			65.5	65.5	65.5	53.6	53.6
Effective Green, g (s)		21.1		21.1	21.1			65.5	65.5	65.5	53.6	53.6
Actuated g/C Ratio		0.21		0.21	0.21			0.66	0.66	0.66	0.54	0.54
Clearance Time (s)		7.0		7.0	7.0			3.0	6.4	6.4	6.4	6.4
Vehicle Extension (s)		3.0		3.0	3.0			3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		355		147	347			364	2227	993	74	1765
v/s Ratio Prot					0.03			0.07	c0.53			0.29
v/s Ratio Perm		0.07		c0.20				0.44		0.01	0.34	
v/c Ratio		0.33		0.93	0.16			0.77	0.81	0.02	0.64	0.54
Uniform Delay, d1		33.5		38.7	32.2			9.5	12.7	6.0	16.3	15.2
Progression Factor		1.00		0.86	0.78			0.77	0.66	0.06	1.00	1.00
Incremental Delay, d2		0.6		40.1	0.1			5.4	1.9	0.0	34.9	1.2
Delay (s)		34.1		73.4	25.2			12.8	10.3	0.4	51.2	16.4
Level of Service		C		E	C			B	B	A	D	B
Approach Delay (s)		34.1			57.1				10.5			18.0
Approach LOS		C			E				B			B

Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	114.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	18
Future Volume (vph)	18
Ideal Flow (vphpl)	1900
Lane Width	3.5
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.90
Adj. Flow (vph)	20
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	10
Heavy Vehicles (%)	6%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Intersection: 1: Brock Road & Finch Avenue

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	TR
Maximum Queue (m)	48.3	62.9	20.2	41.3	60.0	53.2	5.5	297.4	303.7
Average Queue (m)	26.2	31.8	6.1	21.1	28.6	15.9	0.2	143.2	149.2
95th Queue (m)	45.4	54.9	16.6	35.9	51.7	38.1	3.0	261.3	271.0
Link Distance (m)	403.4	403.4	313.4		113.3	113.3		350.8	350.8
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)				63.0			13.0		
Storage Blk Time (%)					0		0	36	
Queuing Penalty (veh)					0		0	0	

Intersection: 2: Brock Road & Usman Road

Movement	SB	SB
Directions Served	UL	T
Maximum Queue (m)	15.2	3.0
Average Queue (m)	2.9	0.1
95th Queue (m)	10.2	1.6
Link Distance (m)		208.0
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)	60.0	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Brock Road & Major Oaks Road/Usman Road

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	TR	L	T	T	R	L	T	TR
Maximum Queue (m)	93.0	33.1	21.3	57.2	62.6	67.2	9.0	3.0	168.5	159.6
Average Queue (m)	48.3	14.6	3.2	26.5	31.6	36.0	0.9	0.1	98.0	85.4
95th Queue (m)	83.6	28.8	12.4	46.3	56.2	62.7	5.1	1.6	169.0	154.8
Link Distance (m)	279.4		97.4		208.0	208.0			170.1	170.1
Upstream Blk Time (%)									2	1
Queuing Penalty (veh)									0	0
Storage Bay Dist (m)		20.0		72.0			70.0	60.0		
Storage Blk Time (%)		10	1	0	0	0			20	
Queuing Penalty (veh)		1	1	0	0	0			0	

Network Summary

Network wide Queuing Penalty: 3

Intersection: 1: Brock Road & Finch Avenue

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	UL	T	TR	L	T	TR
Maximum Queue (m)	138.8	46.2	24.8	82.8	117.9	119.8	11.2	86.6	95.5
Average Queue (m)	78.6	22.8	5.3	42.0	82.6	71.5	1.5	53.8	60.5
95th Queue (m)	124.7	38.6	15.7	85.7	127.1	115.9	6.9	80.1	88.8
Link Distance (m)	403.4	403.4	313.4		113.3	113.3		350.8	350.8
Upstream Blk Time (%)					3	1			
Queuing Penalty (veh)					0	0			
Storage Bay Dist (m)				63.0			13.0		
Storage Blk Time (%)				0	11		0	26	
Queuing Penalty (veh)				2	26		2	1	

Intersection: 2: Brock Road & Usman Road

Movement	NB	SB	SB
Directions Served	T	UL	T
Maximum Queue (m)	3.0	21.0	2.8
Average Queue (m)	0.1	6.8	0.1
95th Queue (m)	1.7	17.1	1.5
Link Distance (m)	350.8		208.0
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)		60.0	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Brock Road & Major Oaks Road/Usman Road

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	TR	L	T	T	R	L	T	TR
Maximum Queue (m)	63.1	24.3	18.8	82.8	66.6	67.7	7.2	17.6	81.8	69.2
Average Queue (m)	23.8	11.2	3.6	28.9	34.4	38.1	1.3	4.0	42.2	29.3
95th Queue (m)	44.6	21.6	11.8	56.8	59.9	60.9	5.6	12.2	73.9	59.4
Link Distance (m)	279.4		97.4		208.0	208.0			170.1	170.1
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)		20.0		72.0			70.0	60.0		
Storage Blk Time (%)		4		1	0	0			2	
Queuing Penalty (veh)		1		7	0	0			0	

Network Summary

Network wide Queuing Penalty: 40

Intersection: 1: Brock Road & Finch Avenue

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	TR
Maximum Queue (m)	96.6	57.6	18.4	82.8	114.3	118.4	40.7	94.4	113.3
Average Queue (m)	54.7	21.4	3.8	34.7	67.3	59.1	2.2	58.7	65.6
95th Queue (m)	83.1	38.7	12.2	68.9	105.3	92.5	16.3	94.2	100.7
Link Distance (m)	403.4	403.4	313.4		113.3	113.3		350.8	350.8
Upstream Blk Time (%)					1	0			
Queuing Penalty (veh)					0	0			
Storage Bay Dist (m)				63.0			13.0		
Storage Blk Time (%)				1	6		2	26	
Queuing Penalty (veh)				9	13		11	1	

Intersection: 2: Brock Road & Usman Road

Movement	WB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	R	L	T	T
Maximum Queue (m)	18.8	13.9	22.3	11.2	23.0	17.5	16.7
Average Queue (m)	2.5	1.7	2.8	1.7	10.4	0.9	0.9
95th Queue (m)	11.8	9.1	13.8	7.6	19.9	7.6	7.6
Link Distance (m)	93.4	350.8	350.8			208.0	208.0
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)				38.0	60.0		
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 3: Brock Road & Major Oaks Road/Usman Road

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	TR	UL	T	T	R	L	T	TR
Maximum Queue (m)	66.3	44.6	33.6	68.4	64.9	80.3	7.9	24.3	91.7	75.8
Average Queue (m)	30.8	20.6	11.2	33.0	35.0	41.3	1.4	9.9	50.5	35.1
95th Queue (m)	53.6	36.3	25.1	58.7	56.5	64.8	5.9	21.3	80.8	66.4
Link Distance (m)	279.4		97.4		208.0	208.0			170.1	170.1
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)		20.0		72.0			70.0	60.0		
Storage Blk Time (%)		18	3	1	0	0			3	
Queuing Penalty (veh)		11	3	8	0	0			1	

Network Summary

Network wide Queuing Penalty: 57

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	382	15	239	14	4	7	1	225	1687	20	5	892
Future Volume (vph)	382	15	239	14	4	7	1	225	1687	20	5	892
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.6	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5
Storage Length (m)	0.0		0.0	0.0		0.0		63.0		0.0	13.0	
Storage Lanes	0		1	0		0		1		0	1	
Taper Length (m)	7.5			7.5				20.0			41.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor		1.00			1.00			1.00	1.00			0.99
Frt			0.850		0.962				0.998			0.978
Flt Protected		0.954			0.973			0.950			0.950	
Satd. Flow (prot)	0	1771	1568	0	1704	0	0	1668	3459	0	1705	3302
Flt Permitted		0.716			0.538			0.176			0.080	
Satd. Flow (perm)	0	1326	1568	0	942	0	0	308	3459	0	144	3302
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			201		7				2			30
Link Speed (k/h)		60			40				60			60
Link Distance (m)		416.8			328.7				124.4			367.1
Travel Time (s)		25.0			29.6				7.5			22.0
Confl. Peds. (#/hr)	2					2		8		6	6	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	1%	7%	3%	0%	0%	14%	0%	1%	3%	0%	0%	6%
Adj. Flow (vph)	390	15	244	14	4	7	1	230	1721	20	5	910
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	405	244	0	25	0	0	231	1741	0	5	1070
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	Left	Left
Median Width(m)		0.0			0.0				3.1			3.1
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		4.8			4.8				4.8			4.8
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.00	1.00	1.00	1.00	1.00	1.09	1.01	1.01	1.08	1.01
Turning Speed (k/h)	25		15	25		15	15	25		15	25	
Number of Detectors	1	2	1	1	2		1	1	2		1	2
Detector Template	Left	Thru	Right	Left	Thru		Left	Left	Thru		Left	Thru
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	2.0	10.0		2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	2.0	0.6		2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4			9.4				9.4			9.4
Detector 2 Size(m)		0.6			0.6				0.6			0.6
Detector 2 Type		Cl+Ex			Cl+Ex				Cl+Ex			Cl+Ex
Detector 2 Channel												



Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	157
Future Volume (vph)	157
Ideal Flow (vphpl)	1900
Lane Width (m)	3.5
Storage Length (m)	0.0
Storage Lanes	0
Taper Length (m)	
Lane Util. Factor	0.95
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	Yes
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	8
Peak Hour Factor	0.98
Heavy Vehicles (%)	0%
Adj. Flow (vph)	160
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	1.01
Turning Speed (k/h)	15
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Detector 2 Extend (s)		0.0			0.0				0.0			0.0
Turn Type	Perm	NA	Perm	Perm	NA		custom	pm+pt	NA		Perm	NA
Protected Phases		4			8			5	2			6
Permitted Phases	4		4	8			5	2			6	
Detector Phase	4	4	4	8	8		5	5	2		6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		5.0	5.0	20.0		20.0	20.0
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0		9.0	9.0	28.0		28.0	28.0
Total Split (s)	31.0	31.0	31.0	31.0	31.0		11.0	11.0	69.0		58.0	58.0
Total Split (%)	31.0%	31.0%	31.0%	31.0%	31.0%		11.0%	11.0%	69.0%		58.0%	58.0%
Maximum Green (s)	24.6	24.6	24.6	24.6	24.6		8.0	8.0	62.8		51.8	51.8
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2		3.0	3.0	4.2		4.2	4.2
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2		0.0	0.0	2.0		2.0	2.0
Lost Time Adjust (s)		-3.0	0.0		0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)		3.4	6.4		6.4			3.0	6.2		6.2	6.2
Lead/Lag							Lead	Lead			Lag	Lag
Lead-Lag Optimize?							Yes	Yes			Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	None	None	None		None	None	C-Max		C-Max	C-Max
Walk Time (s)	16.0	16.0	16.0	16.0	16.0				14.0		14.0	14.0
Flash Dont Walk (s)	5.0	5.0	5.0	5.0	5.0				5.0		5.0	5.0
Pedestrian Calls (#/hr)	2	2	2	2	2				0		0	0
Act Effct Green (s)		27.6	24.6		24.6			66.0	62.8		51.8	51.8
Actuated g/C Ratio		0.28	0.25		0.25			0.66	0.63		0.52	0.52
v/c Ratio		1.11	0.45		0.11			0.74	0.80		0.07	0.62
Control Delay		115.7	10.4		24.6			23.2	17.6		15.8	24.7
Queue Delay		0.0	0.0		0.0			0.0	0.0		0.0	0.0
Total Delay		115.7	10.4		24.6			23.2	17.6		15.8	24.7
LOS		F	B		C			C	B		B	C
Approach Delay		76.1			24.6				18.2			24.7
Approach LOS		E			C				B			C

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 40 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.11			
Intersection Signal Delay: 30.2		Intersection LOS: C	
Intersection Capacity Utilization 106.2%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 1: Brock Road & Finch Avenue





Lane Group	SBR
Detector 2 Extend (s)	
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary



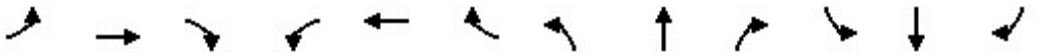
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	382	15	239	14	4	7	1	225	1687	20	5	892
Future Volume (vph)	382	15	239	14	4	7	1	225	1687	20	5	892
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.6	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5
Total Lost time (s)		3.4	6.4		6.4			3.0	6.2		6.2	6.2
Lane Util. Factor		1.00	1.00		1.00			1.00	0.95		1.00	0.95
Frpb, ped/bikes		1.00	1.00		1.00			1.00	1.00		1.00	0.99
Flpb, ped/bikes		1.00	1.00		1.00			1.00	1.00		1.00	1.00
Frt		1.00	0.85		0.96			1.00	1.00		1.00	0.98
Flt Protected		0.95	1.00		0.97			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1766	1568		1704			1668	3460		1705	3300
Flt Permitted		0.72	1.00		0.54			0.18	1.00		0.08	1.00
Satd. Flow (perm)		1325	1568		942			309	3460		143	3300
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	390	15	244	14	4	7	1	230	1721	20	5	910
RTOR Reduction (vph)	0	0	152	0	5	0	0	0	1	0	0	14
Lane Group Flow (vph)	0	405	92	0	20	0	0	231	1740	0	5	1056
Confl. Peds. (#/hr)	2					2		8		6	6	
Heavy Vehicles (%)	1%	7%	3%	0%	0%	14%	0%	1%	3%	0%	0%	6%
Turn Type	Perm	NA	Perm	Perm	NA		custom	pm+pt	NA		Perm	NA
Protected Phases		4			8			5	2			6
Permitted Phases	4		4	8			5	2			6	
Actuated Green, G (s)		24.6	24.6		24.6			62.8	62.8		51.8	51.8
Effective Green, g (s)		27.6	24.6		24.6			62.8	62.8		51.8	51.8
Actuated g/C Ratio		0.28	0.25		0.25			0.63	0.63		0.52	0.52
Clearance Time (s)		6.4	6.4		6.4			3.0	6.2		6.2	6.2
Vehicle Extension (s)		3.0	3.0		3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		365	385		231			302	2172		74	1709
v/s Ratio Prot								0.06	c0.50			0.32
v/s Ratio Perm		c0.31	0.06		0.02			0.42			0.03	
v/c Ratio		1.11	0.24		0.09			0.76	0.80		0.07	0.62
Uniform Delay, d1		36.2	30.2		29.0			11.5	13.9		12.0	17.1
Progression Factor		1.00	1.00		1.00			1.00	1.00		1.08	1.38
Incremental Delay, d2		80.1	0.3		0.2			11.0	3.2		1.6	1.6
Delay (s)		116.3	30.5		29.2			22.5	17.2		14.6	25.1
Level of Service		F	C		C			C	B		B	C
Approach Delay (s)		84.0			29.2				17.8			25.0
Approach LOS		F			C				B			C

Intersection Summary			
HCM 2000 Control Delay	31.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	106.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	157
Future Volume (vph)	157
Ideal Flow (vphpl)	1900
Lane Width	3.5
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.98
Adj. Flow (vph)	160
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	8
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary



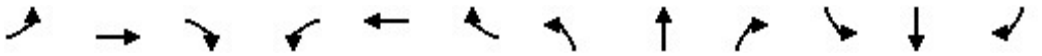
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	303	4	215	6	7	6	210	1608	13	2	942	192
Future Volume (vph)	303	4	215	6	7	6	210	1608	13	2	942	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5	3.5
Storage Length (m)	0.0		0.0	0.0		0.0	63.0		0.0	13.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			20.0			41.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor			0.98		1.00						0.99	
Frt			0.850		0.957			0.999			0.975	
Flt Protected		0.953			0.984		0.950			0.950		
Satd. Flow (prot)	0	1690	1538	0	1479	0	1620	3426	0	852	3252	0
Flt Permitted		0.713			0.814		0.117			0.077		
Satd. Flow (perm)	0	1265	1513	0	1223	0	199	3426	0	69	3252	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			203		7			2			35	
Link Speed (k/h)		60			40			60			60	
Link Distance (m)		416.8			328.7			124.4			367.1	
Travel Time (s)		25.0			29.6			7.5			22.0	
Confl. Peds. (#/hr)			3	3			14					14
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	6%	0%	5%	33%	14%	17%	4%	4%	15%	100%	6%	6%
Adj. Flow (vph)	340	4	242	7	8	7	236	1807	15	2	1058	216
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	344	242	0	22	0	236	1822	0	2	1274	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.1			3.1	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.00	1.00	1.00	1.00	1.09	1.01	1.01	1.08	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		5.0	20.0		20.0	20.0	
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0		9.0	28.0		28.0	28.0	
Total Split (s)	31.0	31.0	31.0	31.0	31.0		11.0	69.0		58.0	58.0	
Total Split (%)	31.0%	31.0%	31.0%	31.0%	31.0%		11.0%	69.0%		58.0%	58.0%	
Maximum Green (s)	24.6	24.6	24.6	24.6	24.6		8.0	62.8		51.8	51.8	
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2		3.0	4.2		4.2	4.2	
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-3.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		3.4	6.4		6.4		3.0	6.2		6.2	6.2	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	16.0	16.0	16.0	16.0	16.0			14.0		14.0	14.0	
Flash Dont Walk (s)	5.0	5.0	5.0	5.0	5.0			5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0	0	0	0			0		0	0	
Act Effct Green (s)		27.6	24.6		24.6		66.0	62.8		51.8	51.8	
Actuated g/C Ratio		0.28	0.25		0.25		0.66	0.63		0.52	0.52	
v/c Ratio		0.99	0.46		0.07		0.96	0.85		0.06	0.75	
Control Delay		82.5	10.3		23.2		66.6	19.7		15.5	23.0	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		82.5	10.3		23.2		66.6	19.7		15.5	23.0	
LOS		F	B		C		E	B		B	C	
Approach Delay		52.7			23.2			25.0			23.0	
Approach LOS		D			C			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 40 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 28.5		Intersection LOS: C	
Intersection Capacity Utilization 98.9%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Brock Road & Finch Avenue





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	303	4	215	6	7	6	210	1608	13	2	942	192
Future Volume (vph)	303	4	215	6	7	6	210	1608	13	2	942	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5	3.5
Total Lost time (s)		3.4	6.4		6.4		3.0	6.2		6.2	6.2	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.98		1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.96		1.00	1.00		1.00	0.97	
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1690	1513		1478		1620	3425		852	3251	
Flt Permitted		0.71	1.00		0.81		0.12	1.00		0.08	1.00	
Satd. Flow (perm)		1264	1513		1223		199	3425		69	3251	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	340	4	242	7	8	7	236	1807	15	2	1058	216
RTOR Reduction (vph)	0	0	153	0	5	0	0	1	0	0	17	0
Lane Group Flow (vph)	0	344	89	0	17	0	236	1821	0	2	1257	0
Confl. Peds. (#/hr)			3	3			14					14
Heavy Vehicles (%)	6%	0%	5%	33%	14%	17%	4%	4%	15%	100%	6%	6%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		24.6	24.6		24.6		62.8	62.8		51.8	51.8	
Effective Green, g (s)		27.6	24.6		24.6		62.8	62.8		51.8	51.8	
Actuated g/C Ratio		0.28	0.25		0.25		0.63	0.63		0.52	0.52	
Clearance Time (s)		6.4	6.4		6.4		3.0	6.2		6.2	6.2	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		348	372		300		238	2150		35	1684	
v/s Ratio Prot							c0.08	0.53			0.39	
v/s Ratio Perm		c0.27	0.06		0.01		c0.54			0.03		
v/c Ratio		0.99	0.24		0.06		0.99	0.85		0.06	0.75	
Uniform Delay, d1		36.0	30.2		28.8		20.1	14.8		12.0	18.9	
Progression Factor		1.00	1.00		1.00		1.00	1.00		0.95	1.08	
Incremental Delay, d2		44.7	0.3		0.1		55.8	4.4		2.7	2.7	
Delay (s)		80.7	30.5		28.9		75.9	19.1		14.1	23.1	
Level of Service		F	C		C		E	B		B	C	
Approach Delay (s)		60.0			28.9			25.6			23.1	
Approach LOS		E			C			C			C	

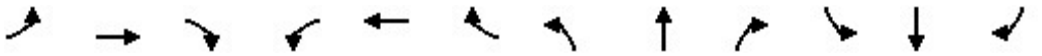
Intersection Summary			
HCM 2000 Control Delay	30.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	98.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 1: Brock Road & Finch Avenue

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	UL	T	TR	L	T	TR
Maximum Queue (m)	138.8	46.2	24.8	82.8	117.9	119.8	11.2	86.6	95.5
Average Queue (m)	78.6	22.8	5.3	42.0	82.6	71.5	1.5	53.8	60.5
95th Queue (m)	124.7	38.6	15.7	85.7	127.1	115.9	6.9	80.1	88.8
Link Distance (m)	403.4	403.4	313.4		113.3	113.3		350.8	350.8
Upstream Blk Time (%)					3	1			
Queuing Penalty (veh)					0	0			
Storage Bay Dist (m)				63.0			13.0		
Storage Blk Time (%)				0	11		0	26	
Queuing Penalty (veh)				2	26		2	1	

Intersection: 1: Brock Road & Finch Avenue

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	TR
Maximum Queue (m)	96.6	57.6	18.4	82.8	114.3	118.4	40.7	94.4	113.3
Average Queue (m)	54.7	21.4	3.8	34.7	67.3	59.1	2.2	58.7	65.6
95th Queue (m)	83.1	38.7	12.2	68.9	105.3	92.5	16.3	94.2	100.7
Link Distance (m)	403.4	403.4	313.4		113.3	113.3		350.8	350.8
Upstream Blk Time (%)					1	0			
Queuing Penalty (veh)					0	0			
Storage Bay Dist (m)				63.0			13.0		
Storage Blk Time (%)				1	6		2	26	
Queuing Penalty (veh)				9	13		11	1	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	3	247	21	4	6	131	786	3	1	2019	210
Future Volume (vph)	170	3	247	21	4	6	131	786	3	1	2019	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5	3.5
Storage Length (m)	0.0		0.0	0.0		0.0	63.0		0.0	13.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			20.0			41.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		1.00	0.99		1.00			1.00		1.00	1.00	
Frt			0.850		0.972			0.999			0.986	
Flt Protected		0.953			0.967		0.950			0.950		
Satd. Flow (prot)	0	1698	1568	0	1501	0	1574	3073	0	852	3339	0
Flt Permitted		0.705			0.744		0.066			0.330		
Satd. Flow (perm)	0	1255	1545	0	1154	0	109	3073	0	295	3339	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			35		7			1			18	
Link Speed (k/h)		60			40			60			60	
Link Distance (m)		416.8			328.7			124.4			367.1	
Travel Time (s)		25.0			29.6			7.5			22.0	
Confl. Peds. (#/hr)	1		2	2		1	9		3	3		9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	7%	16%	33%	100%	5%	5%
Adj. Flow (vph)	185	3	268	23	4	7	142	854	3	1	2195	228
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	188	268	0	34	0	142	857	0	1	2423	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.1			3.1	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.00	1.00	1.00	1.00	1.09	1.01	1.01	1.08	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	5	8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	5.0	8.0	8.0		5.0	20.0		20.0	20.0	
Minimum Split (s)	29.0	29.0	9.0	29.0	29.0		9.0	28.0		28.0	28.0	
Total Split (s)	29.0	29.0	9.0	29.0	29.0		9.0	71.0		62.0	62.0	
Total Split (%)	29.0%	29.0%	9.0%	29.0%	29.0%		9.0%	71.0%		62.0%	62.0%	
Maximum Green (s)	22.6	22.6	6.0	22.6	22.6		6.0	64.8		55.8	55.8	
Yellow Time (s)	4.2	4.2	3.0	4.2	4.2		3.0	4.2		4.2	4.2	
All-Red Time (s)	2.2	2.2	0.0	2.2	2.2		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.4	3.0		6.4		3.0	6.2		6.2	6.2	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	16.0	16.0		16.0	16.0			14.0		14.0	14.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)		18.9	29.9		18.9		71.7	68.5		57.9	57.9	
Actuated g/C Ratio		0.19	0.30		0.19		0.72	0.68		0.58	0.58	
v/c Ratio		0.79	0.55		0.15		0.75	0.41		0.01	1.25	
Control Delay		61.8	27.5		28.5		43.5	8.1		10.0	139.7	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		61.8	27.5		28.5		43.5	8.1		10.0	139.7	
LOS		E	C		C		D	A		A	F	
Approach Delay		41.6			28.5			13.1			139.7	
Approach LOS		D			C			B			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 2 (2%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.25			
Intersection Signal Delay: 95.0		Intersection LOS: F	
Intersection Capacity Utilization 99.0%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Finch Avenue & Brock Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	3	247	21	4	6	131	786	3	1	2019	210
Future Volume (vph)	170	3	247	21	4	6	131	786	3	1	2019	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5	3.5
Total Lost time (s)		6.4	3.0		6.4		3.0	6.2		6.2	6.2	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.97		1.00	1.00		1.00	0.99	
Flt Protected		0.95	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1696	1551		1500		1574	3074		850	3338	
Flt Permitted		0.70	1.00		0.74		0.07	1.00		0.33	1.00	
Satd. Flow (perm)		1254	1551		1153		109	3074		296	3338	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	185	3	268	23	4	7	142	854	3	1	2195	228
RTOR Reduction (vph)	0	0	26	0	6	0	0	0	0	0	8	0
Lane Group Flow (vph)	0	188	242	0	28	0	142	857	0	1	2415	0
Confl. Peds. (#/hr)	1		2	2		1	9		3	3		9
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	7%	16%	33%	100%	5%	5%
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		18.9	26.5		18.9		68.5	68.5		57.9	57.9	
Effective Green, g (s)		18.9	26.5		18.9		68.5	68.5		57.9	57.9	
Actuated g/C Ratio		0.19	0.26		0.19		0.68	0.68		0.58	0.58	
Clearance Time (s)		6.4	3.0		6.4		3.0	6.2		6.2	6.2	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		237	411		217		186	2105		171	1932	
v/s Ratio Prot			0.04				c0.06	0.28			c0.72	
v/s Ratio Perm		c0.15	0.11		0.02		0.47			0.00		
v/c Ratio		0.79	0.59		0.13		0.76	0.41		0.01	1.25	
Uniform Delay, d1		38.7	32.0		33.7		28.1	6.9		8.9	21.1	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		16.5	2.2		0.3		16.8	0.6		0.1	117.1	
Delay (s)		55.2	34.2		34.0		44.9	7.5		9.0	138.1	
Level of Service		E	C		C		D	A		A	F	
Approach Delay (s)		42.8			34.0			12.8			138.1	
Approach LOS		D			C			B			F	

Intersection Summary			
HCM 2000 Control Delay	94.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	99.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	0	12	915	90	1	67	2234
Future Volume (vph)	0	12	915	90	1	67	2234
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	4.5	3.5	3.3	3.3	3.3	3.5
Storage Length (m)	0.0	0.0		38.0		60.0	
Storage Lanes	0	1		1		1	
Taper Length (m)	7.5					75.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Ped Bike Factor							
Frt		0.865		0.850			
Flt Protected						0.950	
Satd. Flow (prot)	0	1808	3131	1459	0	1647	3400
Flt Permitted						0.950	
Satd. Flow (perm)	0	1808	3131	1459	0	1647	3400
Link Speed (k/h)	40		60				60
Link Distance (m)	119.8		367.1				224.5
Travel Time (s)	10.8		22.0				13.5
Confl. Peds. (#/hr)				4		4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	14%	7%	0%	6%	5%
Adj. Flow (vph)	0	13	995	98	1	73	2428
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	13	995	98	0	74	2428
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	R NA	Left	Left
Median Width(m)	0.0		3.3				3.3
Link Offset(m)	0.0		0.0				0.0
Crosswalk Width(m)	4.8		4.8				4.8
Two way Left Turn Lane							
Headway Factor	1.00	0.88	1.01	1.04	1.04	1.04	1.01
Turning Speed (k/h)	25	15		15	15	25	
Sign Control	Stop		Free				Free

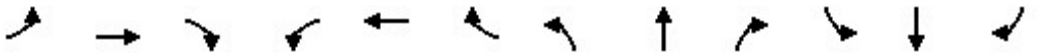
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 65.1%		ICU Level of Service C	
Analysis Period (min) 15			



Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	0	12	915	90	1	67	2234
Future Volume (Veh/h)	0	12	915	90	1	67	2234
Sign Control	Stop		Free				Free
Grade	0%		0%				0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	13	995	98	0	73	2428
Pedestrians	4						
Lane Width (m)	4.5						
Walking Speed (m/s)	1.2						
Percent Blockage	0						
Right turn flare (veh)							
Median type			None				None
Median storage veh)							
Upstream signal (m)			367				225
pX, platoon unblocked	0.45	0.94			0.00	0.94	
vC, conflicting volume	2359	502			0	1097	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	984	339			0	973	
tC, single (s)	6.8	6.9			0.0	4.2	
tC, 2 stage (s)							
tF (s)	3.5	3.3			0.0	2.3	
p0 queue free %	100	98			0	89	
cM capacity (veh/h)	100	620			0	636	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	13	498	498	98	73	1214	1214
Volume Left	0	0	0	0	73	0	0
Volume Right	13	0	0	98	0	0	0
cSH	620	1700	1700	1700	636	1700	1700
Volume to Capacity	0.02	0.29	0.29	0.06	0.11	0.71	0.71
Queue Length 95th (m)	0.5	0.0	0.0	0.0	3.1	0.0	0.0
Control Delay (s)	10.9	0.0	0.0	0.0	11.4	0.0	0.0
Lane LOS	B				B		
Approach Delay (s)	10.9	0.0			0.3		
Approach LOS	B						

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		

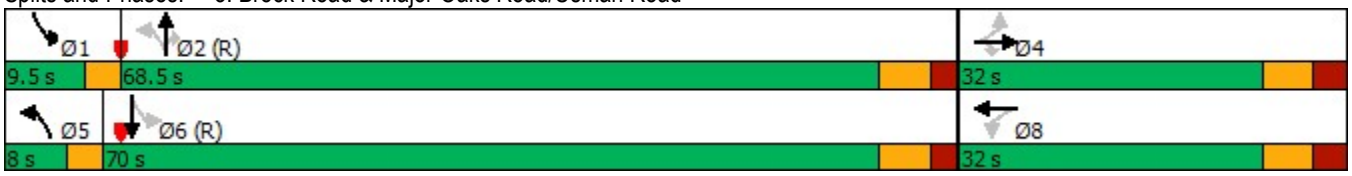


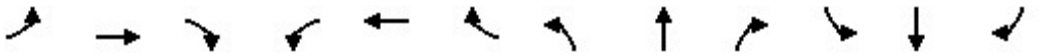
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	4	268	164	12	8	127	802	10	18	1876	19
Future Volume (vph)	39	4	268	164	12	8	127	802	10	18	1876	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.7	3.7	3.0	3.5	3.5	3.0	3.5	3.5
Storage Length (m)	0.0		30.0	20.0		0.0	72.0		70.0	60.0		0.0
Storage Lanes	0		1	1		0	1		1	1		0
Taper Length (m)	7.5			48.0			72.0			92.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor		0.99	0.99	1.00	0.99				0.98	1.00	1.00	
Frt			0.850		0.939				0.850		0.998	
Flt Protected		0.956		0.950			0.950			0.950		
Satd. Flow (prot)	0	1669	1536	1733	1522	0	1589	3077	1439	1685	3388	0
Flt Permitted		0.733		0.727			0.059			0.323		
Satd. Flow (perm)	0	1270	1515	1325	1522	0	99	3077	1406	572	3388	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			89		9				69		2	
Link Speed (k/h)		50			40			60			60	
Link Distance (m)		292.9			123.2			224.5			180.3	
Travel Time (s)		21.1			11.1			13.5			10.8	
Confl. Peds. (#/hr)	6		1	1		6	3		1	1		3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	25%	4%	3%	20%	14%	6%	16%	11%	0%	5%	18%
Adj. Flow (vph)	42	4	291	178	13	9	138	872	11	20	2039	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	46	291	178	22	0	138	872	11	20	2060	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	0.99	0.99	1.09	1.01	1.01	1.09	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	1	1	1	1		1	0	0	1	0	
Detector Template	Left											
Leading Detector (m)	2.0	12.0	12.0	12.0	12.0		24.0	0.0	0.0	24.0	0.0	
Trailing Detector (m)	0.0	-3.0	-3.0	-3.0	-3.0		14.0	0.0	0.0	14.0	0.0	
Detector 1 Position(m)	0.0	-3.0	-3.0	-3.0	-3.0		14.0	0.0	0.0	14.0	0.0	
Detector 1 Size(m)	2.0	15.0	15.0	15.0	15.0		10.0	0.6	2.0	10.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		
Detector Phase	4	4	4	8	8		5	2	2	1	6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		5.0	20.0	20.0	5.0	20.0	
Minimum Split (s)	32.0	32.0	32.0	32.0	32.0		8.0	29.0	29.0	9.5	29.0	
Total Split (s)	32.0	32.0	32.0	32.0	32.0		8.0	68.5	68.5	9.5	70.0	
Total Split (%)	29.1%	29.1%	29.1%	29.1%	29.1%		7.3%	62.3%	62.3%	8.6%	63.6%	
Maximum Green (s)	25.0	25.0	25.0	25.0	25.0		5.0	62.1	62.1	6.5	63.6	
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1		3.0	4.2	4.2	3.0	4.2	
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9		0.0	2.2	2.2	0.0	2.2	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		7.0	7.0	7.0	7.0		3.0	6.4	6.4	3.0	6.4	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		None	C-Max	C-Max	None	C-Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0	7.0		7.0	
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0			14.0	14.0		14.0	
Pedestrian Calls (#/hr)	0	0	0	0	0			0	0		0	
Act Effct Green (s)		20.0	20.0	20.0	20.0		78.7	73.2	73.2	73.6	65.0	
Actuated g/C Ratio		0.18	0.18	0.18	0.18		0.72	0.67	0.67	0.67	0.59	
v/c Ratio		0.20	0.84	0.74	0.08		0.74	0.43	0.01	0.05	1.03	
Control Delay		38.1	50.1	59.1	25.1		46.5	10.8	0.0	5.6	51.5	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		38.1	50.1	59.1	25.1		46.5	10.8	0.0	5.6	51.5	
LOS		D	D	E	C		D	B	A	A	D	
Approach Delay		48.5			55.4			15.5			51.1	
Approach LOS		D			E			B			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.03			
Intersection Signal Delay: 41.1		Intersection LOS: D	
Intersection Capacity Utilization 97.5%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 3: Brock Road & Major Oaks Road/Usman Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	4	268	164	12	8	127	802	10	18	1876	19
Future Volume (vph)	39	4	268	164	12	8	127	802	10	18	1876	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.7	3.7	3.0	3.5	3.5	3.0	3.5	3.5
Total Lost time (s)		7.0	7.0	7.0	7.0		3.0	6.4	6.4	3.0	6.4	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		1.00	0.99	1.00	0.99		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		0.99	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	0.94		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.96	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1657	1515	1731	1522		1589	3077	1406	1684	3389	
Flt Permitted		0.73	1.00	0.73	1.00		0.06	1.00	1.00	0.32	1.00	
Satd. Flow (perm)		1270	1515	1325	1522		98	3077	1406	573	3389	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	4	291	178	13	9	138	872	11	20	2039	21
RTOR Reduction (vph)	0	0	73	0	7	0	0	0	4	0	1	0
Lane Group Flow (vph)	0	46	218	178	15	0	138	872	7	20	2059	0
Confl. Peds. (#/hr)	6		1	1		6	3		1	1		3
Heavy Vehicles (%)	6%	25%	4%	3%	20%	14%	6%	16%	11%	0%	5%	18%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)		20.0	20.0	20.0	20.0		76.6	71.4	71.4	67.2	65.0	
Effective Green, g (s)		20.0	20.0	20.0	20.0		76.6	71.4	71.4	67.2	65.0	
Actuated g/C Ratio		0.18	0.18	0.18	0.18		0.70	0.65	0.65	0.61	0.59	
Clearance Time (s)		7.0	7.0	7.0	7.0		3.0	6.4	6.4	3.0	6.4	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		230	275	240	276		184	1997	912	372	2002	
v/s Ratio Prot					0.01		c0.06	0.28		0.00	c0.61	
v/s Ratio Perm		0.04	c0.14	0.13			0.46		0.01	0.03		
v/c Ratio		0.20	0.79	0.74	0.05		0.75	0.44	0.01	0.05	1.03	
Uniform Delay, d1		38.2	43.0	42.6	37.2		32.3	9.5	6.8	8.4	22.5	
Progression Factor		1.00	1.00	0.99	1.01		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.4	14.5	11.2	0.1		15.7	0.7	0.0	0.1	27.8	
Delay (s)		38.6	57.5	53.2	37.5		48.0	10.1	6.8	8.5	50.3	
Level of Service		D	E	D	D		D	B	A	A	D	
Approach Delay (s)		54.9			51.5			15.2			49.9	
Approach LOS		D			D			B			D	

Intersection Summary			
HCM 2000 Control Delay	40.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	97.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	442	17	264	15	4	8	1	248	1945	22	6	1082
Future Volume (vph)	442	17	264	15	4	8	1	248	1945	22	6	1082
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.6	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5
Storage Length (m)	0.0		0.0	0.0		0.0		63.0		0.0	13.0	
Storage Lanes	0		1	0		0		1		0	1	
Taper Length (m)	7.5			7.5				20.0			41.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor		1.00			1.00				1.00			0.99
Frt			0.850		0.958				0.998			0.976
Flt Protected		0.954			0.973			0.950			0.950	
Satd. Flow (prot)	0	1771	1568	0	1690	0	0	1668	3459	0	1705	3295
Flt Permitted		0.713			0.681			0.096			0.103	
Satd. Flow (perm)	0	1320	1568	0	1182	0	0	169	3459	0	185	3295
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			35		4				2			25
Link Speed (k/h)		60			40				60			60
Link Distance (m)		416.8			328.7				124.4			367.1
Travel Time (s)		25.0			29.6				7.5			22.0
Confl. Peds. (#/hr)	2					2		8		6	6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	7%	3%	0%	0%	14%	0%	1%	3%	0%	0%	6%
Adj. Flow (vph)	480	18	287	16	4	9	1	270	2114	24	7	1176
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	498	287	0	29	0	0	271	2138	0	7	1396
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	Left	Left
Median Width(m)		0.0			0.0				3.1			3.1
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		4.8			4.8				4.8			4.8
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.00	1.00	1.00	1.00	1.00	1.09	1.01	1.01	1.08	1.01
Turning Speed (k/h)	25		15	25		15	15	25		15	25	
Number of Detectors	1	2	1	1	2		1	1	2		1	2
Detector Template	Left	Thru	Right	Left	Thru		Left	Left	Thru		Left	Thru
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	2.0	10.0		2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	2.0	0.6		2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4			9.4				9.4			9.4
Detector 2 Size(m)		0.6			0.6				0.6			0.6
Detector 2 Type		Cl+Ex			Cl+Ex				Cl+Ex			Cl+Ex
Detector 2 Channel												

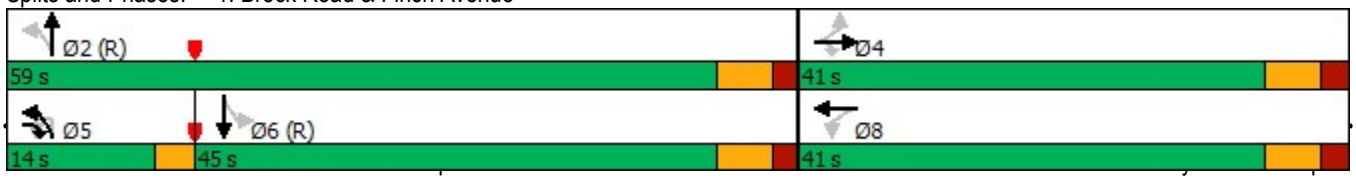


Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	202
Future Volume (vph)	202
Ideal Flow (vphpl)	1900
Lane Width (m)	3.5
Storage Length (m)	0.0
Storage Lanes	0
Taper Length (m)	
Lane Util. Factor	0.95
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	Yes
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	8
Peak Hour Factor	0.92
Heavy Vehicles (%)	0%
Adj. Flow (vph)	220
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	1.01
Turning Speed (k/h)	15
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Detector 2 Extend (s)		0.0			0.0				0.0			0.0
Turn Type	Perm	NA	pm+ov	Perm	NA		custom	pm+pt	NA		Perm	NA
Protected Phases		4	5!		8			5	2			6
Permitted Phases	4		4	8			5!	2			6	
Detector Phase	4	4	5	8	8		5	5	2		6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0	5.0	8.0	8.0		5.0	5.0	20.0		20.0	20.0
Minimum Split (s)	29.0	29.0	9.0	29.0	29.0		9.0	9.0	28.0		28.0	28.0
Total Split (s)	41.0	41.0	14.0	41.0	41.0		14.0	14.0	59.0		45.0	45.0
Total Split (%)	41.0%	41.0%	14.0%	41.0%	41.0%		14.0%	14.0%	59.0%		45.0%	45.0%
Maximum Green (s)	34.6	34.6	11.0	34.6	34.6		11.0	11.0	52.8		38.8	38.8
Yellow Time (s)	4.2	4.2	3.0	4.2	4.2		3.0	3.0	4.2		4.2	4.2
All-Red Time (s)	2.2	2.2	0.0	2.2	2.2		0.0	0.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)		6.4	3.0		6.4			3.0	6.2		6.2	6.2
Lead/Lag			Lead				Lead	Lead			Lag	Lag
Lead-Lag Optimize?			Yes				Yes	Yes			Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	None	None	None		None	None	C-Max		C-Max	C-Max
Walk Time (s)	16.0	16.0		16.0	16.0				14.0		14.0	14.0
Flash Dont Walk (s)	5.0	5.0		5.0	5.0				5.0		5.0	5.0
Pedestrian Calls (#/hr)	0	0		0	0				0		0	0
Act Effct Green (s)		34.6	52.0		34.6			56.0	52.8		38.8	38.8
Actuated g/C Ratio		0.35	0.52		0.35			0.56	0.53		0.39	0.39
v/c Ratio		1.09	0.34		0.07			1.05	1.17		0.10	1.08
Control Delay		102.3	13.6		20.3			94.4	107.6		13.3	69.3
Queue Delay		0.0	0.0		0.0			0.0	0.0		0.0	0.0
Total Delay		102.3	13.6		20.3			94.4	107.6		13.3	69.3
LOS		F	B		C			F	F		B	E
Approach Delay		69.9			20.3				106.1			69.0
Approach LOS		E			C				F			E

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 40 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.17			
Intersection Signal Delay: 88.2		Intersection LOS: F	
Intersection Capacity Utilization 118.9%		ICU Level of Service H	
Analysis Period (min) 15			
! Phase conflict between lane groups.			

Splits and Phases: 1: Brock Road & Finch Avenue





Lane Group	SBR
Detector 2 Extend (s)	
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	442	17	264	15	4	8	1	248	1945	22	6	1082
Future Volume (vph)	442	17	264	15	4	8	1	248	1945	22	6	1082
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.6	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5
Total Lost time (s)		6.4	3.0		6.4			3.0	6.2		6.2	6.2
Lane Util. Factor		1.00	1.00		1.00			1.00	0.95		1.00	0.95
Frpb, ped/bikes		1.00	1.00		1.00			1.00	1.00		1.00	0.99
Flpb, ped/bikes		1.00	1.00		1.00			1.00	1.00		1.00	1.00
Frt		1.00	0.85		0.96			1.00	1.00		1.00	0.98
Flt Protected		0.95	1.00		0.97			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1766	1568		1690			1668	3460		1705	3297
Flt Permitted		0.71	1.00		0.68			0.10	1.00		0.10	1.00
Satd. Flow (perm)		1319	1568		1183			168	3460		185	3297
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	480	18	287	16	4	9	1	270	2114	24	7	1176
RTOR Reduction (vph)	0	0	19	0	3	0	0	0	1	0	0	15
Lane Group Flow (vph)	0	498	268	0	26	0	0	271	2137	0	7	1381
Confl. Peds. (#/hr)	2					2		8		6	6	
Heavy Vehicles (%)	1%	7%	3%	0%	0%	14%	0%	1%	3%	0%	0%	6%
Turn Type	Perm	NA	pm+ov	Perm	NA		custom	pm+pt	NA		Perm	NA
Protected Phases		4	5!		8			5	2			6
Permitted Phases	4		4	8			5!	2			6	
Actuated Green, G (s)		34.6	45.6		34.6			52.8	52.8		38.8	38.8
Effective Green, g (s)		34.6	45.6		34.6			52.8	52.8		38.8	38.8
Actuated g/C Ratio		0.35	0.46		0.35			0.53	0.53		0.39	0.39
Clearance Time (s)		6.4	3.0		6.4			3.0	6.2		6.2	6.2
Vehicle Extension (s)		3.0	3.0		3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		456	715		409			253	1826		71	1279
v/s Ratio Prot			0.04					0.12	c0.62			0.42
v/s Ratio Perm		c0.38	0.13		0.02			0.45			0.04	
v/c Ratio		1.09	0.37		0.06			1.07	1.17		0.10	1.08
Uniform Delay, d1		32.7	17.8		21.9			29.3	23.6		19.5	30.6
Progression Factor		1.00	1.00		1.00			1.00	1.00		0.53	0.69
Incremental Delay, d2		69.4	0.3		0.1			76.7	82.9		2.1	46.8
Delay (s)		102.1	18.2		21.9			106.0	106.5		12.5	67.9
Level of Service		F	B		C			F	F		B	E
Approach Delay (s)		71.4			21.9				106.5			67.6
Approach LOS		E			C				F			E

Intersection Summary			
HCM 2000 Control Delay	88.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	118.9%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	202
Future Volume (vph)	202
Ideal Flow (vphpl)	1900
Lane Width	3.5
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	220
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	8
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary



Lane Group	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	0	34	2263	174	1	112	1304
Future Volume (vph)	0	34	2263	174	1	112	1304
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	4.5	3.5	3.3	3.3	3.3	3.5
Storage Length (m)	0.0	0.0		38.0		60.0	
Storage Lanes	0	1		1		1	
Taper Length (m)	7.5					75.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Ped Bike Factor							
Frt		0.865		0.850			
Flt Protected						0.950	
Satd. Flow (prot)	0	1808	3500	1561	0	1745	3400
Flt Permitted						0.950	
Satd. Flow (perm)	0	1808	3500	1561	0	1745	3400
Link Speed (k/h)	40		60				60
Link Distance (m)	119.8		367.1				224.5
Travel Time (s)	10.8		22.0				13.5
Confl. Peds. (#/hr)	1	1		6		6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	5%
Adj. Flow (vph)	0	37	2460	189	1	122	1417
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	37	2460	189	0	123	1417
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	R NA	Left	Left
Median Width(m)	0.0		3.3				3.3
Link Offset(m)	0.0		0.0				0.0
Crosswalk Width(m)	4.8		4.8				4.8
Two way Left Turn Lane							
Headway Factor	1.00	0.88	1.01	1.04	1.04	1.04	1.01
Turning Speed (k/h)	25	15		15	15	25	
Sign Control	Stop		Free				Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 82.5%		ICU Level of Service E	
Analysis Period (min) 15			



Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	0	34	2263	174	1	112	1304
Future Volume (Veh/h)	0	34	2263	174	1	112	1304
Sign Control	Stop		Free				Free
Grade	0%		0%				0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	37	2460	189	0	122	1417
Pedestrians	6		1				1
Lane Width (m)	4.5		3.4				3.4
Walking Speed (m/s)	1.2		1.2				1.2
Percent Blockage	1		0				0
Right turn flare (veh)							
Median type			None				None
Median storage veh)							
Upstream signal (m)			367				225
pX, platoon unblocked	0.62	0.49			0.00	0.49	
vC, conflicting volume	3420	1237			0	2655	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1826	0			0	2298	
tC, single (s)	6.8	6.9			0.0	4.1	
tC, 2 stage (s)							
tF (s)	3.5	3.3			0.0	2.2	
p0 queue free %	0	93			0	0	
cM capacity (veh/h)	0	532			0	109	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	37	1230	1230	189	122	708	708
Volume Left	0	0	0	0	122	0	0
Volume Right	37	0	0	189	0	0	0
cSH	532	1700	1700	1700	109	1700	1700
Volume to Capacity	0.07	0.72	0.72	0.11	1.12	0.42	0.42
Queue Length 95th (m)	1.8	0.0	0.0	0.0	61.2	0.0	0.0
Control Delay (s)	12.3	0.0	0.0	0.0	198.3	0.0	0.0
Lane LOS	B				F		
Approach Delay (s)	12.3	0.0			15.7		
Approach LOS	B						

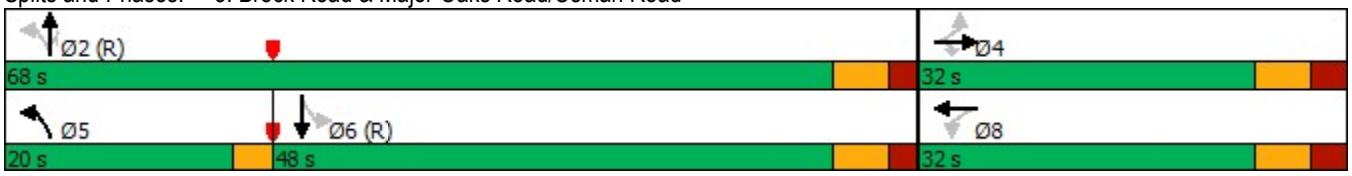
Intersection Summary			
Average Delay	5.8		
Intersection Capacity Utilization	82.5%	ICU Level of Service	E
Analysis Period (min)	15		

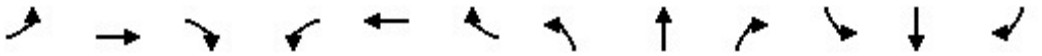
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	11	199	185	21	18	308	2092	28	54	1009	34
Future Volume (vph)	22	11	199	185	21	18	308	2092	28	54	1009	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.7	3.7	3.0	3.5	3.5	3.0	3.5	3.5
Storage Length (m)	0.0		30.0	20.0		0.0	72.0		70.0	60.0		0.0
Storage Lanes	0		1	1		0	1		1	1		0
Taper Length (m)	7.5			48.0			72.0			92.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor		1.00	0.97	0.98	0.99				0.98		1.00	
Frt			0.850		0.930				0.850		0.995	
Flt Protected		0.968		0.950			0.950			0.950		
Satd. Flow (prot)	0	1760	1566	1785	1626	0	1652	3466	1597	1685	3352	0
Flt Permitted		0.809		0.734			0.135			0.085		
Satd. Flow (perm)	0	1468	1517	1354	1626	0	235	3466	1561	151	3352	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			216		7				44		4	
Link Speed (k/h)		50			40			60			60	
Link Distance (m)		292.9			123.2			224.5			180.3	
Travel Time (s)		21.1			11.1			13.5			10.8	
Confl. Peds. (#/hr)	3		16	16		3	10		1	1		10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	10%	2%	0%	17%	0%	2%	3%	0%	0%	6%	0%
Adj. Flow (vph)	24	12	216	201	23	20	335	2274	30	59	1097	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	216	201	43	0	335	2274	30	59	1134	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	0.99	0.99	1.09	1.01	1.01	1.09	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	1	1	1	1		1	0	0	1	0	
Detector Template	Left											
Leading Detector (m)	2.0	12.0	12.0	12.0	12.0		24.0	0.0	0.0	24.0	0.0	
Trailing Detector (m)	0.0	-3.0	-3.0	-3.0	-3.0		14.0	0.0	0.0	14.0	0.0	
Detector 1 Position(m)	0.0	-3.0	-3.0	-3.0	-3.0		14.0	0.0	0.0	14.0	0.0	
Detector 1 Size(m)	2.0	15.0	15.0	15.0	15.0		10.0	0.6	2.0	10.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2		2	6		
Detector Phase	4	4	4	8	8		5	2	2	6	6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	4.0	4.0		5.0	20.0	20.0	20.0	20.0	
Minimum Split (s)	32.0	32.0	32.0	32.0	32.0		8.0	29.0	29.0	29.0	29.0	
Total Split (s)	32.0	32.0	32.0	32.0	32.0		20.0	68.0	68.0	48.0	48.0	
Total Split (%)	32.0%	32.0%	32.0%	32.0%	32.0%		20.0%	68.0%	68.0%	48.0%	48.0%	
Maximum Green (s)	25.0	25.0	25.0	25.0	25.0		17.0	61.6	61.6	41.6	41.6	
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1		3.0	4.2	4.2	4.2	4.2	
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9		0.0	2.2	2.2	2.2	2.2	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		7.0	7.0	7.0	7.0		3.0	6.4	6.4	6.4	6.4	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		None	C-Max	C-Max	C-Max	C-Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0			14.0	14.0	14.0	14.0	
Pedestrian Calls (#/hr)	0	0	0	0	0			0	0	0	0	
Act Effct Green (s)		19.6	19.6	19.6	19.6		70.4	67.0	67.0	46.9	46.9	
Actuated g/C Ratio		0.20	0.20	0.20	0.20		0.70	0.67	0.67	0.47	0.47	
v/c Ratio		0.12	0.46	0.76	0.13		0.82	0.98	0.03	0.84	0.72	
Control Delay		31.8	7.7	45.8	30.3		16.9	20.9	1.0	104.2	26.0	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		31.8	7.7	45.8	30.3		16.9	20.9	1.0	104.2	26.0	
LOS		C	A	D	C		B	C	A	F	C	
Approach Delay		11.2			43.1			20.2			29.9	
Approach LOS		B			D			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 23.6		Intersection LOS: C	
Intersection Capacity Utilization 108.3%		ICU Level of Service G	
Analysis Period (min) 15			

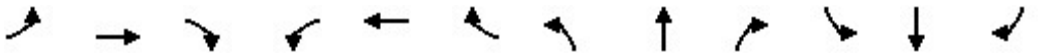
Splits and Phases: 3: Brock Road & Major Oaks Road/Usman Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	11	199	185	21	18	308	2092	28	54	1009	34
Future Volume (vph)	22	11	199	185	21	18	308	2092	28	54	1009	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.7	3.7	3.0	3.5	3.5	3.0	3.5	3.5
Total Lost time (s)		7.0	7.0	7.0	7.0		3.0	6.4	6.4	6.4	6.4	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		1.00	0.97	1.00	0.99		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00	1.00	0.98	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.97	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1756	1517	1752	1626		1652	3466	1561	1685	3353	
Flt Permitted		0.81	1.00	0.73	1.00		0.14	1.00	1.00	0.09	1.00	
Satd. Flow (perm)		1467	1517	1353	1626		236	3466	1561	151	3353	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	12	216	201	23	20	335	2274	30	59	1097	37
RTOR Reduction (vph)	0	0	174	0	6	0	0	0	10	0	2	0
Lane Group Flow (vph)	0	36	42	201	37	0	335	2274	20	59	1132	0
Confl. Peds. (#/hr)	3		16	16		3	10		1	1		10
Heavy Vehicles (%)	0%	10%	2%	0%	17%	0%	2%	3%	0%	0%	6%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)		19.6	19.6	19.6	19.6		67.0	67.0	67.0	46.9	46.9	
Effective Green, g (s)		19.6	19.6	19.6	19.6		67.0	67.0	67.0	46.9	46.9	
Actuated g/C Ratio		0.20	0.20	0.20	0.20		0.67	0.67	0.67	0.47	0.47	
Clearance Time (s)		7.0	7.0	7.0	7.0		3.0	6.4	6.4	6.4	6.4	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		287	297	265	318		400	2322	1045	70	1572	
v/s Ratio Prot					0.02		0.14	c0.66			0.34	
v/s Ratio Perm		0.02	0.03	c0.15			0.42		0.01	0.39		
v/c Ratio		0.13	0.14	0.76	0.12		0.84	0.98	0.02	0.84	0.72	
Uniform Delay, d1		33.1	33.2	38.0	33.1		21.0	15.8	5.5	23.3	21.3	
Progression Factor		1.00	1.00	1.05	1.11		0.81	1.03	0.68	1.00	1.00	
Incremental Delay, d2		0.2	0.2	4.3	0.1		1.5	2.6	0.0	69.5	2.9	
Delay (s)		33.3	33.5	44.0	36.9		18.4	18.9	3.7	92.9	24.2	
Level of Service		C	C	D	D		B	B	A	F	C	
Approach Delay (s)		33.5			42.7			18.7			27.6	
Approach LOS		C			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	23.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	108.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

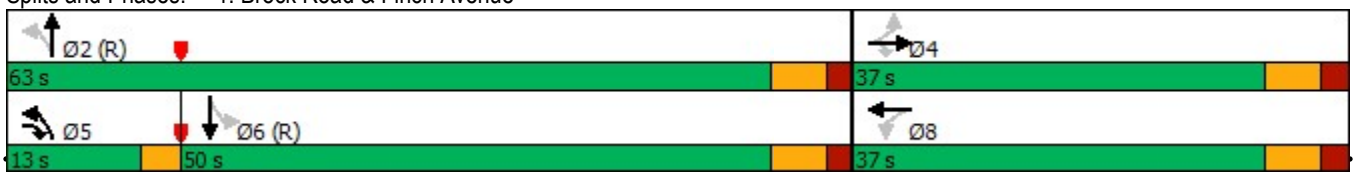


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	360	4	237	7	8	7	232	1876	14	2	1058	217
Future Volume (vph)	360	4	237	7	8	7	232	1876	14	2	1058	217
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5	3.5
Storage Length (m)	0.0		0.0	0.0		0.0	63.0		0.0	13.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			20.0			41.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor			0.98		1.00						0.99	
Frt			0.850		0.957			0.999			0.974	
Flt Protected		0.953			0.984		0.950			0.950		
Satd. Flow (prot)	0	1690	1538	0	1478	0	1620	3426	0	852	3249	0
Flt Permitted		0.710			0.872		0.085			0.091		
Satd. Flow (perm)	0	1259	1513	0	1309	0	145	3426	0	82	3249	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			35		6			1			31	
Link Speed (k/h)		60			40			60			60	
Link Distance (m)		416.8			328.7			124.4			367.1	
Travel Time (s)		25.0			29.6			7.5			22.0	
Confl. Peds. (#/hr)			3	3			14					14
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	6%	0%	5%	33%	14%	17%	4%	4%	15%	100%	6%	6%
Adj. Flow (vph)	404	4	266	8	9	8	261	2108	16	2	1189	244
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	408	266	0	25	0	261	2124	0	2	1433	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.1			3.1	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.00	1.00	1.00	1.00	1.09	1.01	1.01	1.08	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	5	8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	5.0	8.0	8.0		5.0	20.0		20.0	20.0	
Minimum Split (s)	29.0	29.0	9.0	29.0	29.0		9.0	28.0		28.0	28.0	
Total Split (s)	37.0	37.0	13.0	37.0	37.0		13.0	63.0		50.0	50.0	
Total Split (%)	37.0%	37.0%	13.0%	37.0%	37.0%		13.0%	63.0%		50.0%	50.0%	
Maximum Green (s)	30.6	30.6	10.0	30.6	30.6		10.0	56.8		43.8	43.8	
Yellow Time (s)	4.2	4.2	3.0	4.2	4.2		3.0	4.2		4.2	4.2	
All-Red Time (s)	2.2	2.2	0.0	2.2	2.2		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.4	3.0		6.4		3.0	6.2		6.2	6.2	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	16.0	16.0		16.0	16.0			14.0		14.0	14.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)		30.6	44.0		30.6		60.0	56.8		43.8	43.8	
Actuated g/C Ratio		0.31	0.44		0.31		0.60	0.57		0.44	0.44	
v/c Ratio		1.06	0.39		0.06		1.12	1.09		0.06	1.00	
Control Delay		97.8	16.6		20.9		118.8	73.2		21.0	50.9	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		97.8	16.6		20.9		118.8	73.2		21.0	50.9	
LOS		F	B		C		F	E		C	D	
Approach Delay		65.8			20.9			78.2			50.8	
Approach LOS		E			C			E			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 40 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.12			
Intersection Signal Delay: 67.3		Intersection LOS: E	
Intersection Capacity Utilization 111.5%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 1: Brock Road & Finch Avenue



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	360	4	237	7	8	7	232	1876	14	2	1058	217
Future Volume (vph)	360	4	237	7	8	7	232	1876	14	2	1058	217
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5	3.5
Total Lost time (s)		6.4	3.0		6.4		3.0	6.2		6.2	6.2	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.96		1.00	1.00		1.00	0.97	
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1690	1519		1477		1620	3426		852	3250	
Flt Permitted		0.71	1.00		0.87		0.09	1.00		0.09	1.00	
Satd. Flow (perm)		1259	1519		1309		146	3426		82	3250	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	404	4	266	8	9	8	261	2108	16	2	1189	244
RTOR Reduction (vph)	0	0	21	0	4	0	0	0	0	0	17	0
Lane Group Flow (vph)	0	408	245	0	21	0	261	2124	0	2	1416	0
Confl. Peds. (#/hr)			3	3			14					14
Heavy Vehicles (%)	6%	0%	5%	33%	14%	17%	4%	4%	15%	100%	6%	6%
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		30.6	40.6		30.6		56.8	56.8		43.8	43.8	
Effective Green, g (s)		30.6	40.6		30.6		56.8	56.8		43.8	43.8	
Actuated g/C Ratio		0.31	0.41		0.31		0.57	0.57		0.44	0.44	
Clearance Time (s)		6.4	3.0		6.4		3.0	6.2		6.2	6.2	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		385	616		400		230	1945		35	1423	
v/s Ratio Prot			0.04				0.11	c0.62			0.44	
v/s Ratio Perm		c0.32	0.12		0.02		c0.53			0.02		
v/c Ratio		1.06	0.40		0.05		1.13	1.09		0.06	0.99	
Uniform Delay, d1		34.7	21.0		24.5		29.3	21.6		16.2	28.0	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		62.5	0.4		0.1		100.4	50.3		3.1	22.7	
Delay (s)		97.2	21.5		24.5		129.7	71.9		19.3	50.6	
Level of Service		F	C		C		F	E		B	D	
Approach Delay (s)		67.3			24.5			78.3			50.6	
Approach LOS		E			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	67.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	111.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	85	1935	282	149	1139
Future Volume (vph)	0	85	1935	282	149	1139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	4.5	3.5	3.3	3.3	3.5
Storage Length (m)	0.0	0.0		38.0	60.0	
Storage Lanes	0	1		1	1	
Taper Length (m)	7.5				75.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.865		0.850		
Flt Protected					0.950	
Satd. Flow (prot)	0	1790	3400	1516	1711	3336
Flt Permitted					0.950	
Satd. Flow (perm)	0	1790	3400	1516	1711	3336
Link Speed (k/h)	40		60			60
Link Distance (m)	119.8		367.1			224.5
Travel Time (s)	10.8		22.0			13.5
Confl. Peds. (#/hr)	7	1		55	55	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	1%	5%	3%	2%	7%
Adj. Flow (vph)	0	94	2150	313	166	1266
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	94	2150	313	166	1266
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.3			3.3
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	0.88	1.01	1.04	1.04	1.01
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 75.4%		ICU Level of Service D	
Analysis Period (min) 15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	85	1935	282	149	1139
Future Volume (Veh/h)	0	85	1935	282	149	1139
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	94	2150	313	166	1266
Pedestrians	55		7			1
Lane Width (m)	4.5		3.4			3.4
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	6		1			0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			367			225
pX, platoon unblocked	0.59	0.47			0.47	
vC, conflicting volume	3177	1131			2518	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1376	0			1964	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	80			0	
cM capacity (veh/h)	0	477			128	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	94	1075	1075	313	166	633	633
Volume Left	0	0	0	0	166	0	0
Volume Right	94	0	0	313	0	0	0
cSH	477	1700	1700	1700	128	1700	1700
Volume to Capacity	0.20	0.63	0.63	0.18	1.29	0.37	0.37
Queue Length 95th (m)	5.8	0.0	0.0	0.0	84.8	0.0	0.0
Control Delay (s)	14.4	0.0	0.0	0.0	243.5	0.0	0.0
Lane LOS	B				F		
Approach Delay (s)	14.4	0.0			28.2		
Approach LOS	B						

Intersection Summary			
Average Delay	10.5		
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	33	12	249	159	25	47	2	280	1817	24	84	1010
Future Volume (vph)	33	12	249	159	25	47	2	280	1817	24	84	1010
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.7	3.7	3.6	3.0	3.5	3.5	3.0	3.5
Storage Length (m)	0.0		30.0	20.0		0.0		72.0		70.0	60.0	
Storage Lanes	0		1	1		0		1		1	1	
Taper Length (m)	7.5			48.0				72.0			92.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor		0.99	0.94	0.95	0.98					0.95		1.00
Frt			0.850		0.902					0.850		0.997
Flt Protected		0.965		0.950				0.950			0.950	
Satd. Flow (prot)	0	1689	1566	1733	1654	0	0	1652	3400	1597	1685	3294
Flt Permitted		0.741		0.722				0.115			0.075	
Satd. Flow (perm)	0	1286	1472	1257	1654	0	0	200	3400	1512	133	3294
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			277		56					69		2
Link Speed (k/h)		50			40				60			60
Link Distance (m)		292.9			123.2				224.5			180.3
Travel Time (s)		21.1			11.1				13.5			10.8
Confl. Peds. (#/hr)	10		37	37		10		10		13	13	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	10%	0%	2%	3%	5%	2%	0%	2%	5%	0%	0%	8%
Adj. Flow (vph)	39	14	296	189	30	56	2	333	2163	29	100	1202
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	53	296	189	86	0	0	335	2163	29	100	1226
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	Left	Left
Median Width(m)		3.5			3.5				3.3			3.3
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		4.8			4.8				4.8			4.8
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	0.99	0.99	1.00	1.09	1.01	1.01	1.09	1.01
Turning Speed (k/h)	25		15	25		15	15	25		15	25	
Number of Detectors	1	1	1	1	1		1	1	0	0	1	0
Detector Template	Left						Left					
Leading Detector (m)	2.0	12.0	12.0	12.0	12.0		2.0	24.0	0.0	0.0	24.0	0.0
Trailing Detector (m)	0.0	-3.0	-3.0	-3.0	-3.0		0.0	14.0	0.0	0.0	14.0	0.0
Detector 1 Position(m)	0.0	-3.0	-3.0	-3.0	-3.0		0.0	14.0	0.0	0.0	14.0	0.0
Detector 1 Size(m)	2.0	15.0	15.0	15.0	15.0		2.0	10.0	0.6	2.0	10.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Perm	NA	Perm	Perm	NA		custom	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4			8			5	2		1	6
Permitted Phases	4		4	8			5	2		2	6	
Detector Phase	4	4	4	8	8		5	5	2	2	1	6

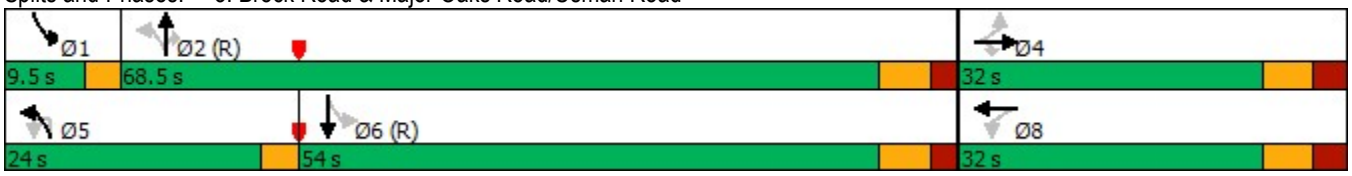


Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	20
Future Volume (vph)	20
Ideal Flow (vphpl)	1900
Lane Width (m)	3.5
Storage Length (m)	0.0
Storage Lanes	0
Taper Length (m)	
Lane Util. Factor	0.95
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	Yes
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	10
Peak Hour Factor	0.84
Heavy Vehicles (%)	6%
Adj. Flow (vph)	24
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	1.01
Turning Speed (k/h)	15
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	4.0	4.0		5.0	5.0	20.0	20.0	5.0	20.0
Minimum Split (s)	32.0	32.0	32.0	32.0	32.0		8.0	8.0	29.0	29.0	9.5	29.0
Total Split (s)	32.0	32.0	32.0	32.0	32.0		24.0	24.0	68.5	68.5	9.5	54.0
Total Split (%)	29.1%	29.1%	29.1%	29.1%	29.1%		21.8%	21.8%	62.3%	62.3%	8.6%	49.1%
Maximum Green (s)	25.0	25.0	25.0	25.0	25.0		21.0	21.0	62.1	62.1	6.5	47.6
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1		3.0	3.0	4.2	4.2	3.0	4.2
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9		0.0	0.0	2.2	2.2	0.0	2.2
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.0	7.0	7.0	7.0			3.0	6.4	6.4	3.0	6.4
Lead/Lag							Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
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
Recall Mode	None	None	None	None	None		None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0				7.0	7.0		7.0
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0				14.0	14.0		14.0
Pedestrian Calls (#/hr)	0	0	0	0	0				0	0		0
Act Effct Green (s)		20.8	20.8	20.8	20.8			79.2	66.6	66.6	63.1	53.5
Actuated g/C Ratio		0.19	0.19	0.19	0.19			0.72	0.61	0.61	0.57	0.49
v/c Ratio		0.22	0.59	0.80	0.24			0.84	1.05	0.03	0.61	0.76
Control Delay		38.1	10.8	65.3	17.7			40.6	57.9	0.0	35.2	28.7
Queue Delay		0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Delay		38.1	10.8	65.3	17.7			40.6	57.9	0.0	35.2	28.7
LOS		D	B	E	B			D	E	A	D	C
Approach Delay		15.0			50.4				54.9			29.2
Approach LOS		B			D				D			C

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 130			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.05			
Intersection Signal Delay: 43.9		Intersection LOS: D	
Intersection Capacity Utilization 96.9%		ICU Level of Service F	
Analysis Period (min) 15			

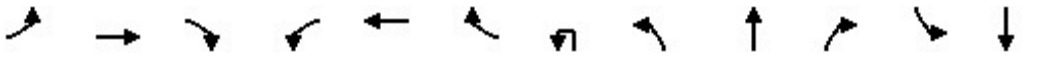
Splits and Phases: 3: Brock Road & Major Oaks Road/Usman Road





Lane Group	SBR
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	33	12	249	159	25	47	2	280	1817	24	84	1010
Future Volume (vph)	33	12	249	159	25	47	2	280	1817	24	84	1010
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.7	3.7	3.6	3.0	3.5	3.5	3.0	3.5
Total Lost time (s)		7.0	7.0	7.0	7.0			3.0	6.4	6.4	3.0	6.4
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes		1.00	0.94	1.00	0.98			1.00	1.00	0.95	1.00	1.00
Flpb, ped/bikes		0.99	1.00	0.95	1.00			1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	0.90			1.00	1.00	0.85	1.00	1.00
Flt Protected		0.96	1.00	0.95	1.00			0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1673	1472	1654	1655			1652	3400	1512	1685	3294
Flt Permitted		0.74	1.00	0.72	1.00			0.11	1.00	1.00	0.07	1.00
Satd. Flow (perm)		1285	1472	1258	1655			199	3400	1512	133	3294
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	39	14	296	189	30	56	2	333	2163	29	100	1202
RTOR Reduction (vph)	0	0	225	0	45	0	0	0	0	11	0	1
Lane Group Flow (vph)	0	53	71	189	41	0	0	335	2163	18	100	1225
Confl. Peds. (#/hr)	10		37	37		10		10		13	13	
Heavy Vehicles (%)	10%	0%	2%	3%	5%	2%	0%	2%	5%	0%	0%	8%
Turn Type	Perm	NA	Perm	Perm	NA		custom	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4			8			5	2		1	6
Permitted Phases	4		4	8			5	2		2	6	
Actuated Green, G (s)		20.8	20.8	20.8	20.8			75.8	66.6	66.6	59.7	53.5
Effective Green, g (s)		20.8	20.8	20.8	20.8			75.8	66.6	66.6	59.7	53.5
Actuated g/C Ratio		0.19	0.19	0.19	0.19			0.69	0.61	0.61	0.54	0.49
Clearance Time (s)		7.0	7.0	7.0	7.0			3.0	6.4	6.4	3.0	6.4
Vehicle Extension (s)		3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		242	278	237	312			392	2058	915	159	1602
v/s Ratio Prot					0.02			c0.15	c0.64		0.04	0.37
v/s Ratio Perm		0.04	0.05	c0.15				0.44		0.01	0.31	
v/c Ratio		0.22	0.26	0.80	0.13			0.85	1.05	0.02	0.63	0.76
Uniform Delay, d1		37.7	38.0	42.6	37.1			26.4	21.7	8.7	24.0	23.1
Progression Factor		1.00	1.00	0.99	1.06			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.5	0.5	16.5	0.2			16.4	34.8	0.0	7.6	3.5
Delay (s)		38.2	38.5	58.8	39.4			42.8	56.5	8.7	31.6	26.6
Level of Service		D	D	E	D			D	E	A	C	C
Approach Delay (s)		38.5			52.8				54.2			27.0
Approach LOS		D			D				D			C

Intersection Summary			
HCM 2000 Control Delay	44.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	96.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	20
Future Volume (vph)	20
Ideal Flow (vphpl)	1900
Lane Width	3.5
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.84
Adj. Flow (vph)	24
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	10
Heavy Vehicles (%)	6%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 1: Finch Avenue & Brock Road

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	TR
Maximum Queue (m)	69.7	69.2	20.4	49.0	89.7	52.3	11.0	363.8	362.2
Average Queue (m)	36.1	32.5	8.3	24.1	33.1	20.1	0.4	336.3	338.5
95th Queue (m)	60.4	58.7	19.2	41.1	67.1	42.8	4.4	408.2	405.6
Link Distance (m)	403.4	403.4	313.4		113.3	113.3		350.8	350.8
Upstream Blk Time (%)					0			9	11
Queuing Penalty (veh)					0			100	127
Storage Bay Dist (m)				63.0			13.0		
Storage Blk Time (%)					1		0	38	
Queuing Penalty (veh)					1		3	0	

Intersection: 2: Brock Road & Usman Road

Movement	NB	SB	SB	SB
Directions Served	R	UL	T	T
Maximum Queue (m)	6.4	134.9	212.0	211.4
Average Queue (m)	0.4	42.1	134.1	138.9
95th Queue (m)	2.8	134.4	256.6	260.4
Link Distance (m)			205.8	205.8
Upstream Blk Time (%)			1	1
Queuing Penalty (veh)			9	13
Storage Bay Dist (m)	38.0	60.0		
Storage Blk Time (%)			36	
Queuing Penalty (veh)			25	

Intersection: 3: Brock Road & Major Oaks Road/Usman Road

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	TR	L	T	T	R	L	T	TR
Maximum Queue (m)	120.4	37.5	64.3	59.0	53.2	65.0	65.2	8.9	104.2	186.9	185.8
Average Queue (m)	47.5	33.8	33.3	6.9	28.2	28.8	30.9	0.8	23.1	154.8	149.1
95th Queue (m)	108.8	44.1	54.5	29.9	47.0	56.3	57.0	4.4	106.6	215.8	217.1
Link Distance (m)	279.4			97.4		205.8	205.8			170.1	170.1
Upstream Blk Time (%)										35	34
Queuing Penalty (veh)										0	0
Storage Bay Dist (m)		30.0	20.0		72.0			70.0	60.0		
Storage Blk Time (%)	1	37	44	2		0	0			41	
Queuing Penalty (veh)	2	16	9	4		0	0			7	

Network Summary

Network wide Queuing Penalty: 315

Intersection: 1: Brock Road & Finch Avenue

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	UL	T	TR	L	T	TR
Maximum Queue (m)	115.5	41.8	17.9	82.9	128.9	131.4	38.7	142.5	147.3
Average Queue (m)	71.3	21.1	4.8	69.6	119.2	119.6	3.0	73.7	80.8
95th Queue (m)	105.4	38.5	12.9	105.8	124.6	125.7	16.7	120.2	127.2
Link Distance (m)	403.4	403.4	313.4		113.3	113.3		350.8	350.8
Upstream Blk Time (%)					36	35			
Queuing Penalty (veh)					0	0			
Storage Bay Dist (m)				63.0			13.0		
Storage Blk Time (%)				8	36		0	48	
Queuing Penalty (veh)				75	89		1	3	

Intersection: 2: Brock Road & Usman Road

Movement	WB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	R	UL	T	T
Maximum Queue (m)	9.6	28.3	12.7	7.5	75.4	65.7	13.3
Average Queue (m)	0.6	1.9	1.0	1.3	39.1	9.2	0.8
95th Queue (m)	5.3	12.3	8.8	5.6	89.5	54.4	7.0
Link Distance (m)	93.4	350.8	350.8			205.8	205.8
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)				38.0	60.0		
Storage Blk Time (%)					19		
Queuing Penalty (veh)					126		

Intersection: 3: Brock Road & Major Oaks Road/Usman Road

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	TR	L	T	T	R	L	T	TR
Maximum Queue (m)	38.8	36.3	58.9	46.4	85.0	117.9	110.5	7.4	46.9	106.5	91.2
Average Queue (m)	7.7	19.0	30.4	9.4	41.4	58.8	61.9	1.1	23.7	61.5	50.3
95th Queue (m)	23.1	31.4	52.3	31.6	69.5	96.7	96.2	4.8	45.8	99.4	86.2
Link Distance (m)	279.4			97.4		205.8	205.8			170.1	170.1
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (m)		30.0	20.0		72.0			70.0	60.0		
Storage Blk Time (%)	0	3	43	2	1	2	4			9	
Queuing Penalty (veh)	0	1	17	3	15	6	1			5	

Network Summary

Network wide Queuing Penalty: 341

Intersection: 1: Brock Road & Finch Avenue

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	TR
Maximum Queue (m)	113.6	38.4	20.3	82.9	125.5	128.4	27.8	141.5	146.7
Average Queue (m)	67.7	20.5	4.4	59.6	106.9	107.5	1.9	82.5	88.2
95th Queue (m)	102.8	35.0	14.0	101.1	143.1	144.3	13.7	130.8	135.9
Link Distance (m)	403.4	403.4	313.4		113.3	113.3		350.8	350.8
Upstream Blk Time (%)					17	19			
Queuing Penalty (veh)					0	0			
Storage Bay Dist (m)				63.0			13.0		
Storage Blk Time (%)				1	24		2	43	
Queuing Penalty (veh)				11	55		13	1	

Intersection: 2: Brock Road & Usman Road

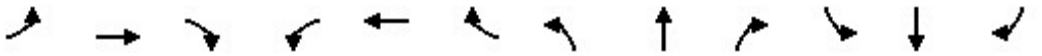
Movement	WB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	R	L	T	T
Maximum Queue (m)	32.5	29.8	20.2	17.7	129.2	138.1	136.1
Average Queue (m)	3.2	3.6	2.0	4.2	63.6	23.5	9.2
95th Queue (m)	16.1	16.7	10.5	12.9	125.7	101.8	63.5
Link Distance (m)	93.4	350.8	350.8			205.8	205.8
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)				38.0	60.0		
Storage Blk Time (%)					39	0	
Queuing Penalty (veh)					221	0	

Intersection: 3: Brock Road & Major Oaks Road/Usman Road

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	TR	UL	T	T	R	L	T	TR
Maximum Queue (m)	52.5	37.4	66.3	71.6	76.5	122.1	123.5	10.0	45.0	116.8	113.0
Average Queue (m)	15.7	25.9	35.7	20.1	39.1	73.8	78.5	1.4	19.9	67.0	57.6
95th Queue (m)	43.6	40.1	59.4	51.3	67.5	114.0	119.2	5.9	37.0	108.3	101.0
Link Distance (m)	279.4			97.4		205.8	205.8			170.1	170.1
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (m)		30.0	20.0		72.0			70.0	60.0		
Storage Blk Time (%)	2	9	52	5	1	7	10			11	
Queuing Penalty (veh)	4	4	37	8	13	20	2			9	

Network Summary

Network wide Queuing Penalty: 399



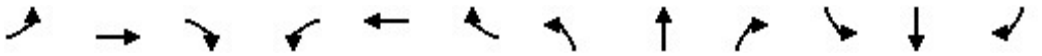
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	186	4	273	23	5	6	145	863	4	1	2223	230
Future Volume (vph)	186	4	273	23	5	6	145	863	4	1	2223	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5	3.5
Storage Length (m)	0.0		0.0	0.0		0.0	63.0		0.0	13.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			20.0			41.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		1.00	0.99		1.00			1.00		1.00	1.00	
Frt			0.850		0.974			0.999			0.986	
Flt Protected		0.953			0.967		0.950			0.950		
Satd. Flow (prot)	0	1697	1568	0	1508	0	1574	3072	0	852	3339	0
Flt Permitted		0.703			0.725		0.067			0.304		
Satd. Flow (perm)	0	1250	1545	0	1129	0	111	3072	0	272	3339	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			35		7			1			18	
Link Speed (k/h)		60			40			60			60	
Link Distance (m)		416.8			328.7			124.4			367.1	
Travel Time (s)		25.0			29.6			7.5			22.0	
Confl. Peds. (#/hr)	1		2	2		1	9		3	3		9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	7%	16%	33%	100%	5%	5%
Adj. Flow (vph)	202	4	297	25	5	7	158	938	4	1	2416	250
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	206	297	0	37	0	158	942	0	1	2666	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.1			3.1	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.00	1.00	1.00	1.00	1.09	1.01	1.01	1.08	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	5	8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	5.0	8.0	8.0		5.0	20.0		20.0	20.0	
Minimum Split (s)	29.0	29.0	9.0	29.0	29.0		9.0	28.0		28.0	28.0	
Total Split (s)	29.0	29.0	9.0	29.0	29.0		9.0	71.0		62.0	62.0	
Total Split (%)	29.0%	29.0%	9.0%	29.0%	29.0%		9.0%	71.0%		62.0%	62.0%	
Maximum Green (s)	22.6	22.6	6.0	22.6	22.6		6.0	64.8		55.8	55.8	
Yellow Time (s)	4.2	4.2	3.0	4.2	4.2		3.0	4.2		4.2	4.2	
All-Red Time (s)	2.2	2.2	0.0	2.2	2.2		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.4	3.0		6.4		3.0	6.2		6.2	6.2	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	16.0	16.0		16.0	16.0			14.0		14.0	14.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)		19.9	31.2		19.9		70.7	67.5		56.6	56.6	
Actuated g/C Ratio		0.20	0.31		0.20		0.71	0.68		0.57	0.57	
v/c Ratio		0.83	0.58		0.16		0.81	0.45		0.01	1.41	
Control Delay		64.8	28.4		28.7		52.3	8.9		10.0	209.1	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		64.8	28.4		28.7		52.3	8.9		10.0	209.1	
LOS		E	C		C		D	A		A	F	
Approach Delay		43.3			28.7			15.1			209.0	
Approach LOS		D			C			B			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 2 (2%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.41			
Intersection Signal Delay: 138.6		Intersection LOS: F	
Intersection Capacity Utilization 106.8%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 1: Brock Road & Finch Avenue





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	186	4	273	23	5	6	145	863	4	1	2223	230
Future Volume (vph)	186	4	273	23	5	6	145	863	4	1	2223	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5	3.5
Total Lost time (s)		6.4	3.0		6.4		3.0	6.2		6.2	6.2	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.97		1.00	1.00		1.00	0.99	
Flt Protected		0.95	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1695	1551		1507		1574	3073		851	3338	
Flt Permitted		0.70	1.00		0.73		0.07	1.00		0.30	1.00	
Satd. Flow (perm)		1250	1551		1130		111	3073		272	3338	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	202	4	297	25	5	7	158	938	4	1	2416	250
RTOR Reduction (vph)	0	0	25	0	6	0	0	0	0	0	8	0
Lane Group Flow (vph)	0	206	272	0	31	0	158	942	0	1	2658	0
Confl. Peds. (#/hr)	1		2	2		1	9		3	3		9
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	7%	16%	33%	100%	5%	5%
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		19.9	27.8		19.9		67.5	67.5		56.6	56.6	
Effective Green, g (s)		19.9	27.8		19.9		67.5	67.5		56.6	56.6	
Actuated g/C Ratio		0.20	0.28		0.20		0.68	0.68		0.57	0.57	
Clearance Time (s)		6.4	3.0		6.4		3.0	6.2		6.2	6.2	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		248	431		224		190	2074		153	1889	
v/s Ratio Prot			0.05				c0.07	0.31			c0.80	
v/s Ratio Perm		c0.16	0.13		0.03		0.49			0.00		
v/c Ratio		0.83	0.63		0.14		0.83	0.45		0.01	1.41	
Uniform Delay, d1		38.4	31.6		33.0		29.3	7.6		9.5	21.7	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		20.4	3.0		0.3		25.5	0.7		0.1	186.5	
Delay (s)		58.9	34.6		33.3		54.8	8.3		9.5	208.2	
Level of Service		E	C		C		D	A		A	F	
Approach Delay (s)		44.5			33.3			15.0			208.1	
Approach LOS		D			C			B			F	

Intersection Summary			
HCM 2000 Control Delay	138.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	106.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	0	12	1011	93	1	69	2459
Future Volume (vph)	0	12	1011	93	1	69	2459
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	4.5	3.5	3.3	3.3	3.3	3.5
Storage Length (m)	0.0	0.0		38.0		60.0	
Storage Lanes	0	1		1		1	
Taper Length (m)	7.5					75.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Ped Bike Factor							
Frt		0.865		0.850			
Flt Protected						0.950	
Satd. Flow (prot)	0	1808	3131	1459	0	1647	3400
Flt Permitted						0.950	
Satd. Flow (perm)	0	1808	3131	1459	0	1647	3400
Link Speed (k/h)	40		60				60
Link Distance (m)	119.8		367.1				224.5
Travel Time (s)	10.8		22.0				13.5
Confl. Peds. (#/hr)				4		4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	14%	7%	0%	6%	5%
Adj. Flow (vph)	0	13	1099	101	1	75	2673
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	13	1099	101	0	76	2673
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	R NA	Left	Left
Median Width(m)	0.0		3.3				3.3
Link Offset(m)	0.0		0.0				0.0
Crosswalk Width(m)	4.8		4.8				4.8
Two way Left Turn Lane							
Headway Factor	1.00	0.88	1.01	1.04	1.04	1.04	1.01
Turning Speed (k/h)	25	15		15	15	25	
Sign Control	Stop		Free				Free

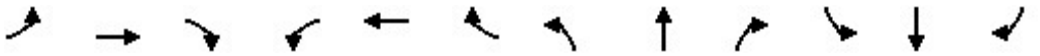
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 71.3%		ICU Level of Service C	
Analysis Period (min) 15			



Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	0	12	1011	93	1	69	2459
Future Volume (Veh/h)	0	12	1011	93	1	69	2459
Sign Control	Stop		Free				Free
Grade	0%		0%				0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	13	1099	101	0	75	2673
Pedestrians	4						
Lane Width (m)	4.5						
Walking Speed (m/s)	1.2						
Percent Blockage	0						
Right turn flare (veh)							
Median type			None				None
Median storage veh)							
Upstream signal (m)			367				225
pX, platoon unblocked	0.48	0.91			0.00	0.91	
vC, conflicting volume	2590	554			0	1204	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1303	312			0	1027	
tC, single (s)	6.8	6.9			0.0	4.2	
tC, 2 stage (s)							
tF (s)	3.5	3.3			0.0	2.3	
p0 queue free %	100	98			0	87	
cM capacity (veh/h)	65	625			0	588	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	13	550	550	101	75	1336	1336
Volume Left	0	0	0	0	75	0	0
Volume Right	13	0	0	101	0	0	0
cSH	625	1700	1700	1700	588	1700	1700
Volume to Capacity	0.02	0.32	0.32	0.06	0.13	0.79	0.79
Queue Length 95th (m)	0.5	0.0	0.0	0.0	3.5	0.0	0.0
Control Delay (s)	10.9	0.0	0.0	0.0	12.0	0.0	0.0
Lane LOS	B				B		
Approach Delay (s)	10.9	0.0			0.3		
Approach LOS	B						

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	71.3%	ICU Level of Service		C
Analysis Period (min)	15			

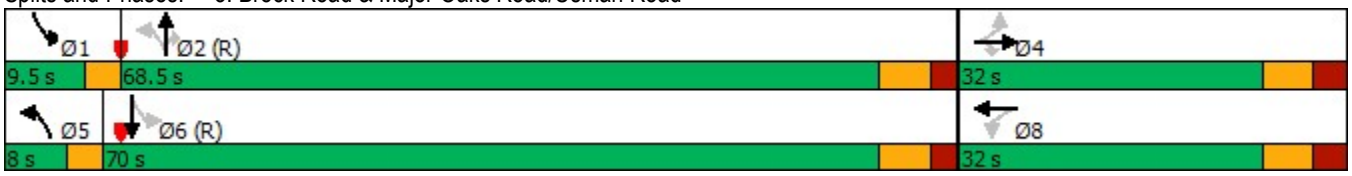


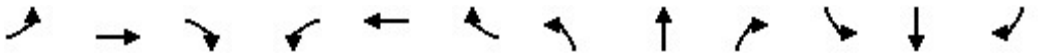
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	5	295	174	12	9	140	882	11	18	2067	21
Future Volume (vph)	43	5	295	174	12	9	140	882	11	18	2067	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.7	3.7	3.0	3.5	3.5	3.0	3.5	3.5
Storage Length (m)	0.0		30.0	20.0		0.0	72.0		70.0	60.0		0.0
Storage Lanes	0		1	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			72.0			92.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor		0.99	0.99	1.00	0.99				0.98	1.00	1.00	
Frt			0.850		0.935				0.850		0.998	
Flt Protected		0.957		0.950			0.950			0.950		
Satd. Flow (prot)	0	1668	1536	1733	1517	0	1589	3077	1439	1685	3388	0
Flt Permitted		0.734		0.723			0.060			0.283		
Satd. Flow (perm)	0	1270	1515	1317	1517	0	100	3077	1406	502	3388	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			86		10				69		2	
Link Speed (k/h)		50			40			60			60	
Link Distance (m)		292.9			123.2			224.5			180.3	
Travel Time (s)		21.1			11.1			13.5			10.8	
Confl. Peds. (#/hr)	6		1	1		6	3		1	1		3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	25%	4%	3%	20%	14%	6%	16%	11%	0%	5%	18%
Adj. Flow (vph)	47	5	321	189	13	10	152	959	12	20	2247	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	52	321	189	23	0	152	959	12	20	2270	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	0.99	0.99	1.09	1.01	1.01	1.09	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	1	1	1	1		1	0	0	1	0	
Detector Template	Left											
Leading Detector (m)	2.0	12.0	12.0	12.0	12.0		24.0	0.0	0.0	24.0	0.0	
Trailing Detector (m)	0.0	-3.0	-3.0	-3.0	-3.0		14.0	0.0	0.0	14.0	0.0	
Detector 1 Position(m)	0.0	-3.0	-3.0	-3.0	-3.0		14.0	0.0	0.0	14.0	0.0	
Detector 1 Size(m)	2.0	15.0	15.0	15.0	15.0		10.0	0.6	2.0	10.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		
Detector Phase	4	4	4	8	8		5	2	2	1	6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		5.0	20.0	20.0	5.0	20.0	
Minimum Split (s)	32.0	32.0	32.0	32.0	32.0		8.0	29.0	29.0	9.5	29.0	
Total Split (s)	32.0	32.0	32.0	32.0	32.0		8.0	68.5	68.5	9.5	70.0	
Total Split (%)	29.1%	29.1%	29.1%	29.1%	29.1%		7.3%	62.3%	62.3%	8.6%	63.6%	
Maximum Green (s)	25.0	25.0	25.0	25.0	25.0		5.0	62.1	62.1	6.5	63.6	
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1		3.0	4.2	4.2	3.0	4.2	
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9		0.0	2.2	2.2	0.0	2.2	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		7.0	7.0	7.0	7.0		3.0	6.4	6.4	3.0	6.4	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		None	C-Max	C-Max	None	C-Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0	7.0		7.0	
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0			14.0	14.0		14.0	
Pedestrian Calls (#/hr)	0	0	0	0	0			0	0		0	
Act Effct Green (s)		21.7	21.7	21.7	21.7		76.9	71.5	71.5	72.2	63.6	
Actuated g/C Ratio		0.20	0.20	0.20	0.20		0.70	0.65	0.65	0.66	0.58	
v/c Ratio		0.21	0.87	0.73	0.07		0.84	0.48	0.01	0.05	1.16	
Control Delay		37.4	54.9	56.2	23.9		60.9	12.0	0.0	5.8	102.0	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		37.4	54.9	56.2	23.9		60.9	12.0	0.0	5.8	102.0	
LOS		D	D	E	C		E	B	A	A	F	
Approach Delay		52.5			52.7			18.5			101.1	
Approach LOS		D			D			B			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.16			
Intersection Signal Delay: 70.8		Intersection LOS: E	
Intersection Capacity Utilization 104.9%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 3: Brock Road & Major Oaks Road/Usman Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	5	295	174	12	9	140	882	11	18	2067	21
Future Volume (vph)	43	5	295	174	12	9	140	882	11	18	2067	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.7	3.7	3.0	3.5	3.5	3.0	3.5	3.5
Total Lost time (s)		7.0	7.0	7.0	7.0		3.0	6.4	6.4	3.0	6.4	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		1.00	0.99	1.00	0.99		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		0.99	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.96	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1656	1515	1731	1517		1589	3077	1406	1684	3390	
Flt Permitted		0.73	1.00	0.72	1.00		0.06	1.00	1.00	0.28	1.00	
Satd. Flow (perm)		1271	1515	1317	1517		100	3077	1406	503	3390	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	5	321	189	13	10	152	959	12	20	2247	23
RTOR Reduction (vph)	0	0	69	0	8	0	0	0	4	0	1	0
Lane Group Flow (vph)	0	52	252	189	15	0	152	959	8	20	2269	0
Confl. Peds. (#/hr)	6		1	1		6	3		1	1		3
Heavy Vehicles (%)	6%	25%	4%	3%	20%	14%	6%	16%	11%	0%	5%	18%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)		21.7	21.7	21.7	21.7		74.9	69.7	69.7	65.8	63.6	
Effective Green, g (s)		21.7	21.7	21.7	21.7		74.9	69.7	69.7	65.8	63.6	
Actuated g/C Ratio		0.20	0.20	0.20	0.20		0.68	0.63	0.63	0.60	0.58	
Clearance Time (s)		7.0	7.0	7.0	7.0		3.0	6.4	6.4	3.0	6.4	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		250	298	259	299		180	1949	890	324	1960	
v/s Ratio Prot					0.01		c0.06	0.31		0.00	c0.67	
v/s Ratio Perm		0.04	c0.17	0.14			0.51		0.01	0.04		
v/c Ratio		0.21	0.85	0.73	0.05		0.84	0.49	0.01	0.06	1.16	
Uniform Delay, d1		37.0	42.5	41.4	35.8		33.8	10.7	7.4	9.0	23.2	
Progression Factor		1.00	1.00	0.99	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.4	19.3	9.3	0.1		28.7	0.9	0.0	0.1	77.2	
Delay (s)		37.4	61.8	50.3	35.9		62.4	11.6	7.4	9.1	100.4	
Level of Service		D	E	D	D		E	B	A	A	F	
Approach Delay (s)		58.4			48.7			18.4			99.6	
Approach LOS		E			D			B			F	

Intersection Summary			
HCM 2000 Control Delay	70.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	104.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	486	18	291	17	5	9	1	274	2138	24	6	1184
Future Volume (vph)	486	18	291	17	5	9	1	274	2138	24	6	1184
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.6	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5
Storage Length (m)	0.0		0.0	0.0		0.0		63.0		0.0	13.0	
Storage Lanes	0		1	0		0		1		0	1	
Taper Length (m)	7.5			7.5				20.0			41.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor		1.00			1.00				1.00			0.99
Frt			0.850		0.959				0.998			0.977
Flt Protected		0.954			0.973			0.950			0.950	
Satd. Flow (prot)	0	1771	1568	0	1693	0	0	1668	3459	0	1705	3299
Flt Permitted		0.710			0.591			0.096			0.103	
Satd. Flow (perm)	0	1314	1568	0	1028	0	0	169	3459	0	185	3299
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			35		2				2			25
Link Speed (k/h)		60			40				60			60
Link Distance (m)		416.8			328.7				124.4			367.1
Travel Time (s)		25.0			29.6				7.5			22.0
Confl. Peds. (#/hr)	2					2		8		6	6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	7%	3%	0%	0%	14%	0%	1%	3%	0%	0%	6%
Adj. Flow (vph)	528	20	316	18	5	10	1	298	2324	26	7	1287
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	548	316	0	33	0	0	299	2350	0	7	1526
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	Left	Left
Median Width(m)		0.0			0.0				3.1			3.1
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		4.8			4.8				4.8			4.8
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.00	1.00	1.00	1.00	1.00	1.09	1.01	1.01	1.08	1.01
Turning Speed (k/h)	25		15	25		15	15	25		15	25	
Number of Detectors	1	2	1	1	2		1	1	2		1	2
Detector Template	Left	Thru	Right	Left	Thru		Left	Left	Thru		Left	Thru
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	2.0	10.0		2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	2.0	0.6		2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4			9.4				9.4			9.4
Detector 2 Size(m)		0.6			0.6				0.6			0.6
Detector 2 Type		Cl+Ex			Cl+Ex				Cl+Ex			Cl+Ex
Detector 2 Channel												

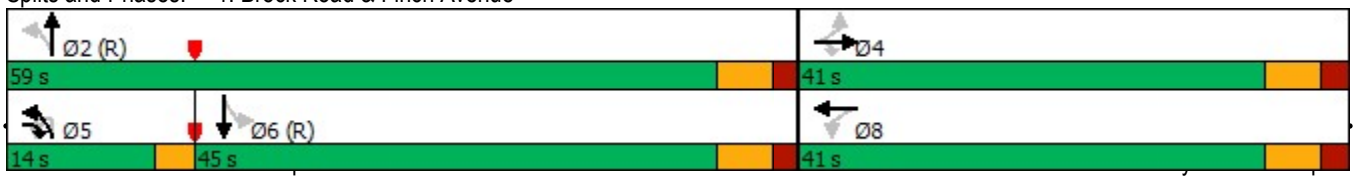


Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	220
Future Volume (vph)	220
Ideal Flow (vphpl)	1900
Lane Width (m)	3.5
Storage Length (m)	0.0
Storage Lanes	0
Taper Length (m)	
Lane Util. Factor	0.95
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	Yes
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	8
Peak Hour Factor	0.92
Heavy Vehicles (%)	0%
Adj. Flow (vph)	239
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	1.01
Turning Speed (k/h)	15
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Detector 2 Extend (s)		0.0			0.0				0.0			0.0
Turn Type	Perm	NA	pm+ov	Perm	NA		custom	pm+pt	NA		Perm	NA
Protected Phases		4	5!		8			5	2			6
Permitted Phases	4		4	8			5!	2			6	
Detector Phase	4	4	5	8	8		5	5	2		6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0	5.0	8.0	8.0		5.0	5.0	20.0		20.0	20.0
Minimum Split (s)	29.0	29.0	9.0	29.0	29.0		9.0	9.0	28.0		28.0	28.0
Total Split (s)	41.0	41.0	14.0	41.0	41.0		14.0	14.0	59.0		45.0	45.0
Total Split (%)	41.0%	41.0%	14.0%	41.0%	41.0%		14.0%	14.0%	59.0%		45.0%	45.0%
Maximum Green (s)	34.6	34.6	11.0	34.6	34.6		11.0	11.0	52.8		38.8	38.8
Yellow Time (s)	4.2	4.2	3.0	4.2	4.2		3.0	3.0	4.2		4.2	4.2
All-Red Time (s)	2.2	2.2	0.0	2.2	2.2		0.0	0.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)		6.4	3.0		6.4			3.0	6.2		6.2	6.2
Lead/Lag			Lead				Lead	Lead			Lag	Lag
Lead-Lag Optimize?			Yes				Yes	Yes			Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	None	None	None		None	None	C-Max		C-Max	C-Max
Walk Time (s)	16.0	16.0		16.0	16.0				14.0		14.0	14.0
Flash Dont Walk (s)	5.0	5.0		5.0	5.0				5.0		5.0	5.0
Pedestrian Calls (#/hr)	0	0		0	0				0		0	0
Act Effct Green (s)		34.6	52.0		34.6			56.0	52.8		38.8	38.8
Actuated g/C Ratio		0.35	0.52		0.35			0.56	0.53		0.39	0.39
v/c Ratio		1.21	0.38		0.09			1.15	1.29		0.10	1.18
Control Delay		143.7	14.2		22.1			129.5	157.7		12.2	106.3
Queue Delay		0.0	0.0		0.0			0.0	0.0		0.0	0.0
Total Delay		143.7	14.2		22.1			129.5	157.7		12.2	106.3
LOS		F	B		C			F	F		B	F
Approach Delay		96.3			22.1				154.5			105.9
Approach LOS		F			C				F			F

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 40 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.29			
Intersection Signal Delay: 129.1		Intersection LOS: F	
Intersection Capacity Utilization 126.7%		ICU Level of Service H	
Analysis Period (min) 15			
! Phase conflict between lane groups.			

Splits and Phases: 1: Brock Road & Finch Avenue





Lane Group	SBR
Detector 2 Extend (s)	
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	486	18	291	17	5	9	1	274	2138	24	6	1184
Future Volume (vph)	486	18	291	17	5	9	1	274	2138	24	6	1184
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.6	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5
Total Lost time (s)		6.4	3.0		6.4			3.0	6.2		6.2	6.2
Lane Util. Factor		1.00	1.00		1.00			1.00	0.95		1.00	0.95
Frpb, ped/bikes		1.00	1.00		1.00			1.00	1.00		1.00	0.99
Flpb, ped/bikes		1.00	1.00		1.00			1.00	1.00		1.00	1.00
Frt		1.00	0.85		0.96			1.00	1.00		1.00	0.98
Flt Protected		0.95	1.00		0.97			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1766	1568		1694			1668	3460		1705	3297
Flt Permitted		0.71	1.00		0.59			0.10	1.00		0.10	1.00
Satd. Flow (perm)		1314	1568		1028			168	3460		185	3297
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	528	20	316	18	5	10	1	298	2324	26	7	1287
RTOR Reduction (vph)	0	0	19	0	1	0	0	0	1	0	0	15
Lane Group Flow (vph)	0	548	297	0	32	0	0	299	2349	0	7	1511
Confl. Peds. (#/hr)	2					2		8		6	6	
Heavy Vehicles (%)	1%	7%	3%	0%	0%	14%	0%	1%	3%	0%	0%	6%
Turn Type	Perm	NA	pm+ov	Perm	NA		custom	pm+pt	NA		Perm	NA
Protected Phases		4	5!		8			5	2			6
Permitted Phases	4		4	8			5!	2			6	
Actuated Green, G (s)		34.6	45.6		34.6			52.8	52.8		38.8	38.8
Effective Green, g (s)		34.6	45.6		34.6			52.8	52.8		38.8	38.8
Actuated g/C Ratio		0.35	0.46		0.35			0.53	0.53		0.39	0.39
Clearance Time (s)		6.4	3.0		6.4			3.0	6.2		6.2	6.2
Vehicle Extension (s)		3.0	3.0		3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		454	715		355			253	1826		71	1279
v/s Ratio Prot			0.05					0.13	c0.68			0.46
v/s Ratio Perm		c0.42	0.14		0.03			0.49			0.04	
v/c Ratio		1.21	0.42		0.09			1.18	1.29		0.10	1.18
Uniform Delay, d1		32.7	18.3		22.1			29.3	23.6		19.5	30.6
Progression Factor		1.00	1.00		1.00			1.00	1.00		0.49	0.59
Incremental Delay, d2		112.3	0.4		0.1			114.8	133.2		1.7	86.9
Delay (s)		145.0	18.6		22.2			144.1	156.8		11.3	104.9
Level of Service		F	B		C			F	F		B	F
Approach Delay (s)		98.8			22.2				155.4			104.5
Approach LOS		F			C				F			F

Intersection Summary			
HCM 2000 Control Delay	129.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.30		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	126.7%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	220
Future Volume (vph)	220
Ideal Flow (vphpl)	1900
Lane Width	3.5
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	239
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	8
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary



Lane Group	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	0	36	2499	181	1	116	1427
Future Volume (vph)	0	36	2499	181	1	116	1427
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	4.5	3.5	3.3	3.3	3.3	3.5
Storage Length (m)	0.0	0.0		38.0		60.0	
Storage Lanes	0	1		1		1	
Taper Length (m)	7.5					75.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Ped Bike Factor							
Frt		0.865		0.850			
Flt Protected						0.950	
Satd. Flow (prot)	0	1808	3500	1561	0	1745	3400
Flt Permitted						0.950	
Satd. Flow (perm)	0	1808	3500	1561	0	1745	3400
Link Speed (k/h)	40		60				60
Link Distance (m)	119.8		367.1				224.5
Travel Time (s)	10.8		22.0				13.5
Confl. Peds. (#/hr)	1	1		6		6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	5%
Adj. Flow (vph)	0	39	2716	197	1	126	1551
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	39	2716	197	0	127	1551
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	R NA	Left	Left
Median Width(m)	0.0		3.3				3.3
Link Offset(m)	0.0		0.0				0.0
Crosswalk Width(m)	4.8		4.8				4.8
Two way Left Turn Lane							
Headway Factor	1.00	0.88	1.01	1.04	1.04	1.04	1.01
Turning Speed (k/h)	25	15		15	15	25	
Sign Control	Stop		Free				Free

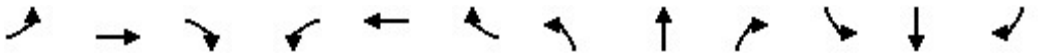
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 89.2%		ICU Level of Service E	
Analysis Period (min) 15			



Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	0	36	2499	181	1	116	1427
Future Volume (Veh/h)	0	36	2499	181	1	116	1427
Sign Control	Stop		Free				Free
Grade	0%		0%				0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	39	2716	197	0	126	1551
Pedestrians	6		1				1
Lane Width (m)	4.5		3.4				3.4
Walking Speed (m/s)	1.2		1.2				1.2
Percent Blockage	1		0				0
Right turn flare (veh)							
Median type			None				None
Median storage veh)							
Upstream signal (m)			367				225
pX, platoon unblocked	0.65	0.49			0.00	0.49	
vC, conflicting volume	3750	1365			0	2919	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1910	0			0	2835	
tC, single (s)	6.8	6.9			0.0	4.1	
tC, 2 stage (s)							
tF (s)	3.5	3.3			0.0	2.2	
p0 queue free %	0	93			0	0	
cM capacity (veh/h)	0	532			0	67	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	39	1358	1358	197	126	776	776
Volume Left	0	0	0	0	126	0	0
Volume Right	39	0	0	197	0	0	0
cSH	532	1700	1700	1700	67	1700	1700
Volume to Capacity	0.07	0.80	0.80	0.12	1.89	0.46	0.46
Queue Length 95th (m)	1.9	0.0	0.0	0.0	92.2	0.0	0.0
Control Delay (s)	12.3	0.0	0.0	0.0	553.2	0.0	0.0
Lane LOS	B				F		
Approach Delay (s)	12.3	0.0			41.6		
Approach LOS	B						

Intersection Summary			
Average Delay	15.2		
Intersection Capacity Utilization	89.2%	ICU Level of Service	E
Analysis Period (min)	15		

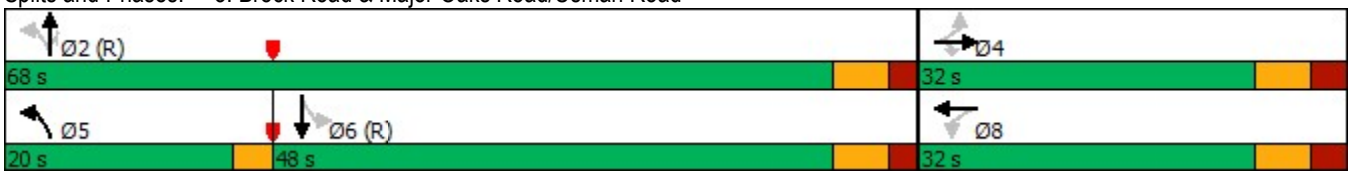


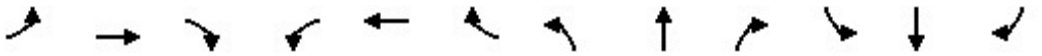
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	12	218	192	21	20	338	2298	30	57	1108	38
Future Volume (vph)	24	12	218	192	21	20	338	2298	30	57	1108	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.7	3.7	3.0	3.5	3.5	3.0	3.5	3.5
Storage Length (m)	0.0		30.0	20.0		0.0	72.0		70.0	60.0		0.0
Storage Lanes	0		1	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			72.0			92.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor		1.00	0.97	0.98	0.99				0.98		1.00	
Frt			0.850		0.927				0.850		0.995	
Flt Protected		0.968		0.950			0.950			0.950		
Satd. Flow (prot)	0	1760	1566	1785	1626	0	1652	3466	1597	1685	3352	0
Flt Permitted		0.806		0.732			0.088			0.094		
Satd. Flow (perm)	0	1462	1517	1350	1626	0	153	3466	1561	167	3352	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			237		4				44		4	
Link Speed (k/h)		50			40			60			60	
Link Distance (m)		292.9			123.2			224.5			180.3	
Travel Time (s)		21.1			11.1			13.5			10.8	
Confl. Peds. (#/hr)	3		16	16		3	10		1	1		10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	10%	2%	0%	17%	0%	2%	3%	0%	0%	6%	0%
Adj. Flow (vph)	26	13	237	209	23	22	367	2498	33	62	1204	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	39	237	209	45	0	367	2498	33	62	1245	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	0.99	0.99	1.09	1.01	1.01	1.09	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	1	1	1	1		1	0	0	1	0	
Detector Template	Left											
Leading Detector (m)	2.0	12.0	12.0	12.0	12.0		24.0	0.0	0.0	24.0	0.0	
Trailing Detector (m)	0.0	-3.0	-3.0	-3.0	-3.0		14.0	0.0	0.0	14.0	0.0	
Detector 1 Position(m)	0.0	-3.0	-3.0	-3.0	-3.0		14.0	0.0	0.0	14.0	0.0	
Detector 1 Size(m)	2.0	15.0	15.0	15.0	15.0		10.0	0.6	2.0	10.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2		2	6		
Detector Phase	4	4	4	8	8		5	2	2	6	6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	4.0	4.0		5.0	20.0	20.0	20.0	20.0	
Minimum Split (s)	32.0	32.0	32.0	32.0	32.0		8.0	29.0	29.0	29.0	29.0	
Total Split (s)	32.0	32.0	32.0	32.0	32.0		20.0	68.0	68.0	48.0	48.0	
Total Split (%)	32.0%	32.0%	32.0%	32.0%	32.0%		20.0%	68.0%	68.0%	48.0%	48.0%	
Maximum Green (s)	25.0	25.0	25.0	25.0	25.0		17.0	61.6	61.6	41.6	41.6	
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1		3.0	4.2	4.2	4.2	4.2	
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9		0.0	2.2	2.2	2.2	2.2	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		7.0	7.0	7.0	7.0		3.0	6.4	6.4	6.4	6.4	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		None	C-Max	C-Max	C-Max	C-Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0			14.0	14.0	14.0	14.0	
Pedestrian Calls (#/hr)	0	0	0	0	0			0	0	0	0	
Act Effct Green (s)		20.1	20.1	20.1	20.1		69.9	66.5	66.5	42.6	42.6	
Actuated g/C Ratio		0.20	0.20	0.20	0.20		0.70	0.66	0.66	0.43	0.43	
v/c Ratio		0.13	0.48	0.77	0.14		0.87	1.08	0.03	0.87	0.87	
Control Delay		31.7	7.6	42.6	32.7		26.7	58.6	1.1	111.6	34.6	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		31.7	7.6	42.6	32.7		26.7	58.6	1.1	111.6	34.6	
LOS		C	A	D	C		C	E	A	F	C	
Approach Delay		11.0			40.9			53.9			38.2	
Approach LOS		B			D			D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.08			
Intersection Signal Delay: 46.4		Intersection LOS: D	
Intersection Capacity Utilization 114.3%		ICU Level of Service H	
Analysis Period (min) 15			

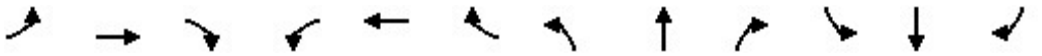
Splits and Phases: 3: Brock Road & Major Oaks Road/Usman Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	12	218	192	21	20	338	2298	30	57	1108	38
Future Volume (vph)	24	12	218	192	21	20	338	2298	30	57	1108	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.7	3.7	3.0	3.5	3.5	3.0	3.5	3.5
Total Lost time (s)		7.0	7.0	7.0	7.0		3.0	6.4	6.4	6.4	6.4	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		1.00	0.97	1.00	0.99		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00	1.00	0.98	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.97	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1756	1517	1752	1625		1652	3466	1561	1685	3353	
Flt Permitted		0.81	1.00	0.73	1.00		0.09	1.00	1.00	0.09	1.00	
Satd. Flow (perm)		1462	1517	1350	1625		153	3466	1561	167	3353	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	13	237	209	23	22	367	2498	33	62	1204	41
RTOR Reduction (vph)	0	0	189	0	3	0	0	0	11	0	2	0
Lane Group Flow (vph)	0	39	48	209	42	0	367	2498	22	62	1243	0
Confl. Peds. (#/hr)	3		16	16		3	10		1	1		10
Heavy Vehicles (%)	0%	10%	2%	0%	17%	0%	2%	3%	0%	0%	6%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)		20.1	20.1	20.1	20.1		66.5	66.5	66.5	42.6	42.6	
Effective Green, g (s)		20.1	20.1	20.1	20.1		66.5	66.5	66.5	42.6	42.6	
Actuated g/C Ratio		0.20	0.20	0.20	0.20		0.66	0.66	0.66	0.43	0.43	
Clearance Time (s)		7.0	7.0	7.0	7.0		3.0	6.4	6.4	6.4	6.4	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		293	304	271	326		415	2304	1038	71	1428	
v/s Ratio Prot					0.03		0.18	c0.72			0.37	
v/s Ratio Perm		0.03	0.03	c0.15			0.40		0.01	0.37		
v/c Ratio		0.13	0.16	0.77	0.13		0.88	1.08	0.02	0.87	0.87	
Uniform Delay, d1		32.8	33.0	37.8	32.8		28.6	16.8	5.7	26.2	26.2	
Progression Factor		1.00	1.00	1.09	1.14		0.83	1.06	0.63	1.00	1.00	
Incremental Delay, d2		0.2	0.2	1.3	0.0		2.3	38.8	0.0	75.3	7.5	
Delay (s)		33.0	33.2	42.5	37.4		26.1	56.6	3.6	101.5	33.7	
Level of Service		C	C	D	D		C	E	A	F	C	
Approach Delay (s)		33.2			41.6			52.1			36.9	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	46.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	114.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

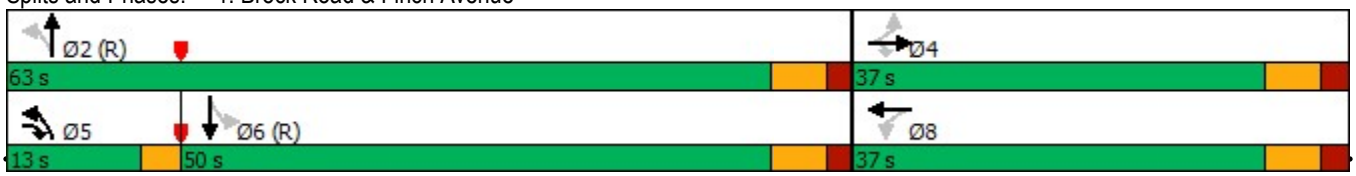


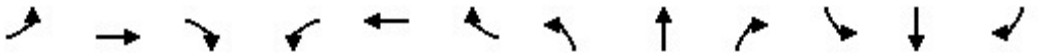
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	394	5	262	7	9	7	256	2061	16	2	1166	239
Future Volume (vph)	394	5	262	7	9	7	256	2061	16	2	1166	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5	3.5
Storage Length (m)	0.0		0.0	0.0		0.0	63.0		0.0	13.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			20.0			41.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor			0.98		1.00						0.99	
Frt			0.850		0.958			0.999			0.974	
Flt Protected		0.953			0.985		0.950			0.950		
Satd. Flow (prot)	0	1691	1538	0	1485	0	1620	3426	0	852	3249	0
Flt Permitted		0.710			0.841		0.085			0.091		
Satd. Flow (perm)	0	1259	1513	0	1267	0	145	3426	0	82	3249	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			35		4			1			31	
Link Speed (k/h)		60			40			60			60	
Link Distance (m)		416.8			328.7			124.4			367.1	
Travel Time (s)		25.0			29.6			7.5			22.0	
Confl. Peds. (#/hr)			3	3			14					14
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	6%	0%	5%	33%	14%	17%	4%	4%	15%	100%	6%	6%
Adj. Flow (vph)	443	6	294	8	10	8	288	2316	18	2	1310	269
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	449	294	0	26	0	288	2334	0	2	1579	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.1			3.1	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.00	1.00	1.00	1.00	1.09	1.01	1.01	1.08	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	5	8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	5.0	8.0	8.0		5.0	20.0		20.0	20.0	
Minimum Split (s)	29.0	29.0	9.0	29.0	29.0		9.0	28.0		28.0	28.0	
Total Split (s)	37.0	37.0	13.0	37.0	37.0		13.0	63.0		50.0	50.0	
Total Split (%)	37.0%	37.0%	13.0%	37.0%	37.0%		13.0%	63.0%		50.0%	50.0%	
Maximum Green (s)	30.6	30.6	10.0	30.6	30.6		10.0	56.8		43.8	43.8	
Yellow Time (s)	4.2	4.2	3.0	4.2	4.2		3.0	4.2		4.2	4.2	
All-Red Time (s)	2.2	2.2	0.0	2.2	2.2		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.4	3.0		6.4		3.0	6.2		6.2	6.2	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	16.0	16.0		16.0	16.0			14.0		14.0	14.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)		30.6	44.0		30.6		60.0	56.8		43.8	43.8	
Actuated g/C Ratio		0.31	0.44		0.31		0.60	0.57		0.44	0.44	
v/c Ratio		1.17	0.43		0.07		1.23	1.20		0.06	1.10	
Control Delay		132.9	17.5		22.5		160.4	118.3		21.0	82.6	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		132.9	17.5		22.5		160.4	118.3		21.0	82.6	
LOS		F	B		C		F	F		C	F	
Approach Delay		87.2			22.5			122.9			82.6	
Approach LOS		F			C			F			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 40 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.23			
Intersection Signal Delay: 104.2		Intersection LOS: F	
Intersection Capacity Utilization 118.6%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 1: Brock Road & Finch Avenue





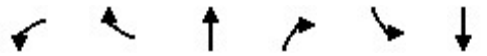
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	394	5	262	7	9	7	256	2061	16	2	1166	239
Future Volume (vph)	394	5	262	7	9	7	256	2061	16	2	1166	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5	3.5
Total Lost time (s)		6.4	3.0		6.4		3.0	6.2		6.2	6.2	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.96		1.00	1.00		1.00	0.97	
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1690	1519		1484		1620	3426		852	3250	
Flt Permitted		0.71	1.00		0.84		0.09	1.00		0.09	1.00	
Satd. Flow (perm)		1259	1519		1267		146	3426		82	3250	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	443	6	294	8	10	8	288	2316	18	2	1310	269
RTOR Reduction (vph)	0	0	21	0	3	0	0	0	0	0	17	0
Lane Group Flow (vph)	0	449	273	0	23	0	288	2334	0	2	1562	0
Confl. Peds. (#/hr)			3	3			14					14
Heavy Vehicles (%)	6%	0%	5%	33%	14%	17%	4%	4%	15%	100%	6%	6%
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		30.6	40.6		30.6		56.8	56.8		43.8	43.8	
Effective Green, g (s)		30.6	40.6		30.6		56.8	56.8		43.8	43.8	
Actuated g/C Ratio		0.31	0.41		0.31		0.57	0.57		0.44	0.44	
Clearance Time (s)		6.4	3.0		6.4		3.0	6.2		6.2	6.2	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		385	616		387		230	1945		35	1423	
v/s Ratio Prot			0.04				0.13	c0.68			0.48	
v/s Ratio Perm		c0.36	0.14		0.02		c0.59			0.02		
v/c Ratio		1.17	0.44		0.06		1.25	1.20		0.06	1.10	
Uniform Delay, d1		34.7	21.5		24.5		30.1	21.6		16.2	28.1	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		99.5	0.5		0.1		144.1	95.2		3.1	55.1	
Delay (s)		134.2	22.0		24.6		174.2	116.8		19.3	83.2	
Level of Service		F	C		C		F	F		B	F	
Approach Delay (s)		89.8			24.6			123.1			83.2	
Approach LOS		F			C			F			F	

Intersection Summary			
HCM 2000 Control Delay	104.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.26		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	118.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	93	2137	298	155	1255
Future Volume (vph)	0	93	2137	298	155	1255
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	4.5	3.5	3.3	3.3	3.5
Storage Length (m)	0.0	0.0		38.0	60.0	
Storage Lanes	0	1		1	1	
Taper Length (m)	7.5				75.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.865		0.850		
Flt Protected					0.950	
Satd. Flow (prot)	0	1790	3400	1516	1711	3336
Flt Permitted					0.950	
Satd. Flow (perm)	0	1790	3400	1516	1711	3336
Link Speed (k/h)	40		60			60
Link Distance (m)	119.8		367.1			224.5
Travel Time (s)	10.8		22.0			13.5
Confl. Peds. (#/hr)	7	1		55	55	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	1%	5%	3%	2%	7%
Adj. Flow (vph)	0	103	2374	331	172	1394
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	103	2374	331	172	1394
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.3			3.3
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	0.88	1.01	1.04	1.04	1.01
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 81.3%		ICU Level of Service D	
Analysis Period (min) 15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	93	2137	298	155	1255
Future Volume (Veh/h)	0	93	2137	298	155	1255
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	103	2374	331	172	1394
Pedestrians	55		7			1
Lane Width (m)	4.5		3.4			3.4
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	6		1			0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			367			225
pX, platoon unblocked	0.62	0.45			0.45	
vC, conflicting volume	3477	1243			2760	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1383	0			2470	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	78			0	
cM capacity (veh/h)	0	464			79	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	103	1187	1187	331	172	697	697
Volume Left	0	0	0	0	172	0	0
Volume Right	103	0	0	331	0	0	0
cSH	464	1700	1700	1700	79	1700	1700
Volume to Capacity	0.22	0.70	0.70	0.19	2.18	0.41	0.41
Queue Length 95th (m)	6.7	0.0	0.0	0.0	126.0	0.0	0.0
Control Delay (s)	15.0	0.0	0.0	0.0	657.6	0.0	0.0
Lane LOS	B				F		
Approach Delay (s)	15.0	0.0			72.2		
Approach LOS	B						

Intersection Summary			
Average Delay	26.2		
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	37	13	274	173	27	52	2	309	2004	27	89	1107
Future Volume (vph)	37	13	274	173	27	52	2	309	2004	27	89	1107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.7	3.7	3.6	3.0	3.5	3.5	3.0	3.5
Storage Length (m)	0.0		30.0	20.0		0.0		72.0		70.0	60.0	
Storage Lanes	0		1	1		0		1		1	1	
Taper Length (m)	7.5			7.5				72.0			92.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor		0.99	0.94	0.96	0.98					0.95		1.00
Frt			0.850		0.901					0.850		0.997
Flt Protected		0.964		0.950				0.950			0.950	
Satd. Flow (prot)	0	1686	1566	1733	1653	0	0	1652	3400	1597	1685	3294
Flt Permitted		0.730		0.719				0.076			0.080	
Satd. Flow (perm)	0	1265	1472	1253	1653	0	0	132	3400	1512	142	3294
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			271		62					69		2
Link Speed (k/h)		50			40				60			60
Link Distance (m)		292.9			123.2				224.5			180.3
Travel Time (s)		21.1			11.1				13.5			10.8
Confl. Peds. (#/hr)	10		37	37		10		10		13	13	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	10%	0%	2%	3%	5%	2%	0%	2%	5%	0%	0%	8%
Adj. Flow (vph)	44	15	326	206	32	62	2	368	2386	32	106	1318
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	59	326	206	94	0	0	370	2386	32	106	1344
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	Left	Left
Median Width(m)		3.5			3.5				3.3			3.3
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		4.8			4.8				4.8			4.8
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	0.99	0.99	1.00	1.09	1.01	1.01	1.09	1.01
Turning Speed (k/h)	25		15	25		15	15	25		15	25	
Number of Detectors	1	1	1	1	1		1	1	0	0	1	0
Detector Template	Left						Left					
Leading Detector (m)	2.0	12.0	12.0	12.0	12.0		2.0	24.0	0.0	0.0	24.0	0.0
Trailing Detector (m)	0.0	-3.0	-3.0	-3.0	-3.0		0.0	14.0	0.0	0.0	14.0	0.0
Detector 1 Position(m)	0.0	-3.0	-3.0	-3.0	-3.0		0.0	14.0	0.0	0.0	14.0	0.0
Detector 1 Size(m)	2.0	15.0	15.0	15.0	15.0		2.0	10.0	0.6	2.0	10.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Perm	NA	Perm	Perm	NA		custom	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4			8			5	2		1	6
Permitted Phases	4		4	8			5	2		2	6	
Detector Phase	4	4	4	8	8		5	5	2	2	1	6

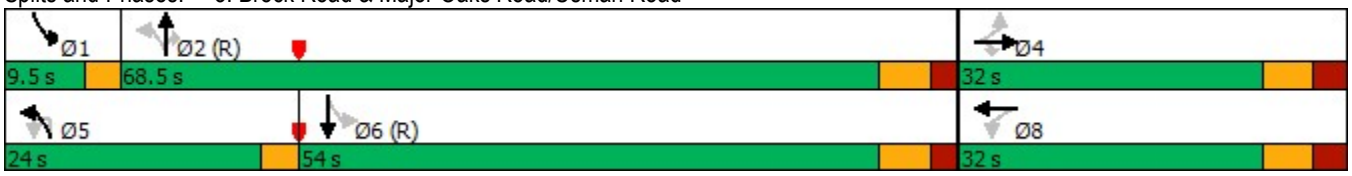


Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	22
Future Volume (vph)	22
Ideal Flow (vphpl)	1900
Lane Width (m)	3.5
Storage Length (m)	0.0
Storage Lanes	0
Taper Length (m)	
Lane Util. Factor	0.95
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	Yes
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	10
Peak Hour Factor	0.84
Heavy Vehicles (%)	6%
Adj. Flow (vph)	26
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	1.01
Turning Speed (k/h)	15
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	4.0	4.0		5.0	5.0	20.0	20.0	5.0	20.0
Minimum Split (s)	32.0	32.0	32.0	32.0	32.0		8.0	8.0	29.0	29.0	9.5	29.0
Total Split (s)	32.0	32.0	32.0	32.0	32.0		24.0	24.0	68.5	68.5	9.5	54.0
Total Split (%)	29.1%	29.1%	29.1%	29.1%	29.1%		21.8%	21.8%	62.3%	62.3%	8.6%	49.1%
Maximum Green (s)	25.0	25.0	25.0	25.0	25.0		21.0	21.0	62.1	62.1	6.5	47.6
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1		3.0	3.0	4.2	4.2	3.0	4.2
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9		0.0	0.0	2.2	2.2	0.0	2.2
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.0	7.0	7.0	7.0			3.0	6.4	6.4	3.0	6.4
Lead/Lag							Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
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
Recall Mode	None	None	None	None	None		None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0				7.0	7.0		7.0
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0				14.0	14.0		14.0
Pedestrian Calls (#/hr)	0	0	0	0	0				0	0		0
Act Effct Green (s)		21.8	21.8	21.8	21.8			78.2	65.4	65.4	59.5	49.8
Actuated g/C Ratio		0.20	0.20	0.20	0.20			0.71	0.59	0.59	0.54	0.45
v/c Ratio		0.24	0.64	0.83	0.25			0.93	1.18	0.03	0.64	0.90
Control Delay		38.1	14.2	68.5	17.7			62.3	110.7	0.3	36.8	38.3
Queue Delay		0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Delay		38.1	14.2	68.5	17.7			62.3	110.7	0.3	36.8	38.3
LOS		D	B	E	B			E	F	A	D	D
Approach Delay		17.8			52.6				103.0			38.2
Approach LOS		B			D				F			D

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.18			
Intersection Signal Delay: 74.2		Intersection LOS: E	
Intersection Capacity Utilization 102.3%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 3: Brock Road & Major Oaks Road/Usman Road





Lane Group	SBR
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	37	13	274	173	27	52	2	309	2004	27	89	1107
Future Volume (vph)	37	13	274	173	27	52	2	309	2004	27	89	1107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.7	3.7	3.6	3.0	3.5	3.5	3.0	3.5
Total Lost time (s)		7.0	7.0	7.0	7.0			3.0	6.4	6.4	3.0	6.4
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes		1.00	0.94	1.00	0.98			1.00	1.00	0.95	1.00	1.00
Flpb, ped/bikes		0.99	1.00	0.96	1.00			1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	0.90			1.00	1.00	0.85	1.00	1.00
Flt Protected		0.96	1.00	0.95	1.00			0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1671	1472	1655	1653			1652	3400	1512	1685	3294
Flt Permitted		0.73	1.00	0.72	1.00			0.08	1.00	1.00	0.08	1.00
Satd. Flow (perm)		1265	1472	1252	1653			132	3400	1512	142	3294
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	44	15	326	206	32	62	2	368	2386	32	106	1318
RTOR Reduction (vph)	0	0	217	0	50	0	0	0	0	13	0	1
Lane Group Flow (vph)	0	59	109	206	44	0	0	370	2386	19	106	1343
Confl. Peds. (#/hr)	10		37	37		10		10		13	13	
Heavy Vehicles (%)	10%	0%	2%	3%	5%	2%	0%	2%	5%	0%	0%	8%
Turn Type	Perm	NA	Perm	Perm	NA		custom	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4			8			5	2		1	6
Permitted Phases	4		4	8			5	2		2	6	
Actuated Green, G (s)		21.8	21.8	21.8	21.8			74.8	65.4	65.4	56.2	49.8
Effective Green, g (s)		21.8	21.8	21.8	21.8			74.8	65.4	65.4	56.2	49.8
Actuated g/C Ratio		0.20	0.20	0.20	0.20			0.68	0.59	0.59	0.51	0.45
Clearance Time (s)		7.0	7.0	7.0	7.0			3.0	6.4	6.4	3.0	6.4
Vehicle Extension (s)		3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		250	291	248	327			393	2021	898	162	1491
v/s Ratio Prot					0.03			c0.19	c0.70		0.04	0.41
v/s Ratio Perm		0.05	0.07	c0.16				0.45		0.01	0.29	
v/c Ratio		0.24	0.37	0.83	0.14			0.94	1.18	0.02	0.65	0.90
Uniform Delay, d1		37.1	38.2	42.3	36.3			34.0	22.3	9.2	24.2	27.8
Progression Factor		1.00	1.00	1.01	1.10			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.5	0.8	20.0	0.2			30.7	86.7	0.0	9.1	9.1
Delay (s)		37.6	39.0	62.8	40.2			64.7	109.0	9.2	33.3	36.9
Level of Service		D	D	E	D			E	F	A	C	D
Approach Delay (s)		38.8			55.7				102.0			36.6
Approach LOS		D			E				F			D

Intersection Summary			
HCM 2000 Control Delay	75.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	102.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	22
Future Volume (vph)	22
Ideal Flow (vphpl)	1900
Lane Width	3.5
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.84
Adj. Flow (vph)	26
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	10
Heavy Vehicles (%)	6%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 1: Brock Road & Finch Avenue

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	TR
Maximum Queue (m)	74.5	67.8	25.9	68.8	71.0	57.8	10.0	359.0	358.8
Average Queue (m)	37.9	34.6	8.2	31.4	33.3	24.3	0.6	350.2	351.1
95th Queue (m)	62.4	59.8	19.8	56.9	60.5	48.5	5.4	373.8	374.7
Link Distance (m)	403.4	403.4	313.4		113.3	113.3		350.8	350.8
Upstream Blk Time (%)								12	15
Queuing Penalty (veh)								144	184
Storage Bay Dist (m)				63.0			13.0		
Storage Blk Time (%)				1	0		1	39	
Queuing Penalty (veh)				4	1		15	0	

Intersection: 2: Brock Road & Usman Road

Movement	NB	NB	SB	SB	SB
Directions Served	T	R	UL	T	T
Maximum Queue (m)	2.2	4.5	134.9	215.3	212.2
Average Queue (m)	0.1	0.3	56.4	174.7	176.4
95th Queue (m)	1.2	2.5	159.4	262.1	261.9
Link Distance (m)	350.8			205.8	205.8
Upstream Blk Time (%)				2	3
Queuing Penalty (veh)				24	34
Storage Bay Dist (m)		38.0	60.0		
Storage Blk Time (%)				46	
Queuing Penalty (veh)				32	

Intersection: 3: Brock Road & Major Oaks Road/Usman Road

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	TR	L	T	T	R	L	T	TR
Maximum Queue (m)	146.4	37.5	27.4	90.8	64.9	78.8	74.9	5.1	151.7	185.7	188.2
Average Queue (m)	77.8	36.8	23.6	26.5	36.2	34.6	36.3	0.5	24.5	177.2	178.3
95th Queue (m)	129.4	40.6	31.3	71.9	58.2	63.6	65.6	3.0	110.8	182.7	185.8
Link Distance (m)	279.4			97.4		205.8	205.8			170.1	170.1
Upstream Blk Time (%)				1						57	58
Queuing Penalty (veh)				1						0	0
Storage Bay Dist (m)		30.0	20.0		72.0			70.0	60.0		
Storage Blk Time (%)	1	63	44	2	0	0	0			53	
Queuing Penalty (veh)	2	30	9	3	1	1	0			10	

Network Summary

Network wide Queuing Penalty: 495

Intersection: 1: Brock Road & Finch Avenue

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	UL	T	TR	L	T	TR
Maximum Queue (m)	158.7	84.4	20.5	82.9	127.8	128.4	38.9	291.3	292.1
Average Queue (m)	92.3	28.9	6.1	68.5	119.3	118.9	3.4	192.3	198.0
95th Queue (m)	143.9	57.0	16.1	105.0	124.4	123.2	17.4	368.5	370.4
Link Distance (m)	403.4	403.4	313.4		113.3	113.3		350.8	350.8
Upstream Blk Time (%)					39	40		4	4
Queuing Penalty (veh)					0	0		27	32
Storage Bay Dist (m)				63.0			13.0		
Storage Blk Time (%)				6	40		2	57	
Queuing Penalty (veh)				64	109		12	3	

Intersection: 2: Brock Road & Usman Road

Movement	WB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	R	UL	T	T
Maximum Queue (m)	10.4	20.2	18.9	9.3	134.9	197.5	201.8
Average Queue (m)	0.3	1.1	1.3	1.3	97.6	112.1	99.5
95th Queue (m)	4.2	8.7	9.1	6.0	166.2	254.8	259.0
Link Distance (m)	93.4	350.8	350.8			205.8	205.8
Upstream Blk Time (%)						4	3
Queuing Penalty (veh)						29	20
Storage Bay Dist (m)				38.0	60.0		
Storage Blk Time (%)					67	6	
Queuing Penalty (veh)					478	7	

Intersection: 3: Brock Road & Major Oaks Road/Usman Road

Movement	EB	EB	WB	WB	B11	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	TR	T	L	T	T	R	L	T	TR
Maximum Queue (m)	76.6	37.5	27.4	99.8	8.0	90.1	104.4	113.8	7.7	81.4	147.1	139.1
Average Queue (m)	15.0	25.7	24.2	31.1	0.3	50.1	61.1	68.2	0.6	49.3	106.4	97.3
95th Queue (m)	48.7	40.8	31.0	78.8	4.4	83.1	93.0	98.2	3.9	136.9	189.1	186.4
Link Distance (m)	279.4			97.4	200.3		205.8	205.8			170.1	170.1
Upstream Blk Time (%)				1							25	20
Queuing Penalty (veh)				3							0	0
Storage Bay Dist (m)		30.0	20.0			72.0			70.0	60.0		
Storage Blk Time (%)	1	11	53	3		3	2	5		3	37	
Queuing Penalty (veh)	1	4	22	6		39	8	1		14	21	

Network Summary

Network wide Queuing Penalty: 900

Intersection: 1: Brock Road & Finch Avenue

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	TR
Maximum Queue (m)	125.5	46.4	24.4	82.9	127.3	128.9	23.0	208.7	211.7
Average Queue (m)	72.6	21.6	5.0	72.2	119.1	118.9	1.3	111.7	118.4
95th Queue (m)	111.0	39.0	15.8	102.1	124.3	124.1	11.8	209.4	217.1
Link Distance (m)	403.4	403.4	313.4		113.3	113.3		350.8	350.8
Upstream Blk Time (%)					32	35			
Queuing Penalty (veh)					0	0			
Storage Bay Dist (m)				63.0			13.0		
Storage Blk Time (%)				10	31		2	49	
Queuing Penalty (veh)				106	81		14	1	

Intersection: 2: Brock Road & Usman Road

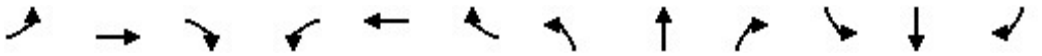
Movement	WB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	R	L	T	T
Maximum Queue (m)	22.5	20.4	27.0	19.7	134.9	193.5	157.4
Average Queue (m)	4.9	2.3	2.2	3.7	105.1	111.2	83.0
95th Queue (m)	17.4	11.5	12.6	13.2	167.1	267.6	251.2
Link Distance (m)	93.4	350.8	350.8			205.8	205.8
Upstream Blk Time (%)						14	3
Queuing Penalty (veh)						108	24
Storage Bay Dist (m)				38.0	60.0		
Storage Blk Time (%)			0		75	0	
Queuing Penalty (veh)			0		471	0	

Intersection: 3: Brock Road & Major Oaks Road/Usman Road

Movement	EB	EB	WB	WB	B11	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	TR	T	UL	T	T	R	L	T	TR
Maximum Queue (m)	148.7	37.5	27.4	107.8	73.9	91.8	132.3	135.7	7.6	119.0	169.2	159.1
Average Queue (m)	54.2	33.2	23.5	38.9	6.9	48.4	81.0	88.3	1.6	52.4	113.9	103.8
95th Queue (m)	144.6	44.7	32.2	99.5	57.3	80.1	128.3	134.8	5.7	145.3	197.8	196.9
Link Distance (m)	279.4			97.4	200.3		205.8	205.8			170.1	170.1
Upstream Blk Time (%)				6	0						28	25
Queuing Penalty (veh)				27	0						0	0
Storage Bay Dist (m)		30.0	20.0			72.0			70.0	60.0		
Storage Blk Time (%)	1	45	51	7		3	9	13			45	
Queuing Penalty (veh)	2	23	40	13		25	28	3			40	

Network Summary

Network wide Queuing Penalty: 1006



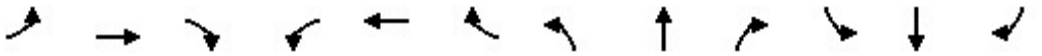
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	173	3	247	21	4	6	131	803	3	1	2074	219
Future Volume (vph)	173	3	247	21	4	6	131	803	3	1	2074	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5	3.5
Storage Length (m)	0.0		0.0	0.0		0.0	63.0		0.0	13.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			20.0			41.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		1.00	0.99		1.00			1.00		1.00	1.00	
Frt			0.850		0.972			0.999			0.986	
Flt Protected		0.953			0.967		0.950			0.950		
Satd. Flow (prot)	0	1698	1568	0	1501	0	1574	3073	0	852	3338	0
Flt Permitted		0.704			0.743		0.066			0.324		
Satd. Flow (perm)	0	1253	1545	0	1152	0	109	3073	0	290	3338	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			35		7			1			18	
Link Speed (k/h)		60			40			60			60	
Link Distance (m)		416.8			328.7			124.4			367.1	
Travel Time (s)		25.0			29.6			7.5			22.0	
Confl. Peds. (#/hr)	1		2	2		1	9		3	3		9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	7%	16%	33%	100%	5%	5%
Adj. Flow (vph)	188	3	268	23	4	7	142	873	3	1	2254	238
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	191	268	0	34	0	142	876	0	1	2492	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.1			3.1	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.00	1.00	1.00	1.00	1.09	1.01	1.01	1.08	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	5	8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	5.0	8.0	8.0		5.0	20.0		20.0	20.0	
Minimum Split (s)	29.0	29.0	9.0	29.0	29.0		9.0	28.0		28.0	28.0	
Total Split (s)	29.0	29.0	9.0	29.0	29.0		9.0	71.0		62.0	62.0	
Total Split (%)	29.0%	29.0%	9.0%	29.0%	29.0%		9.0%	71.0%		62.0%	62.0%	
Maximum Green (s)	22.6	22.6	6.0	22.6	22.6		6.0	64.8		55.8	55.8	
Yellow Time (s)	4.2	4.2	3.0	4.2	4.2		3.0	4.2		4.2	4.2	
All-Red Time (s)	2.2	2.2	0.0	2.2	2.2		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.4	3.0		6.4		3.0	6.2		6.2	6.2	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	16.0	16.0		16.0	16.0			14.0		14.0	14.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)		19.1	30.0		19.1		71.5	68.3		57.8	57.8	
Actuated g/C Ratio		0.19	0.30		0.19		0.72	0.68		0.58	0.58	
v/c Ratio		0.80	0.55		0.15		0.76	0.42		0.01	1.29	
Control Delay		62.3	27.4		28.4		44.1	8.2		10.0	156.6	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		62.3	27.4		28.4		44.1	8.2		10.0	156.6	
LOS		E	C		C		D	A		A	F	
Approach Delay		41.9			28.4			13.2			156.5	
Approach LOS		D			C			B			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 2 (2%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.29			
Intersection Signal Delay: 105.8		Intersection LOS: F	
Intersection Capacity Utilization 100.8%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 1: Brock Road & Finch Avenue





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	173	3	247	21	4	6	131	803	3	1	2074	219
Future Volume (vph)	173	3	247	21	4	6	131	803	3	1	2074	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5	3.5
Total Lost time (s)		6.4	3.0		6.4		3.0	6.2		6.2	6.2	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.97		1.00	1.00		1.00	0.99	
Flt Protected		0.95	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1696	1551		1500		1574	3074		850	3337	
Flt Permitted		0.70	1.00		0.74		0.07	1.00		0.32	1.00	
Satd. Flow (perm)		1254	1551		1153		109	3074		290	3337	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	188	3	268	23	4	7	142	873	3	1	2254	238
RTOR Reduction (vph)	0	0	26	0	6	0	0	0	0	0	8	0
Lane Group Flow (vph)	0	191	242	0	28	0	142	876	0	1	2484	0
Confl. Peds. (#/hr)	1		2	2		1	9		3	3		9
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	7%	16%	33%	100%	5%	5%
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		19.1	26.7		19.1		68.3	68.3		57.7	57.7	
Effective Green, g (s)		19.1	26.7		19.1		68.3	68.3		57.7	57.7	
Actuated g/C Ratio		0.19	0.27		0.19		0.68	0.68		0.58	0.58	
Clearance Time (s)		6.4	3.0		6.4		3.0	6.2		6.2	6.2	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		239	414		220		185	2099		167	1925	
v/s Ratio Prot			0.04				c0.06	0.28			c0.74	
v/s Ratio Perm		c0.15	0.11		0.02		0.46			0.00		
v/c Ratio		0.80	0.59		0.13		0.77	0.42		0.01	1.29	
Uniform Delay, d1		38.6	31.8		33.5		28.0	7.0		9.0	21.1	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		16.8	2.1		0.3		17.2	0.6		0.1	134.8	
Delay (s)		55.4	34.0		33.8		45.2	7.6		9.0	155.9	
Level of Service		E	C		C		D	A		A	F	
Approach Delay (s)		42.9			33.8			12.9			155.9	
Approach LOS		D			C			B			F	

Intersection Summary			
HCM 2000 Control Delay	105.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	100.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	0	40	915	110	1	76	2298
Future Volume (vph)	0	40	915	110	1	76	2298
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	4.5	3.5	3.3	3.3	3.3	3.5
Storage Length (m)	0.0	0.0		38.0		60.0	
Storage Lanes	0	1		1		1	
Taper Length (m)	7.5					75.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Ped Bike Factor							
Frt		0.865		0.850			
Flt Protected						0.950	
Satd. Flow (prot)	0	1808	3131	1459	0	1647	3400
Flt Permitted						0.950	
Satd. Flow (perm)	0	1808	3131	1459	0	1647	3400
Link Speed (k/h)	40		60				60
Link Distance (m)	71.8		367.1				224.5
Travel Time (s)	6.5		22.0				13.5
Confl. Peds. (#/hr)				4		4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	14%	7%	0%	6%	5%
Adj. Flow (vph)	0	43	995	120	1	83	2498
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	43	995	120	0	84	2498
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	R NA	Left	Left
Median Width(m)	0.0		3.3				3.3
Link Offset(m)	0.0		0.0				0.0
Crosswalk Width(m)	4.8		4.8				4.8
Two way Left Turn Lane							
Headway Factor	1.00	0.88	1.01	1.04	1.04	1.04	1.01
Turning Speed (k/h)	25	15		15	15	25	
Sign Control	Stop		Free				Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 66.9%		ICU Level of Service C	
Analysis Period (min) 15			



Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	0	40	915	110	1	76	2298
Future Volume (Veh/h)	0	40	915	110	1	76	2298
Sign Control	Stop		Free				Free
Grade	0%		0%				0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	43	995	120	0	83	2498
Pedestrians	4						
Lane Width (m)	4.5						
Walking Speed (m/s)	1.2						
Percent Blockage	0						
Right turn flare (veh)							
Median type			None				None
Median storage veh)							
Upstream signal (m)			367				225
pX, platoon unblocked	0.47	0.94			0.00	0.94	
vC, conflicting volume	2414	502			0	1119	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1147	337			0	996	
tC, single (s)	6.8	6.9			0.0	4.2	
tC, 2 stage (s)							
tF (s)	3.5	3.3			0.0	2.3	
p0 queue free %	100	93			0	87	
cM capacity (veh/h)	79	621			0	623	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	43	498	498	120	83	1249	1249
Volume Left	0	0	0	0	83	0	0
Volume Right	43	0	0	120	0	0	0
cSH	621	1700	1700	1700	623	1700	1700
Volume to Capacity	0.07	0.29	0.29	0.07	0.13	0.73	0.73
Queue Length 95th (m)	1.8	0.0	0.0	0.0	3.7	0.0	0.0
Control Delay (s)	11.2	0.0	0.0	0.0	11.7	0.0	0.0
Lane LOS	B				B		
Approach Delay (s)	11.2	0.0			0.4		
Approach LOS	B						

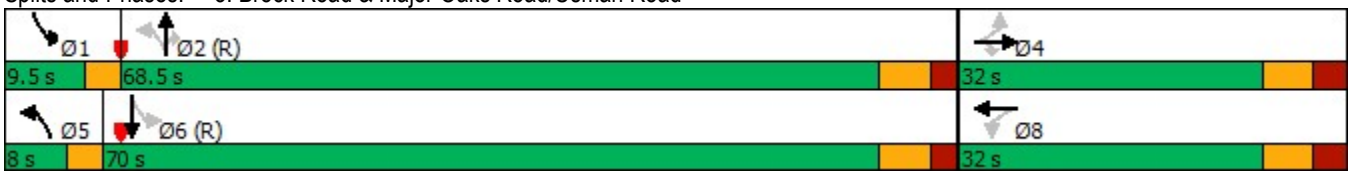
Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	66.9%	ICU Level of Service		C
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	4	268	228	12	8	127	830	10	18	1885	19
Future Volume (vph)	39	4	268	228	12	8	127	830	10	18	1885	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.7	3.7	3.0	3.5	3.5	3.0	3.5	3.5
Storage Length (m)	0.0		30.0	20.0		0.0	72.0		70.0	60.0		0.0
Storage Lanes	0		1	1		0	1		1	1		0
Taper Length (m)	7.5			48.0			72.0			92.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor		0.99	0.99	1.00	0.99				0.98	1.00	1.00	
Frt			0.850		0.939				0.850		0.998	
Flt Protected		0.956		0.950			0.950			0.950		
Satd. Flow (prot)	0	1669	1536	1733	1522	0	1589	3077	1439	1685	3388	0
Flt Permitted		0.746		0.727			0.060			0.295		
Satd. Flow (perm)	0	1293	1515	1325	1522	0	100	3077	1406	523	3388	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			89		9				69		2	
Link Speed (k/h)		50			40			60			60	
Link Distance (m)		292.9			123.2			224.5			180.3	
Travel Time (s)		21.1			11.1			13.5			10.8	
Confl. Peds. (#/hr)	6		1	1		6	3		1	1		3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	25%	4%	3%	20%	14%	6%	16%	11%	0%	5%	18%
Adj. Flow (vph)	42	4	291	248	13	9	138	902	11	20	2049	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	46	291	248	22	0	138	902	11	20	2070	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	0.99	0.99	1.09	1.01	1.01	1.09	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	1	1	1	1		1	0	0	1	0	
Detector Template	Left											
Leading Detector (m)	2.0	12.0	12.0	12.0	12.0		24.0	0.0	0.0	24.0	0.0	
Trailing Detector (m)	0.0	-3.0	-3.0	-3.0	-3.0		14.0	0.0	0.0	14.0	0.0	
Detector 1 Position(m)	0.0	-3.0	-3.0	-3.0	-3.0		14.0	0.0	0.0	14.0	0.0	
Detector 1 Size(m)	2.0	15.0	15.0	15.0	15.0		10.0	0.6	2.0	10.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		
Detector Phase	4	4	4	8	8		5	2	2	1	6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		5.0	20.0	20.0	5.0	20.0	
Minimum Split (s)	32.0	32.0	32.0	32.0	32.0		8.0	29.0	29.0	9.5	29.0	
Total Split (s)	32.0	32.0	32.0	32.0	32.0		8.0	68.5	68.5	9.5	70.0	
Total Split (%)	29.1%	29.1%	29.1%	29.1%	29.1%		7.3%	62.3%	62.3%	8.6%	63.6%	
Maximum Green (s)	25.0	25.0	25.0	25.0	25.0		5.0	62.1	62.1	6.5	63.6	
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1		3.0	4.2	4.2	3.0	4.2	
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9		0.0	2.2	2.2	0.0	2.2	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		7.0	7.0	7.0	7.0		3.0	6.4	6.4	3.0	6.4	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		None	C-Max	C-Max	None	C-Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0	7.0		7.0	
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0			14.0	14.0		14.0	
Pedestrian Calls (#/hr)	0	0	0	0	0			0	0		0	
Act Effct Green (s)		23.3	23.3	23.3	23.3		75.3	69.9	69.9	72.2	63.6	
Actuated g/C Ratio		0.21	0.21	0.21	0.21		0.68	0.64	0.64	0.66	0.58	
v/c Ratio		0.17	0.74	0.88	0.07		0.87	0.46	0.01	0.05	1.06	
Control Delay		36.2	40.0	72.6	24.4		68.4	12.2	0.0	5.9	61.3	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		36.2	40.0	72.6	24.4		68.4	12.2	0.0	5.9	61.3	
LOS		D	D	E	C		E	B	A	A	E	
Approach Delay		39.5			68.6			19.5			60.8	
Approach LOS		D			E			B			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.06			
Intersection Signal Delay: 47.8		Intersection LOS: D	
Intersection Capacity Utilization 100.7%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 3: Brock Road & Major Oaks Road/Usman Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	4	268	228	12	8	127	830	10	18	1885	19
Future Volume (vph)	39	4	268	228	12	8	127	830	10	18	1885	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.7	3.7	3.0	3.5	3.5	3.0	3.5	3.5
Total Lost time (s)		7.0	7.0	7.0	7.0		3.0	6.4	6.4	3.0	6.4	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		1.00	0.99	1.00	0.99		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		0.99	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	0.94		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.96	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1657	1515	1731	1522		1589	3077	1406	1684	3390	
Flt Permitted		0.75	1.00	0.73	1.00		0.06	1.00	1.00	0.30	1.00	
Satd. Flow (perm)		1293	1515	1325	1522		100	3077	1406	524	3390	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	4	291	248	13	9	138	902	11	20	2049	21
RTOR Reduction (vph)	0	0	70	0	7	0	0	0	4	0	1	0
Lane Group Flow (vph)	0	46	221	248	15	0	138	902	7	20	2069	0
Confl. Peds. (#/hr)	6		1	1		6	3		1	1		3
Heavy Vehicles (%)	6%	25%	4%	3%	20%	14%	6%	16%	11%	0%	5%	18%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)		23.3	23.3	23.3	23.3		73.3	68.1	68.1	65.8	63.6	
Effective Green, g (s)		23.3	23.3	23.3	23.3		73.3	68.1	68.1	65.8	63.6	
Actuated g/C Ratio		0.21	0.21	0.21	0.21		0.67	0.62	0.62	0.60	0.58	
Clearance Time (s)		7.0	7.0	7.0	7.0		3.0	6.4	6.4	3.0	6.4	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		273	320	280	322		157	1904	870	336	1960	
v/s Ratio Prot					0.01		c0.05	0.29		0.00	c0.61	
v/s Ratio Perm		0.04	0.15	c0.19			0.53		0.00	0.03		
v/c Ratio		0.17	0.69	0.89	0.05		0.88	0.47	0.01	0.06	1.06	
Uniform Delay, d1		35.4	40.0	42.1	34.5		32.7	11.3	8.0	9.1	23.2	
Progression Factor		1.00	1.00	0.99	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.3	6.3	26.3	0.1		38.6	0.8	0.0	0.1	36.9	
Delay (s)		35.7	46.3	68.1	34.7		71.3	12.1	8.0	9.1	60.1	
Level of Service		D	D	E	C		E	B	A	A	E	
Approach Delay (s)		44.9			65.3			19.9			59.6	
Approach LOS		D			E			B			E	

Intersection Summary			
HCM 2000 Control Delay	47.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	100.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	126	29	0	20	28	64
Future Volume (vph)	126	29	0	20	28	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.974				0.905	
Flt Protected					0.985	
Satd. Flow (prot)	1814	0	0	1863	1660	0
Flt Permitted					0.985	
Satd. Flow (perm)	1814	0	0	1863	1660	0
Link Speed (k/h)	40			40	50	
Link Distance (m)	71.8			48.0	46.9	
Travel Time (s)	6.5			4.3	3.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	137	32	0	22	30	70
Shared Lane Traffic (%)						
Lane Group Flow (vph)	169	0	0	22	100	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 20.5%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	126	29	0	20	28	64
Future Volume (Veh/h)	126	29	0	20	28	64
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	137	32	0	22	30	70
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				391		
pX, platoon unblocked						
vC, conflicting volume			169		175	153
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			169		175	153
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		96	92
cM capacity (veh/h)			1409		815	893

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	169	22	100
Volume Left	0	0	30
Volume Right	32	0	70
cSH	1700	1409	868
Volume to Capacity	0.10	0.00	0.12
Queue Length 95th (m)	0.0	0.0	3.1
Control Delay (s)	0.0	0.0	9.7
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.7
Approach LOS			A

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	20.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	451	17	264	15	4	8	1	248	1996	22	6	1114
Future Volume (vph)	451	17	264	15	4	8	1	248	1996	22	6	1114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.6	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5
Storage Length (m)	0.0		0.0	0.0		0.0		63.0		0.0	13.0	
Storage Lanes	0		1	0		0		1		0	1	
Taper Length (m)	7.5			7.5				20.0			41.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor		1.00			1.00				1.00			0.99
Frt			0.850		0.958				0.998			0.976
Flt Protected		0.954			0.973			0.950			0.950	
Satd. Flow (prot)	0	1771	1568	0	1690	0	0	1668	3459	0	1705	3295
Flt Permitted		0.712			0.668			0.096			0.103	
Satd. Flow (perm)	0	1318	1568	0	1160	0	0	169	3459	0	185	3295
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			35		3				2			25
Link Speed (k/h)		60			40				60			60
Link Distance (m)		416.8			328.7				124.4			367.1
Travel Time (s)		25.0			29.6				7.5			22.0
Confl. Peds. (#/hr)	2					2		8		6	6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	7%	3%	0%	0%	14%	0%	1%	3%	0%	0%	6%
Adj. Flow (vph)	490	18	287	16	4	9	1	270	2170	24	7	1211
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	508	287	0	29	0	0	271	2194	0	7	1436
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	Left	Left
Median Width(m)		0.0			0.0				3.1			3.1
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		4.8			4.8				4.8			4.8
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.00	1.00	1.00	1.00	1.00	1.09	1.01	1.01	1.08	1.01
Turning Speed (k/h)	25		15	25		15	15	25		15	25	
Number of Detectors	1	2	1	1	2		1	1	2		1	2
Detector Template	Left	Thru	Right	Left	Thru		Left	Left	Thru		Left	Thru
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	2.0	10.0		2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	2.0	0.6		2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4			9.4				9.4			9.4
Detector 2 Size(m)		0.6			0.6				0.6			0.6
Detector 2 Type		Cl+Ex			Cl+Ex				Cl+Ex			Cl+Ex
Detector 2 Channel												



Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	207
Future Volume (vph)	207
Ideal Flow (vphpl)	1900
Lane Width (m)	3.5
Storage Length (m)	0.0
Storage Lanes	0
Taper Length (m)	
Lane Util. Factor	0.95
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	Yes
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	8
Peak Hour Factor	0.92
Heavy Vehicles (%)	0%
Adj. Flow (vph)	225
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	1.01
Turning Speed (k/h)	15
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Detector 2 Extend (s)		0.0			0.0				0.0			0.0
Turn Type	Perm	NA	pm+ov	Perm	NA			pm+pt	NA		Perm	NA
Protected Phases		4	5		8			5	2			6
Permitted Phases	4		4	8				2			6	
Detector Phase	4	4	5	8	8			5	2		6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0	5.0	8.0	8.0			5.0	20.0		20.0	20.0
Minimum Split (s)	29.0	29.0	9.0	29.0	29.0			9.0	28.0		28.0	28.0
Total Split (s)	41.0	41.0	14.0	41.0	41.0			14.0	59.0		45.0	45.0
Total Split (%)	41.0%	41.0%	14.0%	41.0%	41.0%			14.0%	59.0%		45.0%	45.0%
Maximum Green (s)	34.6	34.6	11.0	34.6	34.6			11.0	52.8		38.8	38.8
Yellow Time (s)	4.2	4.2	3.0	4.2	4.2			3.0	4.2		4.2	4.2
All-Red Time (s)	2.2	2.2	0.0	2.2	2.2			0.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)		6.4	3.0		6.4			3.0	6.2		6.2	6.2
Lead/Lag			Lead					Lead			Lag	Lag
Lead-Lag Optimize?			Yes					Yes			Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0		3.0	3.0
Recall Mode	None	None	None	None	None			None	C-Max		C-Max	C-Max
Walk Time (s)	16.0	16.0		16.0	16.0				14.0		14.0	14.0
Flash Dont Walk (s)	5.0	5.0		5.0	5.0				5.0		5.0	5.0
Pedestrian Calls (#/hr)	0	0		0	0				0		0	0
Act Effct Green (s)		34.6	52.0		34.6			56.0	52.8		38.8	38.8
Actuated g/C Ratio		0.35	0.52		0.35			0.56	0.53		0.39	0.39
v/c Ratio		1.11	0.34		0.07			1.05	1.20		0.10	1.11
Control Delay		109.6	13.6		21.0			94.4	120.6		13.8	80.6
Queue Delay		0.0	0.0		0.0			0.0	0.0		0.0	0.0
Total Delay		109.6	13.6		21.0			94.4	120.6		13.8	80.6
LOS		F	B		C			F	F		B	F
Approach Delay		75.0			21.0				117.8			80.3
Approach LOS		E			C				F			F

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 40 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 130			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.20			
Intersection Signal Delay: 98.5		Intersection LOS: F	
Intersection Capacity Utilization 120.8%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 1: Brock Road & Finch Avenue





Lane Group	SBR
Detector 2 Extend (s)	
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	451	17	264	15	4	8	1	248	1996	22	6	1114
Future Volume (vph)	451	17	264	15	4	8	1	248	1996	22	6	1114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.6	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5
Total Lost time (s)		6.4	3.0		6.4			3.0	6.2		6.2	6.2
Lane Util. Factor		1.00	1.00		1.00			1.00	0.95		1.00	0.95
Frpb, ped/bikes		1.00	1.00		1.00			1.00	1.00		1.00	0.99
Flpb, ped/bikes		1.00	1.00		1.00			1.00	1.00		1.00	1.00
Frt		1.00	0.85		0.96			1.00	1.00		1.00	0.98
Flt Protected		0.95	1.00		0.97			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1766	1568		1690			1668	3460		1705	3297
Flt Permitted		0.71	1.00		0.67			0.10	1.00		0.10	1.00
Satd. Flow (perm)		1319	1568		1159			168	3460		185	3297
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	490	18	287	16	4	9	1	270	2170	24	7	1211
RTOR Reduction (vph)	0	0	19	0	2	0	0	0	1	0	0	15
Lane Group Flow (vph)	0	508	268	0	27	0	0	271	2193	0	7	1421
Confl. Peds. (#/hr)	2					2		8		6	6	
Heavy Vehicles (%)	1%	7%	3%	0%	0%	14%	0%	1%	3%	0%	0%	6%
Turn Type	Perm	NA	pm+ov	Perm	NA			pm+pt	NA		Perm	NA
Protected Phases		4	5		8			5	2			6
Permitted Phases	4		4	8				2			6	
Actuated Green, G (s)		34.6	45.6		34.6			52.8	52.8		38.8	38.8
Effective Green, g (s)		34.6	45.6		34.6			52.8	52.8		38.8	38.8
Actuated g/C Ratio		0.35	0.46		0.35			0.53	0.53		0.39	0.39
Clearance Time (s)		6.4	3.0		6.4			3.0	6.2		6.2	6.2
Vehicle Extension (s)		3.0	3.0		3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		456	715		401			253	1826		71	1279
v/s Ratio Prot			0.04					0.12	c0.63			0.43
v/s Ratio Perm		c0.39	0.13		0.02			0.45			0.04	
v/c Ratio		1.11	0.37		0.07			1.07	1.20		0.10	1.11
Uniform Delay, d1		32.7	17.8		21.9			29.3	23.6		19.5	30.6
Progression Factor		1.00	1.00		1.00			1.00	1.00		0.56	0.68
Incremental Delay, d2		77.0	0.3		0.1			76.7	96.0		1.9	58.3
Delay (s)		109.7	18.2		22.0			106.0	119.6		12.9	79.1
Level of Service		F	B		C			F	F		B	E
Approach Delay (s)		76.7			22.0				118.1			78.8
Approach LOS		E			C				F			E

Intersection Summary			
HCM 2000 Control Delay	98.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	120.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	207
Future Volume (vph)	207
Ideal Flow (vphpl)	1900
Lane Width	3.5
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	225
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	8
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary



Lane Group	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	0	50	2263	234	1	138	1342
Future Volume (vph)	0	50	2263	234	1	138	1342
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	4.5	3.5	3.3	3.3	3.3	3.5
Storage Length (m)	0.0	0.0		38.0		60.0	
Storage Lanes	0	1		1		1	
Taper Length (m)	7.5					75.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Ped Bike Factor							
Frt		0.865		0.850			
Flt Protected						0.950	
Satd. Flow (prot)	0	1808	3500	1561	0	1745	3400
Flt Permitted						0.950	
Satd. Flow (perm)	0	1808	3500	1561	0	1745	3400
Link Speed (k/h)	40		60				60
Link Distance (m)	73.4		367.1				224.5
Travel Time (s)	6.6		22.0				13.5
Confl. Peds. (#/hr)	1	1		6		6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	5%
Adj. Flow (vph)	0	54	2460	254	1	150	1459
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	54	2460	254	0	151	1459
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	R NA	Left	Left
Median Width(m)	0.0		3.3				3.3
Link Offset(m)	0.0		0.0				0.0
Crosswalk Width(m)	4.8		4.8				4.8
Two way Left Turn Lane							
Headway Factor	1.00	0.88	1.01	1.04	1.04	1.04	1.01
Turning Speed (k/h)	25	15		15	15	25	
Sign Control	Stop		Free				Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 83.9%		ICU Level of Service E	
Analysis Period (min) 15			



Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	0	50	2263	234	1	138	1342
Future Volume (Veh/h)	0	50	2263	234	1	138	1342
Sign Control	Stop		Free				Free
Grade	0%		0%				0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	54	2460	254	0	150	1459
Pedestrians	6		1				1
Lane Width (m)	4.5		3.4				3.4
Walking Speed (m/s)	1.2		1.2				1.2
Percent Blockage	1		0				0
Right turn flare (veh)							
Median type			None				None
Median storage veh)							
Upstream signal (m)			367				225
pX, platoon unblocked	0.63	0.49			0.00	0.49	
vC, conflicting volume	3496	1237			0	2720	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1833	0			0	2430	
tC, single (s)	6.8	6.9			0.0	4.1	
tC, 2 stage (s)							
tF (s)	3.5	3.3			0.0	2.2	
p0 queue free %	0	90			0	0	
cM capacity (veh/h)	0	532			0	96	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	54	1230	1230	254	150	730	730
Volume Left	0	0	0	0	150	0	0
Volume Right	54	0	0	254	0	0	0
cSH	532	1700	1700	1700	96	1700	1700
Volume to Capacity	0.10	0.72	0.72	0.15	1.56	0.43	0.43
Queue Length 95th (m)	2.7	0.0	0.0	0.0	92.5	0.0	0.0
Control Delay (s)	12.5	0.0	0.0	0.0	372.1	0.0	0.0
Lane LOS	B				F		
Approach Delay (s)	12.5	0.0			34.7		
Approach LOS	B						

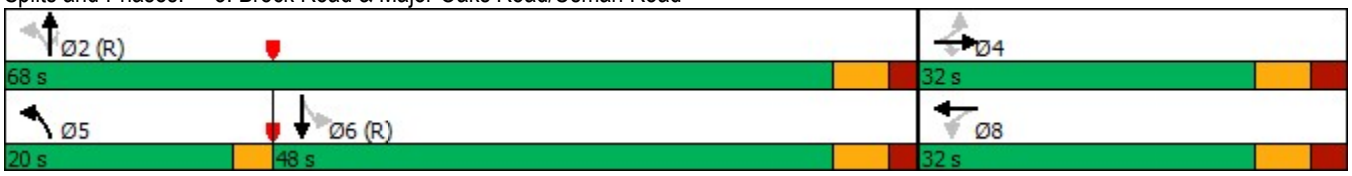
Intersection Summary			
Average Delay	12.9		
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	11	199	223	21	18	308	2108	28	54	1035	34
Future Volume (vph)	22	11	199	223	21	18	308	2108	28	54	1035	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.7	3.7	3.0	3.5	3.5	3.0	3.5	3.5
Storage Length (m)	0.0		30.0	20.0		0.0	72.0		70.0	60.0		0.0
Storage Lanes	0		1	1		0	1		1	1		0
Taper Length (m)	7.5			48.0			72.0			92.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor		1.00	0.97	0.98	0.99				0.98		1.00	
Frt			0.850		0.930				0.850		0.995	
Flt Protected		0.968		0.950			0.950			0.950		
Satd. Flow (prot)	0	1760	1566	1785	1626	0	1652	3466	1597	1685	3352	0
Flt Permitted		0.817		0.734			0.117			0.089		
Satd. Flow (perm)	0	1482	1517	1354	1626	0	203	3466	1561	158	3352	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			216		6				44		4	
Link Speed (k/h)		50			40			60			60	
Link Distance (m)		292.9			123.2			224.5			180.3	
Travel Time (s)		21.1			11.1			13.5			10.8	
Confl. Peds. (#/hr)	3		16	16		3	10		1	1		10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	10%	2%	0%	17%	0%	2%	3%	0%	0%	6%	0%
Adj. Flow (vph)	24	12	216	242	23	20	335	2291	30	59	1125	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	216	242	43	0	335	2291	30	59	1162	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	0.99	0.99	1.09	1.01	1.01	1.09	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	1	1	1	1		1	0	0	1	0	
Detector Template	Left											
Leading Detector (m)	2.0	12.0	12.0	12.0	12.0		24.0	0.0	0.0	24.0	0.0	
Trailing Detector (m)	0.0	-3.0	-3.0	-3.0	-3.0		14.0	0.0	0.0	14.0	0.0	
Detector 1 Position(m)	0.0	-3.0	-3.0	-3.0	-3.0		14.0	0.0	0.0	14.0	0.0	
Detector 1 Size(m)	2.0	15.0	15.0	15.0	15.0		10.0	0.6	2.0	10.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2		2	6		
Detector Phase	4	4	4	8	8		5	2	2	6	6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	4.0	4.0		5.0	20.0	20.0	20.0	20.0	
Minimum Split (s)	32.0	32.0	32.0	32.0	32.0		8.0	29.0	29.0	29.0	29.0	
Total Split (s)	32.0	32.0	32.0	32.0	32.0		20.0	68.0	68.0	48.0	48.0	
Total Split (%)	32.0%	32.0%	32.0%	32.0%	32.0%		20.0%	68.0%	68.0%	48.0%	48.0%	
Maximum Green (s)	25.0	25.0	25.0	25.0	25.0		17.0	61.6	61.6	41.6	41.6	
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1		3.0	4.2	4.2	4.2	4.2	
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9		0.0	2.2	2.2	2.2	2.2	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		7.0	7.0	7.0	7.0		3.0	6.4	6.4	6.4	6.4	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		None	C-Max	C-Max	C-Max	C-Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0			14.0	14.0	14.0	14.0	
Pedestrian Calls (#/hr)	0	0	0	0	0			0	0	0	0	
Act Effct Green (s)		21.7	21.7	21.7	21.7		68.3	64.9	64.9	44.9	44.9	
Actuated g/C Ratio		0.22	0.22	0.22	0.22		0.68	0.65	0.65	0.45	0.45	
v/c Ratio		0.11	0.43	0.82	0.12		0.87	1.02	0.03	0.84	0.77	
Control Delay		30.5	7.2	51.2	29.8		21.2	31.5	1.0	103.3	28.5	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		30.5	7.2	51.2	29.8		21.2	31.5	1.0	103.3	28.5	
LOS		C	A	D	C		C	C	A	F	C	
Approach Delay		10.5			48.0			29.8			32.1	
Approach LOS		B			D			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.02			
Intersection Signal Delay: 30.5		Intersection LOS: C	
Intersection Capacity Utilization 110.6%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 3: Brock Road & Major Oaks Road/Usman Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	11	199	223	21	18	308	2108	28	54	1035	34
Future Volume (vph)	22	11	199	223	21	18	308	2108	28	54	1035	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.7	3.7	3.0	3.5	3.5	3.0	3.5	3.5
Total Lost time (s)		7.0	7.0	7.0	7.0		3.0	6.4	6.4	6.4	6.4	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		1.00	0.97	1.00	0.99		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00	1.00	0.98	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.97	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1756	1517	1752	1626		1652	3466	1561	1685	3353	
Flt Permitted		0.82	1.00	0.73	1.00		0.12	1.00	1.00	0.09	1.00	
Satd. Flow (perm)		1481	1517	1353	1626		204	3466	1561	158	3353	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	12	216	242	23	20	335	2291	30	59	1125	37
RTOR Reduction (vph)	0	0	169	0	5	0	0	0	11	0	2	0
Lane Group Flow (vph)	0	36	47	242	38	0	335	2291	19	59	1160	0
Confl. Peds. (#/hr)	3		16	16		3	10		1	1		10
Heavy Vehicles (%)	0%	10%	2%	0%	17%	0%	2%	3%	0%	0%	6%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)		21.7	21.7	21.7	21.7		64.9	64.9	64.9	45.0	45.0	
Effective Green, g (s)		21.7	21.7	21.7	21.7		64.9	64.9	64.9	45.0	45.0	
Actuated g/C Ratio		0.22	0.22	0.22	0.22		0.65	0.65	0.65	0.45	0.45	
Clearance Time (s)		7.0	7.0	7.0	7.0		3.0	6.4	6.4	6.4	6.4	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		321	329	293	352		377	2249	1013	71	1508	
v/s Ratio Prot					0.02		0.15	c0.66			0.35	
v/s Ratio Perm		0.02	0.03	c0.18			0.43		0.01	0.37		
v/c Ratio		0.11	0.14	0.83	0.11		0.89	1.02	0.02	0.83	0.77	
Uniform Delay, d1		31.4	31.6	37.3	31.4		24.6	17.5	6.2	24.2	23.1	
Progression Factor		1.00	1.00	1.04	1.11		0.82	1.04	0.70	1.00	1.00	
Incremental Delay, d2		0.2	0.2	9.2	0.1		2.6	11.3	0.0	66.5	3.8	
Delay (s)		31.6	31.8	48.2	34.9		22.9	29.6	4.4	90.7	27.0	
Level of Service		C	C	D	C		C	C	A	F	C	
Approach Delay (s)		31.8			46.2			28.5			30.0	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	110.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	231	85	0	51	16	38
Future Volume (vph)	231	85	0	51	16	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.964				0.905	
Flt Protected					0.986	
Satd. Flow (prot)	1796	0	0	1863	1662	0
Flt Permitted					0.986	
Satd. Flow (perm)	1796	0	0	1863	1662	0
Link Speed (k/h)	40			40	50	
Link Distance (m)	73.4			46.4	24.9	
Travel Time (s)	6.6			4.2	1.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	251	92	0	55	17	41
Shared Lane Traffic (%)						
Lane Group Flow (vph)	343	0	0	55	58	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

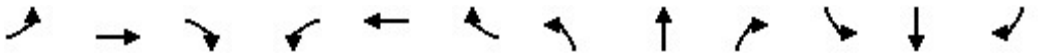
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 27.3%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	231	85	0	51	16	38
Future Volume (Veh/h)	231	85	0	51	16	38
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	251	92	0	55	17	41
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				389		
pX, platoon unblocked						
vC, conflicting volume			343		352	297
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			343		352	297
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	94
cM capacity (veh/h)			1216		646	742

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	343	55	58
Volume Left	0	0	17
Volume Right	92	0	41
cSH	1700	1216	711
Volume to Capacity	0.20	0.00	0.08
Queue Length 95th (m)	0.0	0.0	2.1
Control Delay (s)	0.0	0.0	10.5
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.5
Approach LOS			B

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	27.3%	ICU Level of Service	A
Analysis Period (min)	15		

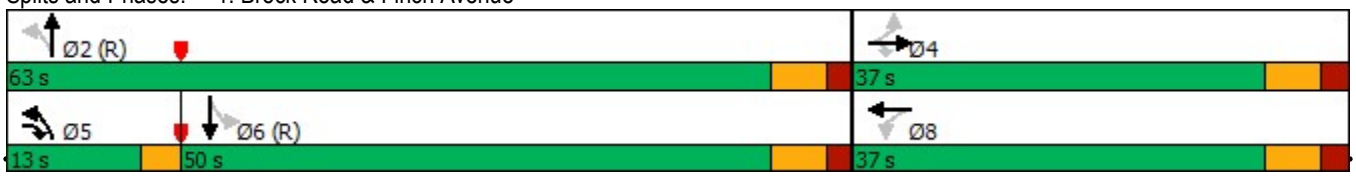


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	369	4	237	7	8	7	232	1927	14	2	1090	222
Future Volume (vph)	369	4	237	7	8	7	232	1927	14	2	1090	222
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5	3.5
Storage Length (m)	0.0		0.0	0.0		0.0	63.0		0.0	13.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			20.0			41.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor			0.98		1.00						0.99	
Frt			0.850		0.957			0.999			0.975	
Flt Protected		0.953			0.984		0.950			0.950		
Satd. Flow (prot)	0	1690	1538	0	1478	0	1620	3426	0	852	3253	0
Flt Permitted		0.710			0.870		0.085			0.091		
Satd. Flow (perm)	0	1259	1513	0	1306	0	145	3426	0	82	3253	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			35		6			1			30	
Link Speed (k/h)		60			40			60			60	
Link Distance (m)		416.8			328.7			124.4			367.1	
Travel Time (s)		25.0			29.6			7.5			22.0	
Confl. Peds. (#/hr)			3	3			14					14
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	6%	0%	5%	33%	14%	17%	4%	4%	15%	100%	6%	6%
Adj. Flow (vph)	415	4	266	8	9	8	261	2165	16	2	1225	249
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	419	266	0	25	0	261	2181	0	2	1474	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.1			3.1	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.00	1.00	1.00	1.00	1.09	1.01	1.01	1.08	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	5	8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	5.0	8.0	8.0		5.0	20.0		20.0	20.0	
Minimum Split (s)	29.0	29.0	9.0	29.0	29.0		9.0	28.0		28.0	28.0	
Total Split (s)	37.0	37.0	13.0	37.0	37.0		13.0	63.0		50.0	50.0	
Total Split (%)	37.0%	37.0%	13.0%	37.0%	37.0%		13.0%	63.0%		50.0%	50.0%	
Maximum Green (s)	30.6	30.6	10.0	30.6	30.6		10.0	56.8		43.8	43.8	
Yellow Time (s)	4.2	4.2	3.0	4.2	4.2		3.0	4.2		4.2	4.2	
All-Red Time (s)	2.2	2.2	0.0	2.2	2.2		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.4	3.0		6.4		3.0	6.2		6.2	6.2	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	16.0	16.0		16.0	16.0			14.0		14.0	14.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)		30.6	44.0		30.6		60.0	56.8		43.8	43.8	
Actuated g/C Ratio		0.31	0.44		0.31		0.60	0.57		0.44	0.44	
v/c Ratio		1.09	0.39		0.06		1.12	1.12		0.06	1.02	
Control Delay		106.5	16.6		20.9		118.8	85.0		21.0	58.0	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		106.5	16.6		20.9		118.8	85.0		21.0	58.0	
LOS		F	B		C		F	F		C	E	
Approach Delay		71.6			20.9			88.6			57.9	
Approach LOS		E			C			F			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 40 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 130			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.12			
Intersection Signal Delay: 75.9		Intersection LOS: E	
Intersection Capacity Utilization 113.4%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 1: Brock Road & Finch Avenue



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	369	4	237	7	8	7	232	1927	14	2	1090	222
Future Volume (vph)	369	4	237	7	8	7	232	1927	14	2	1090	222
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5	3.5
Total Lost time (s)		6.4	3.0		6.4		3.0	6.2		6.2	6.2	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.96		1.00	1.00		1.00	0.97	
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1690	1519		1478		1620	3426		852	3251	
Flt Permitted		0.71	1.00		0.87		0.09	1.00		0.09	1.00	
Satd. Flow (perm)		1259	1519		1306		146	3426		82	3251	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	415	4	266	8	9	8	261	2165	16	2	1225	249
RTOR Reduction (vph)	0	0	21	0	4	0	0	0	0	0	17	0
Lane Group Flow (vph)	0	419	245	0	21	0	261	2181	0	2	1457	0
Confl. Peds. (#/hr)			3	3			14					14
Heavy Vehicles (%)	6%	0%	5%	33%	14%	17%	4%	4%	15%	100%	6%	6%
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		30.6	40.6		30.6		56.8	56.8		43.8	43.8	
Effective Green, g (s)		30.6	40.6		30.6		56.8	56.8		43.8	43.8	
Actuated g/C Ratio		0.31	0.41		0.31		0.57	0.57		0.44	0.44	
Clearance Time (s)		6.4	3.0		6.4		3.0	6.2		6.2	6.2	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		385	616		399		230	1945		35	1423	
v/s Ratio Prot			0.04				0.11	c0.64			0.45	
v/s Ratio Perm		c0.33	0.12		0.02		c0.53			0.02		
v/c Ratio		1.09	0.40		0.05		1.13	1.12		0.06	1.02	
Uniform Delay, d1		34.7	21.0		24.5		29.6	21.6		16.2	28.1	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		71.7	0.4		0.1		100.4	62.0		3.1	30.1	
Delay (s)		106.4	21.5		24.5		130.0	83.6		19.3	58.2	
Level of Service		F	C		C		F	F		B	E	
Approach Delay (s)		73.4			24.5			88.6			58.2	
Approach LOS		E			C			F			E	

Intersection Summary			
HCM 2000 Control Delay	76.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	113.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	101	1935	342	175	1177
Future Volume (vph)	0	101	1935	342	175	1177
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	4.5	3.5	3.3	3.3	3.5
Storage Length (m)	0.0	0.0		38.0	60.0	
Storage Lanes	0	1		1	1	
Taper Length (m)	7.5				75.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.865		0.850		
Flt Protected					0.950	
Satd. Flow (prot)	0	1790	3400	1516	1711	3336
Flt Permitted					0.950	
Satd. Flow (perm)	0	1790	3400	1516	1711	3336
Link Speed (k/h)	40		60			60
Link Distance (m)	62.6		367.1			224.5
Travel Time (s)	5.6		22.0			13.5
Confl. Peds. (#/hr)	7	1		55	55	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	1%	5%	3%	2%	7%
Adj. Flow (vph)	0	112	2150	380	194	1308
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	112	2150	380	194	1308
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.3			3.3
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	0.88	1.01	1.04	1.04	1.01
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 76.8%		ICU Level of Service D	
Analysis Period (min) 15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	101	1935	342	175	1177
Future Volume (Veh/h)	0	101	1935	342	175	1177
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	112	2150	380	194	1308
Pedestrians	55		7			1
Lane Width (m)	4.5		3.4			3.4
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	6		1			0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			367			225
pX, platoon unblocked	0.60	0.47			0.47	
vC, conflicting volume	3254	1131			2585	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1351	0			2108	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	77			0	
cM capacity (veh/h)	0	477			113	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	112	1075	1075	380	194	654	654
Volume Left	0	0	0	0	194	0	0
Volume Right	112	0	0	380	0	0	0
cSH	477	1700	1700	1700	113	1700	1700
Volume to Capacity	0.23	0.63	0.63	0.22	1.72	0.38	0.38
Queue Length 95th (m)	7.2	0.0	0.0	0.0	120.2	0.0	0.0
Control Delay (s)	14.9	0.0	0.0	0.0	426.4	0.0	0.0
Lane LOS	B				F		
Approach Delay (s)	14.9	0.0			55.1		
Approach LOS	B						

Intersection Summary			
Average Delay	20.4		
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	33	12	249	197	25	47	2	280	1833	24	84	1036
Future Volume (vph)	33	12	249	197	25	47	2	280	1833	24	84	1036
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.7	3.7	3.6	3.0	3.5	3.5	3.0	3.5
Storage Length (m)	0.0		30.0	20.0		0.0		72.0		70.0	60.0	
Storage Lanes	0		1	1		0		1		1	1	
Taper Length (m)	7.5			48.0				72.0			92.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor		0.99	0.94	0.95	0.98					0.95		1.00
Frt			0.850		0.902					0.850		0.997
Flt Protected		0.965		0.950				0.950			0.950	
Satd. Flow (prot)	0	1689	1566	1733	1654	0	0	1652	3400	1597	1685	3294
Flt Permitted		0.751		0.722				0.094			0.079	
Satd. Flow (perm)	0	1303	1472	1257	1654	0	0	163	3400	1512	140	3294
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			296		56					69		2
Link Speed (k/h)		50			40				60			60
Link Distance (m)		292.9			123.2				224.5			180.3
Travel Time (s)		21.1			11.1				13.5			10.8
Confl. Peds. (#/hr)	10		37	37		10		10		13	13	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	10%	0%	2%	3%	5%	2%	0%	2%	5%	0%	0%	8%
Adj. Flow (vph)	39	14	296	235	30	56	2	333	2182	29	100	1233
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	53	296	235	86	0	0	335	2182	29	100	1257
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	Left	Left
Median Width(m)		3.5			3.5				3.3			3.3
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		4.8			4.8				4.8			4.8
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	0.99	0.99	1.00	1.09	1.01	1.01	1.09	1.01
Turning Speed (k/h)	25		15	25		15	15	25		15	25	
Number of Detectors	1	1	1	1	1		1	1	0	0	1	0
Detector Template	Left						Left					
Leading Detector (m)	2.0	12.0	12.0	12.0	12.0		2.0	24.0	0.0	0.0	24.0	0.0
Trailing Detector (m)	0.0	-3.0	-3.0	-3.0	-3.0		0.0	14.0	0.0	0.0	14.0	0.0
Detector 1 Position(m)	0.0	-3.0	-3.0	-3.0	-3.0		0.0	14.0	0.0	0.0	14.0	0.0
Detector 1 Size(m)	2.0	15.0	15.0	15.0	15.0		2.0	10.0	0.6	2.0	10.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Perm	NA	Perm	Perm	NA			pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4			8			5	2		1	6
Permitted Phases	4		4	8				2		2	6	
Detector Phase	4	4	4	8	8			5	2	2	1	6

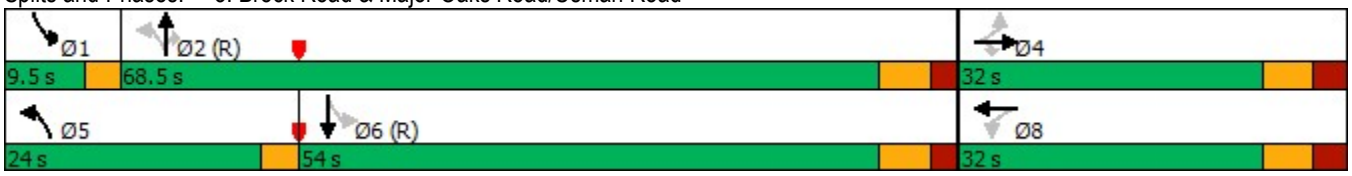


Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	20
Future Volume (vph)	20
Ideal Flow (vphpl)	1900
Lane Width (m)	3.5
Storage Length (m)	0.0
Storage Lanes	0
Taper Length (m)	
Lane Util. Factor	0.95
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	Yes
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	10
Peak Hour Factor	0.84
Heavy Vehicles (%)	6%
Adj. Flow (vph)	24
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	1.01
Turning Speed (k/h)	15
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	4.0	4.0			5.0	20.0	20.0	5.0	20.0
Minimum Split (s)	32.0	32.0	32.0	32.0	32.0			8.0	29.0	29.0	9.5	29.0
Total Split (s)	32.0	32.0	32.0	32.0	32.0			24.0	68.5	68.5	9.5	54.0
Total Split (%)	29.1%	29.1%	29.1%	29.1%	29.1%			21.8%	62.3%	62.3%	8.6%	49.1%
Maximum Green (s)	25.0	25.0	25.0	25.0	25.0			21.0	62.1	62.1	6.5	47.6
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1			3.0	4.2	4.2	3.0	4.2
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9			0.0	2.2	2.2	0.0	2.2
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.0	7.0	7.0	7.0			3.0	6.4	6.4	3.0	6.4
Lead/Lag								Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?								Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None			None	C-Max	C-Max	None	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0				7.0	7.0		7.0
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0				14.0	14.0		14.0
Pedestrian Calls (#/hr)	0	0	0	0	0				0	0		0
Act Effct Green (s)		23.3	23.3	23.3	23.3			76.7	64.1	64.1	60.4	50.8
Actuated g/C Ratio		0.21	0.21	0.21	0.21			0.70	0.58	0.58	0.55	0.46
v/c Ratio		0.19	0.54	0.88	0.22			0.89	1.10	0.03	0.61	0.83
Control Delay		36.6	8.2	74.4	16.8			52.1	78.2	0.1	34.3	32.4
Queue Delay		0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Delay		36.6	8.2	74.4	16.8			52.1	78.2	0.1	34.3	32.4
LOS		D	A	E	B			D	E	A	C	C
Approach Delay		12.5			59.0				73.9			32.6
Approach LOS		B			E				E			C

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 130			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.10			
Intersection Signal Delay: 55.9		Intersection LOS: E	
Intersection Capacity Utilization 99.2%		ICU Level of Service F	
Analysis Period (min) 15			

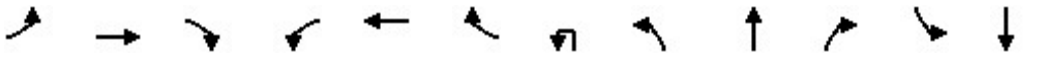
Splits and Phases: 3: Brock Road & Major Oaks Road/Usman Road





Lane Group	SBR
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	33	12	249	197	25	47	2	280	1833	24	84	1036
Future Volume (vph)	33	12	249	197	25	47	2	280	1833	24	84	1036
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.7	3.7	3.6	3.0	3.5	3.5	3.0	3.5
Total Lost time (s)		7.0	7.0	7.0	7.0			3.0	6.4	6.4	3.0	6.4
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes		1.00	0.94	1.00	0.98			1.00	1.00	0.95	1.00	1.00
Flpb, ped/bikes		0.99	1.00	0.95	1.00			1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	0.90			1.00	1.00	0.85	1.00	1.00
Flt Protected		0.96	1.00	0.95	1.00			0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1673	1472	1654	1655			1652	3400	1512	1685	3294
Flt Permitted		0.75	1.00	0.72	1.00			0.09	1.00	1.00	0.08	1.00
Satd. Flow (perm)		1302	1472	1258	1655			163	3400	1512	140	3294
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	39	14	296	235	30	56	2	333	2182	29	100	1233
RTOR Reduction (vph)	0	0	233	0	44	0	0	0	0	12	0	1
Lane Group Flow (vph)	0	53	63	235	42	0	0	335	2182	17	100	1256
Confl. Peds. (#/hr)	10		37	37		10		10		13	13	
Heavy Vehicles (%)	10%	0%	2%	3%	5%	2%	0%	2%	5%	0%	0%	8%
Turn Type	Perm	NA	Perm	Perm	NA			pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4			8			5	2		1	6
Permitted Phases	4		4	8				2		2	6	
Actuated Green, G (s)		23.3	23.3	23.3	23.3			73.3	64.1	64.1	57.0	50.8
Effective Green, g (s)		23.3	23.3	23.3	23.3			73.3	64.1	64.1	57.0	50.8
Actuated g/C Ratio		0.21	0.21	0.21	0.21			0.67	0.58	0.58	0.52	0.46
Clearance Time (s)		7.0	7.0	7.0	7.0			3.0	6.4	6.4	3.0	6.4
Vehicle Extension (s)		3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		275	311	266	350			372	1981	881	159	1521
v/s Ratio Prot					0.03			c0.16	c0.64		0.04	0.38
v/s Ratio Perm		0.04	0.04	c0.19				0.44		0.01	0.29	
v/c Ratio		0.19	0.20	0.88	0.12			0.90	1.10	0.02	0.63	0.83
Uniform Delay, d1		35.6	35.7	42.0	35.1			30.5	23.0	9.7	24.1	25.7
Progression Factor		1.00	1.00	1.00	1.03			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.3	0.3	27.2	0.2			24.0	54.0	0.0	7.6	5.3
Delay (s)		36.0	36.0	69.0	36.4			54.5	76.9	9.7	31.7	31.0
Level of Service		D	D	E	D			D	E	A	C	C
Approach Delay (s)		36.0			60.3				73.2			31.1
Approach LOS		D			E				E			C

Intersection Summary			
HCM 2000 Control Delay	57.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	99.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	20
Future Volume (vph)	20
Ideal Flow (vphpl)	1900
Lane Width	3.5
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.84
Adj. Flow (vph)	24
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	10
Heavy Vehicles (%)	6%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	157	85	0	126	16	38
Future Volume (vph)	157	85	0	126	16	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.953				0.905	
Flt Protected					0.986	
Satd. Flow (prot)	1775	0	0	1863	1662	0
Flt Permitted					0.986	
Satd. Flow (perm)	1775	0	0	1863	1662	0
Link Speed (k/h)	40			40	50	
Link Distance (m)	62.6			57.2	46.3	
Travel Time (s)	5.6			5.1	3.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	171	92	0	137	17	41
Shared Lane Traffic (%)						
Lane Group Flow (vph)	263	0	0	137	58	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 23.4%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	157	85	0	126	16	38
Future Volume (Veh/h)	157	85	0	126	16	38
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	171	92	0	137	17	41
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				400		
pX, platoon unblocked						
vC, conflicting volume			263		354	217
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			263		354	217
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	95
cM capacity (veh/h)			1301		644	823

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	263	137	58
Volume Left	0	0	17
Volume Right	92	0	41
cSH	1700	1301	761
Volume to Capacity	0.15	0.00	0.08
Queue Length 95th (m)	0.0	0.0	2.0
Control Delay (s)	0.0	0.0	10.1
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.1
Approach LOS			B

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	23.4%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Brock Road & Finch Avenue

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	TR
Maximum Queue (m)	70.5	62.6	22.5	59.3	79.9	65.5	5.5	360.3	363.3
Average Queue (m)	34.7	33.8	8.3	25.3	34.5	22.1	0.2	338.9	341.6
95th Queue (m)	55.4	55.8	18.8	50.2	68.9	47.5	3.0	406.9	401.8
Link Distance (m)	403.4	403.4	313.4		113.3	113.3		350.5	350.5
Upstream Blk Time (%)								10	13
Queuing Penalty (veh)								115	151
Storage Bay Dist (m)				63.0			13.0		
Storage Blk Time (%)				0	1		0	38	
Queuing Penalty (veh)				2	1		0	0	

Intersection: 2: Brock Road & Usman Road

Movement	NB	NB	SB	SB	SB
Directions Served	T	R	UL	T	T
Maximum Queue (m)	2.2	5.2	134.8	210.0	214.4
Average Queue (m)	0.1	0.4	62.2	160.9	165.3
95th Queue (m)	1.2	3.7	164.6	276.9	280.0
Link Distance (m)	350.5			206.0	206.0
Upstream Blk Time (%)				1	2
Queuing Penalty (veh)				13	23
Storage Bay Dist (m)		38.0	60.0		
Storage Blk Time (%)				41	
Queuing Penalty (veh)				31	

Intersection: 3: Brock Road & Major Oaks Road/Usman Road

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	TR	L	T	T	R	L	T	TR
Maximum Queue (m)	114.9	37.5	67.8	100.0	57.3	63.4	75.5	8.6	151.5	187.1	188.2
Average Queue (m)	61.7	35.3	43.4	18.5	30.0	30.2	32.9	0.5	16.9	170.2	168.0
95th Queue (m)	126.6	44.6	71.6	65.9	53.2	55.0	61.3	3.7	91.2	207.0	208.4
Link Distance (m)	279.4			97.4		206.0	206.0			170.1	170.1
Upstream Blk Time (%)				1						51	49
Queuing Penalty (veh)				1						0	0
Storage Bay Dist (m)		30.0	20.0		72.0			70.0	60.0		
Storage Blk Time (%)	0	54	60	1	0	0	0			51	
Queuing Penalty (veh)	1	23	12	2	0	0	0			9	

Intersection: 4: Site Access & Usman Road

Movement	NB
Directions Served	LR
Maximum Queue (m)	23.7
Average Queue (m)	10.2
95th Queue (m)	18.0
Link Distance (m)	38.5
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 385

Intersection: 1: Brock Road & Finch Avenue

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	UL	T	TR	L	T	TR
Maximum Queue (m)	150.6	58.2	14.5	82.9	127.8	126.5	9.2	298.2	301.5
Average Queue (m)	86.2	25.2	4.6	71.1	118.8	118.8	1.9	158.6	163.3
95th Queue (m)	138.2	47.2	12.8	104.8	123.1	123.8	7.4	285.8	292.1
Link Distance (m)	403.4	403.4	313.4		113.3	113.3		350.8	350.8
Upstream Blk Time (%)					37	37		0	0
Queuing Penalty (veh)					0	0		1	2
Storage Bay Dist (m)				63.0			13.0		
Storage Blk Time (%)				2	38		0	55	
Queuing Penalty (veh)				18	94		1	3	

Intersection: 2: Brock Road & Usman Road

Movement	WB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	R	UL	T	T
Maximum Queue (m)	14.6	10.4	11.4	8.4	119.5	124.6	88.0
Average Queue (m)	1.2	0.4	0.4	2.2	51.6	17.3	4.4
95th Queue (m)	7.6	4.4	3.9	7.4	102.5	72.2	35.8
Link Distance (m)	45.4	350.8	350.8			205.8	205.8
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)				38.0	60.0		
Storage Blk Time (%)					28	0	
Queuing Penalty (veh)					189	0	

Intersection: 3: Brock Road & Major Oaks Road/Usman Road

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	TR	L	T	T	R	L	T	TR
Maximum Queue (m)	44.0	37.2	67.6	81.0	99.9	116.0	111.8	7.5	38.6	115.8	105.6
Average Queue (m)	8.5	20.5	38.7	11.0	41.2	58.4	63.8	1.1	17.6	66.9	54.7
95th Queue (m)	24.4	34.6	63.7	43.7	73.5	97.8	100.5	4.7	31.5	103.9	94.3
Link Distance (m)	279.4			97.4		205.8	205.8			170.1	170.1
Upstream Blk Time (%)				0							
Queuing Penalty (veh)				0							
Storage Bay Dist (m)		30.0	20.0		72.0			70.0	60.0		
Storage Blk Time (%)		4	51	1	1	3	4			10	
Queuing Penalty (veh)		1	20	2	12	8	1			6	

Intersection: 4: Site Access & Usman Road

Movement	NB
Directions Served	LR
Maximum Queue (m)	15.8
Average Queue (m)	7.5
95th Queue (m)	14.0
Link Distance (m)	15.4
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 358

Intersection: 1: Brock Road & Finch Avenue

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	TR
Maximum Queue (m)	123.4	59.8	22.1	82.9	127.3	130.2	17.3	103.3	116.3
Average Queue (m)	68.2	21.1	5.6	59.3	113.4	113.6	1.0	64.7	72.6
95th Queue (m)	110.8	41.1	16.7	101.6	137.2	136.9	7.4	97.7	108.3
Link Distance (m)	403.4	403.4	313.4		113.3	113.3		350.7	350.7
Upstream Blk Time (%)					21	23			
Queuing Penalty (veh)					0	0			
Storage Bay Dist (m)				63.0			13.0		
Storage Blk Time (%)				1	26		2	40	
Queuing Penalty (veh)				11	61		13	1	

Intersection: 2: Brock Road & Usman Road

Movement	WB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	R	L	T	T
Maximum Queue (m)	27.6	35.1	13.7	19.8	135.0	212.4	228.0
Average Queue (m)	6.1	2.9	1.1	6.4	128.9	182.8	146.3
95th Queue (m)	21.4	15.3	6.9	16.8	155.2	276.1	306.4
Link Distance (m)	34.5	350.7	350.7			205.8	205.8
Upstream Blk Time (%)	1					34	5
Queuing Penalty (veh)	1					253	34
Storage Bay Dist (m)				38.0	60.0		
Storage Blk Time (%)					97	0	
Queuing Penalty (veh)					569	0	

Intersection: 3: Brock Road & Major Oaks Road/Usman Road

Movement	EB	EB	WB	WB	B11	B6	NB	NB	NB	NB	SB	SB
Directions Served	LT	R	L	TR	T	T	UL	T	T	R	L	T
Maximum Queue (m)	173.6	37.5	68.0	124.4	154.4	16.9	98.6	121.8	135.2	51.2	152.0	186.0
Average Queue (m)	58.5	32.4	56.4	66.2	31.6	1.9	47.0	77.3	82.8	2.7	87.1	141.7
95th Queue (m)	153.1	44.4	81.4	149.6	127.1	16.3	82.1	119.1	125.6	27.2	196.9	228.6
Link Distance (m)	279.4			97.4	201.2	41.6		205.8	205.8			170.1
Upstream Blk Time (%)				38	4	1						52
Queuing Penalty (veh)				74	8	2						0
Storage Bay Dist (m)		30.0	20.0				72.0			70.0	60.0	
Storage Blk Time (%)	2	45	80	8			2	9	11			67
Queuing Penalty (veh)	5	20	58	17			20	25	3			57

Intersection: 3: Brock Road & Major Oaks Road/Usman Road

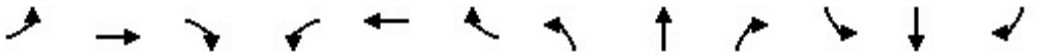
Movement	SB
Directions Served	TR
Maximum Queue (m)	189.3
Average Queue (m)	136.3
95th Queue (m)	232.0
Link Distance (m)	170.1
Upstream Blk Time (%)	45
Queuing Penalty (veh)	0
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: Site Access & Usman Road

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (m)	3.1	11.5	16.3
Average Queue (m)	0.2	0.5	7.8
95th Queue (m)	2.4	6.9	14.8
Link Distance (m)	34.5	41.6	37.1
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 1230

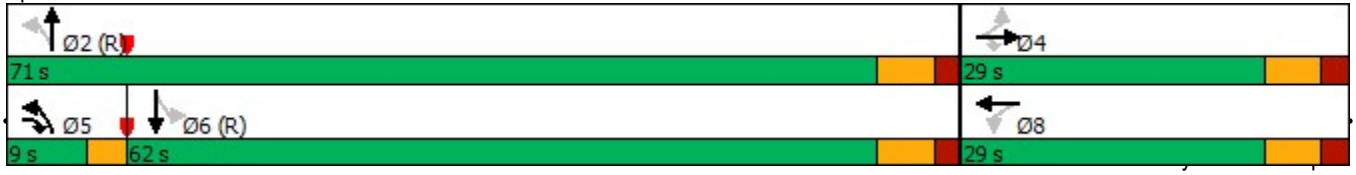


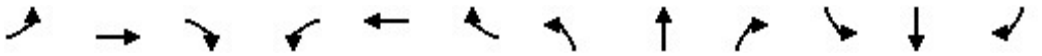
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	189	4	273	23	5	6	145	880	4	1	2278	239
Future Volume (vph)	189	4	273	23	5	6	145	880	4	1	2278	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5	3.5
Storage Length (m)	0.0		0.0	0.0		0.0	63.0		0.0	13.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			20.0			41.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	*0.80	1.00	*0.80	*0.80
Ped Bike Factor		1.00	0.99		1.00			1.00		1.00	1.00	
Frt			0.850		0.974			0.999			0.986	
Flt Protected		0.953			0.967		0.950			0.950		
Satd. Flow (prot)	0	1697	1568	0	1508	0	1574	2587	0	852	2811	0
Flt Permitted		0.703			0.723		0.067			0.249		
Satd. Flow (perm)	0	1250	1545	0	1126	0	111	2587	0	223	2811	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			35		7			1			15	
Link Speed (k/h)		60			40			60			60	
Link Distance (m)		416.8			328.7			124.4			367.1	
Travel Time (s)		25.0			29.6			7.5			22.0	
Confl. Peds. (#/hr)	1		2	2		1	9		3	3		9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	7%	16%	33%	100%	5%	5%
Adj. Flow (vph)	205	4	297	25	5	7	158	957	4	1	2476	260
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	209	297	0	37	0	158	961	0	1	2736	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.1			3.1	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.00	1.00	1.00	1.00	1.09	1.01	1.01	1.08	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	5	8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	5.0	8.0	8.0		5.0	20.0		20.0	20.0	
Minimum Split (s)	29.0	29.0	9.0	29.0	29.0		9.0	28.0		28.0	28.0	
Total Split (s)	29.0	29.0	9.0	29.0	29.0		9.0	71.0		62.0	62.0	
Total Split (%)	29.0%	29.0%	9.0%	29.0%	29.0%		9.0%	71.0%		62.0%	62.0%	
Maximum Green (s)	22.6	22.6	6.0	22.6	22.6		6.0	64.8		55.8	55.8	
Yellow Time (s)	4.2	4.2	3.0	4.2	4.2		3.0	4.2		4.2	4.2	
All-Red Time (s)	2.2	2.2	0.0	2.2	2.2		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.4	3.0		6.4		3.0	6.2		6.2	6.2	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	16.0	16.0		16.0	16.0			14.0		14.0	14.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)		20.1	31.3		20.1		70.5	67.3		56.5	56.5	
Actuated g/C Ratio		0.20	0.31		0.20		0.70	0.67		0.56	0.56	
v/c Ratio		0.83	0.58		0.16		0.82	0.55		0.01	1.72	
Control Delay		65.2	28.3		28.7		53.8	10.5		10.0	346.7	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		65.2	28.3		28.7		53.8	10.5		10.0	346.7	
LOS		E	C		C		D	B		A	F	
Approach Delay		43.6			28.7			16.6			346.6	
Approach LOS		D			C			B			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 2 (2%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.72			
Intersection Signal Delay: 225.1		Intersection LOS: F	
Intersection Capacity Utilization 108.6%		ICU Level of Service G	
Analysis Period (min) 15			
* User Entered Value			

Splits and Phases: 1: Brock Road & Finch Avenue





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	189	4	273	23	5	6	145	880	4	1	2278	239
Future Volume (vph)	189	4	273	23	5	6	145	880	4	1	2278	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5	3.5
Total Lost time (s)		6.4	3.0		6.4		3.0	6.2		6.2	6.2	
Lane Util. Factor		1.00	1.00		1.00		1.00	*0.80		1.00	*0.80	
Frpb, ped/bikes		1.00	0.99		1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.97		1.00	1.00		1.00	0.99	
Flt Protected		0.95	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1695	1551		1507		1574	2588		851	2811	
Flt Permitted		0.70	1.00		0.72		0.07	1.00		0.25	1.00	
Satd. Flow (perm)		1250	1551		1127		111	2588		223	2811	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	205	4	297	25	5	7	158	957	4	1	2476	260
RTOR Reduction (vph)	0	0	25	0	6	0	0	0	0	0	7	0
Lane Group Flow (vph)	0	209	272	0	31	0	158	961	0	1	2729	0
Confl. Peds. (#/hr)	1		2	2		1	9		3	3		9
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	7%	16%	33%	100%	5%	5%
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		20.1	27.9		20.1		67.3	67.3		56.5	56.5	
Effective Green, g (s)		20.1	27.9		20.1		67.3	67.3		56.5	56.5	
Actuated g/C Ratio		0.20	0.28		0.20		0.67	0.67		0.56	0.56	
Clearance Time (s)		6.4	3.0		6.4		3.0	6.2		6.2	6.2	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		251	432		226		188	1741		125	1588	
v/s Ratio Prot			0.05				c0.07	0.37			c0.97	
v/s Ratio Perm		c0.17	0.13		0.03		0.50			0.00		
v/c Ratio		0.83	0.63		0.14		0.84	0.55		0.01	1.72	
Uniform Delay, d1		38.3	31.5		32.8		29.4	8.5		9.5	21.8	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		20.4	2.9		0.3		27.2	1.3		0.1	326.2	
Delay (s)		58.8	34.4		33.1		56.6	9.8		9.6	347.9	
Level of Service		E	C		C		E	A		A	F	
Approach Delay (s)		44.5			33.1			16.4			347.8	
Approach LOS		D			C			B			F	

Intersection Summary			
HCM 2000 Control Delay	225.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.43		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	108.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	0	40	1011	113	1	78	2523
Future Volume (vph)	0	40	1011	113	1	78	2523
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	4.5	3.5	3.3	3.3	3.3	3.5
Storage Length (m)	0.0	0.0		38.0		60.0	
Storage Lanes	0	1		1		1	
Taper Length (m)	7.5					75.0	
Lane Util. Factor	1.00	1.00	*0.80	1.00	0.95	1.00	*0.80
Ped Bike Factor							
Frt		0.865		0.850			
Flt Protected						0.950	
Satd. Flow (prot)	0	1808	2637	1459	0	1647	2863
Flt Permitted						0.950	
Satd. Flow (perm)	0	1808	2637	1459	0	1647	2863
Link Speed (k/h)	40		60				60
Link Distance (m)	71.8		367.1				224.5
Travel Time (s)	6.5		22.0				13.5
Confl. Peds. (#/hr)				4		4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	14%	7%	0%	6%	5%
Adj. Flow (vph)	0	43	1099	123	1	85	2742
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	43	1099	123	0	86	2742
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	R NA	Left	Left
Median Width(m)	0.0		3.3				3.3
Link Offset(m)	0.0		0.0				0.0
Crosswalk Width(m)	4.8		4.8				4.8
Two way Left Turn Lane							
Headway Factor	1.00	0.88	1.01	1.04	1.04	1.04	1.01
Turning Speed (k/h)	25	15		15	15	25	
Sign Control	Stop		Free				Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 73.1%		ICU Level of Service D	
Analysis Period (min) 15			

* User Entered Value



Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	0	40	1011	113	1	78	2523
Future Volume (Veh/h)	0	40	1011	113	1	78	2523
Sign Control	Stop		Free				Free
Grade	0%		0%				0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	43	1099	123	0	85	2742
Pedestrians	4						
Lane Width (m)	4.5						
Walking Speed (m/s)	1.2						
Percent Blockage	0						
Right turn flare (veh)							
Median type			None				None
Median storage veh)							
Upstream signal (m)			367				225
pX, platoon unblocked	0.49	0.92			0.00	0.92	
vC, conflicting volume	2644	554			0	1226	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1541	338			0	1070	
tC, single (s)	6.8	6.9			0.0	4.2	
tC, 2 stage (s)							
tF (s)	3.5	3.3			0.0	2.3	
p0 queue free %	100	93			0	85	
cM capacity (veh/h)	45	607			0	571	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	43	550	550	123	85	1371	1371
Volume Left	0	0	0	0	85	0	0
Volume Right	43	0	0	123	0	0	0
cSH	607	1700	1700	1700	571	1700	1700
Volume to Capacity	0.07	0.32	0.32	0.07	0.15	0.81	0.81
Queue Length 95th (m)	1.8	0.0	0.0	0.0	4.2	0.0	0.0
Control Delay (s)	11.4	0.0	0.0	0.0	12.4	0.0	0.0
Lane LOS	B				B		
Approach Delay (s)	11.4	0.0			0.4		
Approach LOS	B						

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		

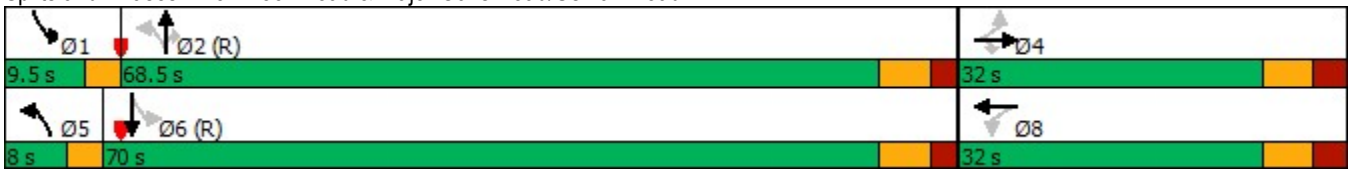
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	5	295	238	12	9	140	910	11	18	2076	21
Future Volume (vph)	43	5	295	238	12	9	140	910	11	18	2076	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.7	3.7	3.0	3.5	3.5	3.0	3.5	3.5
Storage Length (m)	0.0		30.0	20.0		0.0	72.0		70.0	60.0		0.0
Storage Lanes	0		1	1		0	1		1	1		0
Taper Length (m)	7.5			48.0			72.0			92.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	*0.80	1.00	*0.80	*0.80
Ped Bike Factor		0.99	0.99	1.00	0.99				0.98	1.00	1.00	
Frt			0.850		0.935				0.850		0.998	
Flt Protected		0.957		0.950			0.950			0.950		
Satd. Flow (prot)	0	1668	1536	1733	1517	0	1589	2592	1151	1685	2853	0
Flt Permitted		0.743		0.723			0.060			0.196		
Satd. Flow (perm)	0	1286	1515	1317	1517	0	100	2592	1125	347	2853	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			86		10				69		1	
Link Speed (k/h)		50			40			60			60	
Link Distance (m)		292.9			123.2			224.5			180.3	
Travel Time (s)		21.1			11.1			13.5			10.8	
Confl. Peds. (#/hr)	6		1	1		6	3		1	1		3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	25%	4%	3%	20%	14%	6%	16%	11%	0%	5%	18%
Adj. Flow (vph)	47	5	321	259	13	10	152	989	12	20	2257	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	52	321	259	23	0	152	989	12	20	2280	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	0.99	0.99	1.09	1.01	1.01	1.09	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	1	1	1	1		1	0	0	1	0	
Detector Template	Left											
Leading Detector (m)	2.0	12.0	12.0	12.0	12.0		24.0	0.0	0.0	24.0	0.0	
Trailing Detector (m)	0.0	-3.0	-3.0	-3.0	-3.0		14.0	0.0	0.0	14.0	0.0	
Detector 1 Position(m)	0.0	-3.0	-3.0	-3.0	-3.0		14.0	0.0	0.0	14.0	0.0	
Detector 1 Size(m)	2.0	15.0	15.0	15.0	15.0		10.0	0.6	2.0	10.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		
Detector Phase	4	4	4	8	8		5	2	2	1	6	

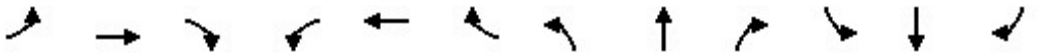
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		5.0	20.0	20.0	5.0	20.0	
Minimum Split (s)	32.0	32.0	32.0	32.0	32.0		8.0	29.0	29.0	9.5	29.0	
Total Split (s)	32.0	32.0	32.0	32.0	32.0		8.0	68.5	68.5	9.5	70.0	
Total Split (%)	29.1%	29.1%	29.1%	29.1%	29.1%		7.3%	62.3%	62.3%	8.6%	63.6%	
Maximum Green (s)	25.0	25.0	25.0	25.0	25.0		5.0	62.1	62.1	6.5	63.6	
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1		3.0	4.2	4.2	3.0	4.2	
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9		0.0	2.2	2.2	0.0	2.2	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		7.0	7.0	7.0	7.0		3.0	6.4	6.4	3.0	6.4	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		None	C-Max	C-Max	None	C-Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0	7.0		7.0	
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0			14.0	14.0		14.0	
Pedestrian Calls (#/hr)	0	0	0	0	0			0	0		0	
Act Effct Green (s)		23.9	23.9	23.9	23.9		74.6	69.2	69.2	72.2	63.6	
Actuated g/C Ratio		0.22	0.22	0.22	0.22		0.68	0.63	0.63	0.66	0.58	
v/c Ratio		0.19	0.81	0.91	0.07		1.02	0.61	0.02	0.07	1.38	
Control Delay		36.4	46.4	75.4	23.8		105.1	15.2	0.0	6.2	200.2	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		36.4	46.4	75.4	23.8		105.1	15.2	0.0	6.2	200.2	
LOS		D	D	E	C		F	B	A	A	F	
Approach Delay		45.0			71.2			26.9			198.5	
Approach LOS		D			E			C			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.38			
Intersection Signal Delay: 127.7		Intersection LOS: F	
Intersection Capacity Utilization 108.1%		ICU Level of Service G	
Analysis Period (min) 15			

* User Entered Value

Splits and Phases: 3: Brock Road & Major Oaks Road/Usman Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	5	295	238	12	9	140	910	11	18	2076	21
Future Volume (vph)	43	5	295	238	12	9	140	910	11	18	2076	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.7	3.7	3.0	3.5	3.5	3.0	3.5	3.5
Total Lost time (s)		7.0	7.0	7.0	7.0		3.0	6.4	6.4	3.0	6.4	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	*0.80	*0.80	1.00	*0.80	
Frpb, ped/bikes		1.00	0.99	1.00	0.99		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		0.99	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.96	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1656	1515	1731	1517		1589	2592	1125	1685	2854	
Flt Permitted		0.74	1.00	0.72	1.00		0.06	1.00	1.00	0.20	1.00	
Satd. Flow (perm)		1285	1515	1317	1517		100	2592	1125	347	2854	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	5	321	259	13	10	152	989	12	20	2257	23
RTOR Reduction (vph)	0	0	67	0	8	0	0	0	5	0	0	0
Lane Group Flow (vph)	0	52	254	259	15	0	152	989	7	20	2280	0
Confl. Peds. (#/hr)	6		1	1		6	3		1	1		3
Heavy Vehicles (%)	6%	25%	4%	3%	20%	14%	6%	16%	11%	0%	5%	18%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)		23.9	23.9	23.9	23.9		72.7	67.5	67.5	65.8	63.6	
Effective Green, g (s)		23.9	23.9	23.9	23.9		72.7	67.5	67.5	65.8	63.6	
Actuated g/C Ratio		0.22	0.22	0.22	0.22		0.66	0.61	0.61	0.60	0.58	
Clearance Time (s)		7.0	7.0	7.0	7.0		3.0	6.4	6.4	3.0	6.4	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		279	329	286	329		148	1590	690	234	1650	
v/s Ratio Prot					0.01		c0.06	0.38		0.00	c0.80	
v/s Ratio Perm		0.04	0.17	c0.20			0.62		0.01	0.05		
v/c Ratio		0.19	0.77	0.91	0.05		1.03	0.62	0.01	0.09	1.38	
Uniform Delay, d1		35.1	40.5	42.0	34.0		34.5	13.3	8.3	9.7	23.2	
Progression Factor		1.00	1.00	0.99	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.3	10.7	29.4	0.1		81.3	1.8	0.0	0.2	175.6	
Delay (s)		35.4	51.1	71.0	34.3		115.8	15.1	8.3	9.8	198.8	
Level of Service		D	D	E	C		F	B	A	A	F	
Approach Delay (s)		48.9			68.0			28.3			197.1	
Approach LOS		D			E			C			F	

Intersection Summary			
HCM 2000 Control Delay	127.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	108.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	131	29	0	21	28	64
Future Volume (vph)	131	29	0	21	28	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.975				0.905	
Flt Protected					0.985	
Satd. Flow (prot)	1816	0	0	1863	1660	0
Flt Permitted					0.985	
Satd. Flow (perm)	1816	0	0	1863	1660	0
Link Speed (k/h)	40			40	50	
Link Distance (m)	71.8			48.0	46.9	
Travel Time (s)	6.5			4.3	3.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	142	32	0	23	30	70
Shared Lane Traffic (%)						
Lane Group Flow (vph)	174	0	0	23	100	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 20.8%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	131	29	0	21	28	64
Future Volume (Veh/h)	131	29	0	21	28	64
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	142	32	0	23	30	70
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				391		
pX, platoon unblocked						
vC, conflicting volume			174		181	158
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			174		181	158
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		96	92
cM capacity (veh/h)			1403		808	887

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	174	23	100
Volume Left	0	0	30
Volume Right	32	0	70
cSH	1700	1403	862
Volume to Capacity	0.10	0.00	0.12
Queue Length 95th (m)	0.0	0.0	3.1
Control Delay (s)	0.0	0.0	9.7
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.7
Approach LOS			A

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	20.8%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	495	18	291	17	5	9	1	274	2189	24	6	1216
Future Volume (vph)	495	18	291	17	5	9	1	274	2189	24	6	1216
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.6	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5
Storage Length (m)	0.0		0.0	0.0		0.0		63.0		0.0	13.0	
Storage Lanes	0		1	0		0		1		0	1	
Taper Length (m)	7.5			7.5				20.0			41.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	*0.80	0.95	1.00	*0.80
Ped Bike Factor		1.00	0.99		1.00				1.00			0.99
Frt			0.850		0.959				0.998			0.977
Flt Protected		0.954			0.973			0.950			0.950	
Satd. Flow (prot)	0	1691	1568	0	1448	0	0	1575	2582	0	852	2778
Flt Permitted		0.709			0.577			0.096			0.103	
Satd. Flow (perm)	0	1255	1545	0	859	0	0	159	2582	0	92	2778
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			35		2				1			20
Link Speed (k/h)		60			40				60			60
Link Distance (m)		416.8			328.7				124.4			367.1
Travel Time (s)		25.0			29.6				7.5			22.0
Confl. Peds. (#/hr)	1		2	2		1		9		3	3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	0%	7%	16%	33%	100%	5%
Adj. Flow (vph)	538	20	316	18	5	10	1	298	2379	26	7	1322
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	558	316	0	33	0	0	299	2405	0	7	1567
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	Left	Left
Median Width(m)		0.0			0.0				3.1			3.1
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		4.8			4.8				4.8			4.8
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.00	1.00	1.00	1.00	1.00	1.09	1.01	1.01	1.08	1.01
Turning Speed (k/h)	25		15	25		15	15	25		15	25	
Number of Detectors	1	2	1	1	2		1	1	2		1	2
Detector Template	Left	Thru	Right	Left	Thru		Left	Left	Thru		Left	Thru
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	2.0	10.0		2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	2.0	0.6		2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4			9.4				9.4			9.4
Detector 2 Size(m)		0.6			0.6				0.6			0.6
Detector 2 Type		Cl+Ex			Cl+Ex				Cl+Ex			Cl+Ex
Detector 2 Channel												

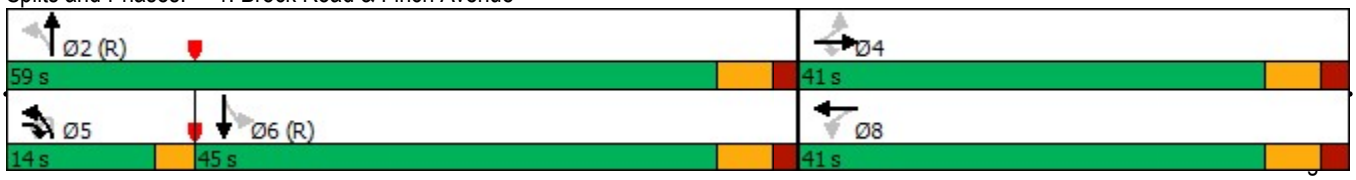


Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	225
Future Volume (vph)	225
Ideal Flow (vphpl)	1900
Lane Width (m)	3.5
Storage Length (m)	0.0
Storage Lanes	0
Taper Length (m)	
Lane Util. Factor	0.95
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	Yes
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	9
Peak Hour Factor	0.92
Heavy Vehicles (%)	5%
Adj. Flow (vph)	245
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	1.01
Turning Speed (k/h)	15
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Detector 2 Extend (s)		0.0			0.0				0.0			0.0
Turn Type	Perm	NA	pm+ov	Perm	NA		custom	pm+pt	NA		Perm	NA
Protected Phases		4	5!		8			5	2			6
Permitted Phases	4		4	8			5!	2			6	
Detector Phase	4	4	5	8	8		5	5	2		6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0	5.0	8.0	8.0		5.0	5.0	20.0		20.0	20.0
Minimum Split (s)	29.0	29.0	9.0	29.0	29.0		9.0	9.0	28.0		28.0	28.0
Total Split (s)	41.0	41.0	14.0	41.0	41.0		14.0	14.0	59.0		45.0	45.0
Total Split (%)	41.0%	41.0%	14.0%	41.0%	41.0%		14.0%	14.0%	59.0%		45.0%	45.0%
Maximum Green (s)	34.6	34.6	11.0	34.6	34.6		11.0	11.0	52.8		38.8	38.8
Yellow Time (s)	4.2	4.2	3.0	4.2	4.2		3.0	3.0	4.2		4.2	4.2
All-Red Time (s)	2.2	2.2	0.0	2.2	2.2		0.0	0.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)		6.4	3.0		6.4			3.0	6.2		6.2	6.2
Lead/Lag			Lead				Lead	Lead			Lag	Lag
Lead-Lag Optimize?			Yes				Yes	Yes			Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	None	None	None		None	None	C-Max		C-Max	C-Max
Walk Time (s)	16.0	16.0		16.0	16.0				14.0		14.0	14.0
Flash Dont Walk (s)	5.0	5.0		5.0	5.0				5.0		5.0	5.0
Pedestrian Calls (#/hr)	0	0		0	0				0		0	0
Act Effct Green (s)		34.6	49.0		34.6			56.0	52.8		38.8	38.8
Actuated g/C Ratio		0.35	0.49		0.35			0.56	0.53		0.39	0.39
v/c Ratio		1.29	0.41		0.11			1.23	1.76		0.20	1.44
Control Delay		175.5	14.6		22.5			157.3	369.3		17.7	219.8
Queue Delay		0.0	0.0		0.0			0.0	0.0		0.0	0.0
Total Delay		175.5	14.6		22.5			157.3	369.3		17.7	219.8
LOS		F	B		C			F	F		B	F
Approach Delay		117.3			22.5				345.9			218.9
Approach LOS		F			C				F			F

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 40 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.76			
Intersection Signal Delay: 266.7		Intersection LOS: F	
Intersection Capacity Utilization 128.6%		ICU Level of Service H	
Analysis Period (min) 15			
* User Entered Value			
! Phase conflict between lane groups.			

Splits and Phases: 1: Brock Road & Finch Avenue





Lane Group	SBR
Detector 2 Extend (s)	
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	495	18	291	17	5	9	1	274	2189	24	6	1216
Future Volume (vph)	495	18	291	17	5	9	1	274	2189	24	6	1216
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.6	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5
Total Lost time (s)		6.4	3.0		6.4			3.0	6.2		6.2	6.2
Lane Util. Factor		1.00	1.00		1.00			1.00	*0.80		1.00	*0.80
Frpb, ped/bikes		1.00	0.99		1.00			1.00	1.00		1.00	0.99
Flpb, ped/bikes		1.00	1.00		1.00			1.00	1.00		1.00	1.00
Frt		1.00	0.85		0.96			1.00	1.00		1.00	0.98
Flt Protected		0.95	1.00		0.97			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1689	1550		1449			1575	2583		852	2777
Flt Permitted		0.71	1.00		0.58			0.10	1.00		0.10	1.00
Satd. Flow (perm)		1256	1550		859			159	2583		92	2777
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	538	20	316	18	5	10	1	298	2379	26	7	1322
RTOR Reduction (vph)	0	0	19	0	1	0	0	0	0	0	0	12
Lane Group Flow (vph)	0	558	297	0	32	0	0	299	2405	0	7	1555
Confl. Peds. (#/hr)	1		2	2		1		9		3	3	
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	0%	7%	16%	33%	100%	5%
Turn Type	Perm	NA	pm+ov	Perm	NA		custom	pm+pt	NA		Perm	NA
Protected Phases		4	5!		8			5	2			6
Permitted Phases	4		4	8			5!	2			6	
Actuated Green, G (s)		34.6	45.6		34.6			52.8	52.8		38.8	38.8
Effective Green, g (s)		34.6	45.6		34.6			52.8	52.8		38.8	38.8
Actuated g/C Ratio		0.35	0.46		0.35			0.53	0.53		0.39	0.39
Clearance Time (s)		6.4	3.0		6.4			3.0	6.2		6.2	6.2
Vehicle Extension (s)		3.0	3.0		3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		434	706		297			239	1363		35	1077
v/s Ratio Prot			0.05					0.14	c0.93			0.56
v/s Ratio Perm		c0.44	0.15		0.04			0.52			0.08	
v/c Ratio		1.29	0.42		0.11			1.25	1.76		0.20	1.44
Uniform Delay, d1		32.7	18.3		22.2			29.3	23.6		20.3	30.6
Progression Factor		1.00	1.00		1.00			1.00	1.00		0.53	0.56
Incremental Delay, d2		145.1	0.4		0.2			142.7	346.9		4.7	201.6
Delay (s)		177.8	18.7		22.4			172.0	370.5		15.5	218.8
Level of Service		F	B		C			F	F		B	F
Approach Delay (s)		120.3			22.4				348.5			217.9
Approach LOS		F			C				F			F

Intersection Summary			
HCM 2000 Control Delay	268.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.63		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	128.6%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	225
Future Volume (vph)	225
Ideal Flow (vphpl)	1900
Lane Width	3.5
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	245
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	9
Heavy Vehicles (%)	5%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary



Lane Group	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	0	52	2499	241	1	142	1465
Future Volume (vph)	0	52	2499	241	1	142	1465
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	4.5	3.5	3.3	3.3	3.3	3.5
Storage Length (m)	0.0	0.0		38.0		60.0	
Storage Lanes	0	1		1		1	
Taper Length (m)	7.5					75.0	
Lane Util. Factor	1.00	1.00	*0.80	*0.80	0.95	1.00	*0.80
Ped Bike Factor							
Frt		0.865		0.850			
Flt Protected						0.950	
Satd. Flow (prot)	0	1808	2637	1167	0	1647	2863
Flt Permitted						0.950	
Satd. Flow (perm)	0	1808	2637	1167	0	1647	2863
Link Speed (k/h)	40		60				60
Link Distance (m)	73.4		367.1				224.5
Travel Time (s)	6.6		22.0				13.5
Confl. Peds. (#/hr)				4		4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	14%	7%	0%	6%	5%
Adj. Flow (vph)	0	57	2716	262	1	154	1592
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	57	2716	262	0	155	1592
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	R NA	Left	Left
Median Width(m)	0.0		3.3				3.3
Link Offset(m)	0.0		0.0				0.0
Crosswalk Width(m)	4.8		4.8				4.8
Two way Left Turn Lane							
Headway Factor	1.00	0.88	1.01	1.04	1.04	1.04	1.01
Turning Speed (k/h)	25	15		15	15	25	
Sign Control	Stop		Free				Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 90.3%		ICU Level of Service E	
Analysis Period (min) 15			

* User Entered Value



Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	0	52	2499	241	1	142	1465
Future Volume (Veh/h)	0	52	2499	241	1	142	1465
Sign Control	Stop		Free				Free
Grade	0%		0%				0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	57	2716	262	0	154	1592
Pedestrians	4						
Lane Width (m)	4.5						
Walking Speed (m/s)	1.2						
Percent Blockage	0						
Right turn flare (veh)							
Median type			None				None
Median storage veh)							
Upstream signal (m)			367				225
pX, platoon unblocked	0.74	0.55			0.00	0.55	
vC, conflicting volume	3824	1362			0	2982	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1831	13			0	2967	
tC, single (s)	6.8	6.9			0.0	4.2	
tC, 2 stage (s)							
tF (s)	3.5	3.3			0.0	2.3	
p0 queue free %	0	90			0	0	
cM capacity (veh/h)	0	584			0	59	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	57	1358	1358	262	154	796	796
Volume Left	0	0	0	0	154	0	0
Volume Right	57	0	0	262	0	0	0
cSH	584	1700	1700	1700	59	1700	1700
Volume to Capacity	0.10	0.80	0.80	0.15	2.60	0.47	0.47
Queue Length 95th (m)	2.6	0.0	0.0	0.0	124.5	0.0	0.0
Control Delay (s)	11.8	0.0	0.0	0.0	874.3	0.0	0.0
Lane LOS	B				F		
Approach Delay (s)	11.8	0.0			77.1		
Approach LOS	B						

Intersection Summary			
Average Delay	28.3		
Intersection Capacity Utilization	90.3%	ICU Level of Service	E
Analysis Period (min)	15		

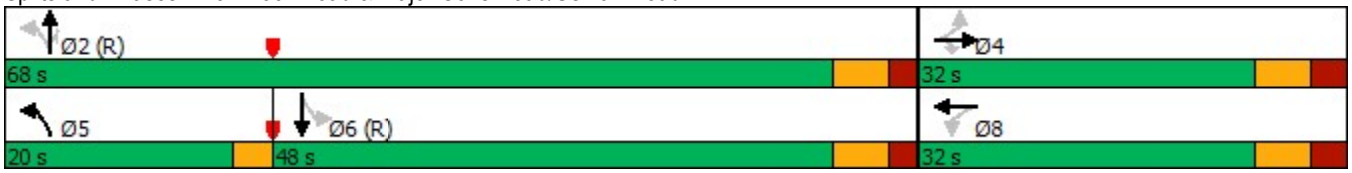
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	12	218	230	21	20	338	2314	30	57	1134	38
Future Volume (vph)	24	12	218	230	21	20	338	2314	30	57	1134	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.7	3.7	3.0	3.5	3.5	3.0	3.5	3.5
Storage Length (m)	0.0		30.0	20.0		0.0	72.0		70.0	60.0		0.0
Storage Lanes	0		1	1		0	1		1	1		0
Taper Length (m)	7.5			48.0			72.0			92.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	*0.80	1.00	*0.80	*0.80
Ped Bike Factor		1.00	0.99	1.00	0.99				0.98		1.00	
Frt			0.850		0.927				0.850		0.995	
Flt Protected		0.968		0.950			0.950			0.950		
Satd. Flow (prot)	0	1619	1536	1733	1507	0	1589	2592	1151	1685	2835	0
Flt Permitted		0.814		0.732			0.090			0.096		
Satd. Flow (perm)	0	1355	1515	1334	1507	0	151	2592	1125	170	2835	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			237		4				44		3	
Link Speed (k/h)		50			40			60			60	
Link Distance (m)		292.9			123.2			224.5			180.3	
Travel Time (s)		21.1			11.1			13.5			10.8	
Confl. Peds. (#/hr)	6		1	1		6	3		1	1		3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	25%	4%	3%	20%	14%	6%	16%	11%	0%	5%	18%
Adj. Flow (vph)	26	13	237	250	23	22	367	2515	33	62	1233	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	39	237	250	45	0	367	2515	33	62	1274	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	0.99	0.99	1.09	1.01	1.01	1.09	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	1	1	1	1		1	0	0	1	0	
Detector Template	Left											
Leading Detector (m)	2.0	12.0	12.0	12.0	12.0		24.0	0.0	0.0	24.0	0.0	
Trailing Detector (m)	0.0	-3.0	-3.0	-3.0	-3.0		14.0	0.0	0.0	14.0	0.0	
Detector 1 Position(m)	0.0	-3.0	-3.0	-3.0	-3.0		14.0	0.0	0.0	14.0	0.0	
Detector 1 Size(m)	2.0	15.0	15.0	15.0	15.0		10.0	0.6	2.0	10.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2		2	6		
Detector Phase	4	4	4	8	8		5	2	2	6	6	

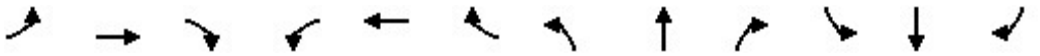
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	4.0	4.0		5.0	20.0	20.0	20.0	20.0	
Minimum Split (s)	32.0	32.0	32.0	32.0	32.0		8.0	29.0	29.0	29.0	29.0	
Total Split (s)	32.0	32.0	32.0	32.0	32.0		20.0	68.0	68.0	48.0	48.0	
Total Split (%)	32.0%	32.0%	32.0%	32.0%	32.0%		20.0%	68.0%	68.0%	48.0%	48.0%	
Maximum Green (s)	25.0	25.0	25.0	25.0	25.0		17.0	61.6	61.6	41.6	41.6	
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1		3.0	4.2	4.2	4.2	4.2	
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9		0.0	2.2	2.2	2.2	2.2	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		7.0	7.0	7.0	7.0		3.0	6.4	6.4	6.4	6.4	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		None	C-Max	C-Max	C-Max	C-Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0			14.0	14.0	14.0	14.0	
Pedestrian Calls (#/hr)	0	0	0	0	0			0	0	0	0	
Act Effct Green (s)		22.3	22.3	22.3	22.3		67.7	64.3	64.3	41.6	41.6	
Actuated g/C Ratio		0.22	0.22	0.22	0.22		0.68	0.64	0.64	0.42	0.42	
v/c Ratio		0.13	0.45	0.84	0.13		0.95	1.51	0.04	0.89	1.08	
Control Delay		30.7	7.1	43.3	31.1		32.5	251.5	1.2	113.4	79.7	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		30.7	7.1	43.3	31.1		32.5	251.5	1.2	113.4	79.7	
LOS		C	A	D	C		C	F	A	F	E	
Approach Delay		10.4			41.4			221.1			81.2	
Approach LOS		B			D			F			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.51			
Intersection Signal Delay: 159.3		Intersection LOS: F	
Intersection Capacity Utilization 116.8%		ICU Level of Service H	
Analysis Period (min) 15			

* User Entered Value

Splits and Phases: 3: Brock Road & Major Oaks Road/Usman Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	12	218	230	21	20	338	2314	30	57	1134	38
Future Volume (vph)	24	12	218	230	21	20	338	2314	30	57	1134	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.7	3.7	3.0	3.5	3.5	3.0	3.5	3.5
Total Lost time (s)		7.0	7.0	7.0	7.0		3.0	6.4	6.4	6.4	6.4	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	*0.80	*0.80	1.00	*0.80	
Frpb, ped/bikes		1.00	0.99	1.00	0.99		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.97	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1611	1515	1731	1507		1589	2592	1125	1685	2835	
Flt Permitted		0.81	1.00	0.73	1.00		0.09	1.00	1.00	0.10	1.00	
Satd. Flow (perm)		1355	1515	1333	1507		150	2592	1125	171	2835	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	13	237	250	23	22	367	2515	33	62	1233	41
RTOR Reduction (vph)	0	0	184	0	3	0	0	0	12	0	2	0
Lane Group Flow (vph)	0	39	53	250	42	0	367	2515	21	62	1272	0
Confl. Peds. (#/hr)	6		1	1		6	3		1	1		3
Heavy Vehicles (%)	6%	25%	4%	3%	20%	14%	6%	16%	11%	0%	5%	18%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)		22.3	22.3	22.3	22.3		64.3	64.3	64.3	41.6	41.6	
Effective Green, g (s)		22.3	22.3	22.3	22.3		64.3	64.3	64.3	41.6	41.6	
Actuated g/C Ratio		0.22	0.22	0.22	0.22		0.64	0.64	0.64	0.42	0.42	
Clearance Time (s)		7.0	7.0	7.0	7.0		3.0	6.4	6.4	6.4	6.4	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		302	337	297	336		379	1666	723	71	1179	
v/s Ratio Prot					0.03		0.19	c0.97			0.45	
v/s Ratio Perm		0.03	0.03	c0.19			0.43		0.02	0.36		
v/c Ratio		0.13	0.16	0.84	0.12		0.97	1.51	0.03	0.87	1.08	
Uniform Delay, d1		31.1	31.3	37.2	31.0		31.1	17.9	6.5	26.8	29.2	
Progression Factor		1.00	1.00	1.09	1.12		0.83	1.07	0.66	1.00	1.00	
Incremental Delay, d2		0.2	0.2	2.1	0.0		7.9	229.6	0.0	75.3	50.3	
Delay (s)		31.3	31.5	42.5	34.8		33.6	248.7	4.3	102.1	79.5	
Level of Service		C	C	D	C		C	F	A	F	E	
Approach Delay (s)		31.5			41.3			218.9			80.6	
Approach LOS		C			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	159.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.38		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	116.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	240	85	0	53	16	38
Future Volume (vph)	240	85	0	53	16	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.965				0.905	
Flt Protected					0.986	
Satd. Flow (prot)	1798	0	0	1863	1662	0
Flt Permitted					0.986	
Satd. Flow (perm)	1798	0	0	1863	1662	0
Link Speed (k/h)	40			40	50	
Link Distance (m)	73.4			46.4	24.9	
Travel Time (s)	6.6			4.2	1.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	261	92	0	58	17	41
Shared Lane Traffic (%)						
Lane Group Flow (vph)	353	0	0	58	58	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

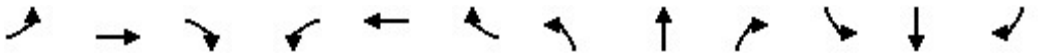
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 27.8%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	240	85	0	53	16	38
Future Volume (Veh/h)	240	85	0	53	16	38
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	261	92	0	58	17	41
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				389		
pX, platoon unblocked						
vC, conflicting volume			353		365	307
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			353		365	307
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	94
cM capacity (veh/h)			1206		635	733

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	353	58	58
Volume Left	0	0	17
Volume Right	92	0	41
cSH	1700	1206	701
Volume to Capacity	0.21	0.00	0.08
Queue Length 95th (m)	0.0	0.0	2.2
Control Delay (s)	0.0	0.0	10.6
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.6
Approach LOS			B

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	27.8%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	403	5	262	7	9	7	256	2112	16	2	1198	244
Future Volume (vph)	403	5	262	7	9	7	256	2112	16	2	1198	244
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5	3.5
Storage Length (m)	0.0		0.0	0.0		0.0	63.0		0.0	13.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			20.0			41.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	*0.80	1.00	*0.80	*0.80
Ped Bike Factor		1.00	0.99		1.00			1.00			0.99	
Frt			0.850		0.958			0.999			0.975	
Flt Protected		0.953			0.985		0.950			0.950		
Satd. Flow (prot)	0	1699	1568	0	1425	0	1574	2586	0	852	2771	0
Flt Permitted		0.710			0.823		0.085			0.091		
Satd. Flow (perm)	0	1264	1545	0	1190	0	141	2586	0	82	2771	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			35		3			1			24	
Link Speed (k/h)		60			40			60			60	
Link Distance (m)		416.8			328.7			124.4			367.1	
Travel Time (s)		25.0			29.6			7.5			22.0	
Confl. Peds. (#/hr)	1		2	2		1	9		3	3		9
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	7%	16%	33%	100%	5%	5%
Adj. Flow (vph)	453	6	294	8	10	8	288	2373	18	2	1346	274
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	459	294	0	26	0	288	2391	0	2	1620	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.1			3.1	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.00	1.00	1.00	1.00	1.09	1.01	1.01	1.08	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	5	8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	5.0	8.0	8.0		5.0	20.0		20.0	20.0	
Minimum Split (s)	29.0	29.0	9.0	29.0	29.0		9.0	28.0		28.0	28.0	
Total Split (s)	37.0	37.0	13.0	37.0	37.0		13.0	63.0		50.0	50.0	
Total Split (%)	37.0%	37.0%	13.0%	37.0%	37.0%		13.0%	63.0%		50.0%	50.0%	
Maximum Green (s)	30.6	30.6	10.0	30.6	30.6		10.0	56.8		43.8	43.8	
Yellow Time (s)	4.2	4.2	3.0	4.2	4.2		3.0	4.2		4.2	4.2	
All-Red Time (s)	2.2	2.2	0.0	2.2	2.2		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.4	3.0		6.4		3.0	6.2		6.2	6.2	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	16.0	16.0		16.0	16.0			14.0		14.0	14.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)		30.6	44.0		30.6		60.0	56.8		43.8	43.8	
Actuated g/C Ratio		0.31	0.44		0.31		0.60	0.57		0.44	0.44	
v/c Ratio		1.19	0.42		0.07		1.27	1.63		0.06	1.32	
Control Delay		141.2	17.3		23.3		175.8	307.9		21.0	176.8	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		141.2	17.3		23.3		175.8	307.9		21.0	176.8	
LOS		F	B		C		F	F		C	F	
Approach Delay		92.8			23.3			293.7			176.6	
Approach LOS		F			C			F			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 40 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.63			
Intersection Signal Delay: 225.2		Intersection LOS: F	
Intersection Capacity Utilization 120.5%		ICU Level of Service H	
Analysis Period (min) 15			
* User Entered Value			

Splits and Phases: 1: Brock Road & Finch Avenue



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	403	5	262	7	9	7	256	2112	16	2	1198	244
Future Volume (vph)	403	5	262	7	9	7	256	2112	16	2	1198	244
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.6	3.6	3.6	3.6	3.0	3.5	3.5	3.1	3.5	3.5
Total Lost time (s)		6.4	3.0		6.4		3.0	6.2		6.2	6.2	
Lane Util. Factor		1.00	1.00		1.00		1.00	*0.80		1.00	*0.80	
Frpb, ped/bikes		1.00	0.99		1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.96		1.00	1.00		1.00	0.97	
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1697	1550		1425		1574	2585		852	2770	
Flt Permitted		0.71	1.00		0.82		0.09	1.00		0.09	1.00	
Satd. Flow (perm)		1264	1550		1190		142	2585		82	2770	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	453	6	294	8	10	8	288	2373	18	2	1346	274
RTOR Reduction (vph)	0	0	21	0	2	0	0	0	0	0	13	0
Lane Group Flow (vph)	0	459	273	0	24	0	288	2391	0	2	1607	0
Confl. Peds. (#/hr)	1		2	2		1	9		3	3		9
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	7%	16%	33%	100%	5%	5%
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		30.6	40.6		30.6		56.8	56.8		43.8	43.8	
Effective Green, g (s)		30.6	40.6		30.6		56.8	56.8		43.8	43.8	
Actuated g/C Ratio		0.31	0.41		0.31		0.57	0.57		0.44	0.44	
Clearance Time (s)		6.4	3.0		6.4		3.0	6.2		6.2	6.2	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		386	629		364		223	1468		35	1213	
v/s Ratio Prot			0.04				0.13	c0.92			0.58	
v/s Ratio Perm		c0.36	0.13		0.02		0.60			0.02		
v/c Ratio		1.19	0.43		0.07		1.29	1.63		0.06	1.32	
Uniform Delay, d1		34.7	21.4		24.6		30.1	21.6		16.2	28.1	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		108.2	0.5		0.1		160.4	285.9		3.1	151.8	
Delay (s)		142.9	21.9		24.7		190.5	307.5		19.3	179.9	
Level of Service		F	C		C		F	F		B	F	
Approach Delay (s)		95.6			24.7			295.0			179.7	
Approach LOS		F			C			F			F	

Intersection Summary			
HCM 2000 Control Delay	227.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.53		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	120.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	109	2137	358	181	1293
Future Volume (vph)	0	109	2137	358	181	1293
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	4.5	3.5	3.3	3.3	3.5
Storage Length (m)	0.0	0.0		38.0	60.0	
Storage Lanes	0	1		1	1	
Taper Length (m)	7.5				75.0	
Lane Util. Factor	1.00	1.00	*0.80	1.00	1.00	*0.80
Ped Bike Factor						
Frt		0.865		0.850		
Flt Protected					0.950	
Satd. Flow (prot)	0	1808	2637	1459	1646	2863
Flt Permitted					0.950	
Satd. Flow (perm)	0	1808	2637	1459	1646	2863
Link Speed (k/h)	40		60			60
Link Distance (m)	62.6		367.1			224.5
Travel Time (s)	5.6		22.0			13.5
Confl. Peds. (#/hr)				4	4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	14%	7%	6%	5%
Adj. Flow (vph)	0	121	2374	398	201	1437
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	121	2374	398	201	1437
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.3			3.3
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	0.88	1.01	1.04	1.04	1.01
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 75.8%		ICU Level of Service D	
Analysis Period (min) 15			

* User Entered Value



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	109	2137	358	181	1293
Future Volume (Veh/h)	0	109	2137	358	181	1293
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	121	2374	398	201	1437
Pedestrians	4					
Lane Width (m)	4.5					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			367			225
pX, platoon unblocked	0.69	0.51			0.51	
vC, conflicting volume	3498	1191			2776	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1328	0			2559	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	0	78			0	
cM capacity (veh/h)	0	552			81	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	121	1187	1187	398	201	718	718
Volume Left	0	0	0	0	201	0	0
Volume Right	121	0	0	398	0	0	0
cSH	552	1700	1700	1700	81	1700	1700
Volume to Capacity	0.22	0.70	0.70	0.23	2.49	0.42	0.42
Queue Length 95th (m)	6.6	0.0	0.0	0.0	152.1	0.0	0.0
Control Delay (s)	13.3	0.0	0.0	0.0	789.0	0.0	0.0
Lane LOS	B				F		
Approach Delay (s)	13.3	0.0			96.8		
Approach LOS	B						

Intersection Summary			
Average Delay	35.4		
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	37	13	274	211	27	52	2	309	2020	27	89	1133
Future Volume (vph)	37	13	274	211	27	52	2	309	2020	27	89	1133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.7	3.7	3.6	3.0	3.5	3.5	3.0	3.5
Storage Length (m)	0.0		30.0	20.0		0.0		72.0		70.0	60.0	
Storage Lanes	0		1	1		0		1		1	1	
Taper Length (m)	7.5			48.0				72.0			92.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	*0.80	*0.80	1.00	*0.80
Ped Bike Factor		0.99	0.99	1.00	0.99					0.98		1.00
Frt			0.850		0.901					0.850		0.997
Flt Protected		0.964		0.950				0.950			0.950	
Satd. Flow (prot)	0	1634	1536	1733	1472	0	0	1590	2592	1151	1685	2846
Flt Permitted		0.737		0.719				0.079			0.084	
Satd. Flow (perm)	0	1243	1515	1310	1472	0	0	132	2592	1125	149	2846
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			295		62					69		2
Link Speed (k/h)		50			40				60			60
Link Distance (m)		292.9			123.2				224.5			180.3
Travel Time (s)		21.1			11.1				13.5			10.8
Confl. Peds. (#/hr)	6		1	1		6		3		1	1	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	6%	25%	4%	3%	20%	14%	0%	6%	16%	11%	0%	5%
Adj. Flow (vph)	44	15	326	251	32	62	2	368	2405	32	106	1349
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	59	326	251	94	0	0	370	2405	32	106	1375
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	Left	Left
Median Width(m)		3.5			3.5				3.3			3.3
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		4.8			4.8				4.8			4.8
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	0.99	0.99	1.00	1.09	1.01	1.01	1.09	1.01
Turning Speed (k/h)	25		15	25		15	15	25		15	25	
Number of Detectors	1	1	1	1	1		1	1	0	0	1	0
Detector Template	Left						Left					
Leading Detector (m)	2.0	12.0	12.0	12.0	12.0		2.0	24.0	0.0	0.0	24.0	0.0
Trailing Detector (m)	0.0	-3.0	-3.0	-3.0	-3.0		0.0	14.0	0.0	0.0	14.0	0.0
Detector 1 Position(m)	0.0	-3.0	-3.0	-3.0	-3.0		0.0	14.0	0.0	0.0	14.0	0.0
Detector 1 Size(m)	2.0	15.0	15.0	15.0	15.0		2.0	10.0	0.6	2.0	10.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Perm	NA	Perm	Perm	NA		custom	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4			8			5	2		1	6
Permitted Phases	4		4	8			5	2		2	6	
Detector Phase	4	4	4	8	8		5	5	2	2	1	6



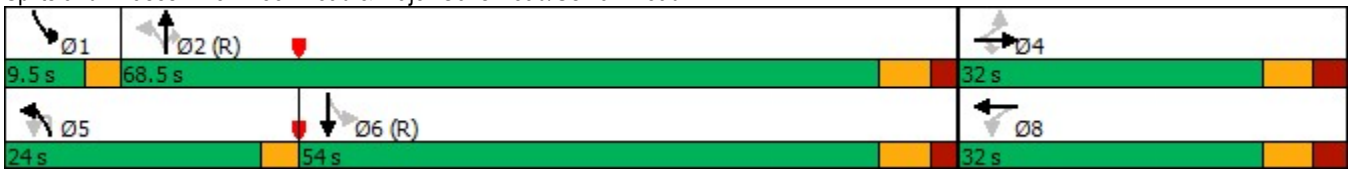
Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	22
Future Volume (vph)	22
Ideal Flow (vphpl)	1900
Lane Width (m)	3.5
Storage Length (m)	0.0
Storage Lanes	0
Taper Length (m)	
Lane Util. Factor	*0.80
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	Yes
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	3
Peak Hour Factor	0.84
Heavy Vehicles (%)	18%
Adj. Flow (vph)	26
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	1.01
Turning Speed (k/h)	15
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	4.0	4.0		5.0	5.0	20.0	20.0	5.0	20.0
Minimum Split (s)	32.0	32.0	32.0	32.0	32.0		8.0	8.0	29.0	29.0	9.5	29.0
Total Split (s)	32.0	32.0	32.0	32.0	32.0		24.0	24.0	68.5	68.5	9.5	54.0
Total Split (%)	29.1%	29.1%	29.1%	29.1%	29.1%		21.8%	21.8%	62.3%	62.3%	8.6%	49.1%
Maximum Green (s)	25.0	25.0	25.0	25.0	25.0		21.0	21.0	62.1	62.1	6.5	47.6
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1		3.0	3.0	4.2	4.2	3.0	4.2
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9		0.0	0.0	2.2	2.2	0.0	2.2
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.0	7.0	7.0	7.0			3.0	6.4	6.4	3.0	6.4
Lead/Lag							Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
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
Recall Mode	None	None	None	None	None		None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0				7.0	7.0		7.0
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0				14.0	14.0		14.0
Pedestrian Calls (#/hr)	0	0	0	0	0				0	0		0
Act Effct Green (s)		23.6	23.6	23.6	23.6			76.4	63.7	63.7	57.6	47.9
Actuated g/C Ratio		0.21	0.21	0.21	0.21			0.69	0.58	0.58	0.52	0.44
v/c Ratio		0.22	0.59	0.89	0.26			0.96	1.60	0.05	0.64	1.11
Control Delay		37.3	10.7	75.3	17.1			70.0	297.4	0.4	36.0	91.7
Queue Delay		0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Delay		37.3	10.7	75.3	17.1			70.0	297.4	0.4	36.0	91.7
LOS		D	B	E	B			E	F	A	D	F
Approach Delay		14.8			59.4				264.1			87.7
Approach LOS		B			E				F			F

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.60			
Intersection Signal Delay: 178.8		Intersection LOS: F	
Intersection Capacity Utilization 100.1%		ICU Level of Service G	
Analysis Period (min) 15			

* User Entered Value

Splits and Phases: 3: Brock Road & Major Oaks Road/Usman Road





Lane Group	SBR
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	37	13	274	211	27	52	2	309	2020	27	89	1133
Future Volume (vph)	37	13	274	211	27	52	2	309	2020	27	89	1133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.7	3.7	3.6	3.0	3.5	3.5	3.0	3.5
Total Lost time (s)		7.0	7.0	7.0	7.0			3.0	6.4	6.4	3.0	6.4
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00	*0.80	*0.80	1.00	*0.80
Frpb, ped/bikes		1.00	0.99	1.00	0.99			1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes		0.99	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	0.90			1.00	1.00	0.85	1.00	1.00
Flt Protected		0.96	1.00	0.95	1.00			0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1626	1515	1731	1472			1590	2592	1125	1685	2847
Flt Permitted		0.74	1.00	0.72	1.00			0.08	1.00	1.00	0.08	1.00
Satd. Flow (perm)		1243	1515	1309	1472			132	2592	1125	148	2847
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	44	15	326	251	32	62	2	368	2405	32	106	1349
RTOR Reduction (vph)	0	0	232	0	49	0	0	0	0	13	0	1
Lane Group Flow (vph)	0	59	94	251	45	0	0	370	2405	19	106	1374
Confl. Peds. (#/hr)	6		1	1		6		3		1	1	
Heavy Vehicles (%)	6%	25%	4%	3%	20%	14%	0%	6%	16%	11%	0%	5%
Turn Type	Perm	NA	Perm	Perm	NA		custom	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4			8			5	2		1	6
Permitted Phases	4		4	8			5	2		2	6	
Actuated Green, G (s)		23.6	23.6	23.6	23.6			73.0	63.7	63.7	54.2	47.9
Effective Green, g (s)		23.6	23.6	23.6	23.6			73.0	63.7	63.7	54.2	47.9
Actuated g/C Ratio		0.21	0.21	0.21	0.21			0.66	0.58	0.58	0.49	0.44
Clearance Time (s)		7.0	7.0	7.0	7.0			3.0	6.4	6.4	3.0	6.4
Vehicle Extension (s)		3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		266	325	280	315			380	1501	651	160	1239
v/s Ratio Prot					0.03			c0.20	c0.93		0.04	0.48
v/s Ratio Perm		0.05	0.06	c0.19				0.45		0.02	0.29	
v/c Ratio		0.22	0.29	0.90	0.14			0.97	1.60	0.03	0.66	1.11
Uniform Delay, d1		35.6	36.2	42.0	35.0			35.4	23.1	9.9	24.4	31.1
Progression Factor		1.00	1.00	1.01	1.05			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.4	0.5	28.3	0.2			38.9	274.2	0.1	9.9	60.9
Delay (s)		36.1	36.7	70.9	37.0			74.3	297.3	10.0	34.3	91.9
Level of Service		D	D	E	D			E	F	A	C	F
Approach Delay (s)		36.6			61.7				264.7			87.8
Approach LOS		D			E				F			F

Intersection Summary			
HCM 2000 Control Delay	181.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.39		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	100.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	22
Future Volume (vph)	22
Ideal Flow (vphpl)	1900
Lane Width	3.5
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.84
Adj. Flow (vph)	26
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	3
Heavy Vehicles (%)	18%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	171	85	0	136	16	38
Future Volume (vph)	171	85	0	136	16	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.955				0.905	
Flt Protected					0.986	
Satd. Flow (prot)	1779	0	0	1863	1662	0
Flt Permitted					0.986	
Satd. Flow (perm)	1779	0	0	1863	1662	0
Link Speed (k/h)	40			40	50	
Link Distance (m)	62.6			57.2	46.3	
Travel Time (s)	5.6			5.1	3.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	186	92	0	148	17	41
Shared Lane Traffic (%)						
Lane Group Flow (vph)	278	0	0	148	58	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 24.2%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	171	85	0	136	16	38
Future Volume (Veh/h)	171	85	0	136	16	38
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	186	92	0	148	17	41
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				400		
pX, platoon unblocked						
vC, conflicting volume			278		380	232
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			278		380	232
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	95
cM capacity (veh/h)			1285		622	807

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	278	148	58
Volume Left	0	0	17
Volume Right	92	0	41
cSH	1700	1285	742
Volume to Capacity	0.16	0.00	0.08
Queue Length 95th (m)	0.0	0.0	2.0
Control Delay (s)	0.0	0.0	10.3
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.3
Approach LOS			B

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	24.2%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Brock Road & Finch Avenue

Movement	EB	EB	WB	NB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	T	TR
Maximum Queue (m)	70.4	67.0	20.5	58.5	73.0	70.2	360.3	363.2
Average Queue (m)	38.0	33.3	8.0	27.4	34.4	25.3	351.9	352.7
95th Queue (m)	62.3	58.3	19.4	51.6	59.3	53.6	370.1	369.2
Link Distance (m)	403.4	403.4	313.4		113.3	113.3	350.5	350.5
Upstream Blk Time (%)							12	16
Queuing Penalty (veh)							158	202
Storage Bay Dist (m)				63.0				
Storage Blk Time (%)				1	0		40	
Queuing Penalty (veh)				5	1		0	

Intersection: 2: Brock Road & Usman Road

Movement	NB	SB	SB	SB
Directions Served	R	UL	T	T
Maximum Queue (m)	4.0	134.9	216.4	218.0
Average Queue (m)	0.1	69.9	186.7	188.4
95th Queue (m)	1.6	174.6	257.9	258.4
Link Distance (m)			206.0	206.0
Upstream Blk Time (%)			2	3
Queuing Penalty (veh)			28	37
Storage Bay Dist (m)	38.0	60.0		
Storage Blk Time (%)			50	
Queuing Penalty (veh)			40	

Intersection: 3: Brock Road & Major Oaks Road/Usman Road

Movement	EB	EB	WB	WB	B11	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	TR	T	L	T	T	R	L	T	TR
Maximum Queue (m)	201.7	37.5	67.8	103.6	26.4	71.0	74.0	86.5	8.8	151.8	189.3	187.1
Average Queue (m)	92.4	36.6	51.8	41.5	6.6	36.1	34.4	35.3	0.6	25.1	177.9	177.8
95th Queue (m)	182.2	39.8	79.5	120.2	35.9	65.4	64.6	64.8	3.9	114.9	184.8	184.2
Link Distance (m)	279.4			97.4	201.3		206.0	206.0			170.1	170.1
Upstream Blk Time (%)				16							65	64
Queuing Penalty (veh)				32							0	0
Storage Bay Dist (m)		30.0	20.0			72.0			70.0	60.0		
Storage Blk Time (%)	0	66	70	2		2	0	1			59	
Queuing Penalty (veh)	1	32	15	6		10	1	0			11	

Intersection: 4: Site Access & Usman Road

Movement	NB
Directions Served	LR
Maximum Queue (m)	21.3
Average Queue (m)	11.0
95th Queue (m)	18.2
Link Distance (m)	38.5
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 576

Intersection: 1: Brock Road & Finch Avenue

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	UL	T	TR	L	T	TR
Maximum Queue (m)	177.0	89.2	31.1	82.9	131.4	130.2	53.6	295.9	293.4
Average Queue (m)	113.9	28.4	7.8	63.1	122.1	122.5	4.9	220.3	226.5
95th Queue (m)	178.9	57.0	22.5	102.9	130.4	129.3	22.9	410.7	415.6
Link Distance (m)	403.4	403.4	313.4		113.3	113.3		350.8	350.8
Upstream Blk Time (%)					39	41		7	9
Queuing Penalty (veh)					0	0		49	64
Storage Bay Dist (m)				63.0			13.0		
Storage Blk Time (%)				2	40		11	57	
Queuing Penalty (veh)				21	110		65	3	

Intersection: 2: Brock Road & Usman Road

Movement	WB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	R	UL	T	T
Maximum Queue (m)	13.2	9.2	4.4	16.4	134.9	211.6	220.2
Average Queue (m)	1.5	0.6	0.3	2.8	113.5	130.3	118.6
95th Queue (m)	8.6	4.5	2.4	10.7	168.8	279.5	283.2
Link Distance (m)	45.4	350.8	350.8			205.8	205.8
Upstream Blk Time (%)						5	4
Queuing Penalty (veh)						43	33
Storage Bay Dist (m)				38.0	60.0		
Storage Blk Time (%)					87	8	
Queuing Penalty (veh)					639	12	

Intersection: 3: Brock Road & Major Oaks Road/Usman Road

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	TR	L	T	T	R	L	T	TR
Maximum Queue (m)	61.5	37.4	57.0	51.7	89.3	98.8	116.1	5.2	112.9	180.9	172.2
Average Queue (m)	14.4	26.4	34.0	10.6	45.4	62.2	65.6	1.2	53.6	115.4	108.9
95th Queue (m)	42.3	39.4	56.2	37.3	73.4	96.9	99.7	4.5	144.6	197.2	197.9
Link Distance (m)	279.4			97.4		205.8	205.8			170.1	170.1
Upstream Blk Time (%)				0						25	23
Queuing Penalty (veh)				0						0	0
Storage Bay Dist (m)		30.0	20.0		72.0			70.0	60.0		
Storage Blk Time (%)	0	9	47	3	2	2	4		1	44	
Queuing Penalty (veh)	0	3	19	6	22	8	1		4	25	

Intersection: 4: Site Access & Usman Road

Movement	NB
Directions Served	LR
Maximum Queue (m)	13.4
Average Queue (m)	7.3
95th Queue (m)	13.8
Link Distance (m)	15.4
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 1129

Intersection: 1: Brock Road & Finch Avenue

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	TR
Maximum Queue (m)	117.9	50.2	25.1	82.9	130.2	127.8	4.8	152.4	156.3
Average Queue (m)	68.7	20.8	5.5	61.9	121.3	121.3	0.2	81.0	89.2
95th Queue (m)	108.6	39.2	17.2	102.5	129.6	127.7	2.7	135.0	142.8
Link Distance (m)	403.4	403.4	313.4		113.3	113.3		350.7	350.7
Upstream Blk Time (%)					32	35			
Queuing Penalty (veh)					0	0			
Storage Bay Dist (m)				63.0			13.0		
Storage Blk Time (%)				3	32		0	44	
Queuing Penalty (veh)				32	82		0	1	

Intersection: 2: Brock Road & Usman Road

Movement	WB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	R	L	T	T
Maximum Queue (m)	35.6	4.4	7.1	12.4	135.0	212.2	227.4
Average Queue (m)	7.1	0.2	0.2	2.5	126.7	170.9	152.3
95th Queue (m)	22.7	2.2	3.9	9.0	162.3	288.8	305.5
Link Distance (m)	34.5	350.7	350.7			205.8	205.8
Upstream Blk Time (%)	0					22	4
Queuing Penalty (veh)	0					179	35
Storage Bay Dist (m)				38.0	60.0		
Storage Blk Time (%)					94		
Queuing Penalty (veh)					607		

Intersection: 3: Brock Road & Major Oaks Road/Usman Road

Movement	EB	EB	WB	WB	B11	B6	NB	NB	NB	NB	SB	SB
Directions Served	LT	R	L	TR	T	T	UL	T	T	R	L	T
Maximum Queue (m)	162.7	37.5	67.9	123.4	96.6	14.5	119.3	141.5	147.9	43.9	151.9	186.4
Average Queue (m)	61.1	32.6	49.7	63.8	27.0	0.8	50.5	83.5	88.2	2.8	77.2	137.5
95th Queue (m)	189.4	44.0	80.1	142.5	121.4	8.9	89.5	129.1	133.6	21.8	182.7	220.8
Link Distance (m)	279.4			97.4	201.2	41.6		205.8	205.8			170.1
Upstream Blk Time (%)	5			31	4	0						39
Queuing Penalty (veh)	0			66	8	1						0
Storage Bay Dist (m)		30.0	20.0				72.0			70.0	60.0	
Storage Blk Time (%)	2	34	71	12			3	8	11			63
Queuing Penalty (veh)	5	17	56	26			35	26	3			56

Intersection: 3: Brock Road & Major Oaks Road/Usman Road

Movement	SB
Directions Served	TR
Maximum Queue (m)	185.3
Average Queue (m)	131.2
95th Queue (m)	220.8
Link Distance (m)	170.1
Upstream Blk Time (%)	31
Queuing Penalty (veh)	0
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

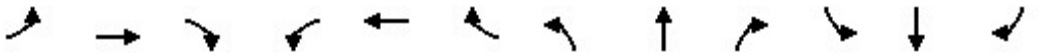
Intersection: 4: Site Access & Usman Road

Movement	EB	NB
Directions Served	TR	LR
Maximum Queue (m)	3.1	16.6
Average Queue (m)	0.1	7.8
95th Queue (m)	1.7	14.5
Link Distance (m)	34.5	37.1
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 1235

With Road Widening



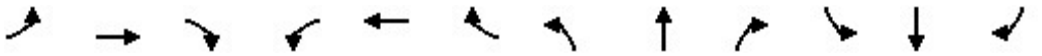
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	186	4	273	23	5	6	145	863	4	1	2223	230
Future Volume (vph)	186	4	273	23	5	6	145	863	4	1	2223	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.3	3.5	3.5	3.3	3.5	3.5
Storage Length (m)	0.0		90.0	0.0		0.0	63.0		90.0	13.0		100.0
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			20.0			41.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Ped Bike Factor	1.00		0.99	1.00	0.99				0.97	1.00		0.96
Frt			0.850		0.912				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1700	1413	1551	1608	1271	0	1631	3887	1201	872	4295	1521
Flt Permitted	0.750			0.755			0.066			0.256		
Satd. Flow (perm)	1340	1413	1528	1274	1271	0	113	3887	1167	235	4295	1455
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			108		7				37			250
Link Speed (k/h)		60			40			60			60	
Link Distance (m)		416.8			328.7			124.4			367.1	
Travel Time (s)		25.0			29.6			7.5			22.0	
Confl. Peds. (#/hr)	1		2	2		1	9		3	3		9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	7%	16%	33%	100%	5%	5%
Adj. Flow (vph)	202	4	297	25	5	7	158	938	4	1	2416	250
Shared Lane Traffic (%)												
Lane Group Flow (vph)	202	4	297	25	12	0	158	938	4	1	2416	250
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.04	1.01	1.01	1.04	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	4	4	4	8	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		5.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0		9.0	28.0	28.0	28.0	28.0	28.0
Total Split (s)	29.0	29.0	29.0	29.0	29.0		9.0	71.0	71.0	62.0	62.0	62.0
Total Split (%)	29.0%	29.0%	29.0%	29.0%	29.0%		9.0%	71.0%	71.0%	62.0%	62.0%	62.0%
Maximum Green (s)	22.6	22.6	22.6	22.6	22.6		6.0	64.8	64.8	55.8	55.8	55.8
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2		3.0	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2		0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4		3.0	6.2	6.2	6.2	6.2	6.2
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
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
Recall Mode	None	None	None	None	None		None	C-Max	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	16.0	16.0	16.0	16.0	16.0			14.0	14.0	14.0	14.0	14.0
Flash Dont Walk (s)	5.0	5.0	5.0	5.0	5.0			5.0	5.0	5.0	5.0	5.0
Pedestrian Calls (#/hr)	0	0	0	0	0			0	0	0	0	0
Act Effct Green (s)	19.0	19.0	19.0	19.0	19.0		71.6	68.4	68.4	57.3	57.3	57.3
Actuated g/C Ratio	0.19	0.19	0.19	0.19	0.19		0.72	0.68	0.68	0.57	0.57	0.57
v/c Ratio	0.80	0.01	0.79	0.10	0.05		0.77	0.35	0.00	0.01	0.98	0.27
Control Delay	60.5	30.5	39.2	32.6	22.1		46.0	7.5	0.0	10.0	36.6	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.5	30.5	39.2	32.6	22.1		46.0	7.5	0.0	10.0	36.6	2.2
LOS	E	C	D	C	C		D	A	A	A	D	A
Approach Delay		47.7			29.2			13.0			33.4	
Approach LOS		D			C			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 2 (2%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 29.8		Intersection LOS: C	
Intersection Capacity Utilization 82.6%		ICU Level of Service E	
Analysis Period (min) 15			
* User Entered Value			

Splits and Phases: 1: Brock Road & Finch Avenue





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	186	4	273	23	5	6	145	863	4	1	2223	230
Future Volume (vph)	186	4	273	23	5	6	145	863	4	1	2223	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.3	3.5	3.5	3.3	3.5	3.5
Total Lost time (s)	6.4	6.4	6.4	6.4	6.4		3.0	6.2	6.2	6.2	6.2	6.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00	0.97	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1698	1413	1528	1603	1272		1631	3887	1167	871	4295	1455
Flt Permitted	0.75	1.00	1.00	0.76	1.00		0.07	1.00	1.00	0.26	1.00	1.00
Satd. Flow (perm)	1340	1413	1528	1275	1272		114	3887	1167	234	4295	1455
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	202	4	297	25	5	7	158	938	4	1	2416	250
RTOR Reduction (vph)	0	0	87	0	6	0	0	0	1	0	0	107
Lane Group Flow (vph)	202	4	210	25	6	0	158	938	3	1	2416	143
Confl. Peds. (#/hr)	1		2	2		1	9		3	3		9
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	7%	16%	33%	100%	5%	5%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	19.0	19.0	19.0	19.0	19.0		68.4	68.4	68.4	57.3	57.3	57.3
Effective Green, g (s)	19.0	19.0	19.0	19.0	19.0		68.4	68.4	68.4	57.3	57.3	57.3
Actuated g/C Ratio	0.19	0.19	0.19	0.19	0.19		0.68	0.68	0.68	0.57	0.57	0.57
Clearance Time (s)	6.4	6.4	6.4	6.4	6.4		3.0	6.2	6.2	6.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	254	268	290	242	241		200	2658	798	134	2461	833
v/s Ratio Prot		0.00			0.00		c0.06	0.24			c0.56	
v/s Ratio Perm	c0.15		0.14	0.02			0.47		0.00	0.00		0.10
v/c Ratio	0.80	0.01	0.72	0.10	0.03		0.79	0.35	0.00	0.01	0.98	0.17
Uniform Delay, d1	38.6	32.9	38.0	33.5	33.0		27.7	6.6	5.0	9.2	20.8	10.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.7	0.0	8.6	0.2	0.0		18.8	0.4	0.0	0.1	14.3	0.4
Delay (s)	54.3	32.9	46.6	33.7	33.0		46.5	7.0	5.0	9.3	35.2	10.6
Level of Service	D	C	D	C	C		D	A	A	A	D	B
Approach Delay (s)		49.6			33.4			12.6			32.8	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	29.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	0	12	1011	93	1	69	2459
Future Volume (vph)	0	12	1011	93	1	69	2459
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.5	3.5	3.3	3.3	3.5
Storage Length (m)	0.0	0.0		38.0		60.0	
Storage Lanes	0	1		0		1	
Taper Length (m)	7.5					75.0	
Lane Util. Factor	1.00	1.00	*0.80	*0.80	0.91	1.00	*0.80
Ped Bike Factor							
Frt		0.865	0.987				
Flt Protected						0.950	
Satd. Flow (prot)	0	1644	3924	0	0	1647	4295
Flt Permitted						0.950	
Satd. Flow (perm)	0	1644	3924	0	0	1647	4295
Link Speed (k/h)	40		60				60
Link Distance (m)	119.8		367.1				224.5
Travel Time (s)	10.8		22.0				13.5
Confl. Peds. (#/hr)				4		4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	14%	7%	0%	6%	5%
Adj. Flow (vph)	0	13	1099	101	1	75	2673
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	13	1200	0	0	76	2673
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	R NA	Left	Left
Median Width(m)	0.0		3.3				3.3
Link Offset(m)	0.0		0.0				0.0
Crosswalk Width(m)	4.8		4.8				4.8
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.01	1.01	1.04	1.04	1.01
Turning Speed (k/h)	25	15		15	15	25	
Sign Control	Stop		Free				Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 50.8%		ICU Level of Service A	
Analysis Period (min) 15			

* User Entered Value



Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	0	12	1011	93	1	69	2459
Future Volume (Veh/h)	0	12	1011	93	1	69	2459
Sign Control	Stop		Free				Free
Grade	0%		0%				0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	13	1099	101	0	75	2673
Pedestrians	4						
Lane Width (m)	3.6						
Walking Speed (m/s)	1.2						
Percent Blockage	0						
Right turn flare (veh)							
Median type			None				None
Median storage veh)							
Upstream signal (m)			367				225
pX, platoon unblocked	0.56	0.99			0.00	0.99	
vC, conflicting volume	2194	421			0	1204	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	213	369			0	1162	
tC, single (s)	6.8	6.9			0.0	4.2	
tC, 2 stage (s)							
tF (s)	3.5	3.3			0.0	2.3	
p0 queue free %	100	98			0	87	
cM capacity (veh/h)	367	624			0	566	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4
Volume Total	13	440	440	321	75	891	891	891
Volume Left	0	0	0	0	75	0	0	0
Volume Right	13	0	0	101	0	0	0	0
cSH	624	1700	1700	1700	566	1700	1700	1700
Volume to Capacity	0.02	0.26	0.26	0.19	0.13	0.52	0.52	0.52
Queue Length 95th (m)	0.5	0.0	0.0	0.0	3.6	0.0	0.0	0.0
Control Delay (s)	10.9	0.0	0.0	0.0	12.3	0.0	0.0	0.0
Lane LOS	B				B			
Approach Delay (s)	10.9	0.0			0.3			
Approach LOS	B							

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		

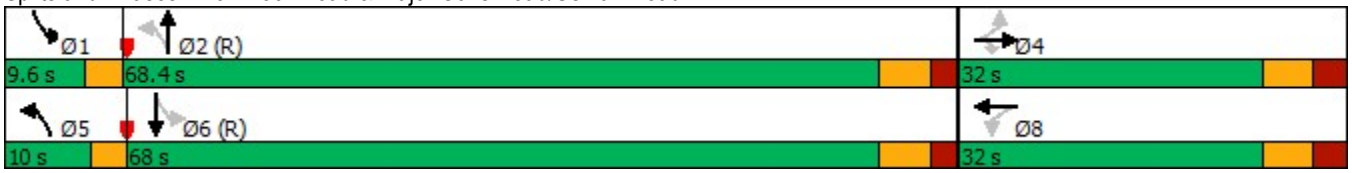
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	5	295	174	12	9	140	882	11	18	2067	21
Future Volume (vph)	43	5	295	174	12	9	140	882	11	18	2067	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.7	3.7	3.3	3.5	3.5	3.3	3.5	3.5
Storage Length (m)	0.0		30.0	20.0		0.0	72.0		70.0	60.0		0.0
Storage Lanes	0		1	1		0	1		0	1		0
Taper Length (m)	7.5			48.0			72.0			92.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	*0.80	1.00	*0.80	*0.80
Ped Bike Factor		0.99	0.99	1.00	0.99			1.00		1.00	1.00	
Frt			0.850		0.935			0.998			0.998	
Flt Protected		0.957		0.950			0.950			0.950		
Satd. Flow (prot)	0	1668	1536	1733	1517	0	1646	3881	0	1745	4279	0
Flt Permitted		0.730		0.723			0.059			0.246		
Satd. Flow (perm)	0	1263	1515	1317	1517	0	102	3881	0	452	4279	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109		10			2			2	
Link Speed (k/h)		50			40			60			60	
Link Distance (m)		292.9			123.2			224.5			180.3	
Travel Time (s)		21.1			11.1			13.5			10.8	
Confl. Peds. (#/hr)	6		1	1		6	3		1	1		3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	25%	4%	3%	20%	14%	6%	16%	11%	0%	5%	18%
Adj. Flow (vph)	47	5	321	189	13	10	152	959	12	20	2247	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	52	321	189	23	0	152	971	0	20	2270	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	0.99	0.99	1.04	1.01	1.01	1.04	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	1	1	1	1		1	0		1	0	
Detector Template	Left											
Leading Detector (m)	2.0	12.0	12.0	12.0	12.0		24.0	0.0		24.0	0.0	
Trailing Detector (m)	0.0	-3.0	-3.0	-3.0	-3.0		14.0	0.0		14.0	0.0	
Detector 1 Position(m)	0.0	-3.0	-3.0	-3.0	-3.0		14.0	0.0		14.0	0.0	
Detector 1 Size(m)	2.0	15.0	15.0	15.0	15.0		10.0	0.6		10.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	8	8		5	2		1	6	

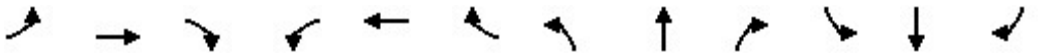
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		5.0	20.0		5.0	20.0	
Minimum Split (s)	32.0	32.0	32.0	32.0	32.0		8.0	29.0		9.5	29.0	
Total Split (s)	32.0	32.0	32.0	32.0	32.0		10.0	68.4		9.6	68.0	
Total Split (%)	29.1%	29.1%	29.1%	29.1%	29.1%		9.1%	62.2%		8.7%	61.8%	
Maximum Green (s)	25.0	25.0	25.0	25.0	25.0		7.0	62.0		6.6	61.6	
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1		3.0	4.2		3.0	4.2	
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9		0.0	2.2		0.0	2.2	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.0	7.0	7.0	7.0		3.0	6.4		3.0	6.4	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0			14.0			14.0	
Pedestrian Calls (#/hr)	0	0	0	0	0			0			0	
Act Effct Green (s)		20.7	20.7	20.7	20.7		78.7	72.5		73.3	64.7	
Actuated g/C Ratio		0.19	0.19	0.19	0.19		0.72	0.66		0.67	0.59	
v/c Ratio		0.22	0.86	0.77	0.08		0.81	0.38		0.06	0.90	
Control Delay		38.2	50.1	60.0	23.9		54.1	10.2		5.8	27.0	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		38.2	50.1	60.0	23.9		54.1	10.2		5.8	27.0	
LOS		D	D	E	C		D	B		A	C	
Approach Delay		48.5			56.1			16.1			26.8	
Approach LOS		D			E			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 27.4		Intersection LOS: C	
Intersection Capacity Utilization 87.5%		ICU Level of Service E	
Analysis Period (min) 15			

* User Entered Value

Splits and Phases: 3: Brock Road & Major Oaks Road/Usman Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	5	295	174	12	9	140	882	11	18	2067	21
Future Volume (vph)	43	5	295	174	12	9	140	882	11	18	2067	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.7	3.7	3.3	3.5	3.5	3.3	3.5	3.5
Total Lost time (s)		7.0	7.0	7.0	7.0		3.0	6.4		3.0	6.4	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	*0.80		1.00	*0.80	
Frpb, ped/bikes		1.00	0.99	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	0.93		1.00	1.00		1.00	1.00	
Flt Protected		0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1656	1515	1731	1517		1646	3881		1745	4282	
Flt Permitted		0.73	1.00	0.72	1.00		0.06	1.00		0.25	1.00	
Satd. Flow (perm)		1264	1515	1317	1517		102	3881		452	4282	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	5	321	189	13	10	152	959	12	20	2247	23
RTOR Reduction (vph)	0	0	88	0	8	0	0	1	0	0	1	0
Lane Group Flow (vph)	0	52	233	189	15	0	152	970	0	20	2269	0
Confl. Peds. (#/hr)	6		1	1		6	3		1	1		3
Heavy Vehicles (%)	6%	25%	4%	3%	20%	14%	6%	16%	11%	0%	5%	18%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		20.7	20.7	20.7	20.7		75.9	70.7		66.9	64.7	
Effective Green, g (s)		20.7	20.7	20.7	20.7		75.9	70.7		66.9	64.7	
Actuated g/C Ratio		0.19	0.19	0.19	0.19		0.69	0.64		0.61	0.59	
Clearance Time (s)		7.0	7.0	7.0	7.0		3.0	6.4		3.0	6.4	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		237	285	247	285		185	2494		300	2518	
v/s Ratio Prot					0.01		c0.06	0.25		0.00	c0.53	
v/s Ratio Perm		0.04	c0.15	0.14			0.50			0.04		
v/c Ratio		0.22	0.82	0.77	0.05		0.82	0.39		0.07	0.90	
Uniform Delay, d1		37.8	42.8	42.3	36.6		30.1	9.4		8.5	19.8	
Progression Factor		1.00	1.00	0.97	0.99		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.5	16.3	12.8	0.1		24.5	0.5		0.1	5.8	
Delay (s)		38.3	59.1	54.0	36.4		54.5	9.8		8.6	25.6	
Level of Service		D	E	D	D		D	A		A	C	
Approach Delay (s)		56.2			52.0			15.9			25.5	
Approach LOS		E			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	486	18	291	17	5	9	1	274	2138	24	6	1184
Future Volume (vph)	486	18	291	17	5	9	1	274	2138	24	6	1184
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.3	3.5	3.5	3.3	3.5
Storage Length (m)	0.0		90.0	0.0		0.0		63.0		90.0	13.0	
Storage Lanes	1		1	1		0		1		1	1	
Taper Length (m)	0.0			0.0				20.0			41.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	*0.80	1.00	1.00	*0.80
Ped Bike Factor	1.00		0.99	1.00	0.99					0.97		
Frt			0.850		0.900					0.850		
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	1700	1413	1551	1608	1241	0	0	1631	3887	1201	872	4295
Flt Permitted	0.748			0.744				0.098			0.106	
Satd. Flow (perm)	1337	1413	1528	1256	1241	0	0	168	3887	1167	97	4295
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			240		3					37		
Link Speed (k/h)		60			40				60			60
Link Distance (m)		416.8			328.7				124.4			367.1
Travel Time (s)		25.0			29.6				7.5			22.0
Confl. Peds. (#/hr)	1		2	2		1		9		3	3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	0%	7%	16%	33%	100%	5%
Adj. Flow (vph)	528	20	316	18	5	10	1	298	2324	26	7	1287
Shared Lane Traffic (%)												
Lane Group Flow (vph)	528	20	316	18	15	0	0	299	2324	26	7	1287
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	Left	Left
Median Width(m)		3.5			3.5				3.3			3.3
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		4.8			4.8				4.8			4.8
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.00	1.04	1.01	1.01	1.04	1.01
Turning Speed (k/h)	25		15	25		15	15	25		15	25	
Number of Detectors	1	2	1	1	2		0	1	2	1	1	2
Detector Template	Left	Thru	Right	Left	Thru			Left	Thru	Right	Left	Thru
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		0.0	2.0	10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		0.0	2.0	0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4				9.4			9.4
Detector 2 Size(m)		0.6			0.6				0.6			0.6
Detector 2 Type		Cl+Ex			Cl+Ex				Cl+Ex			Cl+Ex
Detector 2 Channel												

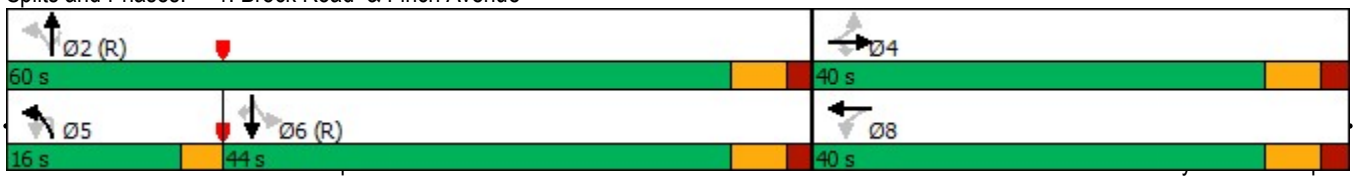


Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	220
Future Volume (vph)	220
Ideal Flow (vphpl)	1900
Lane Width (m)	3.5
Storage Length (m)	100.0
Storage Lanes	1
Taper Length (m)	
Lane Util. Factor	1.00
Ped Bike Factor	0.96
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1521
Flt Permitted	
Satd. Flow (perm)	1455
Right Turn on Red	Yes
Satd. Flow (RTOR)	239
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	9
Peak Hour Factor	0.92
Heavy Vehicles (%)	5%
Adj. Flow (vph)	239
Shared Lane Traffic (%)	
Lane Group Flow (vph)	239
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	1.01
Turning Speed (k/h)	15
Number of Detectors	1
Detector Template	Right
Leading Detector (m)	2.0
Trailing Detector (m)	0.0
Detector 1 Position(m)	0.0
Detector 1 Size(m)	2.0
Detector 1 Type	Cl+Ex
Detector 1 Channel	
Detector 1 Extend (s)	0.0
Detector 1 Queue (s)	0.0
Detector 1 Delay (s)	0.0
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Detector 2 Extend (s)		0.0			0.0				0.0			0.0
Turn Type	Perm	NA	Perm	Perm	NA		custom	pm+pt	NA	Perm	Perm	NA
Protected Phases		4			8			5	2			6
Permitted Phases	4		4	8			5	2		2	6	
Detector Phase	4	4	4	8	8		5	5	2	2	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		5.0	5.0	20.0	20.0	20.0	20.0
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0		9.0	9.0	28.0	28.0	28.0	28.0
Total Split (s)	40.0	40.0	40.0	40.0	40.0		16.0	16.0	60.0	60.0	44.0	44.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	40.0%		16.0%	16.0%	60.0%	60.0%	44.0%	44.0%
Maximum Green (s)	33.6	33.6	33.6	33.6	33.6		13.0	13.0	53.8	53.8	37.8	37.8
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2		3.0	3.0	4.2	4.2	4.2	4.2
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2		0.0	0.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4			3.0	6.2	6.2	6.2	6.2
Lead/Lag							Lead	Lead			Lag	Lag
Lead-Lag Optimize?							Yes	Yes			Yes	Yes
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
Recall Mode	None	None	None	None	None		None	None	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	16.0	16.0	16.0	16.0	16.0				14.0	14.0	14.0	14.0
Flash Dont Walk (s)	5.0	5.0	5.0	5.0	5.0				5.0	5.0	5.0	5.0
Pedestrian Calls (#/hr)	0	0	0	0	0				0	0	0	0
Act Effct Green (s)	33.6	33.6	33.6	33.6	33.6			57.0	53.8	53.8	37.8	37.8
Actuated g/C Ratio	0.34	0.34	0.34	0.34	0.34			0.57	0.54	0.54	0.38	0.38
v/c Ratio	1.18	0.04	0.47	0.04	0.04			1.05	1.11	0.04	0.19	0.79
Control Delay	132.4	22.8	9.4	22.9	19.8			93.5	81.9	2.6	36.5	32.0
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Delay	132.4	22.8	9.4	22.9	19.8			93.5	81.9	2.6	36.5	32.0
LOS	F	C	A	C	B			F	F	A	D	C
Approach Delay		84.9			21.5				82.4			27.7
Approach LOS		F			C				F			C

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 130			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.18			
Intersection Signal Delay: 65.9		Intersection LOS: E	
Intersection Capacity Utilization 107.2%		ICU Level of Service G	
Analysis Period (min) 15			
* User Entered Value			

Splits and Phases: 1: Brock Road & Finch Avenue





Lane Group	SBR
Detector 2 Extend (s)	
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	20.0
Minimum Split (s)	28.0
Total Split (s)	44.0
Total Split (%)	44.0%
Maximum Green (s)	37.8
Yellow Time (s)	4.2
All-Red Time (s)	2.0
Lost Time Adjust (s)	0.0
Total Lost Time (s)	6.2
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	C-Max
Walk Time (s)	14.0
Flash Dont Walk (s)	5.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	37.8
Actuated g/C Ratio	0.38
v/c Ratio	0.34
Control Delay	4.3
Queue Delay	0.0
Total Delay	4.3
LOS	A
Approach Delay	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	486	18	291	17	5	9	1	274	2138	24	6	1184
Future Volume (vph)	486	18	291	17	5	9	1	274	2138	24	6	1184
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.3	3.5	3.5	3.3	3.5
Total Lost time (s)	6.4	6.4	6.4	6.4	6.4			3.0	6.2	6.2	6.2	6.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	*0.80	1.00	1.00	*0.80
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99			1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.90			1.00	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1698	1413	1528	1604	1241			1631	3887	1167	872	4295
Flt Permitted	0.75	1.00	1.00	0.74	1.00			0.10	1.00	1.00	0.11	1.00
Satd. Flow (perm)	1336	1413	1528	1256	1241			168	3887	1167	97	4295
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	528	20	316	18	5	10	1	298	2324	26	7	1287
RTOR Reduction (vph)	0	0	159	0	2	0	0	0	0	12	0	0
Lane Group Flow (vph)	528	20	157	18	13	0	0	299	2324	14	7	1287
Confl. Peds. (#/hr)	1		2	2		1		9		3	3	
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	0%	7%	16%	33%	100%	5%
Turn Type	Perm	NA	Perm	Perm	NA		custom	pm+pt	NA	Perm	Perm	NA
Protected Phases		4			8			5	2			6
Permitted Phases	4		4	8			5	2		2	6	
Actuated Green, G (s)	33.6	33.6	33.6	33.6	33.6			53.8	53.8	53.8	37.8	37.8
Effective Green, g (s)	33.6	33.6	33.6	33.6	33.6			53.8	53.8	53.8	37.8	37.8
Actuated g/C Ratio	0.34	0.34	0.34	0.34	0.34			0.54	0.54	0.54	0.38	0.38
Clearance Time (s)	6.4	6.4	6.4	6.4	6.4			3.0	6.2	6.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	448	474	513	422	416			280	2091	627	36	1623
v/s Ratio Prot		0.01			0.01			0.14	c0.60			0.30
v/s Ratio Perm	c0.40		0.10	0.01				0.43		0.01	0.07	
v/c Ratio	1.18	0.04	0.31	0.04	0.03			1.07	1.11	0.02	0.19	0.79
Uniform Delay, d1	33.2	22.4	24.6	22.4	22.3			28.4	23.1	10.8	20.9	27.6
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	101.4	0.0	0.3	0.0	0.0			72.9	57.6	0.1	11.7	4.1
Delay (s)	134.6	22.4	24.9	22.4	22.3			101.3	80.7	10.9	32.6	31.7
Level of Service	F	C	C	C	C			F	F	B	C	C
Approach Delay (s)		91.9			22.4				82.4			30.1
Approach LOS		F			C				F			C

Intersection Summary			
HCM 2000 Control Delay	67.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	107.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	220
Future Volume (vph)	220
Ideal Flow (vphpl)	1900
Lane Width	3.5
Total Lost time (s)	6.2
Lane Util. Factor	1.00
Frpb, ped/bikes	0.96
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1455
Flt Permitted	1.00
Satd. Flow (perm)	1455
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	239
RTOR Reduction (vph)	149
Lane Group Flow (vph)	90
Confl. Peds. (#/hr)	9
Heavy Vehicles (%)	5%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	37.8
Effective Green, g (s)	37.8
Actuated g/C Ratio	0.38
Clearance Time (s)	6.2
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	549
v/s Ratio Prot	
v/s Ratio Perm	0.06
v/c Ratio	0.16
Uniform Delay, d1	20.6
Progression Factor	1.00
Incremental Delay, d2	0.6
Delay (s)	21.3
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary



Lane Group	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	0	36	2499	181	1	116	1427
Future Volume (vph)	0	36	2499	181	1	116	1427
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.5	3.5	3.3	3.3	3.5
Storage Length (m)	0.0	0.0		38.0		60.0	
Storage Lanes	0	1		0		1	
Taper Length (m)	0.0					75.0	
Lane Util. Factor	1.00	1.00	*0.80	*0.80	0.91	1.00	*0.80
Ped Bike Factor							
Frt		0.865	0.990				
Flt Protected						0.950	
Satd. Flow (prot)	0	1644	3932	0	0	1647	4295
Flt Permitted						0.950	
Satd. Flow (perm)	0	1644	3932	0	0	1647	4295
Link Speed (k/h)	40		60				60
Link Distance (m)	119.8		367.1				224.5
Travel Time (s)	10.8		22.0				13.5
Confl. Peds. (#/hr)				4		4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	14%	7%	0%	6%	5%
Adj. Flow (vph)	0	39	2716	197	1	126	1551
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	39	2913	0	0	127	1551
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	R NA	Left	Left
Median Width(m)	0.0		3.3				3.3
Link Offset(m)	0.0		0.0				0.0
Crosswalk Width(m)	4.8		4.8				4.8
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.01	1.01	1.04	1.04	1.01
Turning Speed (k/h)	25	15		15	15	25	
Sign Control	Stop		Free				Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 72.2%		ICU Level of Service C	
Analysis Period (min) 15			

* User Entered Value



Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	0	36	2499	181	1	116	1427
Future Volume (Veh/h)	0	36	2499	181	1	116	1427
Sign Control	Stop		Free				Free
Grade	0%		0%				0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	39	2716	197	0	126	1551
Pedestrians	4						
Lane Width (m)	3.6						
Walking Speed (m/s)	1.2						
Percent Blockage	0						
Right turn flare (veh)							
Median type			None				None
Median storage veh)							
Upstream signal (m)			367				225
pX, platoon unblocked	0.62	0.54			0.00	0.54	
vC, conflicting volume	3588	1008			0	2917	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1153	0			0	1555	
tC, single (s)	6.8	6.9			0.0	4.2	
tC, 2 stage (s)							
tF (s)	3.5	3.3			0.0	2.3	
p0 queue free %	100	93			0	42	
cM capacity (veh/h)	50	584			0	216	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4
Volume Total	39	1086	1086	740	126	517	517	517
Volume Left	0	0	0	0	126	0	0	0
Volume Right	39	0	0	197	0	0	0	0
cSH	584	1700	1700	1700	216	1700	1700	1700
Volume to Capacity	0.07	0.64	0.64	0.44	0.58	0.30	0.30	0.30
Queue Length 95th (m)	1.7	0.0	0.0	0.0	26.1	0.0	0.0	0.0
Control Delay (s)	11.6	0.0	0.0	0.0	42.6	0.0	0.0	0.0
Lane LOS	B				E			
Approach Delay (s)	11.6	0.0			3.2			
Approach LOS	B							

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		

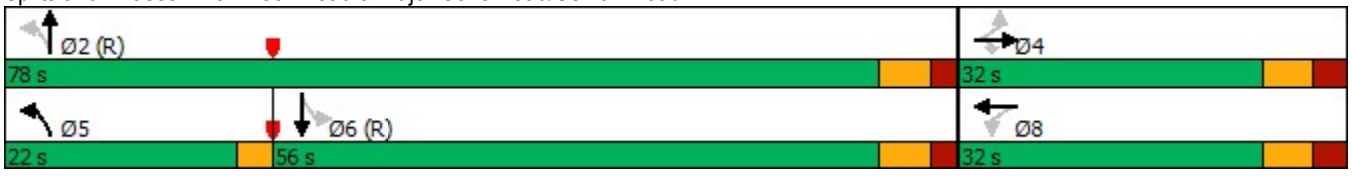
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	12	218	192	21	20	338	2298	30	57	1108	38
Future Volume (vph)	24	12	218	192	21	20	338	2298	30	57	1108	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.7	3.7	3.3	3.5	3.5	3.3	3.5	3.5
Storage Length (m)	0.0		30.0	20.0		0.0	72.0		70.0	60.0		0.0
Storage Lanes	0		1	1		0	1		0	1		0
Taper Length (m)	0.0			48.0			72.0			92.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	*0.80	1.00	*0.80	*0.80
Ped Bike Factor		1.00	0.99	1.00	0.99			1.00			1.00	
Frt			0.850		0.927			0.998			0.995	
Flt Protected		0.968		0.950			0.950			0.950		
Satd. Flow (prot)	0	1619	1536	1733	1507	0	1646	3881	0	1745	4252	0
Flt Permitted		0.805		0.732			0.113			0.077		
Satd. Flow (perm)	0	1340	1515	1334	1507	0	196	3881	0	141	4252	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			237		5			3			5	
Link Speed (k/h)		50			40			60			60	
Link Distance (m)		292.9			123.2			224.5			180.3	
Travel Time (s)		21.1			11.1			13.5			10.8	
Confl. Peds. (#/hr)	6		1	1		6	3		1	1		3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	25%	4%	3%	20%	14%	6%	16%	11%	0%	5%	18%
Adj. Flow (vph)	26	13	237	209	23	22	367	2498	33	62	1204	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	39	237	209	45	0	367	2531	0	62	1245	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	0.99	0.99	1.04	1.01	1.01	1.04	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	1	1	1	1		1	0		1	0	
Detector Template	Left											
Leading Detector (m)	2.0	12.0	12.0	12.0	12.0		24.0	0.0		24.0	0.0	
Trailing Detector (m)	0.0	-3.0	-3.0	-3.0	-3.0		14.0	0.0		14.0	0.0	
Detector 1 Position(m)	0.0	-3.0	-3.0	-3.0	-3.0		14.0	0.0		14.0	0.0	
Detector 1 Size(m)	2.0	15.0	15.0	15.0	15.0		10.0	0.6		10.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	8	8		5	2		6	6	

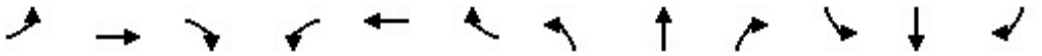
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	4.0	4.0		5.0	20.0		20.0	20.0	
Minimum Split (s)	32.0	32.0	32.0	32.0	32.0		8.0	29.0		29.0	29.0	
Total Split (s)	32.0	32.0	32.0	32.0	32.0		22.0	78.0		56.0	56.0	
Total Split (%)	29.1%	29.1%	29.1%	29.1%	29.1%		20.0%	70.9%		50.9%	50.9%	
Maximum Green (s)	25.0	25.0	25.0	25.0	25.0		19.0	71.6		49.6	49.6	
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1		3.0	4.2		4.2	4.2	
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9		0.0	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.0	7.0	7.0	7.0		3.0	6.4		6.4	6.4	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0			14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0	0	0	0			0		0	0	
Act Effct Green (s)		21.3	21.3	21.3	21.3		78.7	75.3		52.0	52.0	
Actuated g/C Ratio		0.19	0.19	0.19	0.19		0.72	0.68		0.47	0.47	
v/c Ratio		0.15	0.49	0.81	0.15		0.90	0.95		0.94	0.62	
Control Delay		36.4	8.3	61.5	30.5		50.7	26.7		130.2	23.8	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		36.4	8.3	61.5	30.5		50.7	26.7		130.2	23.8	
LOS		D	A	E	C		D	C		F	C	
Approach Delay		12.3			56.0			29.7			28.8	
Approach LOS		B			E			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 29.9		Intersection LOS: C	
Intersection Capacity Utilization 96.2%		ICU Level of Service F	
Analysis Period (min) 15			

* User Entered Value

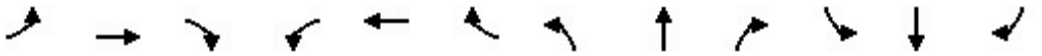
Splits and Phases: 3: Brock Road & Major Oaks Road/Usman Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	12	218	192	21	20	338	2298	30	57	1108	38
Future Volume (vph)	24	12	218	192	21	20	338	2298	30	57	1108	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.7	3.7	3.3	3.5	3.5	3.3	3.5	3.5
Total Lost time (s)		7.0	7.0	7.0	7.0		3.0	6.4		6.4	6.4	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	*0.80		1.00	*0.80	
Frpb, ped/bikes		1.00	0.99	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	0.93		1.00	1.00		1.00	1.00	
Flt Protected		0.97	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1611	1515	1731	1506		1646	3881		1745	4252	
Flt Permitted		0.81	1.00	0.73	1.00		0.11	1.00		0.08	1.00	
Satd. Flow (perm)		1340	1515	1333	1506		195	3881		141	4252	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	13	237	209	23	22	367	2498	33	62	1204	41
RTOR Reduction (vph)	0	0	191	0	4	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	39	46	209	41	0	367	2530	0	62	1242	0
Confl. Peds. (#/hr)	6		1	1		6	3		1	1		3
Heavy Vehicles (%)	6%	25%	4%	3%	20%	14%	6%	16%	11%	0%	5%	18%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		21.3	21.3	21.3	21.3		75.3	75.3		52.0	52.0	
Effective Green, g (s)		21.3	21.3	21.3	21.3		75.3	75.3		52.0	52.0	
Actuated g/C Ratio		0.19	0.19	0.19	0.19		0.68	0.68		0.47	0.47	
Clearance Time (s)		7.0	7.0	7.0	7.0		3.0	6.4		6.4	6.4	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		259	293	258	291		401	2656		66	2010	
v/s Ratio Prot					0.03		0.17	c0.65			0.29	
v/s Ratio Perm		0.03	0.03	c0.16			0.46			0.44		
v/c Ratio		0.15	0.16	0.81	0.14		0.92	0.95		0.94	0.62	
Uniform Delay, d1		36.8	36.9	42.4	36.8		27.5	15.7		27.5	21.6	
Progression Factor		1.00	1.00	0.91	0.92		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3	0.3	17.0	0.2		25.0	9.4		94.6	1.4	
Delay (s)		37.1	37.1	55.6	34.0		52.5	25.2		122.1	23.0	
Level of Service		D	D	E	C		D	C		F	C	
Approach Delay (s)		37.1			51.8			28.6			27.7	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	96.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



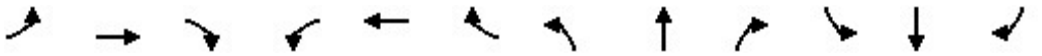
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	394	5	262	7	9	7	256	2061	16	2	1166	239
Future Volume (vph)	394	5	262	7	9	7	256	2061	16	2	1166	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.3	3.5	3.5	3.3	3.5	3.5
Storage Length (m)	0.0		90.0	0.0		0.0	63.0		90.0	13.0		100.0
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (m)	0.0			0.0			20.0			41.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Ped Bike Factor	1.00		0.99	1.00	0.99				0.97			0.96
Frt			0.850		0.933				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1700	1413	1551	1608	1323	0	1631	3887	1201	872	4295	1521
Flt Permitted	0.746			0.754			0.097			0.104		
Satd. Flow (perm)	1333	1413	1528	1273	1323	0	167	3887	1167	96	4295	1455
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			294		4				37			269
Link Speed (k/h)		60			40			60			60	
Link Distance (m)		416.8			328.7			124.4			367.1	
Travel Time (s)		25.0			29.6			7.5			22.0	
Confl. Peds. (#/hr)	1		2	2		1	9		3	3		9
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	7%	16%	33%	100%	5%	5%
Adj. Flow (vph)	443	6	294	8	10	8	288	2316	18	2	1310	269
Shared Lane Traffic (%)												
Lane Group Flow (vph)	443	6	294	8	18	0	288	2316	18	2	1310	269
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.04	1.01	1.01	1.04	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	4	4	4	8	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		5.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0		9.0	28.0	28.0	28.0	28.0	28.0
Total Split (s)	37.0	37.0	37.0	37.0	37.0		20.0	63.0	63.0	43.0	43.0	43.0
Total Split (%)	37.0%	37.0%	37.0%	37.0%	37.0%		20.0%	63.0%	63.0%	43.0%	43.0%	43.0%
Maximum Green (s)	30.6	30.6	30.6	30.6	30.6		17.0	56.8	56.8	36.8	36.8	36.8
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2		3.0	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2		0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4		3.0	6.2	6.2	6.2	6.2	6.2
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
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
Recall Mode	None	None	None	None	None		None	C-Max	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	16.0	16.0	16.0	16.0	16.0			14.0	14.0	14.0	14.0	14.0
Flash Dont Walk (s)	5.0	5.0	5.0	5.0	5.0			5.0	5.0	5.0	5.0	5.0
Pedestrian Calls (#/hr)	0	0	0	0	0			0	0	0	0	0
Act Effct Green (s)	30.6	30.6	30.6	30.6	30.6		60.0	56.8	56.8	38.3	38.3	38.3
Actuated g/C Ratio	0.31	0.31	0.31	0.31	0.31		0.60	0.57	0.57	0.38	0.38	0.38
v/c Ratio	1.09	0.01	0.44	0.02	0.04		0.88	1.05	0.03	0.06	0.80	0.37
Control Delay	105.2	24.4	5.4	24.6	21.2		51.0	56.4	1.3	25.0	32.3	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	105.2	24.4	5.4	24.6	21.2		51.0	56.4	1.3	25.0	32.3	4.4
LOS	F	C	A	C	C		D	E	A	C	C	A
Approach Delay		65.1			22.2			55.4			27.5	
Approach LOS		E			C			E			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 40 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 130			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.09			
Intersection Signal Delay: 47.8		Intersection LOS: D	
Intersection Capacity Utilization 100.6%		ICU Level of Service G	
Analysis Period (min) 15			
* User Entered Value			

Splits and Phases: 1: Brock Road & Finch Avenue





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	394	5	262	7	9	7	256	2061	16	2	1166	239
Future Volume (vph)	394	5	262	7	9	7	256	2061	16	2	1166	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.3	3.5	3.5	3.3	3.5	3.5
Total Lost time (s)	6.4	6.4	6.4	6.4	6.4		3.0	6.2	6.2	6.2	6.2	6.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00	0.97	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1698	1413	1528	1604	1324		1631	3887	1167	872	4295	1455
Flt Permitted	0.75	1.00	1.00	0.75	1.00		0.10	1.00	1.00	0.10	1.00	1.00
Satd. Flow (perm)	1332	1413	1528	1272	1324		166	3887	1167	96	4295	1455
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	443	6	294	8	10	8	288	2316	18	2	1310	269
RTOR Reduction (vph)	0	0	204	0	3	0	0	0	8	0	0	166
Lane Group Flow (vph)	443	6	90	8	15	0	288	2316	10	2	1310	103
Confl. Peds. (#/hr)	1		2	2		1	9		3	3		9
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	7%	16%	33%	100%	5%	5%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	30.6	30.6	30.6	30.6	30.6		56.8	56.8	56.8	38.3	38.3	38.3
Effective Green, g (s)	30.6	30.6	30.6	30.6	30.6		56.8	56.8	56.8	38.3	38.3	38.3
Actuated g/C Ratio	0.31	0.31	0.31	0.31	0.31		0.57	0.57	0.57	0.38	0.38	0.38
Clearance Time (s)	6.4	6.4	6.4	6.4	6.4		3.0	6.2	6.2	6.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	407	432	467	389	405		321	2207	662	36	1644	557
v/s Ratio Prot		0.00			0.01		0.14	c0.60			0.31	
v/s Ratio Perm	c0.33		0.06	0.01			0.37		0.01	0.02		0.07
v/c Ratio	1.09	0.01	0.19	0.02	0.04		0.90	1.05	0.02	0.06	0.80	0.18
Uniform Delay, d1	34.7	24.2	25.6	24.2	24.4		27.2	21.6	9.4	19.4	27.4	20.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	70.5	0.0	0.2	0.0	0.0		25.9	33.7	0.0	2.9	4.1	0.7
Delay (s)	105.2	24.2	25.8	24.3	24.4		53.1	55.3	9.5	22.4	31.5	21.2
Level of Service	F	C	C	C	C		D	E	A	C	C	C
Approach Delay (s)		73.1			24.4			54.7			29.7	
Approach LOS		E			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	49.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	100.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	93	2137	298	155	1255
Future Volume (vph)	0	93	2137	298	155	1255
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.5	3.5	3.3	3.5
Storage Length (m)	0.0	0.0		38.0	60.0	
Storage Lanes	0	1		0	1	
Taper Length (m)	0.0				75.0	
Lane Util. Factor	1.00	1.00	*0.80	*0.80	1.00	*0.80
Ped Bike Factor						
Frt		0.865	0.982			
Flt Protected					0.950	
Satd. Flow (prot)	0	1644	3914	0	1646	4295
Flt Permitted					0.950	
Satd. Flow (perm)	0	1644	3914	0	1646	4295
Link Speed (k/h)	40		60			60
Link Distance (m)	119.8		367.1			224.5
Travel Time (s)	10.8		22.0			13.5
Confl. Peds. (#/hr)				4	4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	14%	7%	6%	5%
Adj. Flow (vph)	0	103	2374	331	172	1394
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	103	2705	0	172	1394
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.3			3.3
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.01	1.01	1.04	1.01
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 63.2%		ICU Level of Service B	
Analysis Period (min) 15			

* User Entered Value



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	93	2137	298	155	1255
Future Volume (Veh/h)	0	93	2137	298	155	1255
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	103	2374	331	172	1394
Pedestrians	4					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			367			225
pX, platoon unblocked	0.58	0.51			0.51	
vC, conflicting volume	3352	961			2709	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	858	0			970	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	100	81			50	
cM capacity (veh/h)	87	552			345	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4
Volume Total	103	950	950	806	172	465	465	465
Volume Left	0	0	0	0	172	0	0	0
Volume Right	103	0	0	331	0	0	0	0
cSH	552	1700	1700	1700	345	1700	1700	1700
Volume to Capacity	0.19	0.56	0.56	0.47	0.50	0.27	0.27	0.27
Queue Length 95th (m)	5.4	0.0	0.0	0.0	21.3	0.0	0.0	0.0
Control Delay (s)	13.0	0.0	0.0	0.0	25.4	0.0	0.0	0.0
Lane LOS	B				D			
Approach Delay (s)	13.0	0.0			2.8			
Approach LOS	B							

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	37	13	274	173	27	52	2	309	2004	27	89	1107
Future Volume (vph)	37	13	274	173	27	52	2	309	2004	27	89	1107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.7	3.7	3.6	3.3	3.5	3.5	3.3	3.5
Storage Length (m)	0.0		30.0	20.0		0.0		72.0		70.0	60.0	
Storage Lanes	0		1	1		0		1		0	1	
Taper Length (m)	0.0			48.0				72.0			92.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	*0.80	*0.80	1.00	*0.80
Ped Bike Factor		0.99	0.99	1.00	0.99				1.00			1.00
Frt			0.850		0.901				0.998			0.997
Flt Protected		0.964		0.950				0.950			0.950	
Satd. Flow (prot)	0	1634	1536	1733	1472	0	0	1647	3881	0	1745	4269
Flt Permitted		0.728		0.719				0.088			0.080	
Satd. Flow (perm)	0	1228	1515	1310	1472	0	0	153	3881	0	147	4269
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			326		62				2			3
Link Speed (k/h)		50			40				60			60
Link Distance (m)		292.9			123.2				224.5			180.3
Travel Time (s)		21.1			11.1				13.5			10.8
Confl. Peds. (#/hr)	6		1	1		6		3		1	1	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	6%	25%	4%	3%	20%	14%	0%	6%	16%	11%	0%	5%
Adj. Flow (vph)	44	15	326	206	32	62	2	368	2386	32	106	1318
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	59	326	206	94	0	0	370	2418	0	106	1344
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	Left	Left
Median Width(m)		3.5			3.5				3.3			3.3
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		4.8			4.8				4.8			4.8
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	0.99	0.99	1.00	1.04	1.01	1.01	1.04	1.01
Turning Speed (k/h)	25		15	25		15	15	25		15	25	
Number of Detectors	1	1	1	1	1		0	1	0		1	0
Detector Template	Left											
Leading Detector (m)	2.0	12.0	12.0	12.0	12.0		0.0	24.0	0.0		24.0	0.0
Trailing Detector (m)	0.0	-3.0	-3.0	-3.0	-3.0		0.0	14.0	0.0		14.0	0.0
Detector 1 Position(m)	0.0	-3.0	-3.0	-3.0	-3.0		0.0	14.0	0.0		14.0	0.0
Detector 1 Size(m)	2.0	15.0	15.0	15.0	15.0		0.0	10.0	0.6		10.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Turn Type	Perm	NA	Perm	Perm	NA		custom	pm+pt	NA		pm+pt	NA
Protected Phases		4			8			5	2		1	6
Permitted Phases	4		4	8			5	2			6	
Detector Phase	4	4	4	8	8		5	5	2		1	6



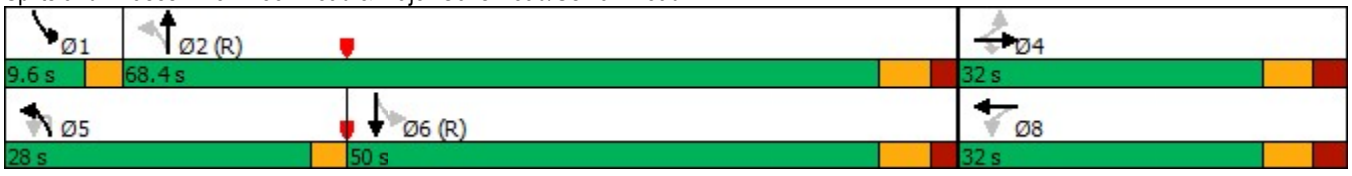
Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	22
Future Volume (vph)	22
Ideal Flow (vphpl)	1900
Lane Width (m)	3.5
Storage Length (m)	0.0
Storage Lanes	0
Taper Length (m)	
Lane Util. Factor	*0.80
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	Yes
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	3
Peak Hour Factor	0.84
Heavy Vehicles (%)	18%
Adj. Flow (vph)	26
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	1.01
Turning Speed (k/h)	15
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	4.0	4.0		5.0	5.0	20.0		5.0	20.0
Minimum Split (s)	32.0	32.0	32.0	32.0	32.0		8.0	8.0	29.0		9.5	29.0
Total Split (s)	32.0	32.0	32.0	32.0	32.0		28.0	28.0	68.4		9.6	50.0
Total Split (%)	29.1%	29.1%	29.1%	29.1%	29.1%		25.5%	25.5%	62.2%		8.7%	45.5%
Maximum Green (s)	25.0	25.0	25.0	25.0	25.0		25.0	25.0	62.0		6.6	43.6
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1		3.0	3.0	4.2		3.0	4.2
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9		0.0	0.0	2.2		0.0	2.2
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)		7.0	7.0	7.0	7.0			3.0	6.4		3.0	6.4
Lead/Lag							Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	None	None	None		None	None	C-Max		None	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0				7.0			7.0
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0				14.0			14.0
Pedestrian Calls (#/hr)	0	0	0	0	0				0			0
Act Effct Green (s)		21.3	21.3	21.3	21.3			78.7	66.0		59.9	50.3
Actuated g/C Ratio		0.19	0.19	0.19	0.19			0.72	0.60		0.54	0.46
v/c Ratio		0.25	0.59	0.81	0.28			0.91	1.04		0.62	0.69
Control Delay		38.7	8.6	65.3	17.7			54.5	52.9		36.2	27.5
Queue Delay		0.0	0.0	0.0	0.0			0.0	0.0		0.0	0.0
Total Delay		38.7	8.6	65.3	17.7			54.5	52.9		36.2	27.5
LOS		D	A	E	B			D	D		D	C
Approach Delay		13.2			50.4				53.1			28.1
Approach LOS		B			D				D			C

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.04			
Intersection Signal Delay: 42.5		Intersection LOS: D	
Intersection Capacity Utilization 88.3%		ICU Level of Service E	
Analysis Period (min) 15			

* User Entered Value

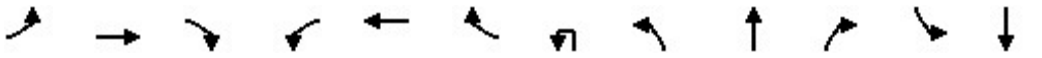
Splits and Phases: 3: Brock Road & Major Oaks Road/Usman Road





Lane Group	SBR
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	37	13	274	173	27	52	2	309	2004	27	89	1107
Future Volume (vph)	37	13	274	173	27	52	2	309	2004	27	89	1107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.7	3.7	3.6	3.3	3.5	3.5	3.3	3.5
Total Lost time (s)		7.0	7.0	7.0	7.0			3.0	6.4		3.0	6.4
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00	*0.80		1.00	*0.80
Frpb, ped/bikes		1.00	0.99	1.00	0.99			1.00	1.00		1.00	1.00
Flpb, ped/bikes		0.99	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frt		1.00	0.85	1.00	0.90			1.00	1.00		1.00	1.00
Flt Protected		0.96	1.00	0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1626	1515	1731	1472			1647	3881		1745	4270
Flt Permitted		0.73	1.00	0.72	1.00			0.09	1.00		0.08	1.00
Satd. Flow (perm)		1227	1515	1309	1472			152	3881		146	4270
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	44	15	326	206	32	62	2	368	2386	32	106	1318
RTOR Reduction (vph)	0	0	263	0	50	0	0	0	1	0	0	2
Lane Group Flow (vph)	0	59	63	206	44	0	0	370	2417	0	106	1342
Confl. Peds. (#/hr)	6		1	1		6		3		1	1	
Heavy Vehicles (%)	6%	25%	4%	3%	20%	14%	0%	6%	16%	11%	0%	5%
Turn Type	Perm	NA	Perm	Perm	NA		custom	pm+pt	NA		pm+pt	NA
Protected Phases		4			8			5	2		1	6
Permitted Phases	4		4	8			5	2			6	
Actuated Green, G (s)		21.3	21.3	21.3	21.3			75.3	66.0		56.6	50.3
Effective Green, g (s)		21.3	21.3	21.3	21.3			75.3	66.0		56.6	50.3
Actuated g/C Ratio		0.19	0.19	0.19	0.19			0.68	0.60		0.51	0.46
Clearance Time (s)		7.0	7.0	7.0	7.0			3.0	6.4		3.0	6.4
Vehicle Extension (s)		3.0	3.0	3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		237	293	253	285			403	2328		166	1952
v/s Ratio Prot					0.03			c0.18	c0.62		0.04	0.31
v/s Ratio Perm		0.05	0.04	c0.16				0.44			0.29	
v/c Ratio		0.25	0.22	0.81	0.15			0.92	1.04		0.64	0.69
Uniform Delay, d1		37.6	37.3	42.5	36.9			31.1	22.0		20.6	23.6
Progression Factor		1.00	1.00	0.99	1.05			1.00	1.00		1.00	1.00
Incremental Delay, d2		0.6	0.4	17.7	0.2			25.4	29.5		7.8	2.0
Delay (s)		38.1	37.7	59.5	39.1			56.5	51.5		28.4	25.6
Level of Service		D	D	E	D			E	D		C	C
Approach Delay (s)		37.8			53.1				52.2			25.8
Approach LOS		D			D				D			C

Intersection Summary			
HCM 2000 Control Delay	43.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	88.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	22
Future Volume (vph)	22
Ideal Flow (vphpl)	1900
Lane Width	3.5
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.84
Adj. Flow (vph)	26
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	3
Heavy Vehicles (%)	18%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 1: Brock Road & Finch Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	L	T	T	T	R	T	T
Maximum Queue (m)	68.0	14.3	49.2	19.7	17.0	53.6	65.5	46.4	26.2	4.8	122.1	117.0
Average Queue (m)	37.9	1.2	19.6	4.7	3.2	22.3	27.5	13.7	8.1	0.3	61.8	67.7
95th Queue (m)	61.6	6.8	43.8	14.2	11.8	41.3	51.7	33.1	21.3	3.5	106.2	108.9
Link Distance (m)	399.8	399.8		305.8	305.8		110.0	110.0	110.0		349.0	349.0
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)			90.0			63.0				90.0		
Storage Blk Time (%)						0	0				26	
Queuing Penalty (veh)						1	0				0	

Intersection: 1: Brock Road & Finch Avenue

Movement	SB	SB
Directions Served	T	R
Maximum Queue (m)	136.5	28.0
Average Queue (m)	67.1	3.1
95th Queue (m)	113.9	15.2
Link Distance (m)	349.0	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		100.0
Storage Blk Time (%)	2	
Queuing Penalty (veh)	4	

Intersection: 2: Brock Road & Usman Road

Movement	NB	SB
Directions Served	TR	UL
Maximum Queue (m)	4.2	19.4
Average Queue (m)	0.2	8.3
95th Queue (m)	2.0	16.5
Link Distance (m)	349.0	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		60.0
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Brock Road & Major Oaks Road/Usman Road

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	L	TR	L	T	T	TR	L	T	T	TR
Maximum Queue (m)	82.3	37.5	61.5	42.0	63.6	54.0	55.0	46.6	13.2	141.4	127.7	103.3
Average Queue (m)	26.6	30.6	35.4	7.7	30.8	21.4	23.2	18.2	3.5	84.8	72.6	49.7
95th Queue (m)	65.5	43.6	55.7	25.6	53.8	41.8	43.1	39.7	10.7	127.6	116.3	87.7
Link Distance (m)	275.9			97.5		205.6	205.6	205.6		170.1	170.1	170.1
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)		30.0	20.0		72.0				60.0			
Storage Blk Time (%)	1	20	43	0	0					15		
Queuing Penalty (veh)	2	10	9	1	0					3		

Network Summary

Network wide Queuing Penalty: 29

Intersection: 1: Brock Road & Finch Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	UL	T	T	T	R	L	T
Maximum Queue (m)	171.0	23.4	33.6	20.3	19.4	83.0	125.3	121.0	116.4	21.5	44.8	84.9
Average Queue (m)	95.1	3.9	8.9	3.7	3.3	58.7	106.4	95.1	73.0	3.0	6.0	51.6
95th Queue (m)	146.8	15.2	26.5	13.4	12.6	101.4	134.4	132.7	113.0	12.9	25.4	80.8
Link Distance (m)	399.8	399.8		305.8	305.8		110.0	110.0	110.0			349.0
Upstream Blk Time (%)							12	3	1			
Queuing Penalty (veh)							0	0	0			
Storage Bay Dist (m)			90.0			63.0				90.0	13.0	
Storage Blk Time (%)						2	23		3		12	37
Queuing Penalty (veh)						14	62		1		48	2

Intersection: 1: Brock Road & Finch Avenue

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (m)	94.1	91.1	34.1
Average Queue (m)	56.6	51.7	5.1
95th Queue (m)	87.4	80.3	20.2
Link Distance (m)	349.0	349.0	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			100.0
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Brock Road & Usman Road

Movement	WB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	TR	UL	T	T
Maximum Queue (m)	11.2	14.5	10.3	15.3	91.9	81.9	48.0
Average Queue (m)	0.4	0.7	0.5	1.7	47.1	15.1	2.8
95th Queue (m)	4.4	6.3	4.8	8.0	105.8	78.9	34.0
Link Distance (m)	94.6	349.0	349.0	349.0		205.6	205.6
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)					60.0		
Storage Blk Time (%)					25	0	
Queuing Penalty (veh)					120	0	

Intersection: 3: Brock Road & Major Oaks Road/Usman Road

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	L	TR	L	T	T	TR	L	T	T	TR
Maximum Queue (m)	37.4	35.9	65.2	63.4	115.3	147.7	144.2	128.0	61.4	90.7	67.8	72.1
Average Queue (m)	11.8	19.5	35.9	12.9	49.2	63.5	69.5	69.3	25.8	55.8	39.1	29.9
95th Queue (m)	28.7	32.4	58.2	40.4	91.7	118.5	123.3	119.6	51.4	86.1	68.2	55.9
Link Distance (m)	275.9			97.5		205.6	205.6	205.6		170.1	170.1	170.1
Upstream Blk Time (%)				0								
Queuing Penalty (veh)				0								
Storage Bay Dist (m)		30.0	20.0		72.0				60.0			
Storage Blk Time (%)	1	2	45	4	5	4			2	6		
Queuing Penalty (veh)	2	1	19	8	42	13			8	3		

Network Summary

Network wide Queuing Penalty: 343

Intersection: 1: Brock Road & Finch Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	L	T	T	T	R	L	T
Maximum Queue (m)	169.6	14.8	33.0	14.0	20.4	82.9	119.5	107.9	106.1	12.8	11.0	88.3
Average Queue (m)	86.4	1.3	7.5	1.7	2.7	46.6	88.0	71.9	55.1	1.5	0.7	41.2
95th Queue (m)	147.2	7.3	25.8	7.8	11.8	91.7	132.3	108.7	88.2	7.9	5.7	69.7
Link Distance (m)	399.8	399.8		305.8	305.8		110.0	110.0	110.0			349.0
Upstream Blk Time (%)							4	1	0			
Queuing Penalty (veh)							0	0	0			
Storage Bay Dist (m)			90.0			63.0				90.0	13.0	
Storage Blk Time (%)						2	13		1		2	34
Queuing Penalty (veh)						11	34		0		9	1

Intersection: 1: Brock Road & Finch Avenue

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (m)	90.7	89.0	34.4
Average Queue (m)	46.2	44.6	4.9
95th Queue (m)	76.4	71.2	20.9
Link Distance (m)	349.0	349.0	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			100.0
Storage Blk Time (%)		0	
Queuing Penalty (veh)		0	

Intersection: 2: Brock Road & Usman Road

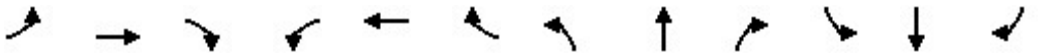
Movement	WB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	TR	L	T	T
Maximum Queue (m)	19.2	4.4	16.0	15.1	107.4	116.3	54.2
Average Queue (m)	3.8	0.2	1.0	2.4	58.1	10.3	2.6
95th Queue (m)	15.5	2.2	7.9	9.5	111.2	61.2	33.3
Link Distance (m)	94.6	349.0	349.0	349.0		205.6	205.6
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)					60.0		
Storage Blk Time (%)					30	0	
Queuing Penalty (veh)					126	0	

Intersection: 3: Brock Road & Major Oaks Road/Usman Road

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	L	TR	UL	T	T	TR	L	T	T	TR
Maximum Queue (m)	49.6	37.1	55.8	45.8	86.1	118.1	142.3	123.7	32.6	93.1	79.1	49.1
Average Queue (m)	14.0	23.8	33.1	18.1	45.7	54.0	60.7	60.2	17.8	58.3	41.1	25.3
95th Queue (m)	33.4	37.8	53.0	36.9	72.8	100.7	113.0	109.4	30.7	89.0	72.5	45.4
Link Distance (m)	275.9			97.5		205.6	205.6	205.6		170.1	170.1	170.1
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)		30.0	20.0		72.0				60.0			
Storage Blk Time (%)	1	5	36	10	1	3				7		
Queuing Penalty (veh)	2	2	28	18	5	9				6		

Network Summary

Network wide Queuing Penalty: 250



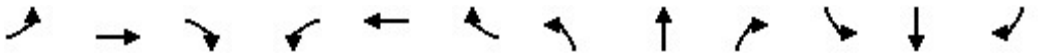
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	189	4	273	23	5	6	145	880	4	1	2278	239
Future Volume (vph)	189	4	273	23	5	6	145	880	4	1	2278	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.3	3.5	3.5	3.3	3.5	3.5
Storage Length (m)	0.0		90.0	0.0		0.0	63.0		90.0	13.0		100.0
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (m)	0.0			0.0			20.0			41.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	*0.80	1.00	*0.80	*0.80
Ped Bike Factor	1.00		0.99	1.00	0.99				0.97	1.00		0.96
Frt			0.850		0.912				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1700	1413	1551	1608	1271	0	1631	3887	961	872	4295	1217
Flt Permitted	0.750			0.755			0.067			0.250		
Satd. Flow (perm)	1340	1413	1528	1274	1271	0	115	3887	934	229	4295	1164
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			108		7				37			260
Link Speed (k/h)		60			40			60			60	
Link Distance (m)		416.8			328.7			124.4			367.1	
Travel Time (s)		25.0			29.6			7.5			22.0	
Confl. Peds. (#/hr)	1		2	2		1	9		3	3		9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	7%	16%	33%	100%	5%	5%
Adj. Flow (vph)	205	4	297	25	5	7	158	957	4	1	2476	260
Shared Lane Traffic (%)												
Lane Group Flow (vph)	205	4	297	25	12	0	158	957	4	1	2476	260
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.04	1.01	1.01	1.04	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	4	4	4	8	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		5.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0		9.0	28.0	28.0	28.0	28.0	28.0
Total Split (s)	29.0	29.0	29.0	29.0	29.0		9.0	71.0	71.0	62.0	62.0	62.0
Total Split (%)	29.0%	29.0%	29.0%	29.0%	29.0%		9.0%	71.0%	71.0%	62.0%	62.0%	62.0%
Maximum Green (s)	22.6	22.6	22.6	22.6	22.6		6.0	64.8	64.8	55.8	55.8	55.8
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2		3.0	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2		0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4		3.0	6.2	6.2	6.2	6.2	6.2
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
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
Recall Mode	None	None	None	None	None		None	C-Max	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	16.0	16.0	16.0	16.0	16.0			14.0	14.0	14.0	14.0	14.0
Flash Dont Walk (s)	5.0	5.0	5.0	5.0	5.0			5.0	5.0	5.0	5.0	5.0
Pedestrian Calls (#/hr)	0	0	0	0	0			0	0	0	0	0
Act Effct Green (s)	19.2	19.2	19.2	19.2	19.2		71.4	68.2	68.2	57.2	57.2	57.2
Actuated g/C Ratio	0.19	0.19	0.19	0.19	0.19		0.71	0.68	0.68	0.57	0.57	0.57
v/c Ratio	0.80	0.01	0.78	0.10	0.05		0.77	0.36	0.01	0.01	1.01	0.34
Control Delay	60.9	30.5	38.7	32.5	22.1		45.4	7.6	0.0	10.0	43.0	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.9	30.5	38.7	32.5	22.1		45.4	7.6	0.0	10.0	43.0	2.6
LOS	E	C	D	C	C		D	A	A	A	D	A
Approach Delay		47.6			29.1			12.9			39.2	
Approach LOS		D			C			B			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 2 (2%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.01			
Intersection Signal Delay: 33.4		Intersection LOS: C	
Intersection Capacity Utilization 83.7%		ICU Level of Service E	
Analysis Period (min) 15			
* User Entered Value			

Splits and Phases: 1: Brock Road & Finch Avenue





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	189	4	273	23	5	6	145	880	4	1	2278	239
Future Volume (vph)	189	4	273	23	5	6	145	880	4	1	2278	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.3	3.5	3.5	3.3	3.5	3.5
Total Lost time (s)	6.4	6.4	6.4	6.4	6.4		3.0	6.2	6.2	6.2	6.2	6.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	*0.80	*0.80	1.00	*0.80	*0.80
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00	0.97	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1698	1413	1528	1603	1272		1631	3887	934	871	4295	1164
Flt Permitted	0.75	1.00	1.00	0.76	1.00		0.07	1.00	1.00	0.25	1.00	1.00
Satd. Flow (perm)	1340	1413	1528	1275	1272		114	3887	934	229	4295	1164
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	205	4	297	25	5	7	158	957	4	1	2476	260
RTOR Reduction (vph)	0	0	87	0	6	0	0	0	1	0	0	112
Lane Group Flow (vph)	205	4	210	25	6	0	158	957	3	1	2476	148
Confl. Peds. (#/hr)	1		2	2		1	9		3	3		9
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	7%	16%	33%	100%	5%	5%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	19.2	19.2	19.2	19.2	19.2		68.2	68.2	68.2	57.1	57.1	57.1
Effective Green, g (s)	19.2	19.2	19.2	19.2	19.2		68.2	68.2	68.2	57.1	57.1	57.1
Actuated g/C Ratio	0.19	0.19	0.19	0.19	0.19		0.68	0.68	0.68	0.57	0.57	0.57
Clearance Time (s)	6.4	6.4	6.4	6.4	6.4		3.0	6.2	6.2	6.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	257	271	293	244	244		200	2650	636	130	2452	664
v/s Ratio Prot		0.00			0.00		c0.06	0.25			c0.58	
v/s Ratio Perm	c0.15		0.14	0.02			0.47		0.00	0.00		0.13
v/c Ratio	0.80	0.01	0.72	0.10	0.03		0.79	0.36	0.00	0.01	1.01	0.22
Uniform Delay, d1	38.5	32.7	37.8	33.3	32.8		28.4	6.7	5.1	9.2	21.4	10.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.7	0.0	8.1	0.2	0.0		18.8	0.4	0.0	0.1	20.6	0.8
Delay (s)	54.2	32.8	45.9	33.5	32.9		47.2	7.1	5.1	9.3	42.0	11.3
Level of Service	D	C	D	C	C		D	A	A	A	D	B
Approach Delay (s)		49.2			33.3			12.8			39.1	
Approach LOS		D			C			B			D	

Intersection Summary			
HCM 2000 Control Delay	33.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	83.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	0	40	1011	113	1	78	2523
Future Volume (vph)	0	40	1011	113	1	78	2523
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.5	3.5	3.3	3.3	3.5
Storage Length (m)	0.0	0.0		38.0		60.0	
Storage Lanes	0	1		0		1	
Taper Length (m)	0.0					75.0	
Lane Util. Factor	1.00	1.00	*0.80	0.91	0.91	1.00	*0.80
Ped Bike Factor							
Frt		0.865	0.985				
Flt Protected						0.950	
Satd. Flow (prot)	0	1644	3920	0	0	1647	4295
Flt Permitted						0.950	
Satd. Flow (perm)	0	1644	3920	0	0	1647	4295
Link Speed (k/h)	40		60				60
Link Distance (m)	66.7		367.1				224.5
Travel Time (s)	6.0		22.0				13.5
Confl. Peds. (#/hr)				4		4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	14%	7%	0%	6%	5%
Adj. Flow (vph)	0	43	1099	123	1	85	2742
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	43	1222	0	0	86	2742
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	R NA	Left	Left
Median Width(m)	0.0		3.3				3.3
Link Offset(m)	0.0		0.0				0.0
Crosswalk Width(m)	4.8		4.8				4.8
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.01	1.01	1.04	1.04	1.01
Turning Speed (k/h)	25	15		15	15	25	
Sign Control	Stop		Free				Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 52.1%		ICU Level of Service A	
Analysis Period (min) 15			

* User Entered Value



Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	0	40	1011	113	1	78	2523
Future Volume (Veh/h)	0	40	1011	113	1	78	2523
Sign Control	Stop		Free				Free
Grade	0%		0%				0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	43	1099	123	0	85	2742
Pedestrians	4						
Lane Width (m)	3.6						
Walking Speed (m/s)	1.2						
Percent Blockage	0						
Right turn flare (veh)							
Median type			None				None
Median storage veh)							
Upstream signal (m)			367				225
pX, platoon unblocked	0.53	0.98			0.00	0.98	
vC, conflicting volume	2248	432			0	1226	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	60	361			0	1169	
tC, single (s)	6.8	6.9			0.0	4.2	
tC, 2 stage (s)							
tF (s)	3.5	3.3			0.0	2.3	
p0 queue free %	100	93			0	85	
cM capacity (veh/h)	426	628			0	559	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4
Volume Total	43	440	440	343	85	914	914	914
Volume Left	0	0	0	0	85	0	0	0
Volume Right	43	0	0	123	0	0	0	0
cSH	628	1700	1700	1700	559	1700	1700	1700
Volume to Capacity	0.07	0.26	0.26	0.20	0.15	0.54	0.54	0.54
Queue Length 95th (m)	1.8	0.0	0.0	0.0	4.3	0.0	0.0	0.0
Control Delay (s)	11.2	0.0	0.0	0.0	12.6	0.0	0.0	0.0
Lane LOS	B				B			
Approach Delay (s)	11.2	0.0			0.4			
Approach LOS	B							

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		

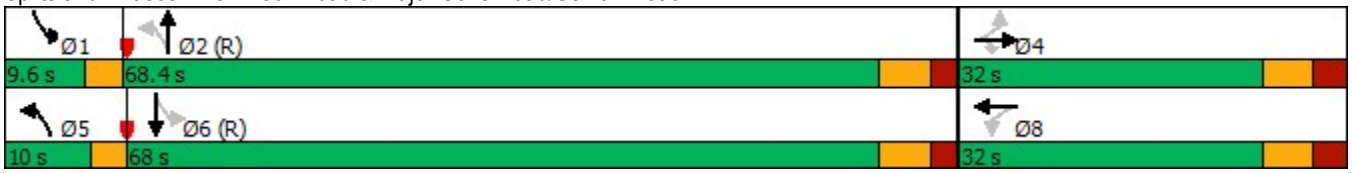
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	5	295	238	12	9	140	910	11	18	2076	21
Future Volume (vph)	43	5	295	238	12	9	140	910	11	18	2076	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.7	3.7	3.3	3.5	3.5	3.3	3.5	3.5
Storage Length (m)	0.0		30.0	20.0		0.0	72.0		70.0	60.0		0.0
Storage Lanes	0		1	1		0	1		0	1		0
Taper Length (m)	0.0			48.0			72.0			92.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	*0.80	1.00	*0.80	*0.80
Ped Bike Factor		0.99	0.99	1.00	0.99			1.00		1.00	1.00	
Frt			0.850		0.935			0.998			0.998	
Flt Protected		0.957		0.950			0.950			0.950		
Satd. Flow (prot)	0	1668	1536	1733	1517	0	1646	3881	0	1745	4279	0
Flt Permitted		0.743		0.723			0.061			0.232		
Satd. Flow (perm)	0	1286	1515	1317	1517	0	106	3881	0	426	4279	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109		10			2			2	
Link Speed (k/h)		50			40			60			60	
Link Distance (m)		292.9			123.2			224.5			180.3	
Travel Time (s)		21.1			11.1			13.5			10.8	
Confl. Peds. (#/hr)	6		1	1		6	3		1	1		3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	25%	4%	3%	20%	14%	6%	16%	11%	0%	5%	18%
Adj. Flow (vph)	47	5	321	259	13	10	152	989	12	20	2257	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	52	321	259	23	0	152	1001	0	20	2280	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	0.99	0.99	1.04	1.01	1.01	1.04	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	1	1	1	1		1	0		1	0	
Detector Template	Left											
Leading Detector (m)	2.0	12.0	12.0	12.0	12.0		24.0	0.0		24.0	0.0	
Trailing Detector (m)	0.0	-3.0	-3.0	-3.0	-3.0		14.0	0.0		14.0	0.0	
Detector 1 Position(m)	0.0	-3.0	-3.0	-3.0	-3.0		14.0	0.0		14.0	0.0	
Detector 1 Size(m)	2.0	15.0	15.0	15.0	15.0		10.0	0.6		10.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	8	8		5	2		1	6	

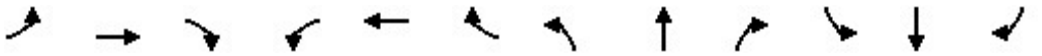
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		5.0	20.0		5.0	20.0	
Minimum Split (s)	32.0	32.0	32.0	32.0	32.0		8.0	29.0		9.5	29.0	
Total Split (s)	32.0	32.0	32.0	32.0	32.0		10.0	68.4		9.6	68.0	
Total Split (%)	29.1%	29.1%	29.1%	29.1%	29.1%		9.1%	62.2%		8.7%	61.8%	
Maximum Green (s)	25.0	25.0	25.0	25.0	25.0		7.0	62.0		6.6	61.6	
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1		3.0	4.2		3.0	4.2	
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9		0.0	2.2		0.0	2.2	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.0	7.0	7.0	7.0		3.0	6.4		3.0	6.4	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0			14.0			14.0	
Pedestrian Calls (#/hr)	0	0	0	0	0			0			0	
Act Effct Green (s)		23.9	23.9	23.9	23.9		75.5	69.3		71.0	62.4	
Actuated g/C Ratio		0.22	0.22	0.22	0.22		0.69	0.63		0.65	0.57	
v/c Ratio		0.19	0.78	0.91	0.07		0.87	0.41		0.06	0.94	
Control Delay		36.4	40.0	75.3	23.9		65.5	11.5		6.1	31.4	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		36.4	40.0	75.3	23.9		65.5	11.5		6.1	31.4	
LOS		D	D	E	C		E	B		A	C	
Approach Delay		39.5			71.1			18.6			31.2	
Approach LOS		D			E			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 31.2		Intersection LOS: C	
Intersection Capacity Utilization 90.6%		ICU Level of Service E	
Analysis Period (min) 15			

* User Entered Value

Splits and Phases: 3: Brock Road & Major Oaks Road/Usman Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	5	295	238	12	9	140	910	11	18	2076	21
Future Volume (vph)	43	5	295	238	12	9	140	910	11	18	2076	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.7	3.7	3.3	3.5	3.5	3.3	3.5	3.5
Total Lost time (s)		7.0	7.0	7.0	7.0		3.0	6.4		3.0	6.4	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	*0.80		1.00	*0.80	
Frpb, ped/bikes		1.00	0.99	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	0.93		1.00	1.00		1.00	1.00	
Flt Protected		0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1656	1515	1731	1517		1646	3881		1745	4282	
Flt Permitted		0.74	1.00	0.72	1.00		0.06	1.00		0.23	1.00	
Satd. Flow (perm)		1285	1515	1317	1517		106	3881		426	4282	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	5	321	259	13	10	152	989	12	20	2257	23
RTOR Reduction (vph)	0	0	85	0	8	0	0	1	0	0	1	0
Lane Group Flow (vph)	0	52	236	259	15	0	152	1000	0	20	2279	0
Confl. Peds. (#/hr)	6		1	1		6	3		1	1		3
Heavy Vehicles (%)	6%	25%	4%	3%	20%	14%	6%	16%	11%	0%	5%	18%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		23.9	23.9	23.9	23.9		72.7	67.5		64.7	62.5	
Effective Green, g (s)		23.9	23.9	23.9	23.9		72.7	67.5		64.7	62.5	
Actuated g/C Ratio		0.22	0.22	0.22	0.22		0.66	0.61		0.59	0.57	
Clearance Time (s)		7.0	7.0	7.0	7.0		3.0	6.4		3.0	6.4	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		279	329	286	329		170	2381		276	2432	
v/s Ratio Prot					0.01		c0.06	0.26		0.00	c0.53	
v/s Ratio Perm		0.04	0.16	c0.20			0.53			0.04		
v/c Ratio		0.19	0.72	0.91	0.05		0.89	0.42		0.07	0.94	
Uniform Delay, d1		35.1	39.9	42.0	34.0		30.8	11.1		9.4	21.9	
Progression Factor		1.00	1.00	0.98	1.01		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3	7.2	29.6	0.1		40.0	0.5		0.1	8.5	
Delay (s)		35.4	47.2	70.8	34.4		70.8	11.6		9.6	30.4	
Level of Service		D	D	E	C		E	B		A	C	
Approach Delay (s)		45.5			67.8			19.4			30.2	
Approach LOS		D			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	31.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	90.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	131	29	0	21	28	64
Future Volume (vph)	131	29	0	21	28	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.975				0.905	
Flt Protected					0.985	
Satd. Flow (prot)	1816	0	0	1863	1660	0
Flt Permitted					0.985	
Satd. Flow (perm)	1816	0	0	1863	1660	0
Link Speed (k/h)	40			40	50	
Link Distance (m)	66.7			53.1	34.4	
Travel Time (s)	6.0			4.8	2.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	142	32	0	23	30	70
Shared Lane Traffic (%)						
Lane Group Flow (vph)	174	0	0	23	100	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 20.8%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	131	29	0	21	28	64
Future Volume (Veh/h)	131	29	0	21	28	64
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	142	32	0	23	30	70
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				396		
pX, platoon unblocked						
vC, conflicting volume			174		181	158
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			174		181	158
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		96	92
cM capacity (veh/h)			1403		808	887

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	174	23	100
Volume Left	0	0	30
Volume Right	32	0	70
cSH	1700	1403	862
Volume to Capacity	0.10	0.00	0.12
Queue Length 95th (m)	0.0	0.0	3.1
Control Delay (s)	0.0	0.0	9.7
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.7
Approach LOS			A

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	20.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	495	18	291	17	5	9	1	274	2189	24	6	1216
Future Volume (vph)	495	18	291	17	5	9	1	274	2189	24	6	1216
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.3	3.5	3.5	3.3	3.5
Storage Length (m)	0.0		90.0	0.0		0.0		63.0		90.0	13.0	
Storage Lanes	1		1	1		0		1		1	1	
Taper Length (m)	0.0			0.0				20.0			41.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	*0.80	1.00	1.00	*0.80
Ped Bike Factor	1.00		0.99	1.00	0.99					0.97		
Frt			0.850		0.900					0.850		
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	1700	1413	1551	1608	1241	0	0	1631	3887	1201	872	4295
Flt Permitted	0.748			0.744				0.098			0.106	
Satd. Flow (perm)	1337	1413	1528	1256	1241	0	0	168	3887	1167	97	4295
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			283		2					37		
Link Speed (k/h)		60			40				60			60
Link Distance (m)		416.8			328.7				124.4			367.1
Travel Time (s)		25.0			29.6				7.5			22.0
Confl. Peds. (#/hr)	1		2	2		1		9		3	3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	0%	7%	16%	33%	100%	5%
Adj. Flow (vph)	538	20	316	18	5	10	1	298	2379	26	7	1322
Shared Lane Traffic (%)												
Lane Group Flow (vph)	538	20	316	18	15	0	0	299	2379	26	7	1322
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	Left	Left
Median Width(m)		3.5			3.5				3.3			3.3
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		4.8			4.8				4.8			4.8
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.00	1.04	1.01	1.01	1.04	1.01
Turning Speed (k/h)	25		15	25		15	15	25		15	25	
Number of Detectors	1	2	1	1	2		0	1	2	1	1	2
Detector Template	Left	Thru	Right	Left	Thru			Left	Thru	Right	Left	Thru
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		0.0	2.0	10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		0.0	2.0	0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4				9.4			9.4
Detector 2 Size(m)		0.6			0.6				0.6			0.6
Detector 2 Type		Cl+Ex			Cl+Ex				Cl+Ex			Cl+Ex
Detector 2 Channel												

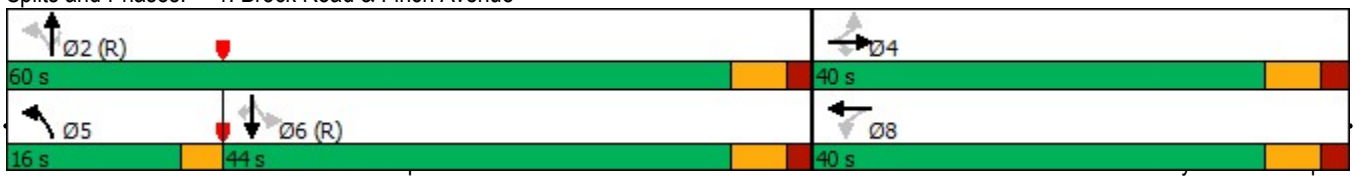


Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	225
Future Volume (vph)	225
Ideal Flow (vphpl)	1900
Lane Width (m)	3.5
Storage Length (m)	100.0
Storage Lanes	1
Taper Length (m)	
Lane Util. Factor	1.00
Ped Bike Factor	0.96
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1521
Flt Permitted	
Satd. Flow (perm)	1455
Right Turn on Red	Yes
Satd. Flow (RTOR)	245
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	9
Peak Hour Factor	0.92
Heavy Vehicles (%)	5%
Adj. Flow (vph)	245
Shared Lane Traffic (%)	
Lane Group Flow (vph)	245
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	1.01
Turning Speed (k/h)	15
Number of Detectors	1
Detector Template	Right
Leading Detector (m)	2.0
Trailing Detector (m)	0.0
Detector 1 Position(m)	0.0
Detector 1 Size(m)	2.0
Detector 1 Type	Cl+Ex
Detector 1 Channel	
Detector 1 Extend (s)	0.0
Detector 1 Queue (s)	0.0
Detector 1 Delay (s)	0.0
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Detector 2 Extend (s)		0.0			0.0				0.0			0.0
Turn Type	Perm	NA	Perm	Perm	NA			pm+pt	NA	Perm	Perm	NA
Protected Phases		4			8			5	2			6
Permitted Phases	4		4	8				2		2	6	
Detector Phase	4	4	4	8	8			5	2	2	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0			5.0	20.0	20.0	20.0	20.0
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0			9.0	28.0	28.0	28.0	28.0
Total Split (s)	40.0	40.0	40.0	40.0	40.0			16.0	60.0	60.0	44.0	44.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	40.0%			16.0%	60.0%	60.0%	44.0%	44.0%
Maximum Green (s)	33.6	33.6	33.6	33.6	33.6			13.0	53.8	53.8	37.8	37.8
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2			3.0	4.2	4.2	4.2	4.2
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2			0.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4			3.0	6.2	6.2	6.2	6.2
Lead/Lag								Lead			Lag	Lag
Lead-Lag Optimize?								Yes			Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None			None	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	16.0	16.0	16.0	16.0	16.0				14.0	14.0	14.0	14.0
Flash Dont Walk (s)	5.0	5.0	5.0	5.0	5.0				5.0	5.0	5.0	5.0
Pedestrian Calls (#/hr)	0	0	0	0	0				0	0	0	0
Act Effct Green (s)	33.6	33.6	33.6	33.6	33.6			57.0	53.8	53.8	37.8	37.8
Actuated g/C Ratio	0.34	0.34	0.34	0.34	0.34			0.57	0.54	0.54	0.38	0.38
v/c Ratio	1.20	0.04	0.45	0.04	0.04			1.05	1.14	0.04	0.19	0.81
Control Delay	140.8	22.8	6.6	22.9	20.8			93.5	92.7	2.6	36.5	32.9
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Delay	140.8	22.8	6.6	22.9	20.8			93.5	92.7	2.6	36.5	32.9
LOS	F	C	A	C	C			F	F	A	D	C
Approach Delay		89.6			21.9				91.9			28.5
Approach LOS		F			C				F			C

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.20			
Intersection Signal Delay: 71.8		Intersection LOS: E	
Intersection Capacity Utilization 108.7%		ICU Level of Service G	
Analysis Period (min) 15			
* User Entered Value			

Splits and Phases: 1: Brock Road & Finch Avenue





Lane Group	SBR
Detector 2 Extend (s)	
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	20.0
Minimum Split (s)	28.0
Total Split (s)	44.0
Total Split (%)	44.0%
Maximum Green (s)	37.8
Yellow Time (s)	4.2
All-Red Time (s)	2.0
Lost Time Adjust (s)	0.0
Total Lost Time (s)	6.2
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	C-Max
Walk Time (s)	14.0
Flash Dont Walk (s)	5.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	37.8
Actuated g/C Ratio	0.38
v/c Ratio	0.35
Control Delay	4.3
Queue Delay	0.0
Total Delay	4.3
LOS	A
Approach Delay	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	495	18	291	17	5	9	1	274	2189	24	6	1216
Future Volume (vph)	495	18	291	17	5	9	1	274	2189	24	6	1216
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.3	3.5	3.5	3.3	3.5
Total Lost time (s)	6.4	6.4	6.4	6.4	6.4			3.0	6.2	6.2	6.2	6.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	*0.80	1.00	1.00	*0.80
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99			1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.90			1.00	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1698	1413	1528	1604	1241			1631	3887	1167	872	4295
Flt Permitted	0.75	1.00	1.00	0.74	1.00			0.10	1.00	1.00	0.11	1.00
Satd. Flow (perm)	1336	1413	1528	1256	1241			168	3887	1167	97	4295
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	538	20	316	18	5	10	1	298	2379	26	7	1322
RTOR Reduction (vph)	0	0	188	0	1	0	0	0	0	12	0	0
Lane Group Flow (vph)	538	20	128	18	14	0	0	299	2379	14	7	1322
Confl. Peds. (#/hr)	1		2	2		1		9		3	3	
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	0%	7%	16%	33%	100%	5%
Turn Type	Perm	NA	Perm	Perm	NA			pm+pt	NA	Perm	Perm	NA
Protected Phases		4			8			5	2			6
Permitted Phases	4		4	8				2		2	6	
Actuated Green, G (s)	33.6	33.6	33.6	33.6	33.6			53.8	53.8	53.8	37.8	37.8
Effective Green, g (s)	33.6	33.6	33.6	33.6	33.6			53.8	53.8	53.8	37.8	37.8
Actuated g/C Ratio	0.34	0.34	0.34	0.34	0.34			0.54	0.54	0.54	0.38	0.38
Clearance Time (s)	6.4	6.4	6.4	6.4	6.4			3.0	6.2	6.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	448	474	513	422	416			280	2091	627	36	1623
v/s Ratio Prot		0.01			0.01			0.14	c0.61			0.31
v/s Ratio Perm	c0.40		0.08	0.01				0.43		0.01	0.07	
v/c Ratio	1.20	0.04	0.25	0.04	0.03			1.07	1.14	0.02	0.19	0.81
Uniform Delay, d1	33.2	22.4	24.1	22.4	22.3			28.5	23.1	10.8	20.9	27.9
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	110.1	0.0	0.3	0.0	0.0			72.9	68.4	0.1	11.7	4.6
Delay (s)	143.3	22.4	24.3	22.4	22.3			101.4	91.5	10.9	32.6	32.6
Level of Service	F	C	C	C	C			F	F	B	C	C
Approach Delay (s)		97.5			22.4				91.8			30.8
Approach LOS		F			C				F			C

Intersection Summary			
HCM 2000 Control Delay	73.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	108.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	225
Future Volume (vph)	225
Ideal Flow (vphpl)	1900
Lane Width	3.5
Total Lost time (s)	6.2
Lane Util. Factor	1.00
Frpb, ped/bikes	0.96
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1455
Flt Permitted	1.00
Satd. Flow (perm)	1455
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	245
RTOR Reduction (vph)	152
Lane Group Flow (vph)	93
Confl. Peds. (#/hr)	9
Heavy Vehicles (%)	5%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	37.8
Effective Green, g (s)	37.8
Actuated g/C Ratio	0.38
Clearance Time (s)	6.2
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	549
v/s Ratio Prot	
v/s Ratio Perm	0.06
v/c Ratio	0.17
Uniform Delay, d1	20.7
Progression Factor	1.00
Incremental Delay, d2	0.7
Delay (s)	21.3
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	0	52	2499	241	1	142	1465
Future Volume (vph)	0	52	2499	241	1	142	1465
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.5	3.5	3.3	3.3	3.5
Storage Length (m)	0.0	0.0		38.0		60.0	
Storage Lanes	0	1		0		1	
Taper Length (m)	0.0					75.0	
Lane Util. Factor	1.00	1.00	*0.80	*0.80	0.91	1.00	*0.80
Ped Bike Factor							
Frt		0.865	0.987				
Flt Protected						0.950	
Satd. Flow (prot)	0	1644	3925	0	0	1647	4295
Flt Permitted						0.950	
Satd. Flow (perm)	0	1644	3925	0	0	1647	4295
Link Speed (k/h)	40		60				60
Link Distance (m)	70.5		367.1				224.5
Travel Time (s)	6.3		22.0				13.5
Confl. Peds. (#/hr)				4		4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	14%	7%	0%	6%	5%
Adj. Flow (vph)	0	57	2716	262	1	154	1592
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	57	2978	0	0	155	1592
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	R NA	Left	Left
Median Width(m)	0.0		3.3				3.3
Link Offset(m)	0.0		0.0				0.0
Crosswalk Width(m)	4.8		4.8				4.8
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.01	1.01	1.04	1.04	1.01
Turning Speed (k/h)	25	15		15	15	25	
Sign Control	Stop		Free				Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 74.9%		ICU Level of Service D	
Analysis Period (min) 15			

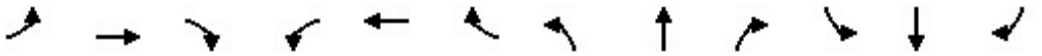
* User Entered Value



Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	0	52	2499	241	1	142	1465
Future Volume (Veh/h)	0	52	2499	241	1	142	1465
Sign Control	Stop		Free				Free
Grade	0%		0%				0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	57	2716	262	0	154	1592
Pedestrians	4						
Lane Width (m)	3.6						
Walking Speed (m/s)	1.2						
Percent Blockage	0						
Right turn flare (veh)							
Median type			None				None
Median storage veh)							
Upstream signal (m)			367				225
pX, platoon unblocked	0.63	0.54			0.00	0.54	
vC, conflicting volume	3690	1040			0	2982	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1233	0			0	1675	
tC, single (s)	6.8	6.9			0.0	4.2	
tC, 2 stage (s)							
tF (s)	3.5	3.3			0.0	2.3	
p0 queue free %	100	90			0	20	
cM capacity (veh/h)	22	584			0	193	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4
Volume Total	57	1086	1086	805	154	531	531	531
Volume Left	0	0	0	0	154	0	0	0
Volume Right	57	0	0	262	0	0	0	0
cSH	584	1700	1700	1700	193	1700	1700	1700
Volume to Capacity	0.10	0.64	0.64	0.47	0.80	0.31	0.31	0.31
Queue Length 95th (m)	2.6	0.0	0.0	0.0	44.2	0.0	0.0	0.0
Control Delay (s)	11.8	0.0	0.0	0.0	71.3	0.0	0.0	0.0
Lane LOS	B				F			
Approach Delay (s)	11.8	0.0			6.3			
Approach LOS	B							

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		



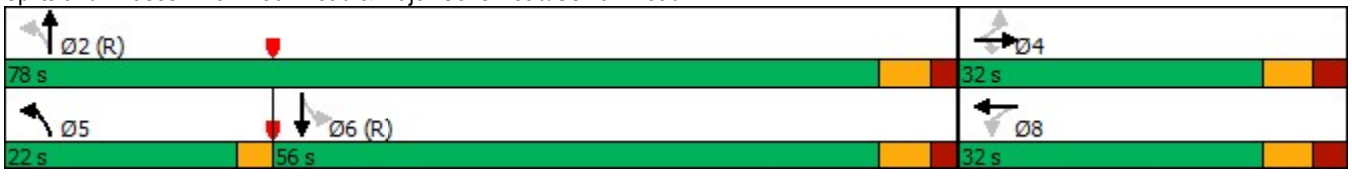
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	12	218	230	21	20	338	2314	30	57	1134	38
Future Volume (vph)	24	12	218	230	21	20	338	2314	30	57	1134	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.7	3.7	3.3	3.5	3.5	3.3	3.5	3.5
Storage Length (m)	0.0		30.0	20.0		0.0	72.0		70.0	60.0		0.0
Storage Lanes	0		1	1		0	1		0	1		0
Taper Length (m)	0.0			48.0			72.0			92.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	*0.80	1.00	*0.80	*0.80
Ped Bike Factor		1.00	0.99	1.00	0.99			1.00			1.00	
Frt			0.850		0.927			0.998			0.995	
Flt Protected		0.968		0.950			0.950			0.950		
Satd. Flow (prot)	0	1619	1536	1733	1507	0	1646	3881	0	1745	4252	0
Flt Permitted		0.812		0.732			0.103			0.079		
Satd. Flow (perm)	0	1351	1515	1334	1507	0	178	3881	0	145	4252	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			237		5			3			5	
Link Speed (k/h)		50			40			60			60	
Link Distance (m)		292.9			123.2			224.5			180.3	
Travel Time (s)		21.1			11.1			13.5			10.8	
Confl. Peds. (#/hr)	6		1	1		6	3		1	1		3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	25%	4%	3%	20%	14%	6%	16%	11%	0%	5%	18%
Adj. Flow (vph)	26	13	237	250	23	22	367	2515	33	62	1233	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	39	237	250	45	0	367	2548	0	62	1274	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	0.99	0.99	1.04	1.01	1.01	1.04	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	1	1	1	1		1	0		1	0	
Detector Template	Left											
Leading Detector (m)	2.0	12.0	12.0	12.0	12.0		24.0	0.0		24.0	0.0	
Trailing Detector (m)	0.0	-3.0	-3.0	-3.0	-3.0		14.0	0.0		14.0	0.0	
Detector 1 Position(m)	0.0	-3.0	-3.0	-3.0	-3.0		14.0	0.0		14.0	0.0	
Detector 1 Size(m)	2.0	15.0	15.0	15.0	15.0		10.0	0.6		10.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	8	8		5	2		6	6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	4.0	4.0		5.0	20.0		20.0	20.0	
Minimum Split (s)	32.0	32.0	32.0	32.0	32.0		8.0	29.0		29.0	29.0	
Total Split (s)	32.0	32.0	32.0	32.0	32.0		22.0	78.0		56.0	56.0	
Total Split (%)	29.1%	29.1%	29.1%	29.1%	29.1%		20.0%	70.9%		50.9%	50.9%	
Maximum Green (s)	25.0	25.0	25.0	25.0	25.0		19.0	71.6		49.6	49.6	
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1		3.0	4.2		4.2	4.2	
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9		0.0	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.0	7.0	7.0	7.0		3.0	6.4		6.4	6.4	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0			14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0	0	0	0			0		0	0	
Act Effct Green (s)		23.3	23.3	23.3	23.3		76.7	73.3		50.6	50.6	
Actuated g/C Ratio		0.21	0.21	0.21	0.21		0.70	0.67		0.46	0.46	
v/c Ratio		0.14	0.47	0.88	0.14		0.95	0.99		0.94	0.65	
Control Delay		35.5	7.8	69.7	30.2		63.2	33.6		129.8	25.0	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		35.5	7.8	69.7	30.2		63.2	33.6		129.8	25.0	
LOS		D	A	E	C		E	C		F	C	
Approach Delay		11.7			63.7			37.3			29.8	
Approach LOS		B			E			D			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 35.4		Intersection LOS: D	
Intersection Capacity Utilization 98.2%		ICU Level of Service F	
Analysis Period (min) 15			

* User Entered Value

Splits and Phases: 3: Brock Road & Major Oaks Road/Usman Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	12	218	230	21	20	338	2314	30	57	1134	38
Future Volume (vph)	24	12	218	230	21	20	338	2314	30	57	1134	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.7	3.7	3.3	3.5	3.5	3.3	3.5	3.5
Total Lost time (s)		7.0	7.0	7.0	7.0		3.0	6.4		6.4	6.4	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	*0.80		1.00	*0.80	
Frpb, ped/bikes		1.00	0.99	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	0.93		1.00	1.00		1.00	1.00	
Flt Protected		0.97	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1611	1515	1731	1506		1646	3881		1745	4253	
Flt Permitted		0.81	1.00	0.73	1.00		0.10	1.00		0.08	1.00	
Satd. Flow (perm)		1351	1515	1333	1506		178	3881		145	4253	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	13	237	250	23	22	367	2515	33	62	1233	41
RTOR Reduction (vph)	0	0	187	0	4	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	39	50	250	41	0	367	2547	0	62	1271	0
Confl. Peds. (#/hr)	6		1	1		6	3		1	1		3
Heavy Vehicles (%)	6%	25%	4%	3%	20%	14%	6%	16%	11%	0%	5%	18%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		23.3	23.3	23.3	23.3		73.3	73.3		50.6	50.6	
Effective Green, g (s)		23.3	23.3	23.3	23.3		73.3	73.3		50.6	50.6	
Actuated g/C Ratio		0.21	0.21	0.21	0.21		0.67	0.67		0.46	0.46	
Clearance Time (s)		7.0	7.0	7.0	7.0		3.0	6.4		6.4	6.4	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		286	320	282	318		381	2586		66	1956	
v/s Ratio Prot					0.03		0.17	c0.66			0.30	
v/s Ratio Perm		0.03	0.03	c0.19			0.47			0.43		
v/c Ratio		0.14	0.16	0.89	0.13		0.96	0.98		0.94	0.65	
Uniform Delay, d1		35.2	35.3	42.1	35.1		30.0	17.8		28.2	22.9	
Progression Factor		1.00	1.00	0.92	0.93		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2	0.2	26.3	0.2		36.3	14.5		94.6	1.7	
Delay (s)		35.4	35.6	65.0	33.0		66.3	32.3		122.8	24.6	
Level of Service		D	D	E	C		E	C		F	C	
Approach Delay (s)		35.5			60.1			36.6			29.1	
Approach LOS		D			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	35.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	98.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	240	85	0	53	16	38
Future Volume (vph)	240	85	0	53	16	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.965				0.905	
Flt Protected					0.986	
Satd. Flow (prot)	1798	0	0	1863	1662	0
Flt Permitted					0.986	
Satd. Flow (perm)	1798	0	0	1863	1662	0
Link Speed (k/h)	40			40	50	
Link Distance (m)	70.5			49.3	31.4	
Travel Time (s)	6.3			4.4	2.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	261	92	0	58	17	41
Shared Lane Traffic (%)						
Lane Group Flow (vph)	353	0	0	58	58	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

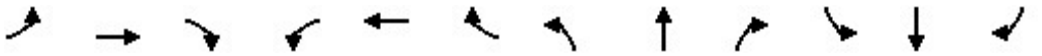
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 27.8%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	240	85	0	53	16	38
Future Volume (Veh/h)	240	85	0	53	16	38
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	261	92	0	58	17	41
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				392		
pX, platoon unblocked						
vC, conflicting volume			353		365	307
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			353		365	307
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	94
cM capacity (veh/h)			1206		635	733

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	353	58	58
Volume Left	0	0	17
Volume Right	92	0	41
cSH	1700	1206	701
Volume to Capacity	0.21	0.00	0.08
Queue Length 95th (m)	0.0	0.0	2.2
Control Delay (s)	0.0	0.0	10.6
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.6
Approach LOS			B

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	27.8%	ICU Level of Service	A
Analysis Period (min)	15		



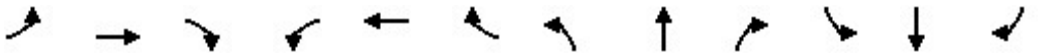
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	403	5	262	7	9	7	256	2112	16	2	1198	244
Future Volume (vph)	403	5	262	7	9	7	256	2112	16	2	1198	244
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.3	3.5	3.5	3.3	3.5	3.5
Storage Length (m)	0.0		90.0	0.0		0.0	63.0		90.0	13.0		100.0
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (m)	0.0			0.0			20.0			41.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	*0.80	1.00	*0.80	*0.80
Ped Bike Factor	1.00		0.99	1.00	0.99				0.97			0.96
Frt			0.850		0.933				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1700	1413	1551	1608	1323	0	1631	3887	961	872	4295	1217
Flt Permitted	0.746			0.754			0.097			0.104		
Satd. Flow (perm)	1333	1413	1528	1273	1323	0	167	3887	934	96	4295	1164
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			294		3				37			274
Link Speed (k/h)		60			40			60			60	
Link Distance (m)		416.8			328.7			124.4			367.1	
Travel Time (s)		25.0			29.6			7.5			22.0	
Confl. Peds. (#/hr)	1		2	2		1	9		3	3		9
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	7%	16%	33%	100%	5%	5%
Adj. Flow (vph)	453	6	294	8	10	8	288	2373	18	2	1346	274
Shared Lane Traffic (%)												
Lane Group Flow (vph)	453	6	294	8	18	0	288	2373	18	2	1346	274
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.04	1.01	1.01	1.04	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	4	4	4	8	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		5.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0		9.0	28.0	28.0	28.0	28.0	28.0
Total Split (s)	37.0	37.0	37.0	37.0	37.0		20.0	63.0	63.0	43.0	43.0	43.0
Total Split (%)	37.0%	37.0%	37.0%	37.0%	37.0%		20.0%	63.0%	63.0%	43.0%	43.0%	43.0%
Maximum Green (s)	30.6	30.6	30.6	30.6	30.6		17.0	56.8	56.8	36.8	36.8	36.8
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2		3.0	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2		0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4		3.0	6.2	6.2	6.2	6.2	6.2
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
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
Recall Mode	None	None	None	None	None		None	C-Max	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	16.0	16.0	16.0	16.0	16.0			14.0	14.0	14.0	14.0	14.0
Flash Dont Walk (s)	5.0	5.0	5.0	5.0	5.0			5.0	5.0	5.0	5.0	5.0
Pedestrian Calls (#/hr)	0	0	0	0	0			0	0	0	0	0
Act Effct Green (s)	30.6	30.6	30.6	30.6	30.6		60.0	56.8	56.8	38.3	38.3	38.3
Actuated g/C Ratio	0.31	0.31	0.31	0.31	0.31		0.60	0.57	0.57	0.38	0.38	0.38
v/c Ratio	1.11	0.01	0.44	0.02	0.04		0.88	1.08	0.03	0.06	0.82	0.45
Control Delay	113.2	24.4	5.4	24.6	22.1		51.0	65.8	1.4	25.0	33.3	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	113.2	24.4	5.4	24.6	22.1		51.0	65.8	1.4	25.0	33.3	5.3
LOS	F	C	A	C	C		D	E	A	C	C	A
Approach Delay		70.4			22.9			63.8			28.5	
Approach LOS		E			C			E			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 40 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.11			
Intersection Signal Delay: 53.3		Intersection LOS: D	
Intersection Capacity Utilization 102.1%		ICU Level of Service G	
Analysis Period (min) 15			
* User Entered Value			

Splits and Phases: 1: Brock Road & Finch Avenue





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	403	5	262	7	9	7	256	2112	16	2	1198	244
Future Volume (vph)	403	5	262	7	9	7	256	2112	16	2	1198	244
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.3	3.5	3.5	3.3	3.5	3.5
Total Lost time (s)	6.4	6.4	6.4	6.4	6.4		3.0	6.2	6.2	6.2	6.2	6.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	*0.80	*0.80	1.00	*0.80	*0.80
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00	0.97	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1698	1413	1528	1604	1324		1631	3887	934	872	4295	1164
Flt Permitted	0.75	1.00	1.00	0.75	1.00		0.10	1.00	1.00	0.10	1.00	1.00
Satd. Flow (perm)	1332	1413	1528	1272	1324		166	3887	934	96	4295	1164
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	453	6	294	8	10	8	288	2373	18	2	1346	274
RTOR Reduction (vph)	0	0	204	0	2	0	0	0	8	0	0	169
Lane Group Flow (vph)	453	6	90	8	16	0	288	2373	10	2	1346	105
Confl. Peds. (#/hr)	1		2	2		1	9		3	3		9
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	7%	16%	33%	100%	5%	5%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	30.6	30.6	30.6	30.6	30.6		56.8	56.8	56.8	38.3	38.3	38.3
Effective Green, g (s)	30.6	30.6	30.6	30.6	30.6		56.8	56.8	56.8	38.3	38.3	38.3
Actuated g/C Ratio	0.31	0.31	0.31	0.31	0.31		0.57	0.57	0.57	0.38	0.38	0.38
Clearance Time (s)	6.4	6.4	6.4	6.4	6.4		3.0	6.2	6.2	6.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	407	432	467	389	405		321	2207	530	36	1644	445
v/s Ratio Prot		0.00			0.01		0.14	c0.61			0.31	
v/s Ratio Perm	c0.34		0.06	0.01			0.37		0.01	0.02		0.09
v/c Ratio	1.11	0.01	0.19	0.02	0.04		0.90	1.08	0.02	0.06	0.82	0.24
Uniform Delay, d1	34.7	24.2	25.6	24.2	24.4		27.4	21.6	9.4	19.4	27.7	20.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	78.9	0.0	0.2	0.0	0.0		25.9	43.0	0.1	2.9	4.7	1.2
Delay (s)	113.6	24.2	25.8	24.3	24.4		53.2	64.6	9.5	22.4	32.4	22.2
Level of Service	F	C	C	C	C		D	E	A	C	C	C
Approach Delay (s)		78.6			24.4			63.0			30.7	
Approach LOS		E			C			E			C	

Intersection Summary			
HCM 2000 Control Delay	54.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	102.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	109	2137	358	181	1293
Future Volume (vph)	0	109	2137	358	181	1293
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.5	3.5	3.3	3.5
Storage Length (m)	0.0	0.0		38.0	60.0	
Storage Lanes	0	1		0	1	
Taper Length (m)	0.0				75.0	
Lane Util. Factor	1.00	1.00	*0.80	0.91	1.00	*0.80
Ped Bike Factor						
Frt		0.865	0.978			
Flt Protected					0.950	
Satd. Flow (prot)	0	1644	3903	0	1646	4295
Flt Permitted					0.950	
Satd. Flow (perm)	0	1644	3903	0	1646	4295
Link Speed (k/h)	40		60			60
Link Distance (m)	74.6		367.1			224.5
Travel Time (s)	6.7		22.0			13.5
Confl. Peds. (#/hr)				4	4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	14%	7%	6%	5%
Adj. Flow (vph)	0	121	2374	398	201	1437
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	121	2772	0	201	1437
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.3			3.3
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.01	1.01	1.04	1.01
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 66.0%		ICU Level of Service C	
Analysis Period (min) 15			

* User Entered Value



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	109	2137	358	181	1293
Future Volume (Veh/h)	0	109	2137	358	181	1293
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	121	2374	398	201	1437
Pedestrians	4					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			367			225
pX, platoon unblocked	0.58	0.51			0.51	
vC, conflicting volume	3458	994			2776	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	944	0			1103	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	100	78			34	
cM capacity (veh/h)	53	552			307	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4
Volume Total	121	950	950	873	201	479	479	479
Volume Left	0	0	0	0	201	0	0	0
Volume Right	121	0	0	398	0	0	0	0
cSH	552	1700	1700	1700	307	1700	1700	1700
Volume to Capacity	0.22	0.56	0.56	0.51	0.66	0.28	0.28	0.28
Queue Length 95th (m)	6.6	0.0	0.0	0.0	34.5	0.0	0.0	0.0
Control Delay (s)	13.3	0.0	0.0	0.0	36.6	0.0	0.0	0.0
Lane LOS	B				E			
Approach Delay (s)	13.3	0.0			4.5			
Approach LOS	B							

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	37	13	274	211	27	52	2	309	2020	27	89	1133
Future Volume (vph)	37	13	274	211	27	52	2	309	2020	27	89	1133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.7	3.7	3.6	3.3	3.5	3.5	3.3	3.5
Storage Length (m)	0.0		30.0	20.0		0.0		72.0		70.0	60.0	
Storage Lanes	0		1	1		0		1		0	1	
Taper Length (m)	0.0			48.0				72.0			92.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	*0.80	*0.80	1.00	*0.80
Ped Bike Factor		0.99	0.99	1.00	0.99				1.00			1.00
Frt			0.850		0.901				0.998			0.997
Flt Protected		0.964		0.950				0.950			0.950	
Satd. Flow (prot)	0	1634	1536	1733	1472	0	0	1647	3881	0	1745	4269
Flt Permitted		0.737		0.719				0.079			0.084	
Satd. Flow (perm)	0	1243	1515	1310	1472	0	0	137	3881	0	154	4269
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			326		62				2			3
Link Speed (k/h)		50			40				60			60
Link Distance (m)		292.9			123.2				224.5			180.3
Travel Time (s)		21.1			11.1				13.5			10.8
Confl. Peds. (#/hr)	6		1	1		6		3		1	1	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	6%	25%	4%	3%	20%	14%	0%	6%	16%	11%	0%	5%
Adj. Flow (vph)	44	15	326	251	32	62	2	368	2405	32	106	1349
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	59	326	251	94	0	0	370	2437	0	106	1375
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	Left	Left
Median Width(m)		3.5			3.5				3.3			3.3
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		4.8			4.8				4.8			4.8
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	0.99	0.99	1.00	1.04	1.01	1.01	1.04	1.01
Turning Speed (k/h)	25		15	25		15	15	25		15	25	
Number of Detectors	1	1	1	1	1		0	1	0		1	0
Detector Template	Left											
Leading Detector (m)	2.0	12.0	12.0	12.0	12.0		0.0	24.0	0.0		24.0	0.0
Trailing Detector (m)	0.0	-3.0	-3.0	-3.0	-3.0		0.0	14.0	0.0		14.0	0.0
Detector 1 Position(m)	0.0	-3.0	-3.0	-3.0	-3.0		0.0	14.0	0.0		14.0	0.0
Detector 1 Size(m)	2.0	15.0	15.0	15.0	15.0		0.0	10.0	0.6		10.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
Turn Type	Perm	NA	Perm	Perm	NA			pm+pt	NA		pm+pt	NA
Protected Phases		4			8			5	2		1	6
Permitted Phases	4		4	8				2			6	
Detector Phase	4	4	4	8	8			5	2		1	6



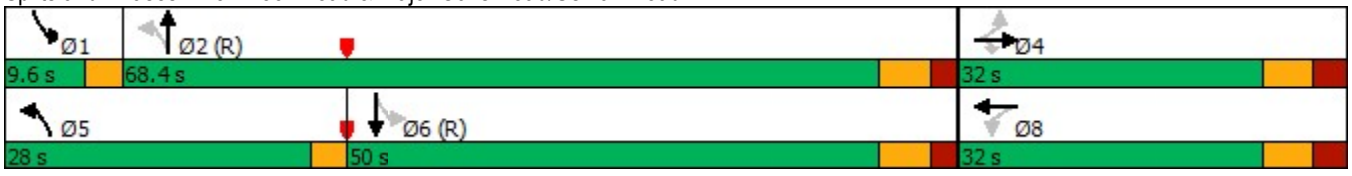
Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	22
Future Volume (vph)	22
Ideal Flow (vphpl)	1900
Lane Width (m)	3.5
Storage Length (m)	0.0
Storage Lanes	0
Taper Length (m)	
Lane Util. Factor	*0.80
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	Yes
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	3
Peak Hour Factor	0.84
Heavy Vehicles (%)	18%
Adj. Flow (vph)	26
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	1.01
Turning Speed (k/h)	15
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	4.0	4.0			5.0	20.0		5.0	20.0
Minimum Split (s)	32.0	32.0	32.0	32.0	32.0			8.0	29.0		9.5	29.0
Total Split (s)	32.0	32.0	32.0	32.0	32.0			28.0	68.4		9.6	50.0
Total Split (%)	29.1%	29.1%	29.1%	29.1%	29.1%			25.5%	62.2%		8.7%	45.5%
Maximum Green (s)	25.0	25.0	25.0	25.0	25.0			25.0	62.0		6.6	43.6
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1			3.0	4.2		3.0	4.2
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9			0.0	2.2		0.0	2.2
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)		7.0	7.0	7.0	7.0			3.0	6.4		3.0	6.4
Lead/Lag								Lead	Lag		Lead	Lag
Lead-Lag Optimize?								Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0		3.0	3.0
Recall Mode	None	None	None	None	None			None	C-Max		None	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0				7.0			7.0
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0				14.0			14.0
Pedestrian Calls (#/hr)	0	0	0	0	0				0			0
Act Effct Green (s)		23.6	23.6	23.6	23.6			76.4	63.7		57.5	47.8
Actuated g/C Ratio		0.21	0.21	0.21	0.21			0.69	0.58		0.52	0.43
v/c Ratio		0.22	0.56	0.89	0.26			0.93	1.08		0.62	0.74
Control Delay		37.3	8.0	74.6	16.9			60.2	70.7		35.6	30.0
Queue Delay		0.0	0.0	0.0	0.0			0.0	0.0		0.0	0.0
Total Delay		37.3	8.0	74.6	16.9			60.2	70.7		35.6	30.0
LOS		D	A	E	B			E	E		D	C
Approach Delay		12.5			58.9				69.3			30.4
Approach LOS		B			E				E			C

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.08			
Intersection Signal Delay: 52.7		Intersection LOS: D	
Intersection Capacity Utilization 90.5%		ICU Level of Service E	
Analysis Period (min) 15			

* User Entered Value

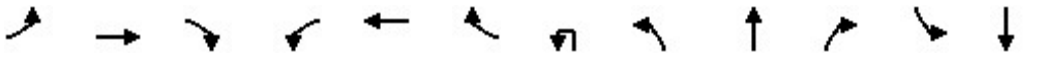
Splits and Phases: 3: Brock Road & Major Oaks Road/Usman Road





Lane Group	SBR
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	37	13	274	211	27	52	2	309	2020	27	89	1133
Future Volume (vph)	37	13	274	211	27	52	2	309	2020	27	89	1133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.7	3.7	3.6	3.3	3.5	3.5	3.3	3.5
Total Lost time (s)		7.0	7.0	7.0	7.0			3.0	6.4		3.0	6.4
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00	*0.80		1.00	*0.80
Frpb, ped/bikes		1.00	0.99	1.00	0.99			1.00	1.00		1.00	1.00
Flpb, ped/bikes		0.99	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frt		1.00	0.85	1.00	0.90			1.00	1.00		1.00	1.00
Flt Protected		0.96	1.00	0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1626	1515	1731	1472			1647	3881		1745	4270
Flt Permitted		0.74	1.00	0.72	1.00			0.08	1.00		0.08	1.00
Satd. Flow (perm)		1243	1515	1309	1472			136	3881		154	4270
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	44	15	326	251	32	62	2	368	2405	32	106	1349
RTOR Reduction (vph)	0	0	256	0	49	0	0	0	1	0	0	2
Lane Group Flow (vph)	0	59	70	251	45	0	0	370	2436	0	106	1373
Confl. Peds. (#/hr)	6		1	1		6		3		1	1	
Heavy Vehicles (%)	6%	25%	4%	3%	20%	14%	0%	6%	16%	11%	0%	5%
Turn Type	Perm	NA	Perm	Perm	NA			pm+pt	NA		pm+pt	NA
Protected Phases		4			8			5	2		1	6
Permitted Phases	4		4	8				2			6	
Actuated Green, G (s)		23.6	23.6	23.6	23.6			73.0	63.7		54.1	47.8
Effective Green, g (s)		23.6	23.6	23.6	23.6			73.0	63.7		54.1	47.8
Actuated g/C Ratio		0.21	0.21	0.21	0.21			0.66	0.58		0.49	0.43
Clearance Time (s)		7.0	7.0	7.0	7.0			3.0	6.4		3.0	6.4
Vehicle Extension (s)		3.0	3.0	3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		266	325	280	315			395	2247		166	1855
v/s Ratio Prot					0.03			c0.19	c0.63		0.04	0.32
v/s Ratio Perm		0.05	0.05	c0.19				0.43			0.28	
v/c Ratio		0.22	0.22	0.90	0.14			0.94	1.08		0.64	0.74
Uniform Delay, d1		35.6	35.6	42.0	35.0			32.9	23.1		22.7	25.9
Progression Factor		1.00	1.00	0.99	1.03			1.00	1.00		1.00	1.00
Incremental Delay, d2		0.4	0.3	28.4	0.2			29.4	46.3		7.8	2.7
Delay (s)		36.1	35.9	70.1	36.4			62.3	69.5		30.5	28.6
Level of Service		D	D	E	D			E	E		C	C
Approach Delay (s)		35.9			60.9				68.5			28.8
Approach LOS		D			E				E			C

Intersection Summary			
HCM 2000 Control Delay	53.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	90.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	22
Future Volume (vph)	22
Ideal Flow (vphpl)	1900
Lane Width	3.5
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.84
Adj. Flow (vph)	26
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	3
Heavy Vehicles (%)	18%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	171	85	0	136	16	38
Future Volume (vph)	171	85	0	136	16	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.955				0.905	
Flt Protected					0.986	
Satd. Flow (prot)	1779	0	0	1863	1662	0
Flt Permitted					0.986	
Satd. Flow (perm)	1779	0	0	1863	1662	0
Link Speed (k/h)	40			40	50	
Link Distance (m)	74.6			45.2	44.9	
Travel Time (s)	6.7			4.1	3.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	186	92	0	148	17	41
Shared Lane Traffic (%)						
Lane Group Flow (vph)	278	0	0	148	58	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 24.2%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	171	85	0	136	16	38
Future Volume (Veh/h)	171	85	0	136	16	38
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	186	92	0	148	17	41
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				388		
pX, platoon unblocked						
vC, conflicting volume			278		380	232
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			278		380	232
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	95
cM capacity (veh/h)			1285		622	807

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	278	148	58
Volume Left	0	0	17
Volume Right	92	0	41
cSH	1700	1285	742
Volume to Capacity	0.16	0.00	0.08
Queue Length 95th (m)	0.0	0.0	2.0
Control Delay (s)	0.0	0.0	10.3
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.3
Approach LOS			B

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	24.2%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Brock Road & Finch Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	L	T	T	T	R	L	T
Maximum Queue (m)	67.0	12.7	45.5	22.4	23.1	48.7	56.0	48.0	36.8	8.4	10.4	113.9
Average Queue (m)	39.3	1.4	17.9	5.6	3.4	22.3	27.7	16.8	8.1	0.4	0.5	63.5
95th Queue (m)	61.0	7.1	42.0	15.8	13.1	41.0	51.4	38.2	21.4	3.5	5.1	107.5
Link Distance (m)	399.8	399.8		305.8	305.8		110.0	110.0	110.0			348.9
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)			90.0			63.0				90.0	13.0	
Storage Blk Time (%)						0	0				0	27
Queuing Penalty (veh)						0	0				1	0

Intersection: 1: Brock Road & Finch Avenue

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (m)	119.3	127.2	27.8
Average Queue (m)	72.3	72.9	3.6
95th Queue (m)	115.5	117.6	16.8
Link Distance (m)	348.9	348.9	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			100.0
Storage Blk Time (%)		3	
Queuing Penalty (veh)		7	

Intersection: 2: Brock Road & Usman Road

Movement	NB	SB	SB
Directions Served	TR	UL	T
Maximum Queue (m)	8.9	27.5	4.1
Average Queue (m)	0.4	11.2	0.1
95th Queue (m)	4.0	21.7	2.3
Link Distance (m)	348.9		205.8
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)		60.0	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Brock Road & Major Oaks Road/Usman Road

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	L	TR	L	T	T	TR	L	T	T	TR
Maximum Queue (m)	90.9	37.5	67.3	88.0	51.1	41.0	49.3	48.4	13.4	147.4	128.8	102.3
Average Queue (m)	32.8	32.2	44.8	18.7	28.4	19.9	22.9	18.5	2.8	89.9	73.0	49.0
95th Queue (m)	79.6	43.5	68.4	63.5	45.5	37.5	41.5	39.6	10.1	132.1	111.3	83.0
Link Distance (m)	275.9			97.5		205.8	205.8	205.8		170.1	170.1	170.1
Upstream Blk Time (%)				0								
Queuing Penalty (veh)				1								
Storage Bay Dist (m)		30.0	20.0		72.0				60.0			
Storage Blk Time (%)	1	24	55	1						16		
Queuing Penalty (veh)	2	11	12	3						3		

Intersection: 4: Usman Road

Movement	NB
Directions Served	LR
Maximum Queue (m)	16.8
Average Queue (m)	10.2
95th Queue (m)	16.5
Link Distance (m)	24.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 41

Intersection: 1: Brock Road & Finch Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	UL	T	T	T	R	L	T
Maximum Queue (m)	251.7	156.8	31.5	18.2	16.5	83.0	125.7	123.9	125.5	49.7	45.4	96.2
Average Queue (m)	173.7	15.6	9.4	3.8	2.6	62.1	111.2	95.5	79.2	7.4	8.9	51.5
95th Queue (m)	285.7	90.0	27.0	13.1	10.5	99.8	134.4	131.3	126.0	39.7	29.9	83.7
Link Distance (m)	399.8	399.8		305.8	305.8		110.0	110.0	110.0			349.0
Upstream Blk Time (%)							16	5	3	0		
Queuing Penalty (veh)							0	0	0	0		
Storage Bay Dist (m)			90.0			63.0				90.0	13.0	
Storage Blk Time (%)						5	24		4		20	35
Queuing Penalty (veh)						37	66		1		80	2

Intersection: 1: Brock Road & Finch Avenue

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (m)	92.3	93.6	30.2
Average Queue (m)	56.6	57.9	4.9
95th Queue (m)	86.5	90.1	19.7
Link Distance (m)	349.0	349.0	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			100.0
Storage Blk Time (%)		0	
Queuing Penalty (veh)		0	

Intersection: 2: Brock Road & Usman Road

Movement	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	R	T	T	TR	UL	T	T	T
Maximum Queue (m)	15.2	12.7	44.3	13.7	134.9	196.0	197.7	139.9
Average Queue (m)	1.8	0.4	2.0	1.8	107.6	105.7	76.3	21.4
95th Queue (m)	10.9	4.4	25.6	7.8	167.8	245.1	222.1	121.5
Link Distance (m)	43.6	349.0	349.0	349.0		205.6	205.6	205.6
Upstream Blk Time (%)						8	1	0
Queuing Penalty (veh)						42	3	0
Storage Bay Dist (m)					60.0			
Storage Blk Time (%)					82			
Queuing Penalty (veh)					401			

Intersection: 3: Brock Road & Major Oaks Road/Usman Road

Movement	EB	EB	WB	WB	B11	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	TR	T	L	T	T	TR	L	T	T
Maximum Queue (m)	38.3	35.8	67.8	112.0	30.0	105.6	132.4	118.9	128.8	44.9	124.3	104.4
Average Queue (m)	11.7	21.7	48.0	36.2	2.2	58.0	59.9	65.0	66.6	20.6	72.8	55.8
95th Queue (m)	34.1	35.3	74.5	99.6	19.3	96.4	108.1	111.3	116.8	38.9	114.3	97.0
Link Distance (m)	275.9			97.5	201.2		205.6	205.6	205.6		170.1	170.1
Upstream Blk Time (%)				5							0	
Queuing Penalty (veh)				14							0	
Storage Bay Dist (m)		30.0	20.0			72.0				60.0		
Storage Blk Time (%)	0	5	61	6		7	3				20	
Queuing Penalty (veh)	1	2	25	14		50	10				11	

Intersection: 3: Brock Road & Major Oaks Road/Usman Road

Movement	SB
Directions Served	TR
Maximum Queue (m)	72.3
Average Queue (m)	38.4
95th Queue (m)	70.2
Link Distance (m)	170.1
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: Site Access & Usman Road

Movement	NB
Directions Served	LR
Maximum Queue (m)	18.7
Average Queue (m)	8.9
95th Queue (m)	15.1
Link Distance (m)	22.3
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 762

Intersection: 1: Brock Road & Finch Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	L	T	T	T	R	L	T
Maximum Queue (m)	149.8	10.6	35.1	13.4	24.2	82.9	124.6	123.4	119.0	13.2	15.3	85.7
Average Queue (m)	83.6	1.4	8.7	1.2	3.5	47.5	87.2	74.4	64.3	2.5	1.1	44.0
95th Queue (m)	131.3	6.7	27.0	6.8	13.7	91.1	131.3	116.3	105.2	10.1	7.3	75.5
Link Distance (m)	399.8	399.8		305.8	305.8		110.0	110.0	110.0			349.0
Upstream Blk Time (%)							4	1	1			
Queuing Penalty (veh)							0	0	0			
Storage Bay Dist (m)			90.0			63.0				90.0	13.0	
Storage Blk Time (%)						1	13		2		2	33
Queuing Penalty (veh)						5	32		0		9	1

Intersection: 1: Brock Road & Finch Avenue

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (m)	93.3	88.6	37.0
Average Queue (m)	48.5	47.7	7.5
95th Queue (m)	80.7	77.1	26.7
Link Distance (m)	349.0	349.0	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			100.0
Storage Blk Time (%)		0	
Queuing Penalty (veh)		0	

Intersection: 2: Brock Road & Usman Road

Movement	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	R	T	T	TR	L	T	T	T
Maximum Queue (m)	24.2	11.7	12.6	17.6	121.6	146.8	131.7	67.6
Average Queue (m)	3.0	0.5	0.8	3.1	84.6	62.1	25.6	4.4
95th Queue (m)	14.9	4.3	6.8	10.6	147.7	203.6	130.6	52.4
Link Distance (m)	47.5	349.0	349.0	349.0		205.6	205.6	205.6
Upstream Blk Time (%)						10	0	0
Queuing Penalty (veh)						55	1	0
Storage Bay Dist (m)					60.0			
Storage Blk Time (%)					55	0		
Queuing Penalty (veh)					238	0		

Intersection: 3: Brock Road & Major Oaks Road/Usman Road

Movement	EB	EB	WB	WB	B11	B6	NB	NB	NB	NB	SB	SB
Directions Served	LT	R	L	TR	T	T	UL	T	T	TR	L	T
Maximum Queue (m)	96.3	37.5	65.0	85.8	73.8	12.0	90.6	104.9	110.7	106.1	80.7	123.9
Average Queue (m)	21.4	26.7	45.7	41.3	28.3	1.1	46.8	52.7	58.1	58.5	20.0	71.2
95th Queue (m)	63.2	40.6	70.0	108.1	138.5	9.9	78.3	90.9	100.8	98.5	47.5	129.9
Link Distance (m)	275.9			97.5	201.2	30.1		205.6	205.6	205.6		170.1
Upstream Blk Time (%)				17	6	0						0
Queuing Penalty (veh)				36	12	0						0
Storage Bay Dist (m)		30.0	20.0				72.0				60.0	
Storage Blk Time (%)	1	12	60	8			2	2				23
Queuing Penalty (veh)	3	6	48	18			11	7				21

Intersection: 3: Brock Road & Major Oaks Road/Usman Road

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	108.6	74.7
Average Queue (m)	57.0	34.8
95th Queue (m)	112.9	69.0
Link Distance (m)	170.1	170.1
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Site Access & Usman Road

Movement	NB
Directions Served	LR
Maximum Queue (m)	18.4
Average Queue (m)	8.1
95th Queue (m)	15.2
Link Distance (m)	36.2
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 502

Sensitivity Analysis

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	495	18	291	17	5	9	1	274	2189	24	6	1216
Future Volume (vph)	495	18	291	17	5	9	1	274	2189	24	6	1216
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.3	3.5	3.5	3.3	3.5
Storage Length (m)	0.0		90.0	0.0		0.0		63.0		90.0	13.0	
Storage Lanes	1		1	1		0		1		1	1	
Taper Length (m)	0.0			0.0				20.0			41.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	*0.80	1.00	1.00	*0.80
Ped Bike Factor	1.00		0.99	1.00	0.99					0.97		
Frt			0.850		0.904					0.850		
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	1700	1413	1551	1608	1251	0	0	1631	3887	1201	872	4295
Flt Permitted	0.748			0.746				0.103			0.112	
Satd. Flow (perm)	1337	1413	1528	1259	1251	0	0	177	3887	1167	103	4295
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			297		3					37		
Link Speed (k/h)		60			40				60			60
Link Distance (m)		416.8			328.7				124.4			367.1
Travel Time (s)		25.0			29.6				7.5			22.0
Confl. Peds. (#/hr)	1		2	2		1		9		3	3	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	0%	7%	16%	33%	100%	5%
Adj. Flow (vph)	505	18	297	17	5	9	1	280	2234	24	6	1241
Shared Lane Traffic (%)												
Lane Group Flow (vph)	505	18	297	17	14	0	0	281	2234	24	6	1241
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	Left	Left
Median Width(m)		3.5			3.5				3.3			3.3
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		4.8			4.8				4.8			4.8
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.00	1.04	1.01	1.01	1.04	1.01
Turning Speed (k/h)	25		15	25		15	15	25		15	25	
Number of Detectors	1	2	1	1	2		0	1	2	1	1	2
Detector Template	Left	Thru	Right	Left	Thru			Left	Thru	Right	Left	Thru
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		0.0	2.0	10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		0.0	2.0	0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4				9.4			9.4
Detector 2 Size(m)		0.6			0.6				0.6			0.6
Detector 2 Type		Cl+Ex			Cl+Ex				Cl+Ex			Cl+Ex
Detector 2 Channel												

SENSITIVITY ANALYSIS



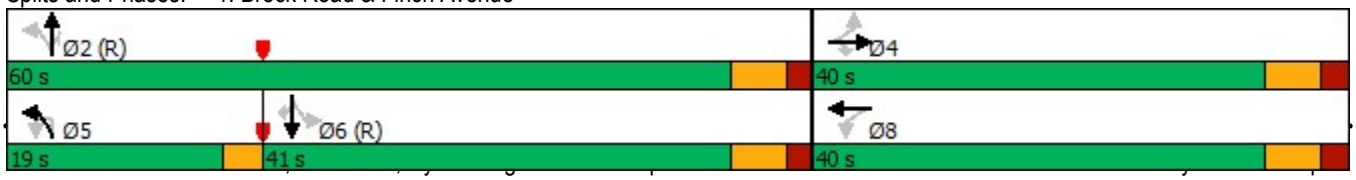
Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	225
Future Volume (vph)	225
Ideal Flow (vphpl)	1900
Lane Width (m)	3.5
Storage Length (m)	100.0
Storage Lanes	1
Taper Length (m)	
Lane Util. Factor	1.00
Ped Bike Factor	0.96
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1521
Flt Permitted	
Satd. Flow (perm)	1455
Right Turn on Red	Yes
Satd. Flow (RTOR)	230
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	9
Peak Hour Factor	0.98
Heavy Vehicles (%)	5%
Adj. Flow (vph)	230
Shared Lane Traffic (%)	
Lane Group Flow (vph)	230
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	1.01
Turning Speed (k/h)	15
Number of Detectors	1
Detector Template	Right
Leading Detector (m)	2.0
Trailing Detector (m)	0.0
Detector 1 Position(m)	0.0
Detector 1 Size(m)	2.0
Detector 1 Type	Cl+Ex
Detector 1 Channel	
Detector 1 Extend (s)	0.0
Detector 1 Queue (s)	0.0
Detector 1 Delay (s)	0.0
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	

SENSITIVITY ANALYSIS

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Detector 2 Extend (s)		0.0			0.0				0.0			0.0
Turn Type	Perm	NA	Perm	Perm	NA		custom	pm+pt	NA	Perm	Perm	NA
Protected Phases		4			8			5	2			6
Permitted Phases	4		4	8			5	2		2	6	
Detector Phase	4	4	4	8	8		5	5	2	2	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		5.0	5.0	20.0	20.0	20.0	20.0
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0		9.0	9.0	28.0	28.0	28.0	28.0
Total Split (s)	40.0	40.0	40.0	40.0	40.0		19.0	19.0	60.0	60.0	41.0	41.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	40.0%		19.0%	19.0%	60.0%	60.0%	41.0%	41.0%
Maximum Green (s)	33.6	33.6	33.6	33.6	33.6		16.0	16.0	53.8	53.8	34.8	34.8
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2		3.0	3.0	4.2	4.2	4.2	4.2
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2		0.0	0.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4			3.0	6.2	6.2	6.2	6.2
Lead/Lag							Lead	Lead			Lag	Lag
Lead-Lag Optimize?							Yes	Yes			Yes	Yes
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
Recall Mode	None	None	None	None	None		None	None	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	16.0	16.0	16.0	16.0	16.0				14.0	14.0	14.0	14.0
Flash Dont Walk (s)	5.0	5.0	5.0	5.0	5.0				5.0	5.0	5.0	5.0
Pedestrian Calls (#/hr)	0	0	0	0	0				0	0	0	0
Act Effct Green (s)	33.6	33.6	33.6	33.6	33.6			57.0	53.8	53.8	35.8	35.8
Actuated g/C Ratio	0.34	0.34	0.34	0.34	0.34			0.57	0.54	0.54	0.36	0.36
v/c Ratio	1.12	0.04	0.42	0.04	0.03			0.88	1.07	0.04	0.17	0.81
Control Delay	114.0	22.8	4.9	22.8	19.8			51.9	65.0	2.3	35.8	34.3
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Delay	114.0	22.8	4.9	22.8	19.8			51.9	65.0	2.3	35.8	34.3
LOS	F	C	A	C	B			D	E	A	D	C
Approach Delay		72.5			21.5				63.0			29.7
Approach LOS		E			C				E			C

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.12			
Intersection Signal Delay: 54.2		Intersection LOS: D	
Intersection Capacity Utilization 108.7%		ICU Level of Service G	
Analysis Period (min) 15			
* User Entered Value			

Splits and Phases: 1: Brock Road & Finch Avenue



SENSITIVITY ANALYSIS



Lane Group	SBR
Detector 2 Extend (s)	
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	20.0
Minimum Split (s)	28.0
Total Split (s)	41.0
Total Split (%)	41.0%
Maximum Green (s)	34.8
Yellow Time (s)	4.2
All-Red Time (s)	2.0
Lost Time Adjust (s)	0.0
Total Lost Time (s)	6.2
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	C-Max
Walk Time (s)	14.0
Flash Dont Walk (s)	5.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	35.8
Actuated g/C Ratio	0.36
v/c Ratio	0.34
Control Delay	4.7
Queue Delay	0.0
Total Delay	4.7
LOS	A
Approach Delay	
Approach LOS	

Intersection Summary

SENSITIVITY ANALYSIS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	495	18	291	17	5	9	1	274	2189	24	6	1216
Future Volume (vph)	495	18	291	17	5	9	1	274	2189	24	6	1216
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.3	3.5	3.5	3.3	3.5
Total Lost time (s)	6.4	6.4	6.4	6.4	6.4			3.0	6.2	6.2	6.2	6.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	*0.80	1.00	1.00	*0.80
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99			1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.90			1.00	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1698	1413	1528	1604	1250			1631	3887	1167	872	4295
Flt Permitted	0.75	1.00	1.00	0.75	1.00			0.10	1.00	1.00	0.11	1.00
Satd. Flow (perm)	1337	1413	1528	1259	1250			177	3887	1167	103	4295
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	505	18	297	17	5	9	1	280	2234	24	6	1241
RTOR Reduction (vph)	0	0	197	0	2	0	0	0	0	11	0	0
Lane Group Flow (vph)	505	18	100	17	12	0	0	281	2234	13	6	1241
Confl. Peds. (#/hr)	1		2	2		1		9		3	3	
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	0%	7%	16%	33%	100%	5%
Turn Type	Perm	NA	Perm	Perm	NA		custom	pm+pt	NA	Perm	Perm	NA
Protected Phases		4			8			5	2			6
Permitted Phases	4		4	8			5	2		2	6	
Actuated Green, G (s)	33.6	33.6	33.6	33.6	33.6			53.8	53.8	53.8	35.8	35.8
Effective Green, g (s)	33.6	33.6	33.6	33.6	33.6			53.8	53.8	53.8	35.8	35.8
Actuated g/C Ratio	0.34	0.34	0.34	0.34	0.34			0.54	0.54	0.54	0.36	0.36
Clearance Time (s)	6.4	6.4	6.4	6.4	6.4			3.0	6.2	6.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	449	474	513	423	420			313	2091	627	36	1537
v/s Ratio Prot		0.01			0.01			0.13	c0.57			0.29
v/s Ratio Perm	c0.38		0.07	0.01				0.35		0.01	0.06	
v/c Ratio	1.12	0.04	0.19	0.04	0.03			0.90	1.07	0.02	0.17	0.81
Uniform Delay, d1	33.2	22.3	23.6	22.3	22.3			26.7	23.1	10.8	21.9	29.0
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	81.1	0.0	0.2	0.0	0.0			26.4	40.9	0.1	9.7	4.7
Delay (s)	114.3	22.4	23.8	22.4	22.3			53.1	64.0	10.9	31.7	33.6
Level of Service	F	C	C	C	C			D	E	B	C	C
Approach Delay (s)		79.5			22.3				62.3			31.9
Approach LOS		E			C				E			C

Intersection Summary			
HCM 2000 Control Delay	55.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	108.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

SENSITIVITY ANALYSIS



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	225
Future Volume (vph)	225
Ideal Flow (vphpl)	1900
Lane Width	3.5
Total Lost time (s)	6.2
Lane Util. Factor	1.00
Frpb, ped/bikes	0.96
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1455
Flt Permitted	1.00
Satd. Flow (perm)	1455
Peak-hour factor, PHF	0.98
Adj. Flow (vph)	230
RTOR Reduction (vph)	148
Lane Group Flow (vph)	82
Confl. Peds. (#/hr)	9
Heavy Vehicles (%)	5%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	35.8
Effective Green, g (s)	35.8
Actuated g/C Ratio	0.36
Clearance Time (s)	6.2
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	520
v/s Ratio Prot	
v/s Ratio Perm	0.06
v/c Ratio	0.16
Uniform Delay, d1	21.8
Progression Factor	1.00
Incremental Delay, d2	0.7
Delay (s)	22.5
Level of Service	C
Approach Delay (s)	
Approach LOS	
Intersection Summary	

SENSITIVITY ANALYSIS

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	495	18	291	17	5	9	1	274	2189	24	6	1216
Future Volume (vph)	495	18	291	17	5	9	1	274	2189	24	6	1216
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.3	3.5	3.5	3.3	3.5
Storage Length (m)	0.0		90.0	0.0		0.0		63.0		90.0	13.0	
Storage Lanes	1		1	1		0		1		1	1	
Taper Length (m)	0.0			0.0				20.0			41.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	*0.80	1.00	1.00	*0.80
Ped Bike Factor	1.00		0.98	1.00	0.99					0.97		
Frt			0.850		0.904					0.850		
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	1700	1413	1551	1608	1251	0	0	1631	3887	1201	872	4295
Flt Permitted	0.748			0.746				0.089			0.103	
Satd. Flow (perm)	1336	1413	1527	1259	1251	0	0	153	3887	1167	95	4295
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			266		3					34		
Link Speed (k/h)		60			40				60			60
Link Distance (m)		416.8			328.7				124.4			367.1
Travel Time (s)		25.0			29.6				7.5			22.0
Confl. Peds. (#/hr)	1		2	2		1		9		3	3	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	0%	7%	16%	33%	100%	5%
Adj. Flow (vph)	505	18	297	17	5	9	1	280	2234	24	6	1241
Shared Lane Traffic (%)												
Lane Group Flow (vph)	505	18	297	17	14	0	0	281	2234	24	6	1241
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	Left	Left
Median Width(m)		3.5			3.5				3.3			3.3
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		4.8			4.8				4.8			4.8
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.00	1.04	1.01	1.01	1.04	1.01
Turning Speed (k/h)	25		15	25		15	15	25		15	25	
Number of Detectors	1	2	1	1	2		0	1	2	1	1	2
Detector Template	Left	Thru	Right	Left	Thru			Left	Thru	Right	Left	Thru
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		0.0	2.0	10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		0.0	2.0	0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4				9.4			9.4
Detector 2 Size(m)		0.6			0.6				0.6			0.6
Detector 2 Type		Cl+Ex			Cl+Ex				Cl+Ex			Cl+Ex
Detector 2 Channel												

SENSITIVITY ANALYSIS



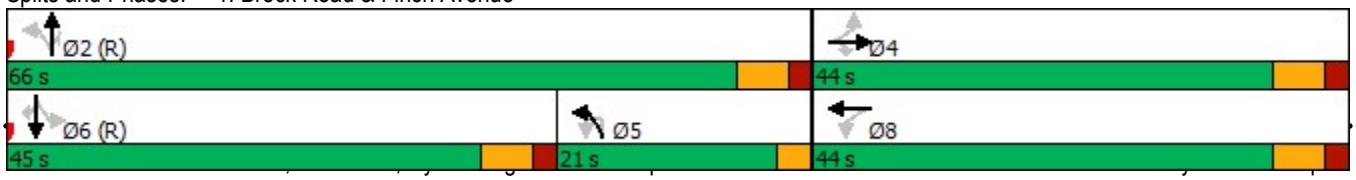
Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	225
Future Volume (vph)	225
Ideal Flow (vphpl)	1900
Lane Width (m)	3.5
Storage Length (m)	100.0
Storage Lanes	1
Taper Length (m)	
Lane Util. Factor	1.00
Ped Bike Factor	0.95
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1521
Flt Permitted	
Satd. Flow (perm)	1452
Right Turn on Red	Yes
Satd. Flow (RTOR)	230
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	9
Peak Hour Factor	0.98
Heavy Vehicles (%)	5%
Adj. Flow (vph)	230
Shared Lane Traffic (%)	
Lane Group Flow (vph)	230
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	1.01
Turning Speed (k/h)	15
Number of Detectors	1
Detector Template	Right
Leading Detector (m)	2.0
Trailing Detector (m)	0.0
Detector 1 Position(m)	0.0
Detector 1 Size(m)	2.0
Detector 1 Type	Cl+Ex
Detector 1 Channel	
Detector 1 Extend (s)	0.0
Detector 1 Queue (s)	0.0
Detector 1 Delay (s)	0.0
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	

SENSITIVITY ANALYSIS

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Detector 2 Extend (s)		0.0			0.0				0.0			0.0
Turn Type	Perm	NA	Perm	Perm	NA		custom	pm+pt	NA	Perm	Perm	NA
Protected Phases		4			8			5	2			6
Permitted Phases	4		4	8			5	2		2	6	
Detector Phase	4	4	4	8	8		5	5	2	2	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		5.0	5.0	20.0	20.0	20.0	20.0
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0		9.0	9.0	28.0	28.0	28.0	28.0
Total Split (s)	44.0	44.0	44.0	44.0	44.0		21.0	21.0	66.0	66.0	45.0	45.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	40.0%		19.1%	19.1%	60.0%	60.0%	40.9%	40.9%
Maximum Green (s)	37.6	37.6	37.6	37.6	37.6		18.0	18.0	59.8	59.8	38.8	38.8
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2		3.0	3.0	4.2	4.2	4.2	4.2
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2		0.0	0.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4			3.0	6.2	6.2	6.2	6.2
Lead/Lag							Lag	Lag			Lead	Lead
Lead-Lag Optimize?							Yes	Yes			Yes	Yes
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
Recall Mode	None	None	None	None	None		None	None	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	16.0	16.0	16.0	16.0	16.0				14.0	14.0	14.0	14.0
Flash Dont Walk (s)	5.0	5.0	5.0	5.0	5.0				5.0	5.0	5.0	5.0
Pedestrian Calls (#/hr)	0	0	0	0	0				0	0	0	0
Act Effct Green (s)	37.6	37.6	37.6	37.6	37.6			63.0	59.8	59.8	38.8	38.8
Actuated g/C Ratio	0.34	0.34	0.34	0.34	0.34			0.57	0.54	0.54	0.35	0.35
v/c Ratio	1.11	0.04	0.43	0.04	0.03			0.85	1.06	0.04	0.18	0.82
Control Delay	110.0	24.6	6.7	24.6	21.0			62.4	62.5	2.8	31.3	30.9
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Delay	110.0	24.6	6.7	24.6	21.0			62.4	62.5	2.8	31.3	30.9
LOS	F	C	A	C	C			E	E	A	C	C
Approach Delay		70.7			23.0				61.9			27.3
Approach LOS		E			C				E			C

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 64 (58%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.11			
Intersection Signal Delay: 52.7		Intersection LOS: D	
Intersection Capacity Utilization 108.7%		ICU Level of Service G	
Analysis Period (min) 15			
* User Entered Value			

Splits and Phases: 1: Brock Road & Finch Avenue



SENSITIVITY ANALYSIS



Lane Group	SBR
Detector 2 Extend (s)	
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	20.0
Minimum Split (s)	28.0
Total Split (s)	45.0
Total Split (%)	40.9%
Maximum Green (s)	38.8
Yellow Time (s)	4.2
All-Red Time (s)	2.0
Lost Time Adjust (s)	0.0
Total Lost Time (s)	6.2
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	C-Max
Walk Time (s)	14.0
Flash Dont Walk (s)	5.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	38.8
Actuated g/C Ratio	0.35
v/c Ratio	0.35
Control Delay	7.8
Queue Delay	0.0
Total Delay	7.8
LOS	A
Approach Delay	
Approach LOS	

Intersection Summary

SENSITIVITY ANALYSIS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	495	18	291	17	5	9	1	274	2189	24	6	1216
Future Volume (vph)	495	18	291	17	5	9	1	274	2189	24	6	1216
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.3	3.5	3.5	3.3	3.5
Total Lost time (s)	6.4	6.4	6.4	6.4	6.4			3.0	6.2	6.2	6.2	6.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	*0.80	1.00	1.00	*0.80
Frpb, ped/bikes	1.00	1.00	0.98	1.00	0.99			1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.90			1.00	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1697	1413	1527	1603	1250			1631	3887	1167	872	4295
Flt Permitted	0.75	1.00	1.00	0.75	1.00			0.09	1.00	1.00	0.10	1.00
Satd. Flow (perm)	1337	1413	1527	1258	1250			153	3887	1167	95	4295
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	505	18	297	17	5	9	1	280	2234	24	6	1241
RTOR Reduction (vph)	0	0	175	0	2	0	0	0	0	11	0	0
Lane Group Flow (vph)	505	18	122	17	12	0	0	281	2234	13	6	1241
Confl. Peds. (#/hr)	1		2	2		1		9		3	3	
Heavy Vehicles (%)	5%	33%	3%	11%	25%	40%	0%	7%	16%	33%	100%	5%
Turn Type	Perm	NA	Perm	Perm	NA		custom	pm+pt	NA	Perm	Perm	NA
Protected Phases		4			8			5	2			6
Permitted Phases	4		4	8			5	2		2	6	
Actuated Green, G (s)	37.6	37.6	37.6	37.6	37.6			63.0	59.8	59.8	38.8	38.8
Effective Green, g (s)	37.6	37.6	37.6	37.6	37.6			63.0	59.8	59.8	38.8	38.8
Actuated g/C Ratio	0.34	0.34	0.34	0.34	0.34			0.57	0.54	0.54	0.35	0.35
Clearance Time (s)	6.4	6.4	6.4	6.4	6.4			3.0	6.2	6.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	457	482	521	430	427			329	2113	634	33	1514
v/s Ratio Prot		0.01			0.01			0.14	c0.57			0.29
v/s Ratio Perm	c0.38		0.08	0.01				0.35		0.01	0.06	
v/c Ratio	1.11	0.04	0.23	0.04	0.03			0.85	1.06	0.02	0.18	0.82
Uniform Delay, d1	36.2	24.1	25.9	24.2	24.1			33.5	25.1	11.6	24.6	32.4
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	0.78	0.82
Incremental Delay, d2	73.8	0.0	0.2	0.0	0.0			18.9	36.8	0.1	9.1	4.0
Delay (s)	110.0	24.2	26.1	24.2	24.1			52.4	61.9	11.6	28.2	30.6
Level of Service	F	C	C	C	C			D	E	B	C	C
Approach Delay (s)		77.7			24.1				60.4			33.4
Approach LOS		E			C				E			C

Intersection Summary			
HCM 2000 Control Delay	54.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	108.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

SENSITIVITY ANALYSIS



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	225
Future Volume (vph)	225
Ideal Flow (vphpl)	1900
Lane Width	3.5
Total Lost time (s)	6.2
Lane Util. Factor	1.00
Frpb, ped/bikes	0.95
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1452
Flt Permitted	1.00
Satd. Flow (perm)	1452
Peak-hour factor, PHF	0.98
Adj. Flow (vph)	230
RTOR Reduction (vph)	149
Lane Group Flow (vph)	81
Confl. Peds. (#/hr)	9
Heavy Vehicles (%)	5%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	38.8
Effective Green, g (s)	38.8
Actuated g/C Ratio	0.35
Clearance Time (s)	6.2
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	512
v/s Ratio Prot	
v/s Ratio Perm	0.06
v/c Ratio	0.16
Uniform Delay, d1	24.4
Progression Factor	1.98
Incremental Delay, d2	0.5
Delay (s)	48.8
Level of Service	D
Approach Delay (s)	
Approach LOS	
Intersection Summary	

SENSITIVITY ANALYSIS



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	101	1935	342	87	1177
Future Volume (vph)	0	101	1935	342	87	1177
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	4.5	3.5	3.3	3.3	3.5
Storage Length (m)	0.0	0.0		38.0	60.0	
Storage Lanes	0	1		1	1	
Taper Length (m)	7.5				75.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.865		0.850		
Flt Protected					0.950	
Satd. Flow (prot)	0	1790	3400	1516	1711	3336
Flt Permitted					0.950	
Satd. Flow (perm)	0	1790	3400	1516	1711	3336
Link Speed (k/h)	40		60			60
Link Distance (m)	62.6		367.1			224.5
Travel Time (s)	5.6		22.0			13.5
Confl. Peds. (#/hr)	7	1		55	55	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	1%	5%	3%	2%	7%
Adj. Flow (vph)	0	112	2150	380	97	1308
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	112	2150	380	97	1308
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.3			3.3
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	0.88	1.01	1.04	1.04	1.01
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 72.0%		ICU Level of Service C	
Analysis Period (min) 15			

SENSITIVITY ANALYSIS



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	101	1935	342	87	1177
Future Volume (Veh/h)	0	101	1935	342	87	1177
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	112	2150	380	97	1308
Pedestrians	55		7			1
Lane Width (m)	4.5		3.4			3.4
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	6		1			0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			367			225
pX, platoon unblocked	0.60	0.47			0.47	
vC, conflicting volume	3060	1131			2585	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1059	0			2108	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	77			14	
cM capacity (veh/h)	17	477			113	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	112	1075	1075	380	97	654	654
Volume Left	0	0	0	0	97	0	0
Volume Right	112	0	0	380	0	0	0
cSH	477	1700	1700	1700	113	1700	1700
Volume to Capacity	0.23	0.63	0.63	0.22	0.86	0.38	0.38
Queue Length 95th (m)	7.2	0.0	0.0	0.0	41.1	0.0	0.0
Control Delay (s)	14.9	0.0	0.0	0.0	121.5	0.0	0.0
Lane LOS	B				F		
Approach Delay (s)	14.9	0.0			8.4		
Approach LOS	B						

Intersection Summary				
Average Delay	3.3			
Intersection Capacity Utilization	72.0%	ICU Level of Service		C
Analysis Period (min)	15			

SENSITIVITY ANALYSIS

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	33	12	249	197	25	47	2	280	1833	24	172	1036
Future Volume (vph)	33	12	249	197	25	47	2	280	1833	24	172	1036
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.7	3.7	3.6	3.0	3.5	3.5	3.0	3.5
Storage Length (m)	0.0		30.0	20.0		0.0		72.0		70.0	60.0	
Storage Lanes	0		1	1		0		1		1	1	
Taper Length (m)	7.5			48.0				72.0			92.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor		0.99	0.94	0.95	0.98					0.95		1.00
Frt			0.850		0.902					0.850		0.997
Flt Protected		0.965		0.950				0.950			0.950	
Satd. Flow (prot)	0	1689	1566	1733	1654	0	0	1652	3400	1597	1685	3294
Flt Permitted		0.751		0.722				0.098			0.077	
Satd. Flow (perm)	0	1303	1472	1257	1654	0	0	170	3400	1512	137	3294
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			246		56					69		2
Link Speed (k/h)		50			40				60			60
Link Distance (m)		292.9			123.2				224.5			180.3
Travel Time (s)		21.1			11.1				13.5			10.8
Confl. Peds. (#/hr)	10		37	37		10		10		13	13	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	10%	0%	2%	3%	5%	2%	0%	2%	5%	0%	0%	8%
Adj. Flow (vph)	39	14	296	235	30	56	2	333	2182	29	205	1233
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	53	296	235	86	0	0	335	2182	29	205	1257
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	Left	Left
Median Width(m)		3.5			3.5				3.3			3.3
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		4.8			4.8				4.8			4.8
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	0.99	0.99	1.00	1.09	1.01	1.01	1.09	1.01
Turning Speed (k/h)	25		15	25		15	15	25		15	25	
Number of Detectors	1	1	1	1	1		1	1	0	0	1	0
Detector Template	Left						Left					
Leading Detector (m)	2.0	12.0	12.0	12.0	12.0		2.0	24.0	0.0	0.0	24.0	0.0
Trailing Detector (m)	0.0	-3.0	-3.0	-3.0	-3.0		0.0	14.0	0.0	0.0	14.0	0.0
Detector 1 Position(m)	0.0	-3.0	-3.0	-3.0	-3.0		0.0	14.0	0.0	0.0	14.0	0.0
Detector 1 Size(m)	2.0	15.0	15.0	15.0	15.0		2.0	10.0	0.6	2.0	10.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Perm	NA	Perm	Perm	NA		custom	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4			8			5	2		1	6
Permitted Phases	4		4	8			5	2		2	6	
Detector Phase	4	4	4	8	8		5	5	2	2	1	6

SENSITIVITY ANALYSIS



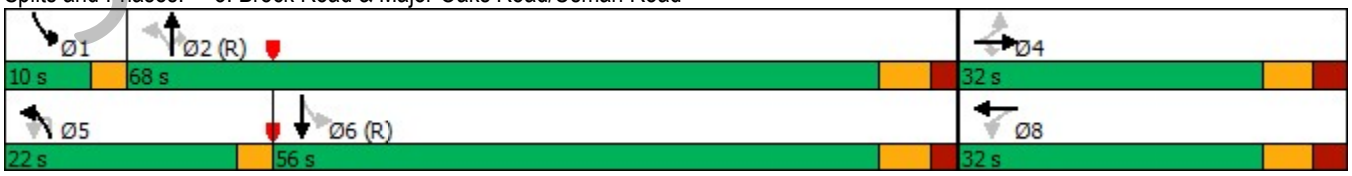
Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	20
Future Volume (vph)	20
Ideal Flow (vphpl)	1900
Lane Width (m)	3.5
Storage Length (m)	0.0
Storage Lanes	0
Taper Length (m)	
Lane Util. Factor	0.95
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	Yes
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	10
Peak Hour Factor	0.84
Heavy Vehicles (%)	6%
Adj. Flow (vph)	24
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	1.01
Turning Speed (k/h)	15
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	

SENSITIVITY ANALYSIS

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	4.0	4.0		5.0	5.0	20.0	20.0	5.0	20.0
Minimum Split (s)	32.0	32.0	32.0	32.0	32.0		8.0	8.0	29.0	29.0	9.5	29.0
Total Split (s)	32.0	32.0	32.0	32.0	32.0		22.0	22.0	68.0	68.0	10.0	56.0
Total Split (%)	29.1%	29.1%	29.1%	29.1%	29.1%		20.0%	20.0%	61.8%	61.8%	9.1%	50.9%
Maximum Green (s)	25.0	25.0	25.0	25.0	25.0		19.0	19.0	61.6	61.6	7.0	49.6
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1		3.0	3.0	4.2	4.2	3.0	4.2
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9		0.0	0.0	2.2	2.2	0.0	2.2
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.0	7.0	7.0	7.0			3.0	6.4	6.4	3.0	6.4
Lead/Lag							Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
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
Recall Mode	None	None	None	None	None		None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0				7.0	7.0		7.0
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0				14.0	14.0		14.0
Pedestrian Calls (#/hr)	0	0	0	0	0				0	0		0
Act Effct Green (s)		23.3	23.3	23.3	23.3			76.4	61.6	61.6	63.8	51.7
Actuated g/C Ratio		0.21	0.21	0.21	0.21			0.69	0.56	0.56	0.58	0.47
v/c Ratio		0.19	0.59	0.88	0.22			0.91	1.15	0.03	1.01	0.81
Control Delay		36.6	13.1	74.5	16.6			56.0	97.6	0.1	99.3	30.8
Queue Delay		0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Delay		36.6	13.1	74.5	16.6			56.0	97.6	0.1	99.3	30.8
LOS		D	B	E	B			E	F	A	F	C
Approach Delay		16.7			59.0				91.0			40.4
Approach LOS		B			E				F			D

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.15			
Intersection Signal Delay: 67.4		Intersection LOS: E	
Intersection Capacity Utilization 99.2%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 3: Brock Road & Major Oaks Road/Usman Road



SENSITIVITY ANALYSIS



Lane Group	SBR
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

SENSITIVITY ANALYSIS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	33	12	249	197	25	47	2	280	1833	24	172	1036
Future Volume (vph)	33	12	249	197	25	47	2	280	1833	24	172	1036
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.7	3.7	3.6	3.0	3.5	3.5	3.0	3.5
Total Lost time (s)		7.0	7.0	7.0	7.0			3.0	6.4	6.4	3.0	6.4
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes		1.00	0.94	1.00	0.98			1.00	1.00	0.95	1.00	1.00
Flpb, ped/bikes		0.99	1.00	0.95	1.00			1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	0.90			1.00	1.00	0.85	1.00	1.00
Flt Protected		0.96	1.00	0.95	1.00			0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1673	1472	1654	1655			1652	3400	1512	1685	3294
Flt Permitted		0.75	1.00	0.72	1.00			0.10	1.00	1.00	0.08	1.00
Satd. Flow (perm)		1302	1472	1258	1655			171	3400	1512	137	3294
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	39	14	296	235	30	56	2	333	2182	29	205	1233
RTOR Reduction (vph)	0	0	194	0	44	0	0	0	0	13	0	1
Lane Group Flow (vph)	0	53	102	235	42	0	0	335	2182	16	205	1256
Confl. Peds. (#/hr)	10		37	37		10		10		13	13	
Heavy Vehicles (%)	10%	0%	2%	3%	5%	2%	0%	2%	5%	0%	0%	8%
Turn Type	Perm	NA	Perm	Perm	NA		custom	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4			8			5	2		1	6
Permitted Phases	4		4	8			5	2		2	6	
Actuated Green, G (s)		23.3	23.3	23.3	23.3			73.3	61.6	61.6	60.4	51.7
Effective Green, g (s)		23.3	23.3	23.3	23.3			73.3	61.6	61.6	60.4	51.7
Actuated g/C Ratio		0.21	0.21	0.21	0.21			0.67	0.56	0.56	0.55	0.47
Clearance Time (s)		7.0	7.0	7.0	7.0			3.0	6.4	6.4	3.0	6.4
Vehicle Extension (s)		3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		275	311	266	350			364	1904	846	197	1548
v/s Ratio Prot					0.03			c0.16	c0.64		c0.08	0.38
v/s Ratio Perm		0.04	0.07	c0.19				0.46		0.01	0.49	
v/c Ratio		0.19	0.33	0.88	0.12			0.92	1.15	0.02	1.04	0.81
Uniform Delay, d1		35.6	36.7	42.0	35.1			30.3	24.2	10.8	32.3	25.0
Progression Factor		1.00	1.00	1.00	1.01			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.3	0.6	27.2	0.2			28.0	72.4	0.0	75.2	4.7
Delay (s)		36.0	37.3	69.2	35.7			58.3	96.6	10.8	107.5	29.7
Level of Service		D	D	E	D			E	F	B	F	C
Approach Delay (s)		37.1			60.2				90.6			40.6
Approach LOS		D			E				F			D

Intersection Summary			
HCM 2000 Control Delay	68.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	99.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

SENSITIVITY ANALYSIS



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	20
Future Volume (vph)	20
Ideal Flow (vphpl)	1900
Lane Width	3.5
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.84
Adj. Flow (vph)	24
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	10
Heavy Vehicles (%)	6%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

SENSITIVITY ANALYSIS

APPENDIX G

Road Improvement Excerpts

APPENDIX B

Proposed Regional Road Intersection Modification Projects (2017 Capital Budget and Nine Year Forecast)

Intersection	Municipality	Estimated Cost	Proposed Year of Construction
Brock Road #1 / 7th Concession	Pickering	$2,700,000	2022
Brock Road #1 / Goodwood Road #21	Uxbridge	$3,000,000	2020
Regional Road #3 / Regional Road #57	Clarington	$2,600,000	2019
Taunton Road #4 / Anderson Street	Whitby	$1,000,000	2021
Taunton Road #4 / Enfield Road #34	Clarington	$5,000,000	2017
Taunton Road #4 / Courtice Road #34	Clarington	$3,400,000	2021
Taunton Road #4 / Regional Road #57	Clarington	$7,000,000	2021
Regional Road #12 / Lake Ridge Road #23	Brock	$3,700,000	2018
Ritson Road #16 / Beatrice Street	Oshawa	$1,100,000	2023
Bayly Street #22 / Sandy Beach Road	Pickering	$1,050,000	2023
Bayly Street #22 / Church Street #24	Pickering	$6,550,000	2020
Bayly Street #22 / Westney Road #31	Ajax	$700,000	2017
Victoria Street #2 / Brock Street #46	Whitby	$4,320,000	2023
Thickson Road #26 / Burns Street	Whitby	$700,000	2021
Thickson Road #26 / Rossland Road #28	Whitby	$3,900,000	2022
Rossland Road #28 / Cochrane Street #43	Whitby	$275,000	2021
Rossland Road #28 / Garden Street	Whitby	$2,500,000	2020
Salem Road #41 / Rossland Road #28	Ajax	$1,800,000	2022
Stevenson Road #53 / Phillip Murray Avenue #52	Oshawa	$520,000	2023
Townline Road #55 / Pebblestone Road	Oshawa/Clarington	$1,000,000	2018
Regional Road #57 / Concession 7	Clarington	$2,060,000	2023
Manning Road #58 / Brock Street	Whitby	$3,250,000	2019
King Street #Hwy 2 / Maple Grove Road	Clarington	$2,970,000	2017
King Street #Hwy 2 / Lambs Road	Clarington	$1,400,000	2023
Regional Highway #47 / Concession 6	Uxbridge	$1,450,000	2022

APPENDIX C

Proposed Regional Road Expansion Projects to 2031

ID #	Corridor	Limits	Description	Recommended Phasing	EA Status
1.2	Brock Road	Finch Avenue to Taunton Road	Widen from 5 to 7 lanes	2027-2031	Completed
1.3a	Brock Road	Taunton Road to Whitevale Road	Widen from 2 to 4 lanes	2017-2021	Completed
1.3b	Brock Road	Taunton Road to Whitevale Road	Widen from 4 to 6 lanes	2027-2031	Completed
1.5	Brock Road	Whitevale Road to Highway 7	Widen from 4 to 6 lanes	2027-2031	Completed
2.1	Simcoe Street	Conlin Road to Winchester Road	Widen from 2/4 to 5 lanes	2017-2021	Completed
2.2	Simcoe Street	King Street to Greenway Boulevard	Widen from 2 to 3 lanes	2027-2031	Completed
3.1a	Winchester Road	Baldwin Street to Anderson Street/Watford Street	Widening from 2 to 3 lanes	2017-2021	Completed
3.1b	Winchester Road	Anderson Street/Watford Street to Garrard Road	Widening from 2 to 5 lanes	2017-2021	Completed
4.1	Taunton Road	York-Durham Line to Brock Road	Widen from 4 to 6/7 lanes	2027-2031	Completed
4.2	Taunton Road	Brock Road to Brock Street	Widen from 5 to 6/7 lanes	2027-2031	Not started
4.3	Taunton Road	Brock Street to Simcoe Street	Widen from 5 to 6/7 lanes	2027-2031	Not started
5.1	Central Street	Canso Drive/William Street to Brock Road	Urbanize and improve corridor	2022-2026	Not started
14.1	Liberty Street	Baseline Road to King Street	Widen from 2 to 3 lanes	2017-2021	Not started
16.1	Ritson Road	Taunton Road to Conlin Road	Widen from 2/3 to 5 lanes	2022-2026	Not started
16.2	Ritson Road	Conlin Road to Britannia Avenue	Widen from 2 to 4 lanes	2027-2031	Not started
17.1	North Street	North of the CPR to Concession Road 3	Construct new alignment and widen from 2 to 3 lanes	2027-2031	Not started
22.1	Bayly Street	Liverpool Road to Brock Road	Widen from 5 to 6/7 lanes	2022-2026	Not started

ID #	Corridor	Limits	Description	Recommended Phasing	EA Status
22.2a	Bayly Street	Brock Road to Westney Road	Widen from 5 to 7 lanes	2027-2031	Not started
22.2b	Bayly Street	Westney Road to Harwood Avenue	Widen from 5 to 7 lanes	2022-2026	Not started
22.3	Bayly Street	Harwood Avenue to Salem Road	Widen from 4 to 6 lanes	2027-2031	Not started
22.5	Victoria Street	South Blair Street to west of Thickson Road	Construct new alignment and widen from 2 to 5 lanes	2017-2021	Completed
22.6	Victoria Street	East of Thickson Road to west of Stevenson Road	Widen from 2/3 to 4/5 lanes	2017-2021	Completed
22.8	Bloor Street	Ritson Road to Farewell Street	Widen from 3 to 5 lanes	2027-2031	Not started
22.10	Bloor Street	Harmony Road to Grandview Drive	Construct new alignment to 4 lanes, with new CPR grade separation and bridge crossing of Farewell Creek	2022-2026	Not started
22.12	Bloor Street	Prestonvale Road to Courtice Road	Widen from 2 to 3 lanes and improve profile	2022-2026	Not started
23.1	Lake Ridge Road	Bayly Street/Victoria Street to Kingston Road/Dundas Street	Widen from 2 to 4/5 lanes	2017-2021	In progress
23.2	Lake Ridge Road	Kingston Road/Dundas Street to Rossland Road	Widen from 2 to 4/5 lanes	2022-2026	Not started
25.1	Consumers Drive	East of Thickson Road to Thornton Road	Construct new 3 lane connection	2017-2021	Completed
26.1	Thickson Road	Wentworth Street to CNR Kingston	Widen from 2 to 4 lanes	2017-2021	Completed
26.2	Thickson Road	Consumers Drive to Dundas Street	Widen from 5 to 7 lanes	2022-2026	Not started
26.3	Thickson Road	Taunton Road to Highway 407	Widen from 2 to 4/5 lanes	2022-2026	Not started
26.4	Thickson Road	Winchester Road to Baldwin Street	Widen from 2 to 4/5 lanes	2022-2026	Not started
27.1	Altona Road	Strouds Lane to Finch Avenue	Widen from 2 to 3 lanes	2027-2031	Completed

ID #	Corridor	Limits	Description	Recommended Phasing	EA Status
28.4	Rossland Road	Ritson Road to Harmony Road	Widen from 3 to 5 lanes	2022-2026	Not started
28.5	Rossland Road	Harmony Road to east of Townline Road	Construct new alignment to 3 lanes including new bridge crossing of Harmony Creek tributary	2027-2031	10 Year Time Lapse: Review & Addendum Required
28.6a	Rossland Road	Brock Road to Sideline 24	Construct new alignment to 4 lanes with CPR grade separation	2017-2021	Completed
28.6b	Rossland Road	Sideline 24 to Whitevale Road Realignment	Construct new alignment to 5 lanes	2017-2021	Completed
28.7	Rossland Road	Whitevale Road Realignment to Highway 7	Construct new alignment to 5 lanes	2022-2026	Completed
29.1	Liverpool Road	Highway 401 to Kingston Road	Widen from 5 to 6 lanes	2022-2026	Not started
31.1	Westney Road	Bayly Street to Highway 401	Widen from 5 to 7 lanes	2022-2026	Not started
31.2	Westney Road	Highway 401 to Kingston Road	Widen from 5 to 7 lanes	2022-2026	Not started
31.4	Westney Road	Rossland Road to Taunton Road	Widen from 2 to 5 lanes	2017-2021	Completed
31.5	Westney Road	Hamlet of Greenwood	Construct new Greenwood Bypass to 2 lanes south of Highway 7 and 4 lanes to Highway 407	2022-2026	Completed
33.1	Harmony Road	Rossland Road to Taunton Road	Widen from 3 to 5 lanes	2017-2021	Completed
33.2	Harmony Road	Taunton Road to Conlin Road	Widen from 2/3 to 5 lanes	2017-2021	Completed
33.3	Harmony Road	Conlin Road to Britannia Avenue	Widen from 2 to 4 lanes	2027-2031	Not started
35.1	Wilson Road	Bloor Street to Olive Avenue	Widen from 2/3 to 4 lanes	2027-2031	Not started
36.1	Hopkins Street	Victoria Street to Consumers Drive	Construct new 4-lane overpass of Highway 401	2022-2026	Completed
36.2	Hopkins Street	Consumers Drive to Dundas Street	Widen from 2 to 3 lanes, with new CPR grade separation	2027-2031	Not started

ID #	Corridor	Limits	Description	Recommended Phasing	EA Status
37.1	Finch Avenue	Altona Road to Brock Road	Widen from 2 to 3 lanes	2022-2026	Not started
38.2	Whites Road	Kingston Road to Finch Avenue	Widen from 5 to 6 lanes including structure widening	2022-2026	Not started
38.3	Whites Road	Finch Avenue to Third Concession Road	Widen from 2 to 6 lanes, with new CPR grade separation	2022-2026	Completed
38.4	Whites Road	Third Concession Road to Taunton Road	Construct new alignment to Sideline 26 (future Whites Rd connection) and widen from 2 to 6 lanes across West Duffins Creek (1.1 km)	2022-2026	Completed
38.5	Whites Road	Taunton Road to Whitevale Road	Construct new connection to 6 lanes	2017-2021	Completed
38.6a	Whites Road	Whitevale Road to Highway 7	Construct new alignment to 4 lanes	2017-2021	Completed
38.6b	Whites Road	Whitevale Road to Highway 7	Widen from 4 to 6 lanes	2027-2031	Completed
52.1a	Thornton Road	Champlain Avenue to north of Consumers Drive Extension	Widen from 2 to 3 lanes	2017-2021	Completed
52.1b	Thornton Road	North of Consumers Drive Extension to King Street	Widen from 2 to 4 lanes, with new CPR grade separation	2022-2026	Not started
53.1	Stevenson Road	CPR Belleville to Bond Street	Widen from 4 to 5 lanes	2027-2031	Not started
53.2	Stevenson Road	Bond Street to Rossland Road	Widen from 3/4 to 5 lanes	2027-2031	Not started
57.1	Regional Road 57	Baseline Road to south of King Street	Widen from 2 to 4 lanes	2017-2021	In progress
57.2	Regional Road 57	South of King Street to north of Stevens Road	Widen from 2 to 4 lanes	2017-2021	In progress
57.3	Regional Road 57	North of Stevens Road to north of Nash Road	Widen from 2 to 4 lanes	2022-2026	In progress
58.1	Manning Road/Adelaide Ave	Garrard Road to Thornton Road	Construct new connection to 3 lanes, with new crossing of Corbett Creek	2017-2021	Completed

ID #	Corridor	Limits	Description	Recommended Phasing	EA Status
58.2	Adelaide Avenue	Townline Road to Trulls Road	Construct new bridge crossing of Farewell Creek and new 3-lane connection	2022-2026	Completed
59.1	Gibb Street	East of Stevenson Road to Simcoe Street	Widen from 3 to 4/5 lanes	2017-2021	Completed
59.2	Gibb Street / Olive Avenue	Simcoe Street to Ritson Road	Construct new connection and widen from 2/3 lanes to 4/5 lanes	2022-2026	Completed
99.1a	Whitevale Road	Brock Road to West limit of Phase 1	Construct new connection to 4/5 lanes. Widen existing portion from 2 to 4 lanes.	2017-2021	Completed
99.1b	Whitevale Road	West limit of Phase 1 to east of West Duffins Creek	Construct new connection to 4/5 lanes	2017-2021	Completed
99.2	Whitevale Road	York-Durham Line to east of West Duffins Creek	Construct new 2-lane connection	2027-2031	Completed
99.3	Whitevale Road	East of Sideline 16 to Brock Road	Widen from 2 to 4 lanes	2022-2026	Completed
102.7	Regional Highway 2	East of Newcastle	Widen railway overpass tunnel from 1 to 2 lanes (bridge replacement)	2027-2031	Not started
112.1	Brock Street (Regional Highway 12)	Rossland Road to Taunton Road	Widen from 3 to 5 lanes	2017-2021	Completed
112.2	Baldwin Street (Regional Highway 12)	Taunton Road to Highway 407	Widen from 2 to 4/5 lanes	2022-2026	Not started
147.1	Regional Highway 47	York-Durham Line to Goodwood Road	Road Widening from 2 to 4 lanes with intersection modifications	2022-2026	Not started

Proposed Road Expansion Projects Beyond 2031

RR	Corridor	Limits	Description	Recommended Phasing	EA Status
1	Brock Road	Highway 7 to Seventh Concession Road	Widen from 2 to 4/5 lanes	Beyond 2031	Not started
1	Brock Road	Bridges over Highway 401 and CNR/GO Rail corridor	Widen bridges to 6/7 lanes	Beyond 2031	Not started
2	Simcoe Street	Winchester Road to Howden Road	Widen from 2 to 4 lanes	Beyond 2031	Not started
3	Winchester Road	Garrard Road to Simcoe Street	Widen from 2 to 4 lanes	Beyond 2031	Not started
4	Taunton Road	Simcoe Street to Townline Road	Widen from 5 to 6/7 lanes	Beyond 2031	Not started
22	Bloor Street	Grandview Drive to Prestonvale Road	Widen from 2 to 4 lanes	Beyond 2031	Not started
23	Lake Ridge Road	Highway 7 to Brawley Road	Widen from 2 to 4 lanes	Beyond 2031	Not started
27	Altona Road	Finch Avenue to Taunton Road	Widen from 2 to 4 lanes, with new CPR grade separation	Beyond 2031	Not started
27	Altona Road	Taunton Road to Whitevale Road Extension	Widen from 2 to 4 lanes	Beyond 2031	Not started
29	Liverpool Road	Bridge over Highway 401 and CNR/GO Rail corridor	Widen bridge over Highway 401 to accommodate cycling facilities	Beyond 2031	Not started
33	Seventh Concession Road	Brock Road to Westney Road	Widen from 2 to 4 lanes	Beyond 2031	Not started
31	Westney Road	Bridges under Highway 401 and CNR/GO Rail corridor	Widen bridges to 6/7 lanes	Beyond 2031	Not started
31	Westney Road	Highway 407 to Seventh Concession Road	Widen from 2 to 4/5 lanes	Beyond 2031	Not started
33	Harmony Road	Britannia Avenue to Winchester Road	Widen from 2 to 4/5 lanes	Beyond 2031	Not started

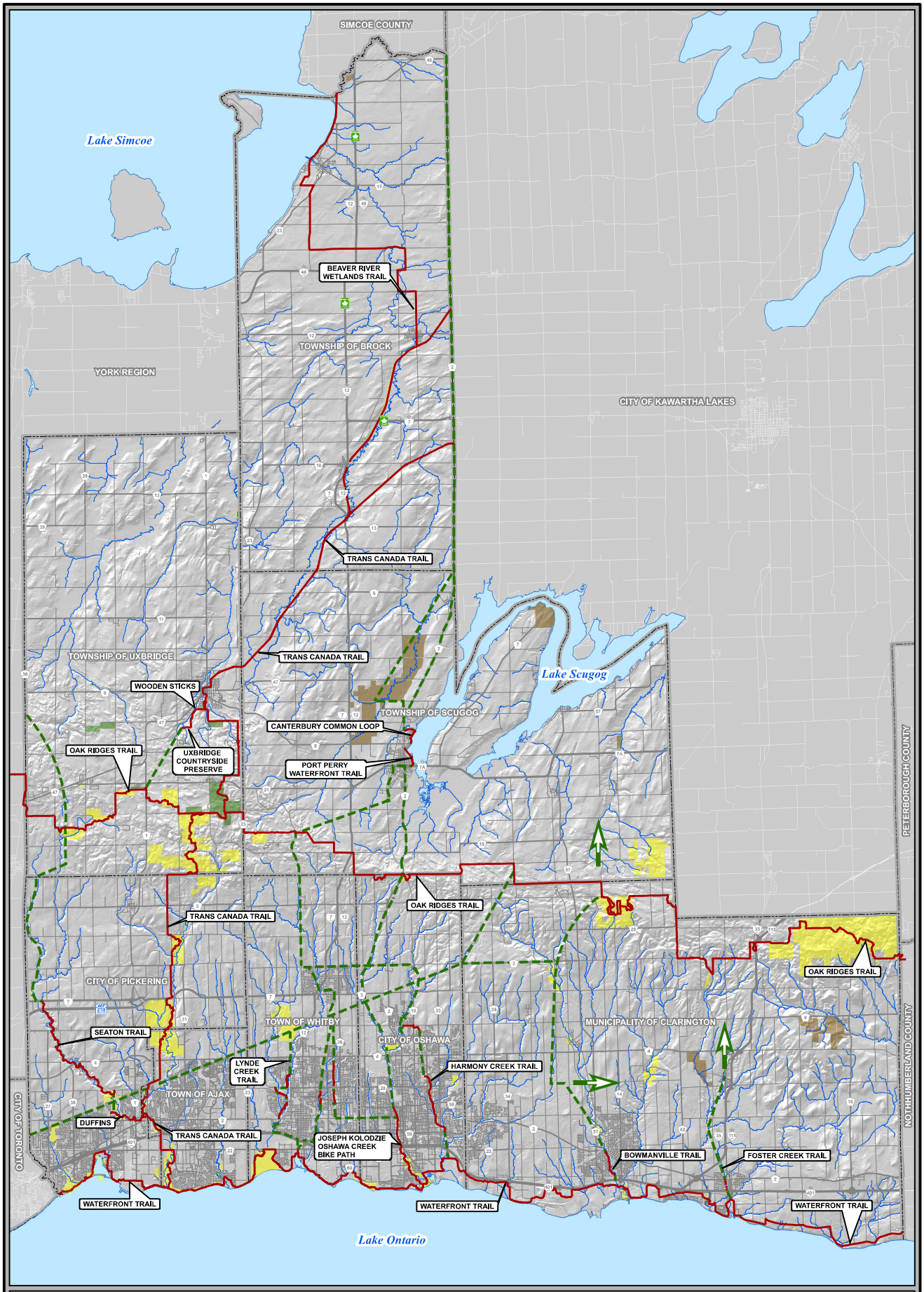
RR	Corridor	Limits	Description	Recommended Phasing	EA Status
34	Courtice Road	Taunton Road to Enfield Road	Construct new connection and realignment north of Taunton Road	Beyond 2031	Not started
34	Courtice Road	Bloor Street to Highway 401	Widen from 2 to 4/5 lanes	Beyond 2031	Not started
35	Wilson Road	Olive Avenue to Bond Street	Widen from 3 to 4 lanes	Beyond 2031	Not started
42	Darlington-Clarke Townline	Regional Highway 2 to Concession Street	Widen from 2 to 3 lanes	Beyond 2031	Not started
55	Townline Road	Olive Avenue to Bloor Street	Construct new bridge crossing of Farewell Creek, with widening of approach roads from 2 to 3 lanes	Beyond 2031	Not started
55	Townline Road	Adelaide Avenue to Pebblestone Road	Widen from 2 to 4 lanes	Beyond 2031	Not started
55	Townline Road	Pebblestone Road to Taunton Road	Widen from 2 to 3 lanes	Beyond 2031	Not started
59	Gibb Street	Stevenson Road to Thornton Road	Widen from 2 to 4 lanes	Beyond 2031	Not started
RHwy2	King Street	Townline Road to Highway 418	Widen from 4/5 lanes to 7 lanes	Beyond 2031	Not started
RHwy2	King Street / Regional Highway 2	Mearns Avenue to Highway 35/115	Widen from 2 to 4 lanes	Beyond 2031	Not started

Non-Regional Roads					
	Baseline Road	Holt Road to Regional Road 57	Widen from 2 to 4 lanes	Beyond 2031	Not started
	Baseline Road	Lambs Road to Regional Highway 2	Construct new 4 lane road.	Beyond 2031	Not started
	Bloor Street	Courtice Road to Holt Road	Widen from 2 to 4/5 lanes	Beyond 2031	Not started
	Brawley Road	Lake Ridge Road to Highway 7/12	Widen from 2 to 4/5 lanes	Beyond 2031	Not started
	Brawley Road	Highway 7/12 to Thornton Road	Construct new 4 lane road.	Beyond 2031	Not started

RR	Corridor	Limits	Description	Recommended Phasing	EA Status
	Brock Concession Road 8	Lake Ridge Road to Highway 12	Upgrade to Type A Arterial standard and realign to Ravenshoe Road	Beyond 2031	Not started
	Clements Road	Church Street to west of Westney Road	New 2-lane arterial over Duffins Creek	Beyond 2031	Not started
	Cochrane Street extension and new east-west midblock arterial	Highway 7 to Garrard Road	New 4-lane arterial	Beyond 2031	Not started
	Columbus Road	Lake Ridge Road to Whitby/Oshawa boundary	Widen from 2 to 4/5 lanes and realign to connect to Seventh Concession Road	Beyond 2031	Not started
	Columbus Road	Whitby/Oshawa boundary to Grandview Street	Widen from 2 to 4/5 lanes	Beyond 2031	Not started
	Consumers Drive Extension	Thornton Road to Fox Street (at Laval Drive)	Construct new 2 lane or 4 lane connection to Stevenson Road (via Laval Drive) with grade separation at CP Rail spur line	Beyond 2031	Not started
	Eighth Concession Road	Brock Road to Lake Ridge Road	Widen from 2 to 4 lanes	Beyond 2031	Not started
	Harmony Road	Winchester Road to Highway 407	Widen from 2 to 4/5 lanes	Beyond 2031	Not started
	Harmony Road	Highway 407 to Columbus Road	Upgrade to Type A Arterial standard when assumed by the Region	Beyond 2031	Not started
	Holt Road	Regional Highway 2 to Bloor Street	Widen from 2 to 3 lanes	Beyond 2031	Not started
	Holt Road	Bloor Street to Highway 401	Widen from 2 to 3 lanes with grade separation at CP Rail	Beyond 2031	Not started

RR	Corridor	Limits	Description	Recommended Phasing	EA Status
	Highway 7	York-Durham Line to Brock Road	Widen 2 to 4 lanes	Beyond 2031	Not started
	King Street	Harmony Road to Townline Road	Widen from 4/5 lanes to 7 lanes	Beyond 2031	Not started
	Kingston-Bayly Connector (Downtown Pickering, hydro corridor west of Brock Road)	Kingston Road to Bayly Street	Construct new connection, including grade separations at Highway 401 and CN/GO rail corridor	Beyond 2031	Not started
	Lambs Road	Durham Highway 2 to Highway 401	Widen from 2 to 4/5 lanes	Beyond 2031	Not started
	New arterial road extension of Garden Street	North of Robert Attersley Drive to east-west mid-block arterial	New 2/4-lane arterial	Beyond 2031	Not started
	Notion Road-Squires Beach Road connection across Highway 401	Pickering Parkway to Kellino Street	New crossing of Highway 401 with grade separation at CN/GO Rail corridor	Beyond 2031	Not started
	Salem Road	Highway 7 to Eighth Concession Road	Widen from 2 to 4/5 lanes	Beyond 2031	Not started
	Scugog Line 2	Highway 7/12 to Simcoe Street	Upgrade and extend across missing section between Old Simcoe Road and Simcoe Street	Beyond 2031	Not started
	Seventh Concession Road	Westney Road to Lake Ridge Road	Widen from 2 to 4/5 lanes and connect to realigned Columbus Road	Beyond 2031	Not started

RR	Corridor	Limits	Description	Recommended Phasing	EA Status
	Stevenson Road	North of Rossland Road to Taunton Road	Construct new 4/5-lane connection and widen existing section from 2 to 4/5 lanes (if Oshawa Executive Airport closes)	Beyond 2031	Not started
	Thornton Road	Taunton Road to Howden Road	Widen from 2 to 4/5 lanes	Beyond 2031	Not started
	Townline Road	Taunton Road to Conlin Road	Widen from 2 to 3 lanes	Beyond 2031	Not started
	Townline Road	Conlin Road to Winchester Road	Construct new 3-lane road and grade separation over Highway 407	Beyond 2031	Not started
	Westney Road	Seventh Concession Road to Eighth Concession Road	Widen from 2 to 4/5 lanes	Beyond 2031	Not started
	Highway 48	Lake Ridge Road to Highway 12	Widen as part of future Highway 404 extension	Beyond 2031	Complete



DURHAM REGIONAL TRAIL NETWORK (2015)

SCALE

0 1 2 4 6 8 10

Kilometres

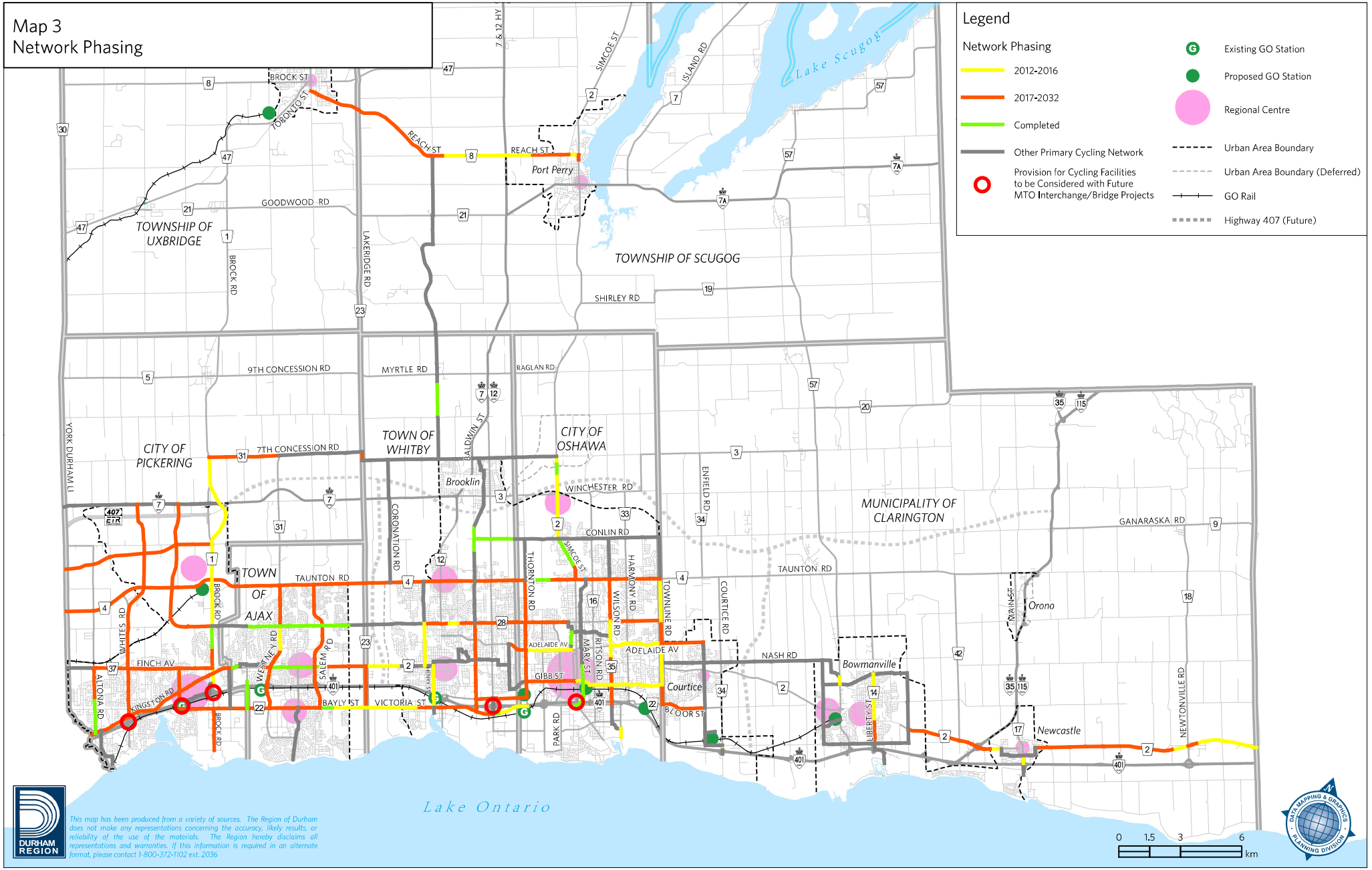
REGIONAL TRAIL NETWORK

Existing Trail — Proposed Linkage — Potential Trail Need

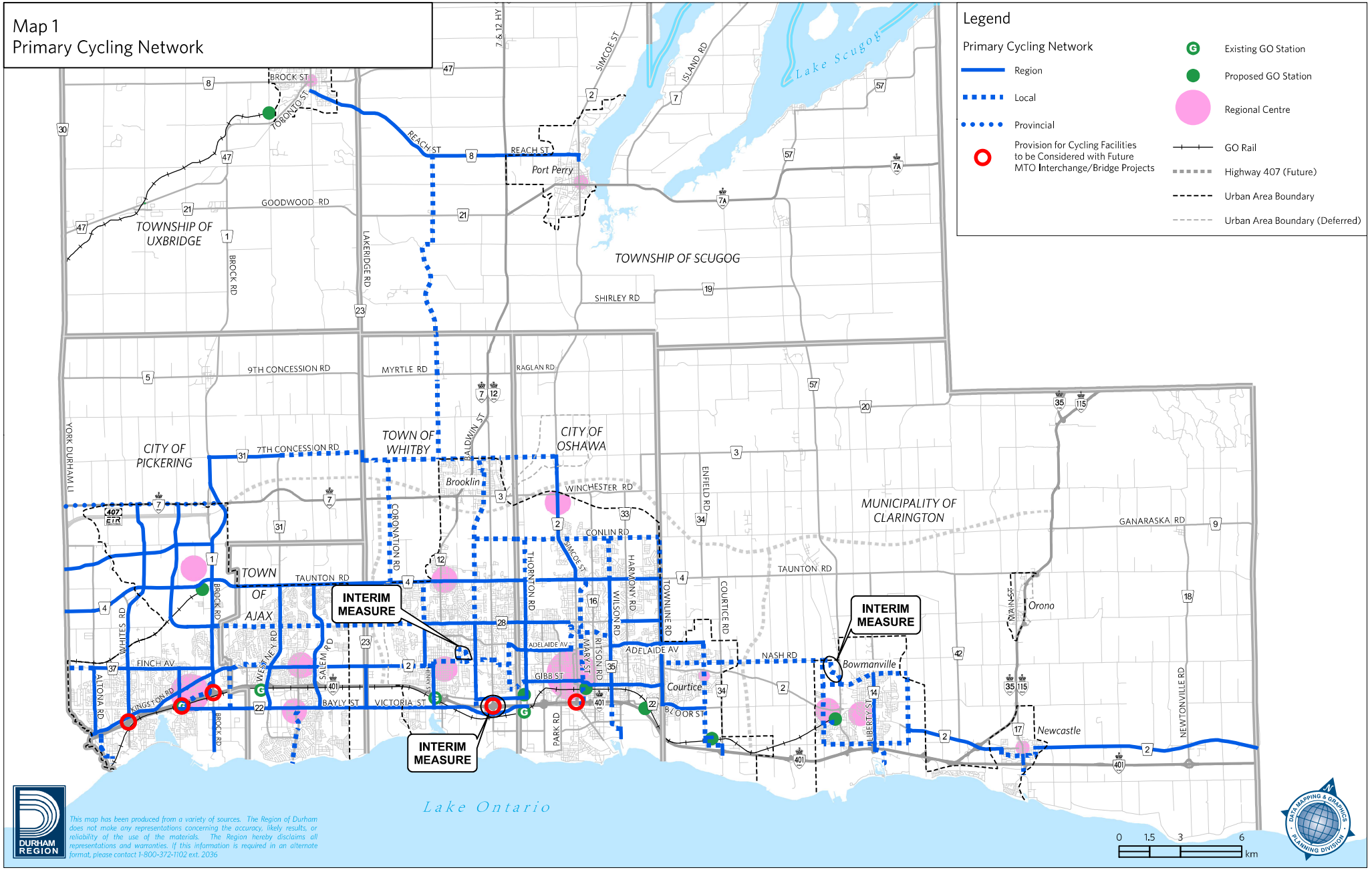
NATURAL AREAS

Conservation Area — Regional Forest — MNR Owned Land

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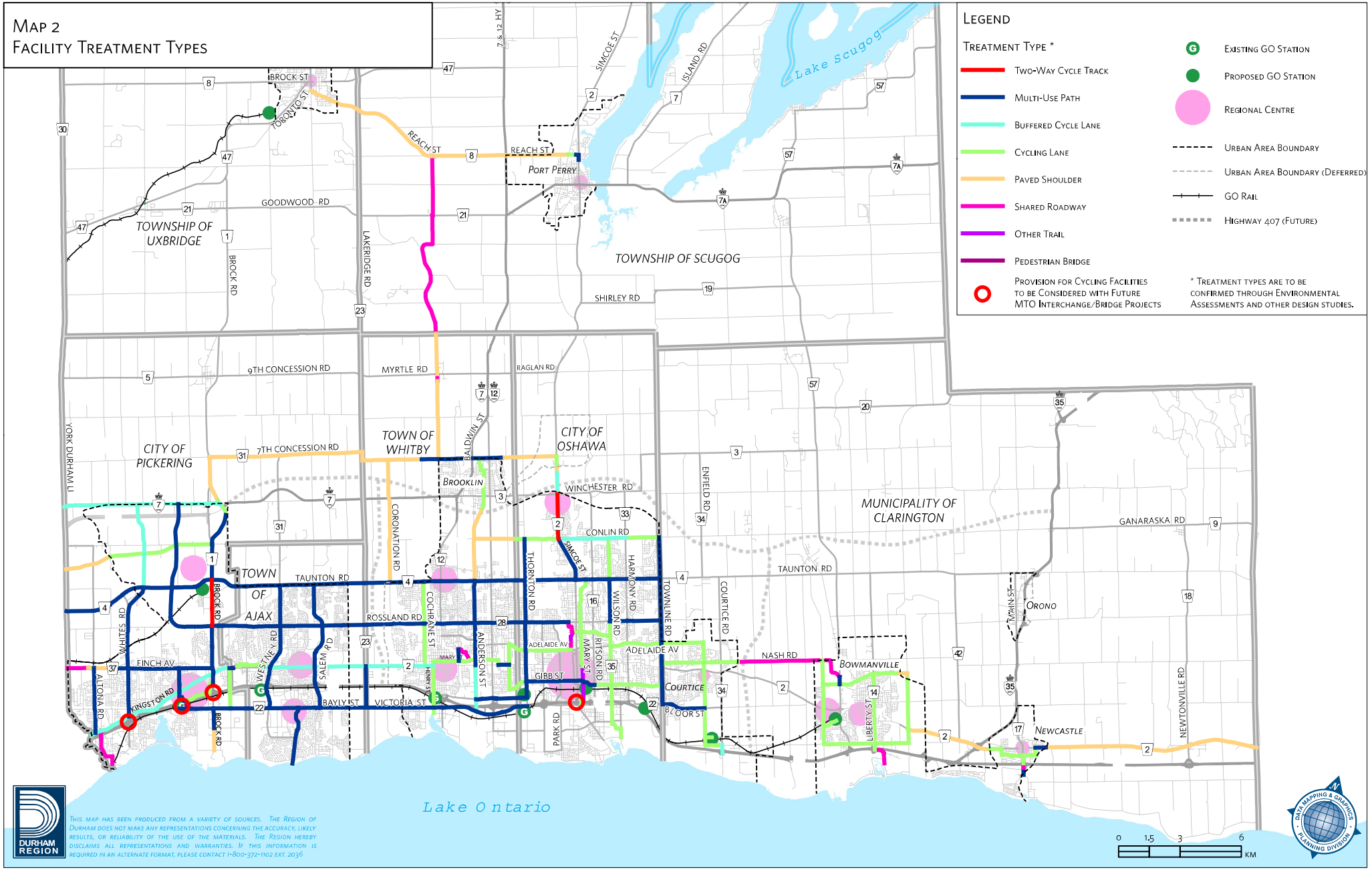


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Map 2
Facility Treatment Types



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APPENDIX H

Background Development Excerpt

TRANS-PLAN™
Transportation Engineering

TRAFFIC IMPACT STUDY, PARKING STUDY, SITE CIRCULATION REVIEW & TDM PLAN
(Update as per Region Comments)

Proposed Addition to Pickering Islamic Centre

2065 Brock Road

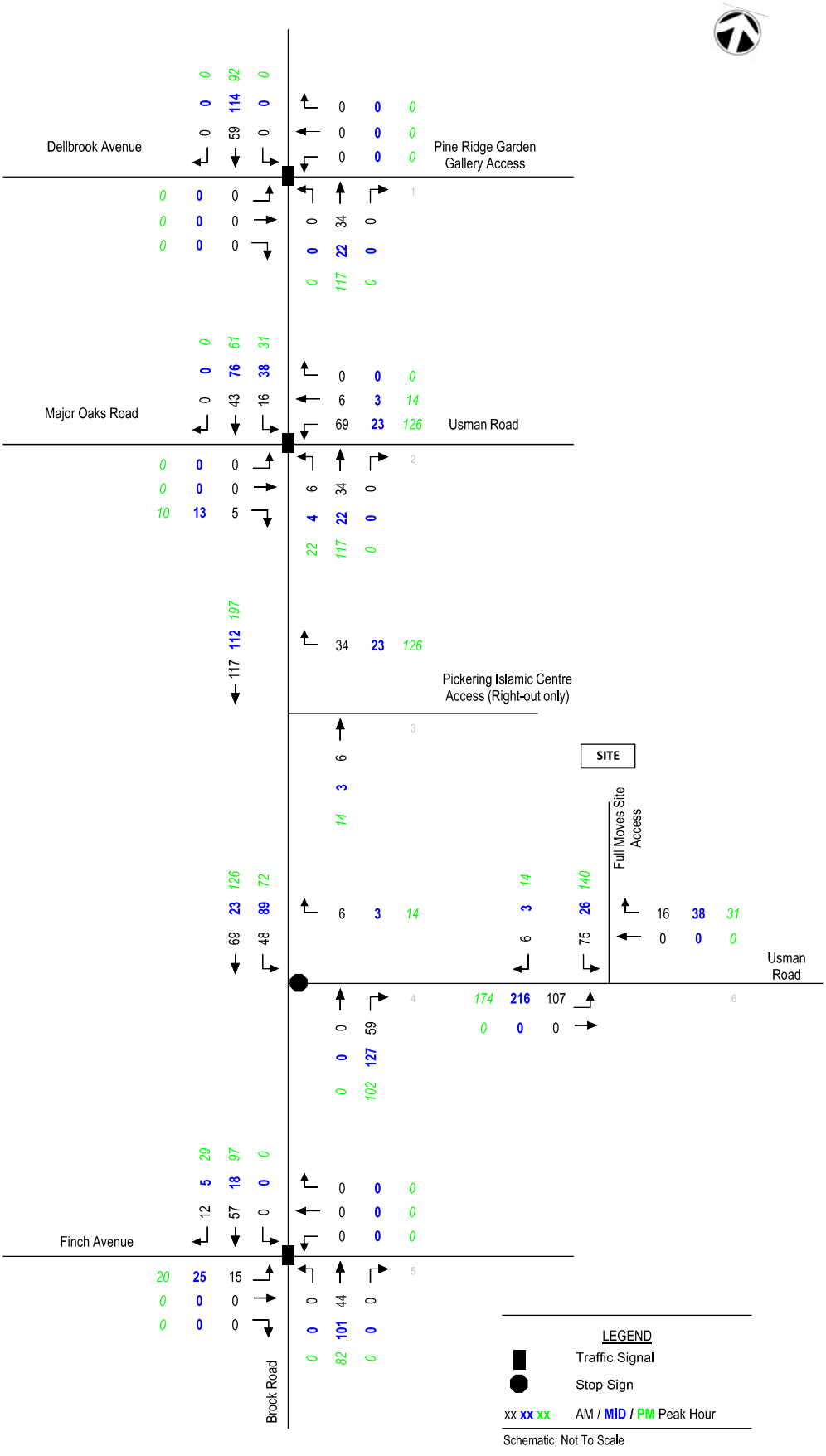
City of Pickering, Ontario

Prepared for: Pickering Islamic Centre – Masjid Usman

July 2018

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Figure 7: Site Traffic Assignment, Weekday AM, Midday and PM Peak Hours



APPENDIX I

Signal Warrant Analysis

Input Data Sheet

Analysis Sheet | Results Sheet | Proposed Collision

GO TO Justification:

What are the intersecting roadways? Brock Road and Usman Road

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

When was the data collected? 2029 Future Total

Justification 1 - 4: Volume Warrants

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

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

c.- How many approaches? 3

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

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

Hour Ending	Main Northbound Approach			Minor Eastbound Approach			Main Southbound Approach			Minor Westbound Approach			Pedestrians Crossing Main Road
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
7:00	0	1,011	113	0	0	0	78	2,523	0	0	0	40	
8:00	0	878	89	0	0	0	55	997	0	0	0	23	
9:00	0	878	89	0	0	0	55	997	0	0	0	23	
10:00	0	878	89	0	0	0	55	997	0	0	0	23	
16:00	0	878	89	0	0	0	55	997	0	0	0	23	
17:00	0	878	89	0	0	0	55	997	0	0	0	23	
18:00	0	878	89	0	0	0	55	997	0	0	0	23	
19:00	0	2,499	241	0	0	0	142	1,465	0	0	0	52	
Total	**0**	**8,778**	**888**	**0**	**0**	**0**	**550**	**9,970**	**0**	**0**	**0**	**230**	**0**

Justification 5: Collision Experience

Preceding Months	Number of Collisions*
1-12	0
13-24	0
25-36	0

* Include only collisions that are susceptable to correction through the installation of traffic signal control

Justification 6: Pedestrian Volume

a.- Please fill in table below summarizing total pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	0	0	0	0			0	0	
Factored 8 hour pedestrian volume	0		0		0		0		
% Assigned to crossing rate	0%		0%		0%		0%		
Net 8 Hour Pedestrian Volume at Crossing									0
Net 8 Hour Vehicular Volume on Street Being Crossed									0

b.- Please fill in table below summarizing delay to pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	0	0	0	0	0	0	0	0	
Total 8 hour pedestrians delayed greater than 10 seconds	0	0					0	0	
Factored volume of total pedestrians	0		0		0		0		
Factored volume of delayed pedestrians	0		0		0		0		
% Assigned to Crossing Rate	0%		0%		0%		0%		
Net 8 Hour Volume of Total Pedestrians									0
Net 8 Hour Volume of Delayed Pedestrians									0

Results Sheet

Input Sheet | Analysis Sheet | Proposed Collision

GO TO Justification:

Intersection: Brock Road and Usman Road

Count Date: 2029 Future Total

Summary Results

Justification			Compliance		Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A	Total Volume	100	%	☐	☑
	B	Crossing Volume	11	%		
2. Delay to Cross Traffic	A	Main Road	100	%	☐	☑
	B	Crossing Road	12	%		
3. Combination	A	Justificaton 1	11	%	☐	☑
	B	Justification 2	12	%		
4. 4-Hr Volume			30	%	☐	☑
5. Collision Experience			0	%	☐	☑
6. Pedestrians	A	Volume	Justification not met		☐	☑
	B	Delay	Justification not met			

Signal Warrant Calculation

Justification 7 - Projected Volumes

Major Street: Brock Road North/South

Minor Street: Usman Road East/West

Traffic Condition:

Number of Approaches: 1 Flow Condition: Restricted Flow (Urban)

Tee Intersection: Yes No. of Peak Hours: 1

Existing Intersection: Yes

Volume	1st Hour	2nd Hour	Factor	Average Hour
1A - All	3765	4399	2	4082
1B - Minor	40	52	2	46
2A - Major	3725	4347	2	4036
2B - Crossing	0	71	2	36

WARRANT 1 - MINIMUM VEHICULAR VOLUME => 18% Satisfied

		Restricted Flow	Average Hour	Percent Satisfied
A.	Vehicle volume all approaches (average hour)	720	4082	567%
B.	Vehicle volume, along minor streets (average hour)	255	46	18%

WARRANT 2 - DELAY TO CROSS TRAFFIC => 48% Satisfied

		Restricted Flow	Average Hour	Percent Satisfied
A.	Vehicle volume all approaches (average hour)	720	4036	561%
B.	Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	75	36	48%

Overall Warrant => 48% Satsified

Result => No signals are warranted nor provision for undergrounds needed.

Input Data Sheet

Analysis Sheet | Results Sheet | Proposed Collision

GO TO Justification:

What are the intersecting roadways? Brock Road and Usman Road

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

When was the data collected? 2029 Future Total

Justification 1 - 4: Volume Warrants

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

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

c.- How many approaches? 3

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

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

Hour Ending	Main Northbound Approach			Minor Eastbound Approach			Main Southbound Approach			Minor Westbound Approach			Pedestrians Crossing Main Road
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
7:00	0	1,011	113	0	0	0	78	2,523	0	0	0	40	
8:00	0	787	118	0	0	0	65	954	0	0	0	37	
9:00	0	787	118	0	0	0	65	954	0	0	0	37	
10:00	0	787	118	0	0	0	65	954	0	0	0	37	
16:00	0	787	118	0	0	0	65	954	0	0	0	37	
17:00	0	787	118	0	0	0	65	954	0	0	0	37	
18:00	0	787	118	0	0	0	65	954	0	0	0	37	
19:00	0	2,137	358	0	0	0	181	1,293	0	0	0	109	
Total	**0**	**7,870**	**1,179**	**0**	**0**	**0**	**649**	**9,540**	**0**	**0**	**0**	**371**	**0**

Justification 5: Collision Experience

Preceding Months	Number of Collisions*
1-12	0
13-24	0
25-36	0

* Include only collisions that are susceptable to correction through the installation of traffic signal control

Justification 6: Pedestrian Volume

a.- Please fill in table below summarizing total pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	0	0	0	0			0	0	
Factored 8 hour pedestrian volume	0		0		0		0		
% Assigned to crossing rate	0%		0%		0%		0%		
Net 8 Hour Pedestrian Volume at Crossing									0
Net 8 Hour Vehicular Volume on Street Being Crossed									0

b.- Please fill in table below summarizing delay to pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	0	0	0	0	0	0	0	0	
Total 8 hour pedestrians delayed greater than 10 seconds	0	0					0	0	
Factored volume of total pedestrians	0		0		0		0		
Factored volume of delayed pedestrians	0		0		0		0		
% Assigned to Crossing Rate	0%		0%		0%		0%		
Net 8 Hour Volume of Total Pedestrians									0
Net 8 Hour Volume of Delayed Pedestrians									0

Results Sheet

Input Sheet | Analysis Sheet | Proposed Collision

GO TO Justification:

Intersection: Brock Road and Usman Road

Count Date: 2029 Future Total

Summary Results

Justification			Compliance		Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A	Total Volume	100	%	☐	☑
	B	Crossing Volume	18	%		
2. Delay to Cross Traffic	A	Main Road	100	%	☐	☑
	B	Crossing Road	13	%		
3. Combination	A	Justificaton 1	18	%	☐	☑
	B	Justification 2	13	%		
4. 4-Hr Volume			48	%	☐	☑
5. Collision Experience			0	%	☐	☑
6. Pedestrians	A	Volume	Justification not met		☐	☑
	B	Delay	Justification not met			

Signal Warrant Calculation

Justification 7 - Projected Volumes

Major Street: Brock Road North/South

Minor Street: Usman Road East/West

Traffic Condition:

Number of Approaches: 1 Flow Condition: Restricted Flow (Urban)

Tee Intersection: Yes No. of Peak Hours: 1

Existing Intersection: Yes

Volume	1st Hour	2nd Hour	Factor	Average Hour
1A - All	3765	4078	2	3922
1B - Minor	40	109	2	75
2A - Major	3725	3969	2	3847
2B - Crossing	0	91	2	46

WARRANT 1 - MINIMUM VEHICULAR VOLUME => 29% Satisfied

		Restricted Flow	Average Hour	Percent Satisfied
A.	Vehicle volume all approaches (average hour)	720	3922	545%
B.	Vehicle volume, along minor streets (average hour)	255	75	29%

WARRANT 2 - DELAY TO CROSS TRAFFIC => 61% Satisfied

		Restricted Flow	Average Hour	Percent Satisfied
A.	Vehicle volume all approaches (average hour)	720	3847	534%
B.	Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	75	46	61%

Overall Warrant => 61% Satsified

Result => No signals are warranted nor provision for undergrounds needed.

Input Data Sheet

Analysis Sheet | Results Sheet | Proposed Collision

GO TO Justification:

What are the intersecting roadways? Brock Road and Usman Road

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

When was the data collected? 2029 Future Total

Justification 1 - 4: Volume Warrants

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

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

c.- How many approaches? 3

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

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

Hour Ending	Main Northbound Approach			Minor Eastbound Approach			Main Southbound Approach			Minor Westbound Approach			Pedestrians Crossing Main Road
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
7:00	0	2,137	358	0	0	0	181	1,293	0	0	0	109	
8:00	0	1,159	150	0	0	0	81	690	0	0	0	40	
9:00	0	1,159	150	0	0	0	81	690	0	0	0	40	
10:00	0	1,159	150	0	0	0	81	690	0	0	0	40	
16:00	0	1,159	150	0	0	0	81	690	0	0	0	40	
17:00	0	1,159	150	0	0	0	81	690	0	0	0	40	
18:00	0	1,159	150	0	0	0	81	690	0	0	0	40	
19:00	0	2,499	241	0	0	0	142	1,465	0	0	0	52	
Total	**0**	**11,590**	**1,499**	**0**	**0**	**0**	**809**	**6,898**	**0**	**0**	**0**	**401**	**0**

Justification 5: Collision Experience

Preceding Months	Number of Collisions*
1-12	0
13-24	0
25-36	0

* Include only collisions that are susceptable to correction through the installation of traffic signal control

Justification 6: Pedestrian Volume

a.- Please fill in table below summarizing total pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	0	0	0	0			0	0	
Factored 8 hour pedestrian volume	0		0		0		0		
% Assigned to crossing rate	0%		0%		0%		0%		
Net 8 Hour Pedestrian Volume at Crossing									0
Net 8 Hour Vehicular Volume on Street Being Crossed									0

b.- Please fill in table below summarizing delay to pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	0	0	0	0	0	0	0	0	
Total 8 hour pedestrians delayed greater than 10 seconds	0	0					0	0	
Factored volume of total pedestrians	0		0		0		0		
Factored volume of delayed pedestrians	0		0		0		0		
% Assigned to Crossing Rate	0%		0%		0%		0%		
Net 8 Hour Volume of Total Pedestrians									0
Net 8 Hour Volume of Delayed Pedestrians									0

Results Sheet

Input Sheet | Analysis Sheet | Proposed Collision

GO TO Justification:

Intersection: Brock Road and Usman Road

Count Date: 2029 Future Total

Summary Results

Justification			Compliance		Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A	Total Volume	100	%	☐	☑
	B	Crossing Volume	20	%		
2. Delay to Cross Traffic	A	Main Road	100	%	☐	☑
	B	Crossing Road	24	%		
3. Combination	A	Justificaton 1	20	%	☐	☑
	B	Justification 2	24	%		
4. 4-Hr Volume			52	%	☐	☑
5. Collision Experience			0	%	☐	☑
6. Pedestrians	A	Volume	Justification not met		☐	☑
	B	Delay	Justification not met			

Signal Warrant Calculation

Justification 7 - Projected Volumes

Major Street: Brock Road North/South

Minor Street: Usman Road East/West

Traffic Condition:

Number of Approaches: 1 Flow Condition: Restricted Flow (Urban)

Tee Intersection: Yes No. of Peak Hours: 1

Existing Intersection: Yes

Volume	1st Hour	2nd Hour	Factor	Average Hour
1A - All	4078	4399	2	4239
1B - Minor	109	52	2	81
2A - Major	3969	4347	2	4158
2B - Crossing	91	71	2	81

WARRANT 1 - MINIMUM VEHICULAR VOLUME => 32% Satisfied

		Restricted Flow	Average Hour	Percent Satisfied
A.	Vehicle volume all approaches (average hour)	720	4239	589%
B.	Vehicle volume, along minor streets (average hour)	255	81	32%

WARRANT 2 - DELAY TO CROSS TRAFFIC => 108% Satisfied

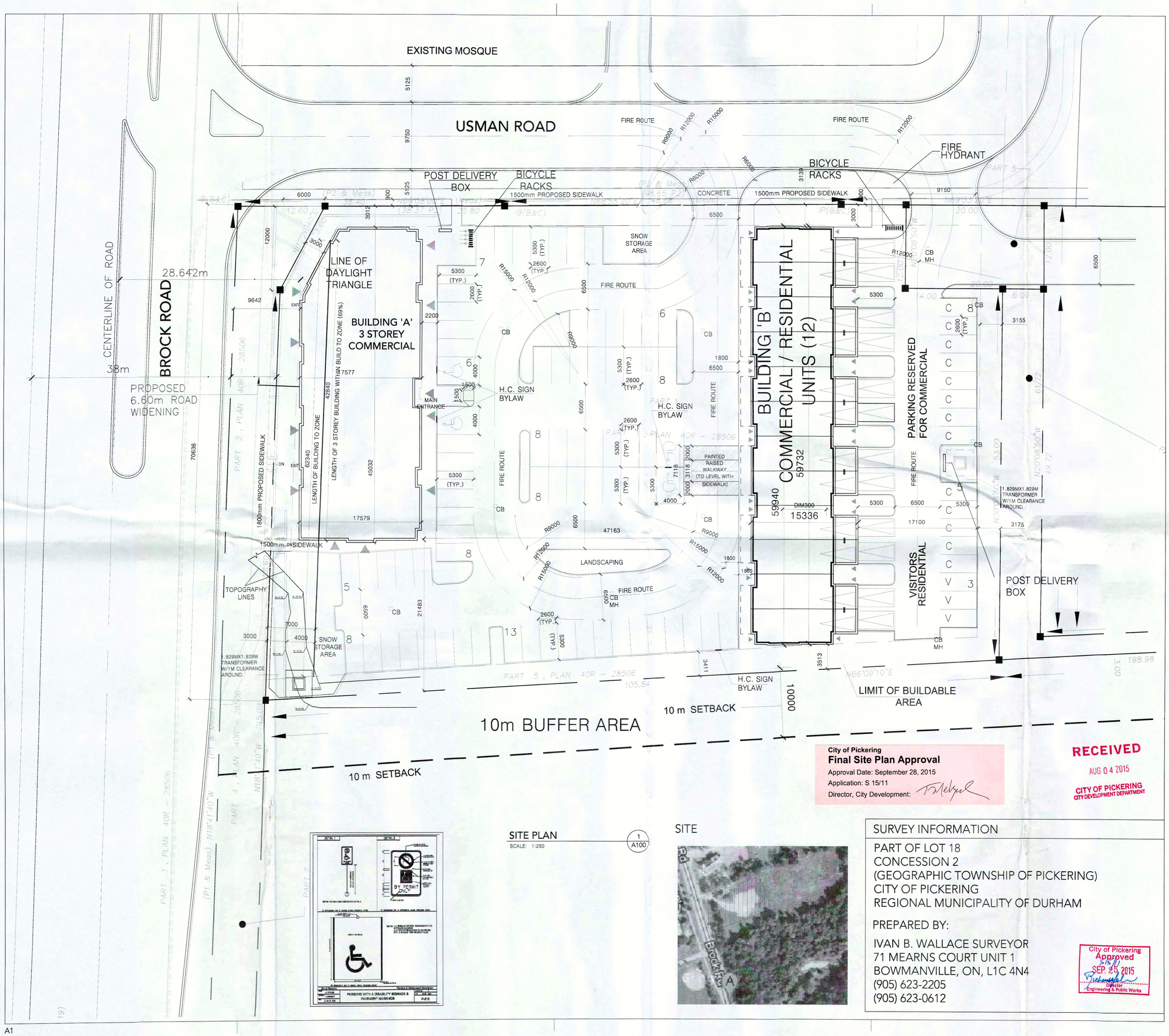
		Restricted Flow	Average Hour	Percent Satisfied
A.	Vehicle volume all approaches (average hour)	720	4158	578%
B.	Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	75	81	108%

Overall Warrant => 108% Satsified

Result => Signals not warranted but provision should be made for undergrounds to be installed.

APPENDIX J

Previously Approved Site Plan



City of Pickering
Final Site Plan Approval
Approval Date: September 28, 2015
Application: S 15/11
Director, City Development:

RECEIVED
AUG 04 2015
CITY OF PICKERING
CITY DEVELOPMENT DEPARTMENT

SITE PLAN
SCALE: 1:250
1 / A100

SITE

SURVEY INFORMATION

PART OF LOT 18
CONCESSION 2
(GEOGRAPHIC TOWNSHIP OF PICKERING)
CITY OF PICKERING
REGIONAL MUNICIPALITY OF DURHAM

PREPARED BY:

IVAN B. WALLACE SURVEYOR
71 MEARNS COURT UNIT 1
BOWMANVILLE, ON, L1C 4N4
(905) 623-2205
(905) 623-0612

City of Pickering
Approved
SEP 25 2015
Director
Engineering & Public Works

A1

Kohn
Kohn Partnership Architects inc.
116 Spadina Avenue, Suite 501, Toronto ON M5V 2K6
Tel 416.703.6700 www.kohnarchitects.com

ALL DIMENSIONS ARE GIVEN IN MILLIMETRES UNLESS OTHERWISE INDICATED.

DO NOT SCALE DRAWINGS.

CONTRACTOR SHALL VERIFY AND CHECK ALL DIMENSIONS AND CONDITIONS ON SITE PRIOR TO STARTING ANY OF THE WORK AND REPORT ANY DISCREPANCY TO THE ARCHITECT AND CONSULTANTS BEFORE PROCEEDING. CONSTRUCTION MUST CONFORM TO ALL APPLICABLE CODES AND REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION PERTAINING TO THIS APPLICATION.

THE ARCHITECT BEARS NO RESPONSIBILITY FOR THE INTERPRETATION OF THESE DOCUMENTS BY THE CONTRACTOR, UPON WRITTEN APPLICATION THE ARCHITECT WILL PROVIDE WRITTEN OR GRAPHIC CLARIFICATION AS SUPPLEMENTARY INFORMATION REGARDING THE INTENT OF THE CONTRACT DOCUMENTS.

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NO INVESTIGATION HAS BEEN UNDERTAKEN OR REPORTED ON THIS OFFICE IN REGARDS TO THE ENVIRONMENTAL CONDITIONS OR POLLUTIONS OF THIS SITE.

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REVISIONS AND DISTRIBUTION LOG

No.	Date	Note
1	DEC 09, 2011	ISSUED FOR SPA
2	MAY 03,2012	ISSUED FOR SPA
3	MAY 01,2013	ISSUED FOR SPA
4	OCT 10,2013	RE-ISSUED FOR S.P.A.
5	NOV. 12, 2013	RE-ISSUED FOR S.P.A
6	NOV 21, 2013	RE-ISSUED FOR COMMITTEE OF ADJUSTMENTS
7	DEC 04, 2013	ISSUED TO LANDSCAPING
8	DEC 15, 2014	RE-ISSUED FOR SPA
9	JAN 09, 2015	REISSUED FOR SPA
10	MAR 31, 2015	REISSUED FOR SPA
11	JUN 09, 2015	REISSUED FOR SPA

SITE STATS:

PHASE 1:

SITE AREA	7,706.1M2/ 82,948SF
BUILDING A- COMMERCIAL:	
FIRST FLOOR- RETAIL AREA	775M2/ 8,342SF
SECOND FLOOR- OFFICE AREA	735M2/ 7,911SF
THIRD FLOOR- OFFICE AREA	735M2/ 7,911SF
TOTAL AREA - BLDG A	2,245M2/ 24,164SF
BUILDING B- COMMERCIAL / RESIDENTIAL UNITS:	
3 STOREY UNITS (12 UNITS)	
GROUND FLOOR AREA (16x6)	96m2/1,033sf
SECOND FLOOR AREA (69x12)	828m2/8,912sf
THIRD FLOOR AREA (60x12)	720m2/7,750sf
TOTAL LIVING AREA	1,644m2/17,695sf*
TOTAL LIVING AREA PER UNIT -TYPE A	145m2/1,560sf x 6 = 870m2/9,365sf*
TOTAL RESIDENTIAL AREA PER UNIT -TYPE B	129m2/1,389sf x 6 = 774m2/8,331sf*
TOTAL COMMERCIAL AREA	70m2/753sf x 6 = 420m2,/ 4,521sf*
TOTAL GFA - BLDG B.	2,064m2 /22,216sf*
TOTAL GFA - BLDG A+B	4,309m2/ 46,382sf
PARKING REQUIRED COMMERCIAL 4 per 100sm	
PARKING REQUIRED:	90 CARS
PARKING PROVIDED COMMERCIAL:	
FRONT	77 CARS
REAR	13 CARS
TOTAL	90 CARS
PARKING REQUIRED RESIDENTIAL	
2/UNIT+ 1/4UNITS	24+3=27
PARKING PROVIDED RESIDENTIAL :	
RESIDENTIAL PARKING (12UNITS)	24 CARS
RESIDENTIAL VISITORS	3 CARS
TOTAL	27CARS
TOTAL CAR PARKING	117 CARS

* Areas are estimate ,they are subject to change as the project moves further into other phases

PROJECT NORTH
TRUE NORTH

ONTARIO ASSOCIATION ARCHITECTS
HARRY KOHN
LICENCE 2517
SEAL MUST BE SIGNED TO BE VALID SEAL

Project:
MIXED USE DEVELOPMENT
AHK CONSTRUCTION - 2143087 ONTARIO LMITED
2055 BROCK ROAD
Pickering, ON Ontario

Drawing Title:
SITE PLAN

Drawn By:	Checked By:	Date Checked:	Project No. 07 130
Date Plotted: Jun 17, 2015 - 4:34pm			Scale: 1:250
Drawing No.: A100			Revision No.: 10

APPENDIX K

2029 Future Total Operations without Road Widening

Table K1
2029 Future Total Level of Service (without Road Widening)

Intersection	Control	Peak Hour	Level of Service[1]	Control Delay	Maximum V/C Ratios[2]	95th Percentile > Storage Length
Brock Road (RR1) at Finch Avenue (RR37)	Signalized (Optimized with overlapping phase)	A.M.	F	225.1 s	1.72 (SBTR)	None
		P.M.	F	266.7 s	1.76 (NBTR) 1.29 (EBLT) 1.23 (NBL) 1.44 (SBTR)	102.9 m > 63.0 m (NBL) 22.9 m > 13.0 m (SBL)
		Friday Mid-day	F	225.2 s	1.63 (NBTR) 1.19 (EBLT) 1.27 (NBL) 1.32 (SBTR)	102.5 m > 63.0 m (NBL)
Brock Road (RR1) at Major Oaks Road/Usman Road	Signalized (Reconfigured & Optimized)	A.M.	F	127.7 s	1.38 (SBTR) 0.91 (WBL) 1.02 (NBL)	39.8 m > 30.0 m (EBR) 79.5 m > 20.0 m (WBL) 114.9 m > 60.0 m (SBL)
		P.M.	F	159.3 s	1.51 (NBT) 0.95 (NBL) 1.08 (SBTR)	39.4 m > 30.0 m (EBR) 56.2 m > 20.0 m (WBL) 73.4 m > 72.0 m (NBL) 144.6 m > 60.0 m (SBL)
		Friday Mid-day	F	178.8 s	1.60 (NBT) 0.96 (NBL) 1.11 (SBTR)	44.0 m > 30.0 m (EBR) 80.1 m > 20.0 m (WBL) 89.5 m > 72.0 m (NBL) 182.7 m > 60.0 m (SBL)
Brock Road (RR1) at Usman Road	One-Way Stop Controlled	A.M.	B	11.4 s	0.81 (SBT)	174.6 m > 60.0 m (SBL)
		P.M.	B	11.8 s	2.60 (SBL)	168.8 m > 60.0 m (SBL)
		Friday Mid-day	B	13.3 s	2.49 (SBL)	162.3 m > 60.0 m (SBL)

Intersection	Control	Peak Hour	Level of Service[1]	Control Delay	Maximum V/C Ratios[2]	95th Percentile > Storage Length
Usman Road Site Access	One-Way Stop Controlled	A.M.	A	9.7 s	0.12 (NBLR)	None
		P.M.	B	10.6 s	0.21 (EBTR)	None
		Friday Mid-day	B	10.3 s	0.16 (EBTR)	None

Note1: The Level of Service of a signalized intersection is based on the average control delay per vehicle. The level of Service of a stop-controlled intersection is based on the minor (stopped)approach control delay per vehicle.

Note2: The critical v/c ratio is considered to be the maximum v/c ratio at the intersection. All v/c ratios greater than 0.90 are outlined and highlighted.

APPENDIX L

Sight Distance Analysis

Table 9.9.3: Time Gap for Case B1, Left Turn from Stop

Design Vehicle	Time Gap (t_g)(s) at Design Speed of Major Road
Passenger car	7.5
Single-unit truck	9.5
Combination truck (WB 19 and WB 20)	11.5
Longer truck	To be established by road authority

Notes: Time gaps are for a stopped vehicle to turn left onto a two-lane highway with no median and with grades of 3% or less. The table values should be adjusted as follows:

- For multi-lane highways: For left turns onto two-lane highways with more than two lanes, add 0.5 s for passenger cars and 0.7 s for trucks for each additional lane, from the left, in excess of one, to be crossed by the turning vehicle.
- For minor approach grades: If the approach grade is an upgrade that exceeds 3%, add 0.2 s for each percent grade for left turns.
- Some road authorities use higher values for certain specialized vehicles (e.g., Alberta uses 22 s for very long log trucks).

The intersection sight distance along the major road (distance b in **Figure 9.9.2**) is determined by:

$$ISD = 0.278\ V_{major}\ t_g \qquad (9.9.1)$$

Where:

ISD = intersection sight distance (length of the leg of sight triangle along the major road) (m)
V_{major} = design speed of the major road (km/h)
t_g = time gap for minor road vehicle to enter the major road (s)

For example, a passenger car turning left onto a two-lane major road should be provided sight distance equivalent to a time gap of 7.5 s in major-road traffic. If the design speed of the major road is 100 km/h, this corresponds to a sight distance of 0.278(100)(7.5) = 208.5 or 210 m, rounded for design.

A passenger car turning left onto a four-lane undivided roadway will need to cross two near lanes, rather than one. This increases the recommended gap in major-road traffic from 7.5 to 8.0 s. The corresponding value of sight distance for this example would be 223 m. If the minor-road approach to such an intersection is located on a 4% upgrade, then the time gap selected for intersection sight distance design for left turns should be increased from 8.0 to 8.8 s, equivalent to an increase of 0.2 s for each percent grade.

The design values for intersection sight distance for passenger cars are shown in **Table 9.9.4**. **Figure 9.9.4** includes design values, based on the time gaps for the design vehicles included in **Table 9.9.3**.

No adjustment of the recommended sight distance values for the major-road grade is generally needed because both the major- and minor-road vehicle will be on the same grade when departing from the intersection. However, if the minor-road design vehicle is a heavy truck and the intersection is located near a sag vertical curve with grades over 3%, then an adjustment to extend the recommended sight distance based on the major-road grade should be considered.

Table 9.9.4: Design Intersection Sight Distance – Case B1, Left Turn From Stop

Design Speed (km/h)	Stopping Sight Distance (m)	Intersection Sight Distance for Passenger Cars	
		Calculated (m)	Design (m)
20	20	41.7	45
30	35	62.6	65
40	50	83.4	85
50	65	104.3	105
60	85	125.1	130
70	105	146.0	150
80	130	166.8	170
90	160	187.7	190
100	185	208.5	210
110	220	229.4	230
120	250	250.2	255
130	285	271.1	275

Note: Intersection sight distance shown is for a stopped passenger car to turn left onto a two-lane highway with no median and grades 3% or less. For other conditions, the time gap should be adjusted and the sight distance recalculated.

Sight distance design for left turns at divided-highway intersections should consider multiple design vehicles and median width. If the design vehicle used to determine sight distance for a divided-highway intersection is larger than a passenger car, then sight distance for left turns will need to be checked for that selected design vehicle and for smaller design vehicles as well. If the divided-highway median is wide enough to store the design vehicle with a clearance to the through lanes of approximately 1 m at both ends of the vehicle, no separate analysis for the departure sight triangle for left turns is needed on the minor-road approach for the near roadway to the left. In most cases, the departure sight triangle for right turns (case B2) will provide sufficient sight distance for a passenger car to cross the near roadway to reach the median. Possible exceptions are addressed in the discussion of case B3.

The time gaps in **Table 9.9.3** can be decreased by 1.0 s for right-turn maneuvers without undue interference with major-road traffic. These adjusted time gaps for the right turn from the minor road are shown in **Table 9.9.5**. Design values based on these adjusted time gaps are shown in **Table 9.9.6** for passenger cars. **Figure 9.9.5** includes the design values for the design vehicles for each of the time gaps in **Table 9.9.5**.

Table 9.9.5: Time Gap for Case B2—Right Turn from Stop and Case B3—Crossing Maneuver

Design Vehicle	Time Gap (t_g)(s) at Design Speed of Major Road
Passenger car	6.5
Single-unit truck	8.5
Combination truck (WB 19 and WB 20)	10.5

Note: Time gaps are for a stopped vehicle to turn left onto a two-lane highway with no median and with grades of 3% or less. The table values should be adjusted as follows:

- For multi-lane highways: For left turns onto two-lane highways with more than two lanes, add 0.5 s for passenger cars and 0.7 s for trucks for each additional lane, from the left, in excess of one, to be crossed by the turning vehicle.
- For minor approach grades: If the approach grade is an upgrade that exceeds 3%, add 0.1 s for each percent grade for left turns.

Table 9.9.6: Design Intersection Sight Distance – Case B2, Right Turn from Stop, and Case B3, Crossing Maneuver

Design Speed (km/h)	Stopping Sight Distance (m)	Intersection Sight Distance for Passenger Cars	
		Calculated (m)	Design (m)
20	20	36.1	40
30	35	54.2	55
40	50	72.3	75
50	65	90.4	95
60	85	108.4	110
70	105	126.5	130
80	130	144.6	145
90	160	162.6	165
100	185	180.7	185
110	220	198.8	200
120	250	216.8	220
130	285	234.9	235

Note: Intersection sight distance shown is for a stopped passenger car to turn right onto or to cross a two-lane highway with no median and with grades of 3% or less. For other conditions, the time gap should be adjusted and the sight distance recalculated.

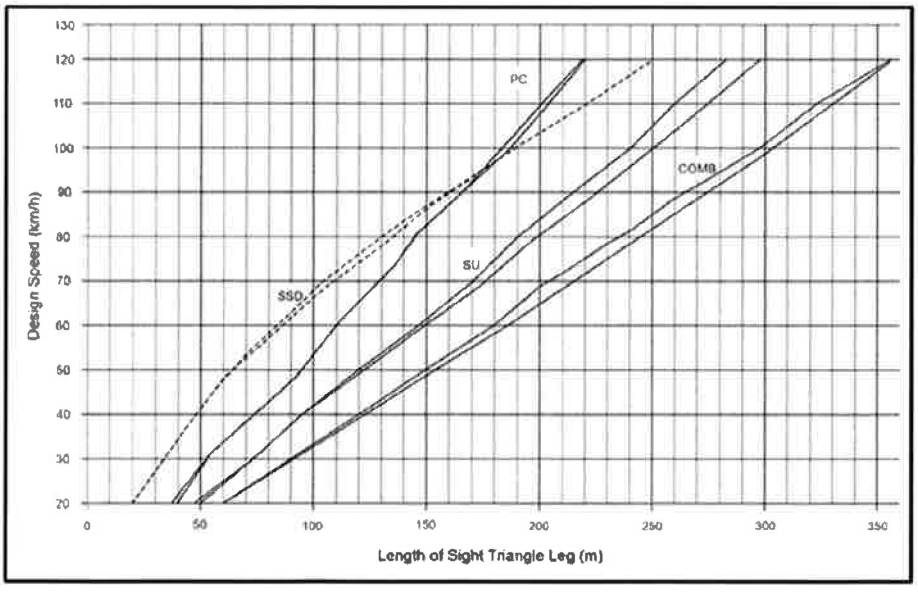
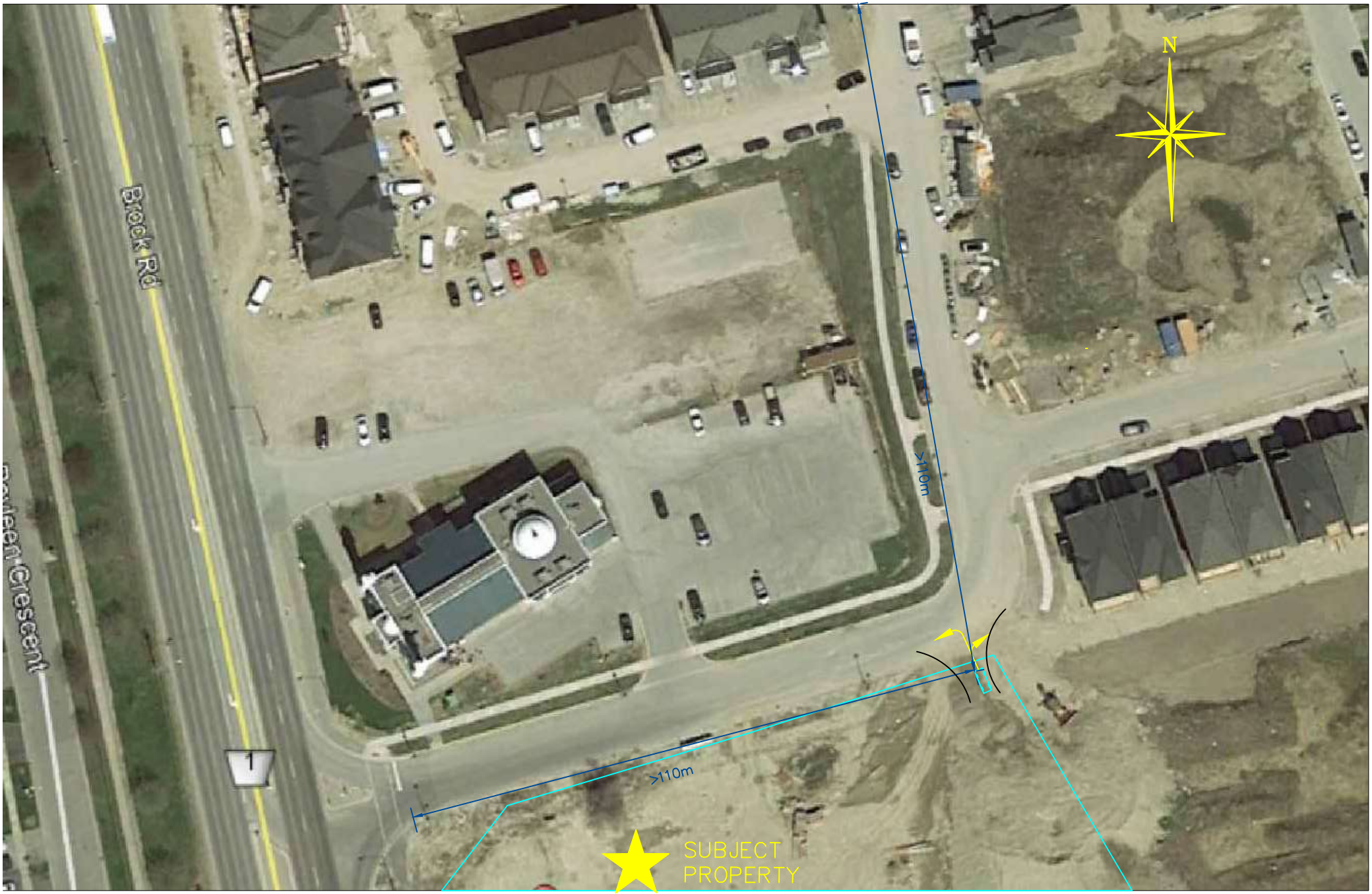


Figure 9.9.5: Intersection Sight Distance – Case B2, Right Turn from Stop, and Case B3, Crossing Maneuver (Calculated and Design Values Plotted)



More than 110 m of sight distance can be observed on both sides of the site access.

In addition, vehicles approaching from the west are not expected to travel at design speed after turning onto Usman Road

NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

APPENDIX M

City of Pickering Zoning By-Law

THE TOWNSHIP OF PICKERING

BY-LAW NO. 3036

A ZONING BY-LAW

(Highway No. 2 Area)

AUGUST, 1965

5.18 (c) **Contiguous to rear lane:** Where the entrance to a private garage is from a lane, such building shall be a minimum of three (3) feet from the rear lot line, but shall be no closer than twenty-five (25) feet from the opposite boundary of the lane;

(d) **Attached accessory buildings:** Any accessory building may be erected as part of the main building, provided that all yard and area requirements of the zone are complied with. Notwithstanding any other provision in this By-law where a garage is erected as part of a one-family detached dwelling, the minimum required side yard for a Residential R1 or R3 Zone shall be six (6) feet and for any other residential zone shall be five (5) feet;

(e) **Height:** No accessory building shall exceed a height of twelve (12) feet in any Residential Zone nor fifteen (15) feet in any Commercial Zone;

(f) **Human habitation:** The use of any accessory building for human habitation is not permitted.

5.19 OFF-STREET PARKING

5.19.1 **Requirements:**

For every building or structure erected, altered or enlarged there shall be provided and maintained off-street parking in conformity with the following schedule and except in the case of one and two family dwellings, each parking space shall be made accessible for ingress and egress by means of a hard surfaced lane or right-of-way or street at least eight (8) feet in width. Parking required in a Residential Zone shall be provided on the same lot as the dwelling unit or the main building. In a Commercial Zone parking spaces shall be provided within the limits of the Commercial Zone in which the commercial use is situated and not more than five hundred (500) feet distant from the principal buildings. Where more than one use occurs in a building the minimum required parking facilities shall be computed for each different use in conformity with the following schedule.

5.19.2 Schedule:

Type or Nature of Building Usage	Minimum Required Parking Facilities
(a) A dwelling	1 parking space for each dwelling unit
(b) A hotel, private hotel or hospital	1 parking space for each two bedrooms
(c) A motel	1 parking space for each living unit,
(d) An eating establishment	1 parking space for each ten (10) persons that can be accommodated at any time
(e) A retail or service store, and similar establishments	1 parking space for each one hundred (100) square feet of retail floor area and in the case of individual retail stores shall not be less than two (2) parking spaces
(f) An office or office building	1 parking space for each five hundred (500) square feet of floor area
(g) A church, church hall, theatre or other place of assembly or place of amusement	1 parking space for each twelve (12) seats, or where the seating is provided by open benches, every twenty (20) inches of bench space shall be considered as one seat for the purposes of this By-law
(h) A factory or other use permitted in an M1 or M2 Zone	1 parking space for each four hundred (400) square feet of floor area
(i) For every building or structure not specified above	1 parking space for every three hundred (300) square feet of floor area.

5.20 SUPPLEMENTARY PARKING REGULATIONS

Wherein this By-law parking facilities other than parking space for one vehicle for a one-family detached or semi-detached dwelling are required or permitted:

(a) the parking area shall be maintained with a stable surface that is treated to prevent the raising of dust or loose particles;

(b) the lights used for illumination of the parking lot or parking station shall be so arranged as to divert the light away from adjacent lots;

(c) a shelter, not more than fifteen (15) feet in height and not more than fifty (50) square feet in area may be erected in the parking area for the use of attendants;in the area;

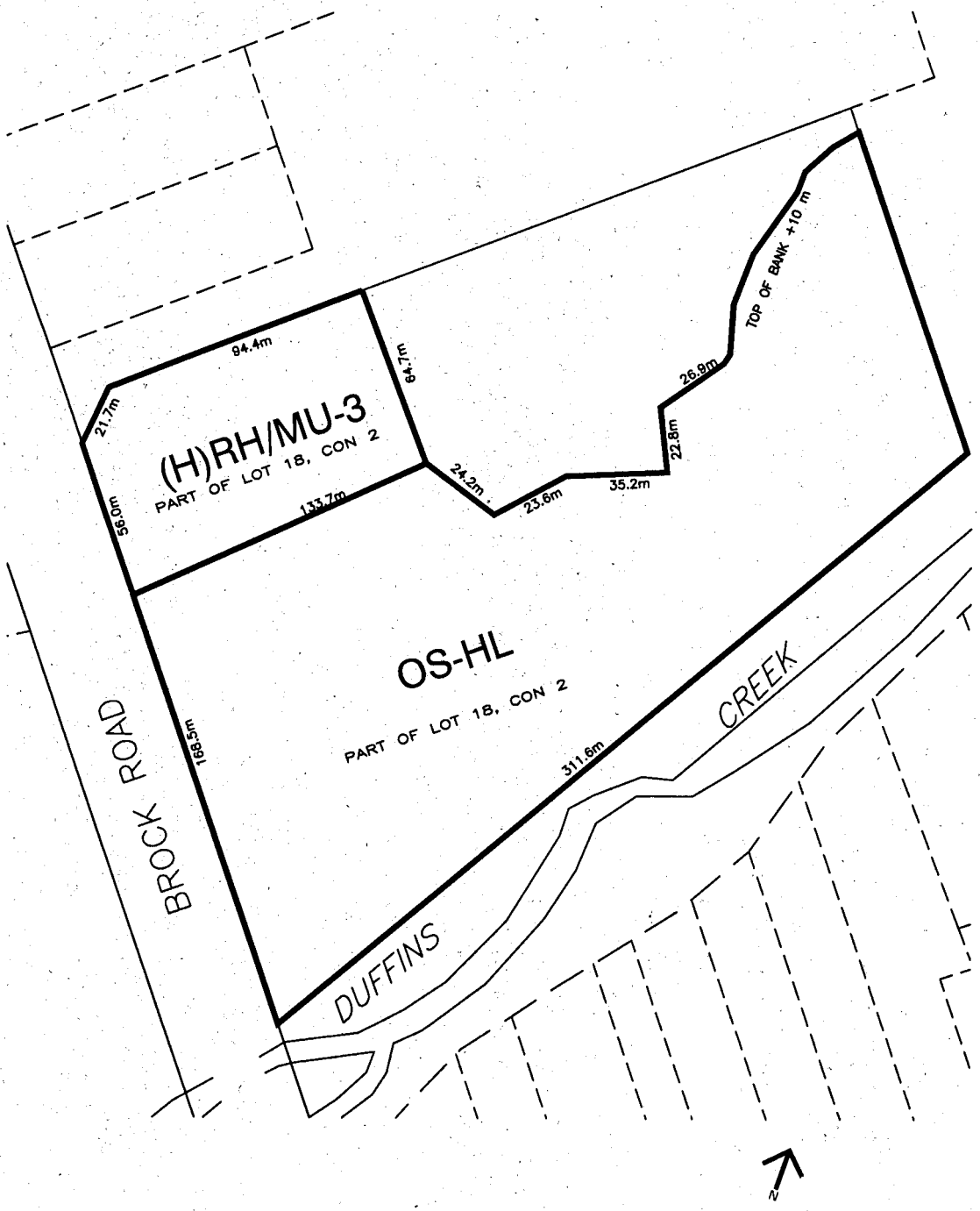
(d) no gasoline pump or other service equipment intended for public use shall be located or maintained on a parking station.

5.21 OFF-STREET LOADING REQUIREMENTS

For every building or structure hereafter erected for an Industrial or Commercial use, involving the frequent shipping, loading or unloading of persons, animals, goods, wares or merchandise, there shall be provided and maintained for the premises, loading facilities on land that is not part of a street, comprised of one or more loading spaces thirty (30) feet long, twelve (12) feet wide and having a vertical clearance of at least fourteen (14) feet, with access to a lane of minimum width twenty (20) feet, or a street, and in accordance with the floor area of the building or structure as follows:

Floor Area	Number of Loading Spaces
4,500 square feet or less	None
from 4,501 square feet to 25,000 square feet inclusive	1
over 25,000 square feet	2

Any loading space or any lane, which is a private lane, required or provided under this Section, shall be hard surfaced. No loading space shall be located at the front of any Industrial or Commercial building or structure.



SCHEDULE I TO BY-LAW 7085/10

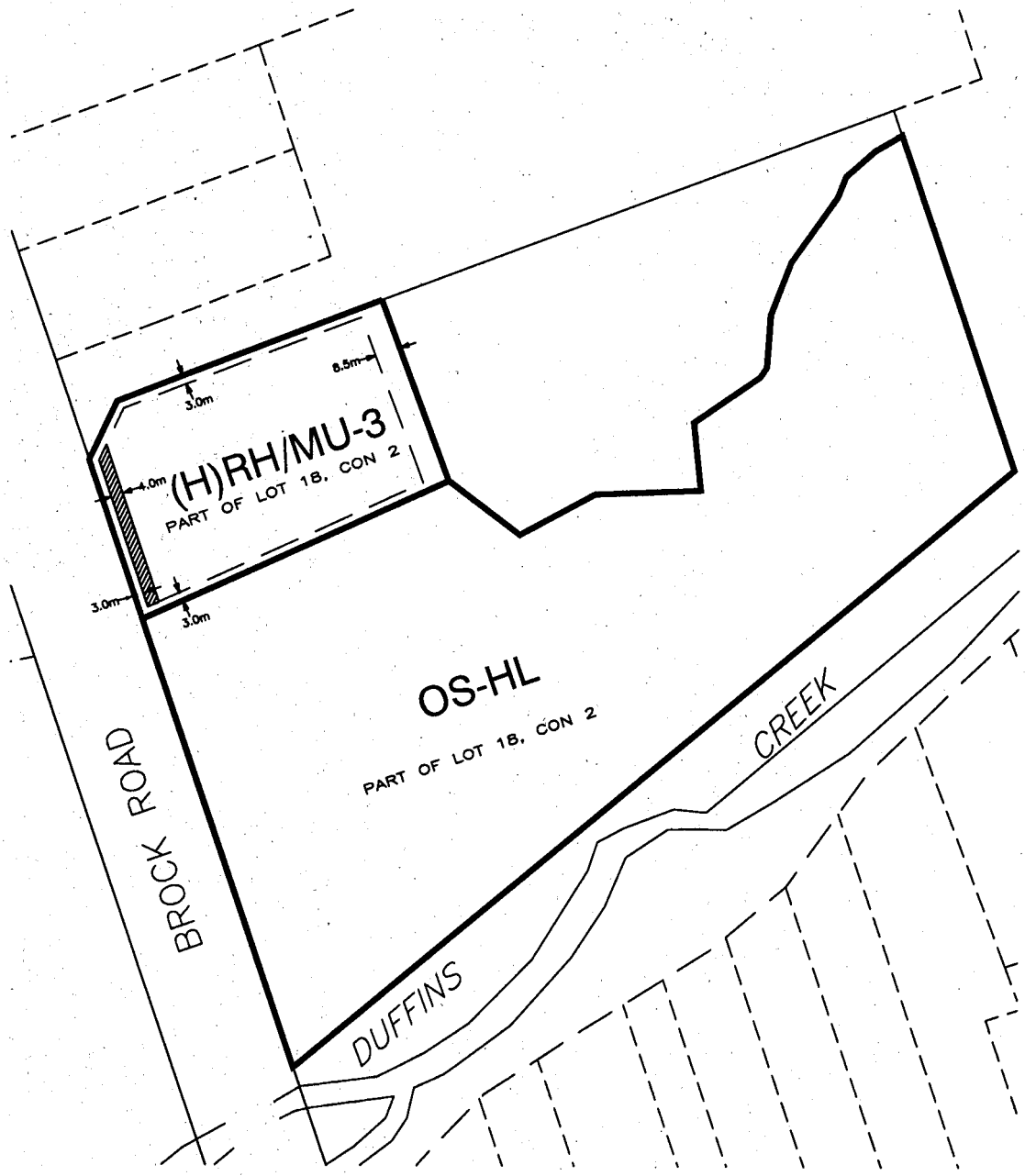
PASSED THIS 13th

DAY OF SEPT **2010**

MAYOR

D. Shields

CLERK



SCHEDULE II TO BY-LAW 7085/10

PASSED THIS 13th

DAY OF SEPT **2010**

MAYOR

D. Shields

CLERK

Martin Chan

From: Ho, Doris <dho@pickering.ca>
Sent: November 4, 2019 10:48 AM
To: Martin Chan
Subject: RE: Pickering Zoning By-Law (Brock Ridge)
Attachments: Section 5.21.2 – Supplementary Parking Regulations.pdf

Hi Martin,

Thanks for your email.
There is no parking rate for loading spaces applicable to this property. However, I can advise that a loading space should have a minimum rectangular size of 20ft by 10ft with a vertical clearance of 14ft. And, I have also attached an excerpt from the By-law outlining the supplementary parking provisions to adhere to.

For your information again, you can find By-laws through Corporate Records found in the following link: https://www.pickering.ca/en/city-hall/bylaws.aspx

Regards,

Doris Ho
(Acting) Zoning Examiner | City Development Department
905.420.4660 ext 2140 | 1.866.683.2760
dho@pickering.ca

City of PICKERING Your City. Right Now. pickering.ca pingstreet

From: Martin Chan <mchan@cfcrozier.ca>
Sent: Friday, November 1, 2019 2:42 PM
To: Ho, Doris <dho@pickering.ca>
Subject: RE: Pickering Zoning By-Law (Brock Ridge)

Hi Doris,

I hope all is well. For the property at 2055 Brock Road, does the site specific Zoning By-Law mention anything about the minimum number of loading spaces? If not, can you sent a link or PDF copy of the applicable Zoning By-law for reference? I tried using the link below, however none of our computers (Chrome and Explorer) can open the webpage (Error: Cookies need to be enabled; but it is enabled).

Thanks for your help,

Martin

Martin Chan EIT | Transportation
C.F. Crozier & Associates Consulting Engineers
211 Yonge Street, Suite 301 | Toronto, ON M5B 1M4
cfcrozier.ca | mchan@cfcrozier.ca
tel: 416.477.3392 ext: 512

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From: Martin Chan
Sent: September 30, 2019 10:48 AM
To: Ho, Doris <dho@pickering.ca>
Subject: RE: Pickering Zoning By-Law (Brock Ridge)

Great, thanks for all the help Doris!

Martin

From: Ho, Doris <dho@pickering.ca>
Sent: September 30, 2019 10:41 AM
To: Martin Chan <mchan@cfcrozier.ca>
Subject: RE: Pickering Zoning By-Law (Brock Ridge)

Hi Martin,

For 2055 Brock Rd, the site specific Zoning By-law 7085/10 applies (see attached). Parking provisions are under Section 4(2)(d).

If you know the By-law number, you can look it up in our Corporate Records: https://corporate.pickering.ca/weblink/Browse.aspx?startid=53657&cr=1.

Our City Centre Zoning By-law and Seaton Zoning By-law are available online:
https://www.pickering.ca/en/city-hall/resources/city-centre-zoning-by-law-7553-17.pdf
https://www.pickering.ca/en/city-hall/resources/SeatonZoningBylaw7364-14.pdf

Otherwise, you may contact me directly and I would be glad to confirm the zoning designation and provide you with the applicable By-law. We are working on consolidating our Zoning By-laws so that one day it should be all available online to the public.

Thanks,

Doris Ho
(Acting) Zoning Examiner | City Development Department
905.420.4660 ext 2140 | 1.866.683.2760
dho@pickering.ca

From: Martin Chan <mchan@cfcrozier.ca>
Sent: Monday, September 30, 2019 9:33 AM
To: Ho, Doris <dho@pickering.ca>
Subject: RE: Pickering Zoning By-Law (Brock Ridge)

Hi Doris,

Thanks for the quick response. My client's property is located at 2055 Brock Road.

Just for future reference, is Pickering's site specific zoning-bylaw available on the open data webpage (I didn't see anything there)?

Thanks again,

Martin

Martin Chan EIT | Transportation
C.F. Crozier & Associates Consulting Engineers
211 Yonge Street, Suite 301 | Toronto, ON M5B 1M4
cfcrozier.ca | mchan@cfcrozier.ca
tel: 416.477.3392 ext: 512

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From: Ho, Doris <dho@pickering.ca>
Sent: September 30, 2019 9:16 AM
To: Martin Chan <mchan@cfcrozier.ca>
Subject: RE: Pickering Zoning By-Law (Brock Ridge)

Good Morning Martin,

Thank you for your inquiry with the City of Pickering.

The applicable Zoning By-law for the Brock Ridge neighbourhood is By-law 3036. I have attached the parking provisions under this By-law for your reference.
On the other hand, if you can provide an address for the development you are inquiring about, I can confirm if a site specific By-law may apply.

Please let me know if you have any further questions.

Regards,

Doris Ho
(Acting) Zoning Examiner | City Development Department
905.420.4660 ext 2140 **|** 1.866.683.2760
dho@pickering.ca



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-----Original Message-----
From: noreply@pickering.ca <noreply@pickering.ca> On Behalf Of Martin Chan
Sent: Friday, September 27, 2019 12:29 PM
To: Planning Web Email <planning@pickering.ca>
Subject: Pickering Zoning By-Law (Brock Ridge)

Hi, I would like to request an electronic copy of the existing Zoning By-Law applicable to the Brock Ridge area. I would like to find out the minimum parking requirements for a residential development there.

Thanks,

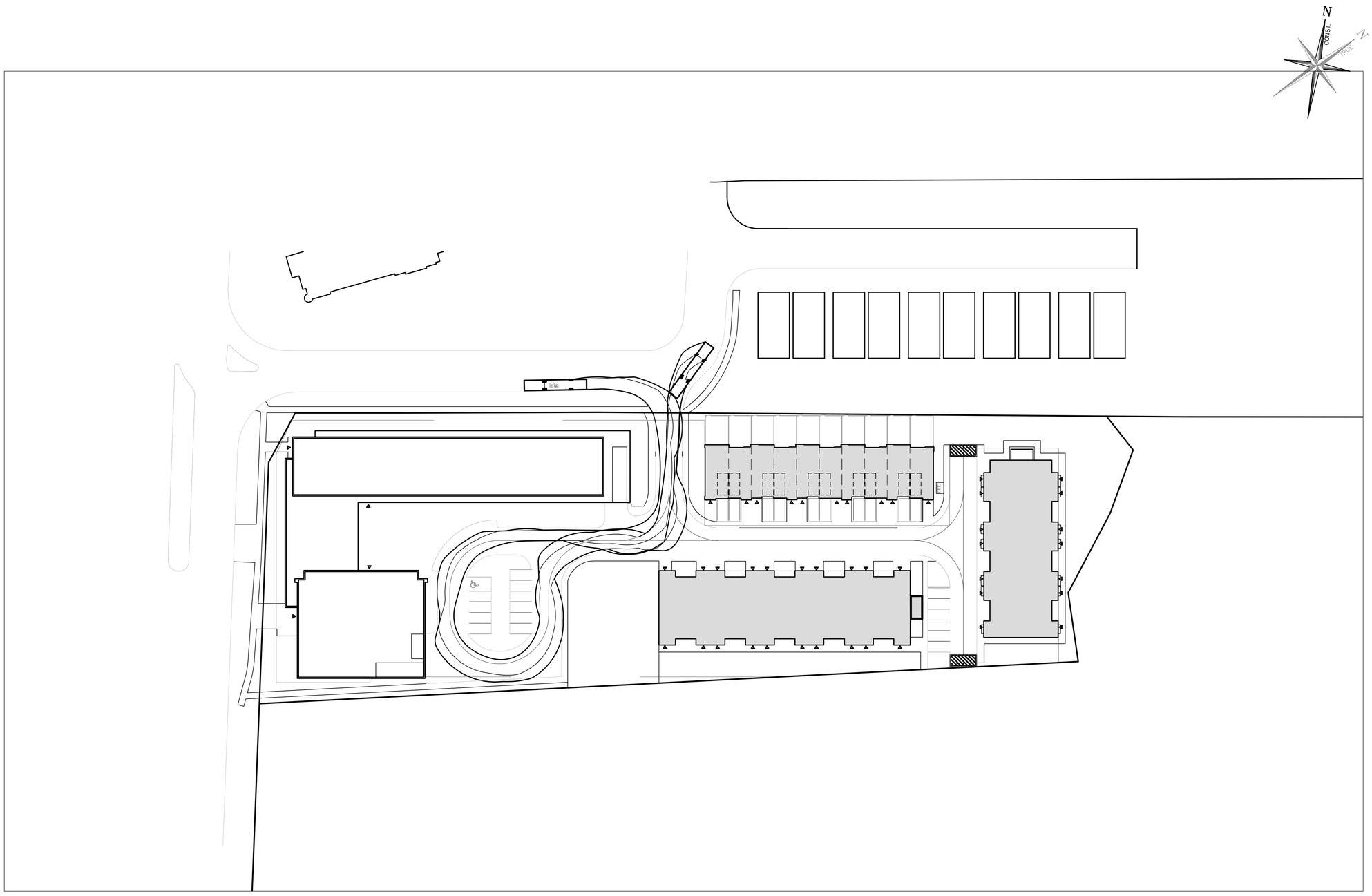
Martin

Origin: https://www.pickering.ca/en/city-hall/officialplan.aspx
---

This email was sent to you by Martin Chan<mchan@cfcrozier.ca> through https://www.pickering.ca.

Appendix N

Truck Turning Diagrams

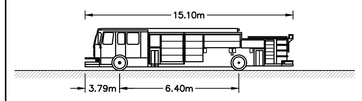


LEGEND

- PROPERTY LINE
- FIRE TRUCK
- DIRECTION OF TRUCK MOVEMENT
- PROPOSED FIRE HYDRANT LOCATION

PUMPER FIRE TRUCK

SCALE: N.T.S.



VEHICLE STATISTICS:

OVERALL VEHICLE LENGTH:	15.10 m
OVERALL VEHICLE WIDTH:	2.49 m
OVERALL VEHICLE HEIGHT:	2.36 m
MIN. BODY/GROUND CLEARANCE:	0.20 m
VEHICLE TRACK WIDTH:	2.49 m
LOCK-TO-LOCK TIME:	5.00 sec
MAX. WHEEL ANGLE:	45.00°

No.	ISSUE / REVISION	YYYY/MMM/DD
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A	FIRST SUBMISSION	2019/OCT/21

Project

BROCK ROAD DUFFINS FOREST INC.
2055 BROCK ROAD
CITY OF PICKERING

Drawing

2055 BROCK ROAD
VEHICLE TURNING DIAGRAM

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Stamp

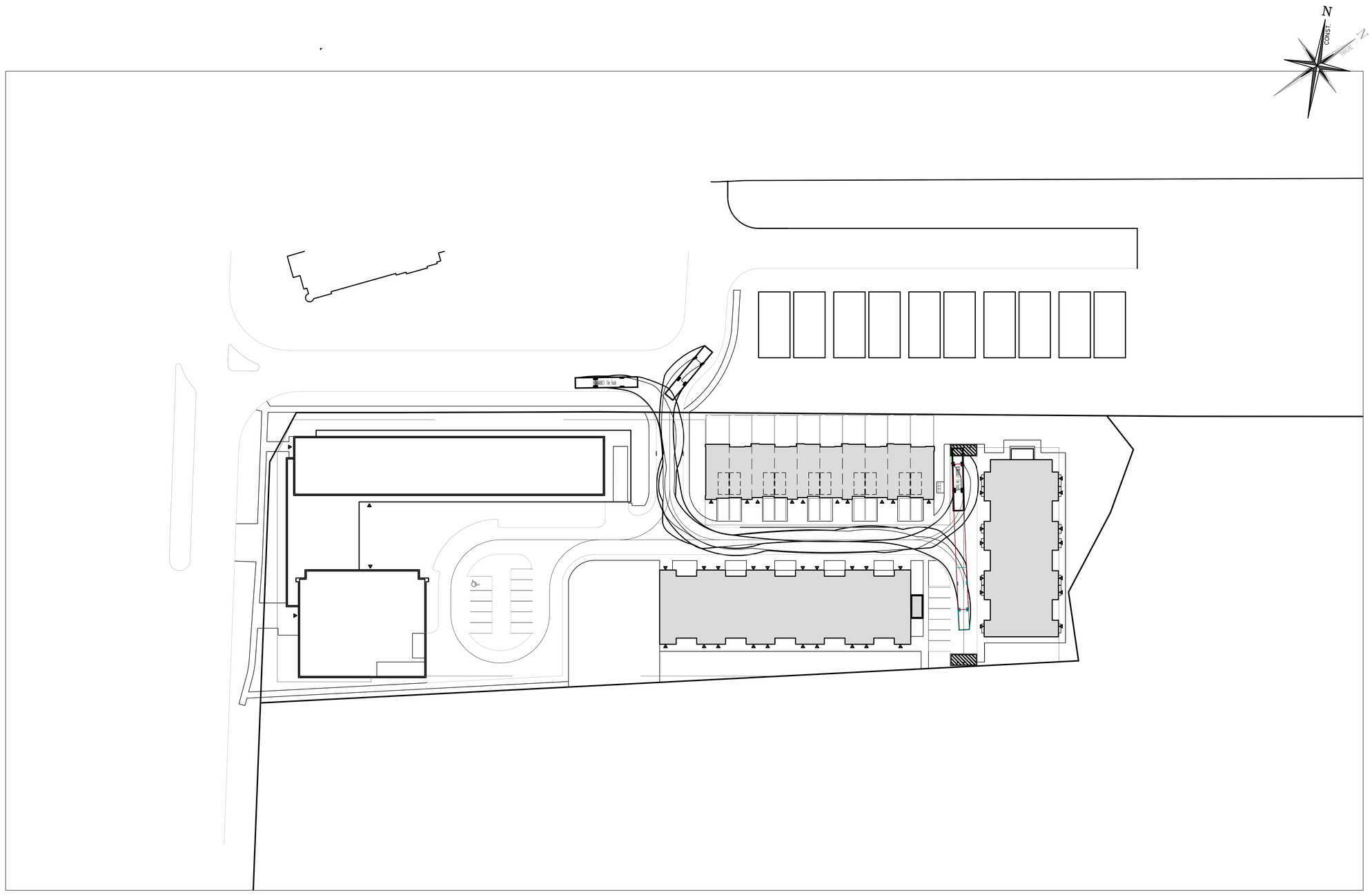
FOR REVIEW

Stamp

10 0m 10 20 30 40
SCALE: 1:500

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Drawn	Design	Project No.	
M.C.	M.C.		1807-5430
Check	Check	Scale	Dwg.
M.L.	M.L.	1:500	T.300

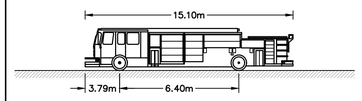


LEGEND

- PROPERTY LINE
- FIRE TRUCK
- DIRECTION OF TRUCK MOVEMENT
- PROPOSED FIRE HYDRANT LOCATION

PUMPER FIRE TRUCK

SCALE: N.T.S.



VEHICLE STATISTICS:

OVERALL VEHICLE LENGTH:	15.10 m
OVERALL VEHICLE WIDTH:	2.49 m
OVERALL VEHICLE HEIGHT:	2.36 m
MIN. BODY/GROUND CLEARANCE:	0.20 m
VEHICLE TRACK WIDTH:	2.49 m
LOCK-TO-LOCK TIME:	5.00 sec
MAX. WHEEL ANGLE:	45.00°

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Project

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2055 BROCK ROAD
CITY OF PICKERING

Drawing

2055 BROCK ROAD
VEHICLE TURNING DIAGRAM

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Stamp

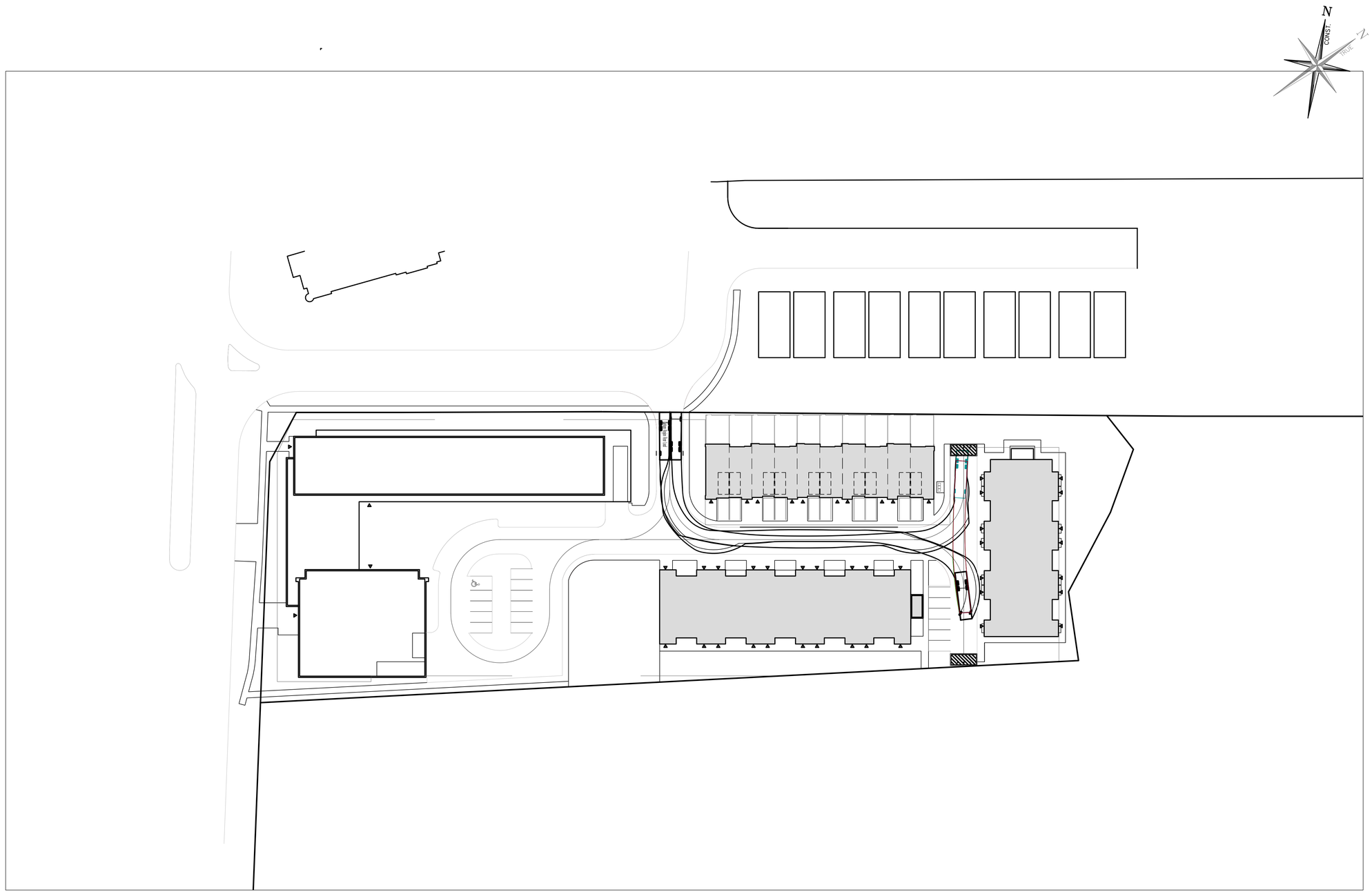
FOR REVIEW

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SCALE: 1:500

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Drawn	Design	Project No.	
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Check	Check	Scale	Dwg.
M.L.	M.L.	1:500	T.301

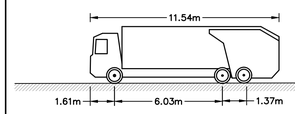


LEGEND

- PROPERTY LINE
- REAR LOAD GARBAGE TRUCK
- DIRECTION OF TRUCK MOVEMENT

REAR LOAD GARBAGE TRUCK

SCALE: N.T.S.



VEHICLE STATISTICS:

OVERALL VEHICLE LENGTH:	11.54 m
OVERALL VEHICLE WIDTH:	2.77 m
OVERALL VEHICLE HEIGHT:	3.69 m
MIN. BODY/GROUND CLEARANCE:	0.30 m
VEHICLE TRACK WIDTH:	2.77 m
LOCK-TO-LOCK TIME:	6.00 sec
CURB TO CURB TURNING RADIUS:	13.00 m

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Project

BROCK ROAD DUFFINS FOREST INC.
2055 BROCK ROAD
CITY OF PICKERING

Drawing

2055 BROCK ROAD
VEHICLE TURNING DIAGRAM

10 0m 10 20 30 40
SCALE: 1:500

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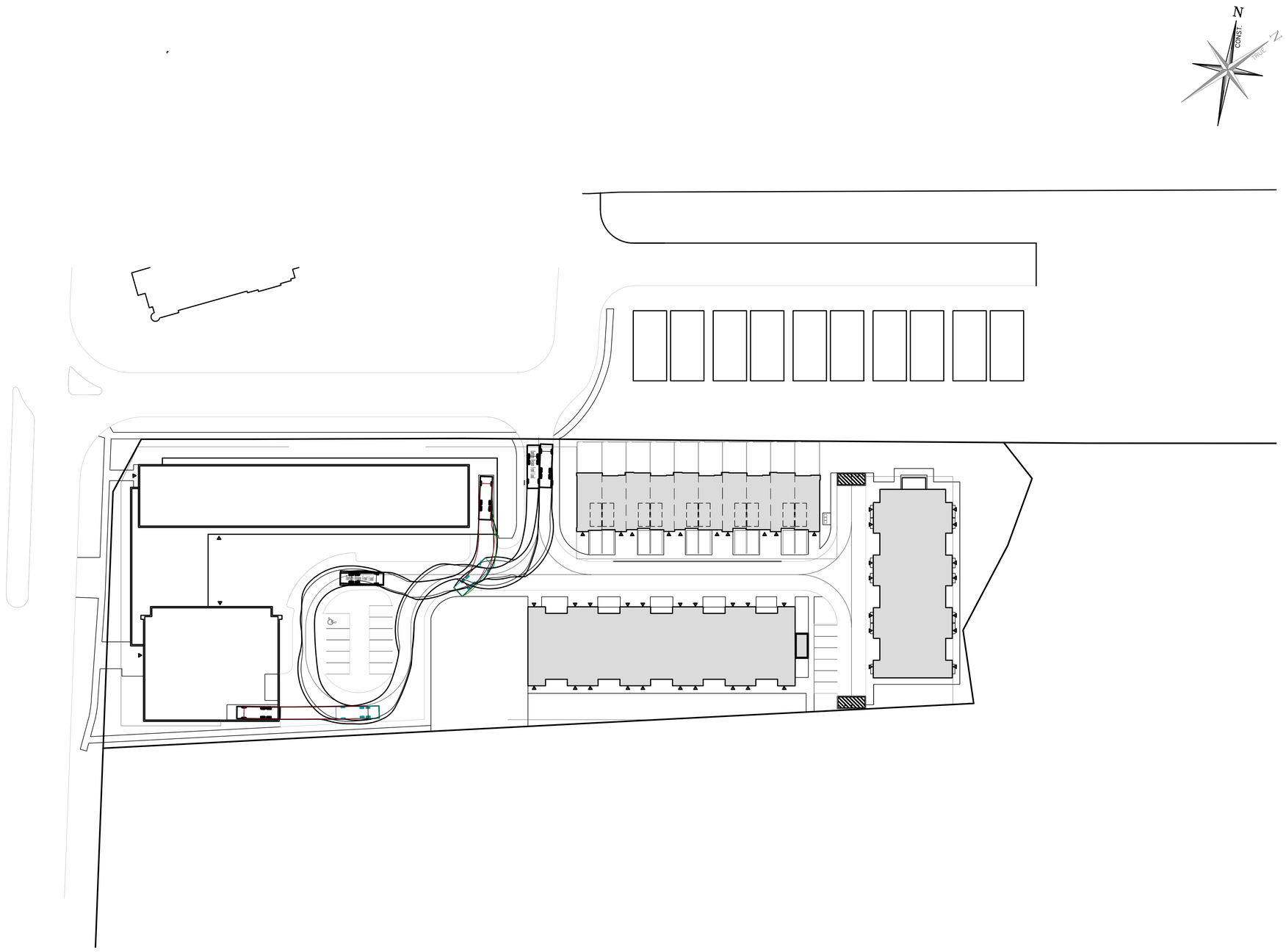
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Check	Check	Scale	Dwg.
M.L.	M.L.	1:500	T.302

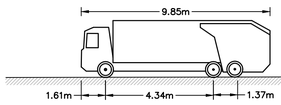


LEGEND

- PROPERTY LINE
- REAR LOAD GARBAGE TRUCK
- DIRECTION OF TRUCK MOVEMENT

FRONT LOAD GARBAGE TRUCK

SCALE: N.T.S.



VEHICLE STATISTICS:

OVERALL VEHICLE LENGTH:	9.85 m
OVERALL VEHICLE WIDTH:	2.77 m
OVERALL VEHICLE HEIGHT:	4.31 m
MIN. BODY/GROUND CLEARANCE:	0.30 m
VEHICLE TRACK WIDTH:	2.77 m
LOCK-TO-LOCK TIME:	6.00 sec
CURB TO CURB TURNING RADIUS:	11.50 m

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2055 BROCK ROAD
CITY OF PICKERING

Drawing

2055 BROCK ROAD
VEHICLE TURNING DIAGRAM

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Stamp

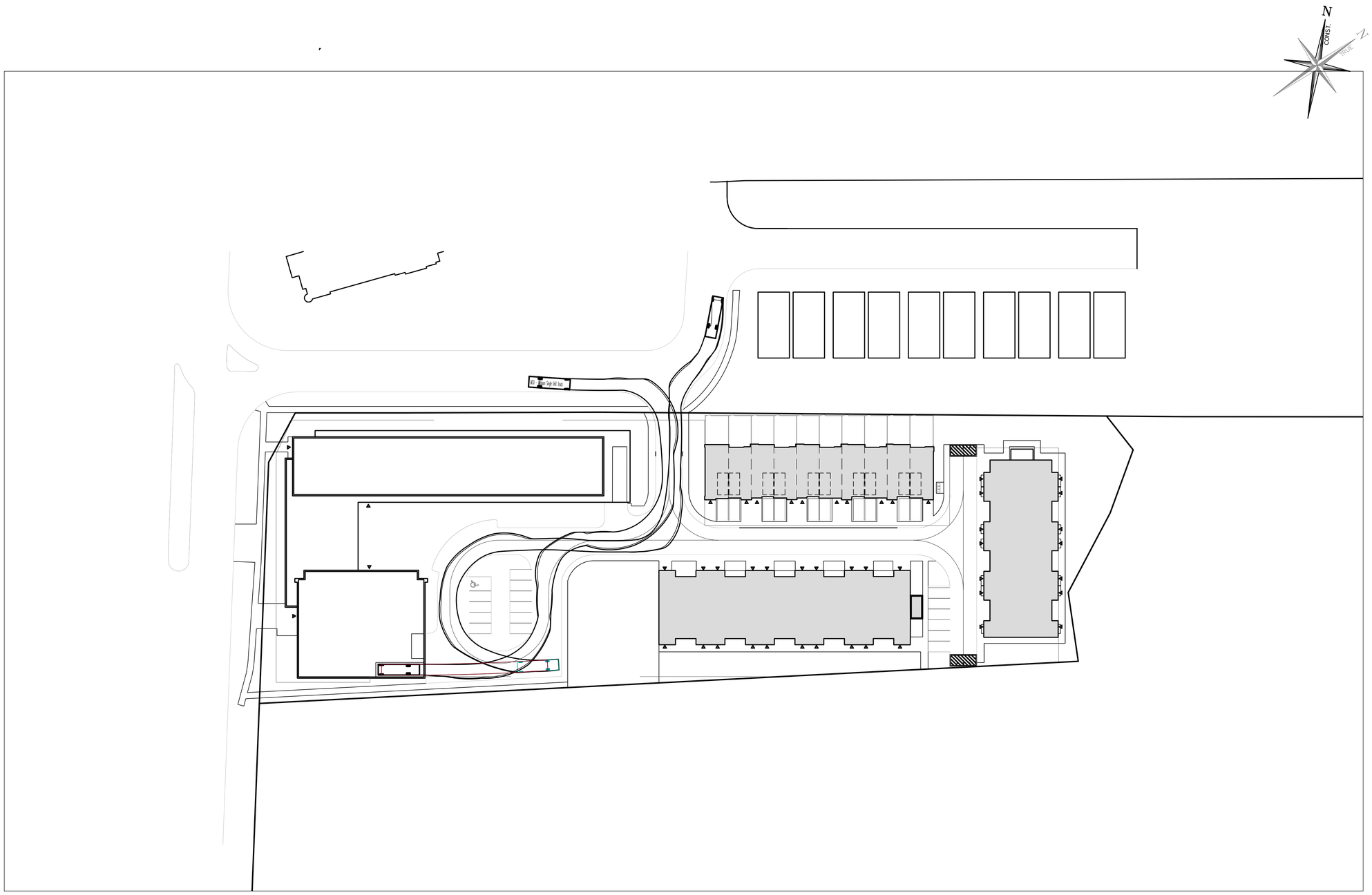
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M.L.	M.L.	1:500	T.303

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SCALE: 1:500



LEGEND

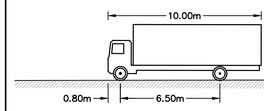
PROPERTY LINE

MSU TRUCK

DIRECTION OF TRUCK MOVEMENT

MEDIUM SINGLE UNIT TRUCK

SCALE: N.T.S.



VEHICLE STATISTICS:

OVERALL VEHICLE LENGTH:	10.00 m
OVERALL VEHICLE WIDTH:	2.60 m
OVERALL VEHICLE HEIGHT:	3.65 m
MIN. BODY/GROUND CLEARANCE:	0.45 m
VEHICLE TRACK WIDTH:	2.60 m
LOCK-TO-LOCK TIME:	4.00 sec
CURB TO CURB TURNING RADIUS:	11.10 m

No.	ISSUE / REVISION	YYYY/MMM/DD
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Project

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2055 BROCK ROAD
CITY OF PICKERING

Drawing

2055 BROCK ROAD
VEHICLE TURNING DIAGRAM

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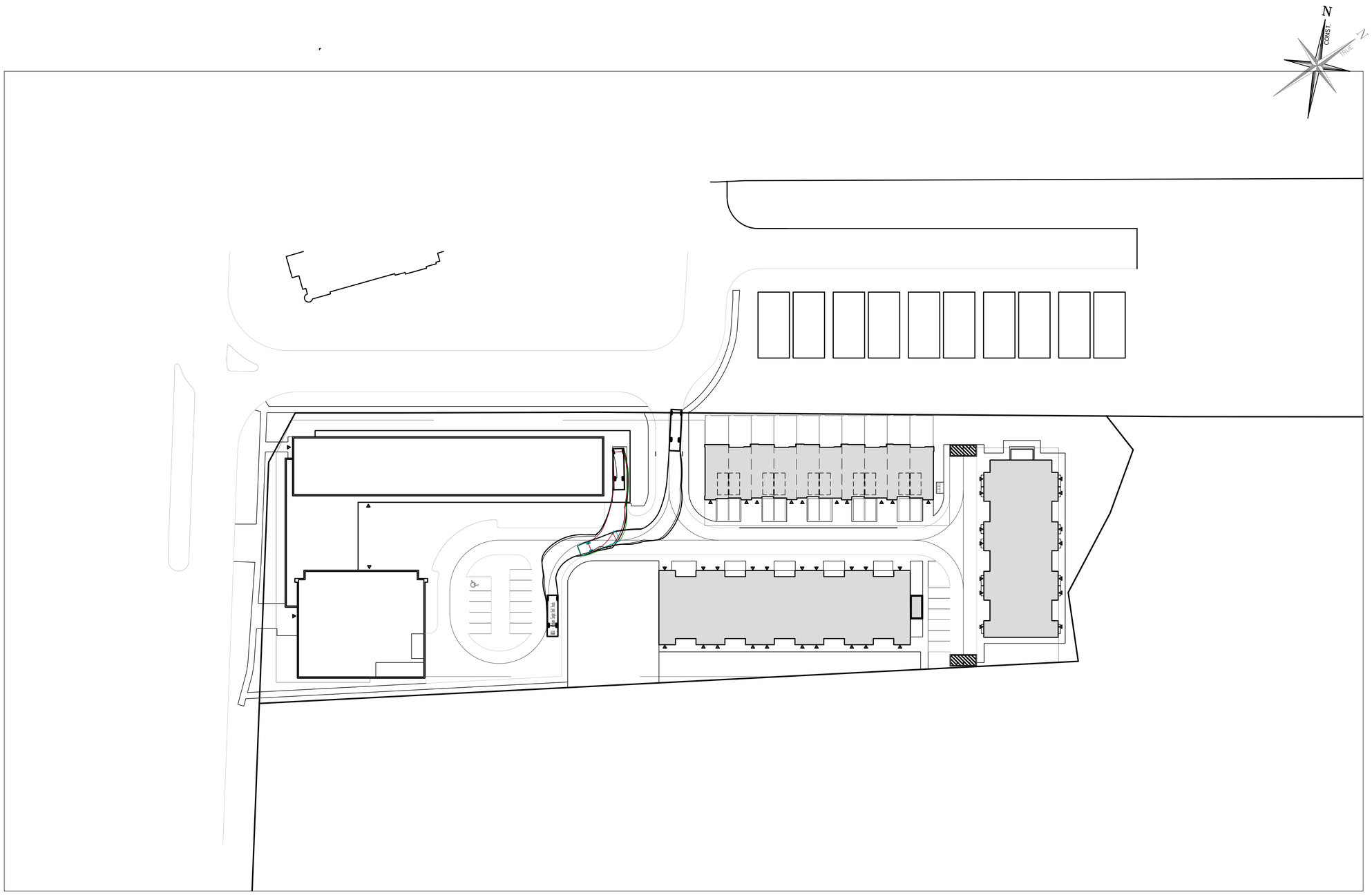
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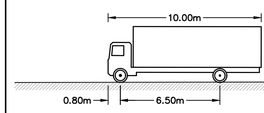


LEGEND

- PROPERTY LINE
- MSU TRUCK
- DIRECTION OF TRUCK MOVEMENT

MEDIUM SINGLE UNIT TRUCK

SCALE: N.T.S.



VEHICLE STATISTICS:

OVERALL VEHICLE LENGTH:	10.00 m
OVERALL VEHICLE WIDTH:	2.60 m
OVERALL VEHICLE HEIGHT:	3.65 m
MIN. BODY/GROUND CLEARANCE:	0.45 m
VEHICLE TRACK WIDTH:	2.60 m
LOCK-TO-LOCK TIME:	4.00 sec
CURB TO CURB TURNING RADIUS:	11.10 m

No.	ISSUE / REVISION	YYYY/MMM/DD
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Drawing

2055 BROCK ROAD
VEHICLE TURNING DIAGRAM

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Drawn	Design	Project No.	
M.C.	M.C.		1807-5430
Check	Check	Scale	Dwg.
M.L.	M.L.	1:500	T.305

Appendix O

TDM Reductions

Table O1
TDM Expected Trip Reductions

TDM Measure	Expected Trip Reductions	Reference
Promotions, Marketing	3% - 5%	(Vermont Agency of Transportation, February 2016)
Design site to support transit and walk access	1% - 2% for moderate transit services	(Vermont Agency of Transportation, February 2016)
Secure Bicycle Parking	0.5% - 15%	(Vermont Agency of Transportation, February 2016) (Victoria Transport Policy Institute, March 2016)
Bicycle Path	0.5% - 1%	(Vermont Agency of Transportation, February 2016)
Financial Incentives (Presto Card, Transit Discounts)	Basic Financial Incentives: 1% - 5%	(Vermont Agency of Transportation, February 2016)
Parking Pricing	10% - 30%	(Victoria Transport Policy Institute, March 2016)
Unbundled Parking & Parking Management	10% - 30%	(Victoria Transport Policy Institute, March 2016)
Comprehensive (Combination of) TDM Measures	10% – 30%	(Victoria Transport Policy Institute, March 2016) (Vermont Agency of Transportation, February 2016)

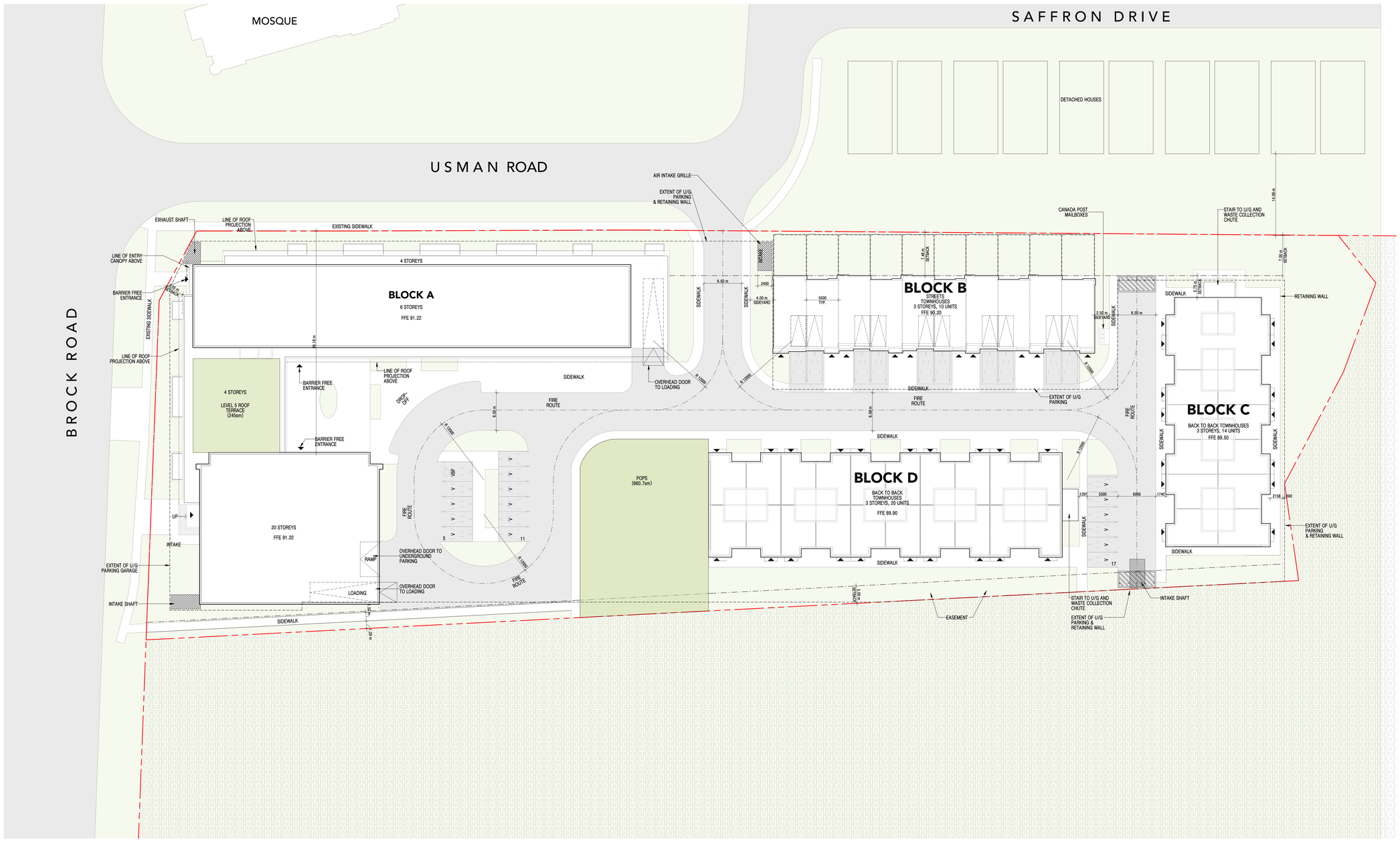
Each TDM strategy's effectiveness has historically varied between studies and locations due to a range of factors. It is noted that a comprehensive suite of TDM measures will not equate to the sum of the above indicated trip reductions. It is generally expected that a simple information and promotional strategy will reduce auto trips of approximately 3% to 5% while a combination of TDM strategy is expected to reduce auto trips of 10% to 30%.

FIGURES

SITE STATISTICS		
ZONING DESIGNATION	RH/MU-3, OS-HL	
GROSS LOT AREA	13,115.2 sm (3.24 AC) (1.3ha)	
POPS AREA	660.7sm (5% SITE AREA)	
GROSS FLOOR AREA		**UNITS**
BACK TO BACK TH.	5,301.4sm (57,066sf)	34
BLOCK C:	2,083.9sm (22,431sf)	14
BLOCK D:	2,952sm (31,775sf)	20
STAIRS TO U/G:	30sm (323sf)	
TOWNHOUSES		10
BLOCK B:	2,100.9m (22,614sf)	10
TOWER	23,132sm (248,991sf)	328
TOTAL:		**372**
PERMITTED DENSITY	PROPOSED DENSITY	
140 UNITS/ha [182 UNITS]	286 UNITS/ha	
LANDSCAPED AREA	REQUIRED	PROPOSED
10% OF LOT AREA	1312 sm	
OUTDOOR AMENITY	640 sm	354 sm
PARKING SPACE RATES:		
2.0/BACK TO BACK TOWNHOUSE 2.0/UNIT FOR TOWNHOUSE 1.0/UNIT FOR APARTMENT DWELLING 0.25/UNIT FOR VISITORS *AS PER OLD ZONING BY-LAW 7085-10*		
PARKING SPACES:	REQUIRED	PROPOSED
BLOCK A	328	328
BLOCK A VISITOR	82	82
BLOCK B	20	20
BLOCK B VISITOR	3	3
BLOCK C	28	28
BLOCK C VISITOR	4	4
BLOCK D	40	40
BLOCK D VISITOR	5	5
TOTAL SPACES:	**510**	**513**
SURFACE		37
UNDERGROUND GARAGE		476

BICYCLE PARKING SPACE RATES (BASED ON ZONING BY-LAW 6604-05)	
APPARTMENT DWELLING RES. PARKING RATIO 0.5/ RES UNIT	

BICYCLE PARKING SPACES:	REQUIRED	PROPOSED
BLOCK A:	164	177
BLOCK B:	-	-
BLOCK C:	-	-
BLOCK D:	-	-
TOTAL SPACES:	164	177



SITE PLAN SYMBOL AND SIGN LEGEND:	
	PRINCIPLE ENTRANCE (FOR FIRE FIGHTING)
	ENTRANCE TO RETAIL OR GRADE REALTED RES. UNIT
A.D	CATCH BASIN (REFER TO CIVIL DWGS.)
A.D	AREA DRAIN (REFER TO CIVIL DWGS.)
T.D	TRENCH DRAIN (REFER TO CIVIL DWGS.)
MH	MANHOLE (REFER TO CIVIL DWGS.)
FH	FIRE HYDRANT
	SIAMESE (STANDPIPE) CONNECTION
HC	ACCESIBLE PARKING SIGNAGE
FR	FIRE ROUTE SIGNAGE
LS	LIGHT STANDARD (EXTERIOR POLE FIXTURE)
	WALL MOUNTED EXTERIOR LIGHT FIXTURE
	ACCESSIBLE CURB CUT
	BARRIER FREE PARKING SPACE

SITE PLAN
SCALE: 1 : 250

1
A1 01

Kohn

Kohn Partnership Architects Inc.
116 Spadina Avenue, Suite 501, Toronto ON M5V 2K6
Tel 416.703.6700 www.kohnarchitects.com

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DO NOT SCALE DRAWINGS.

CONTRACTOR SHALL VERIFY AND CHECK ALL DIMENSIONS AND CONDITIONS ON SITE PRIOR TO STARTING ANY OF THE WORK AND REPORT ANY DISCREPANCY TO THE ARCHITECT AND CONSULTANTS BEFORE PROCEEDING. CONSTRUCTION MUST CONFORM TO ALL APPLICABLE CODES AND REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION PERTAINING TO THIS APPLICATION.

THE ARCHITECT BEARS NO RESPONSIBILITY FOR THE INTERPRETATION OF THESE DOCUMENTS BY THE CONTRACTOR. UPON WRITTEN APPLICATION THE ARCHITECT WILL PROVIDE WRITTEN OR GRAPHIC CLARIFICATION AS SUPPLEMENTARY INFORMATION REGARDING THE INTENT OF THE CONTRACT DOCUMENTS.

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NO INVESTIGATION HAS BEEN UNDERTAKEN OR REPORTED ON THIS OFFICE IN REGARDS TO THE ENVIRONMENTAL CONDITIONS OR POLLUTIONS OF THIS SITE.

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No.	Date	Note
1	2019-08-28	ISSUED FOR COORDINATION
2	2019-10-30	ISSUED FOR COORDINATION
3	2019-11-21	ISSUED FOR COORDINATION
4	2020-02-20	ISSUED FOR COORDINATION
5	2020-03-03	ISSUED FOR COORDINATION
6	2020-03-10	ISSUED FOR COORDINATION
7	2020-04-03	ISSUED FOR ZBA #1
8	2021-06-02	ISSUED FOR COORDINATION

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Project:
2055 BROCK ROAD

BROCK RD DUFFINS FOREST INC.

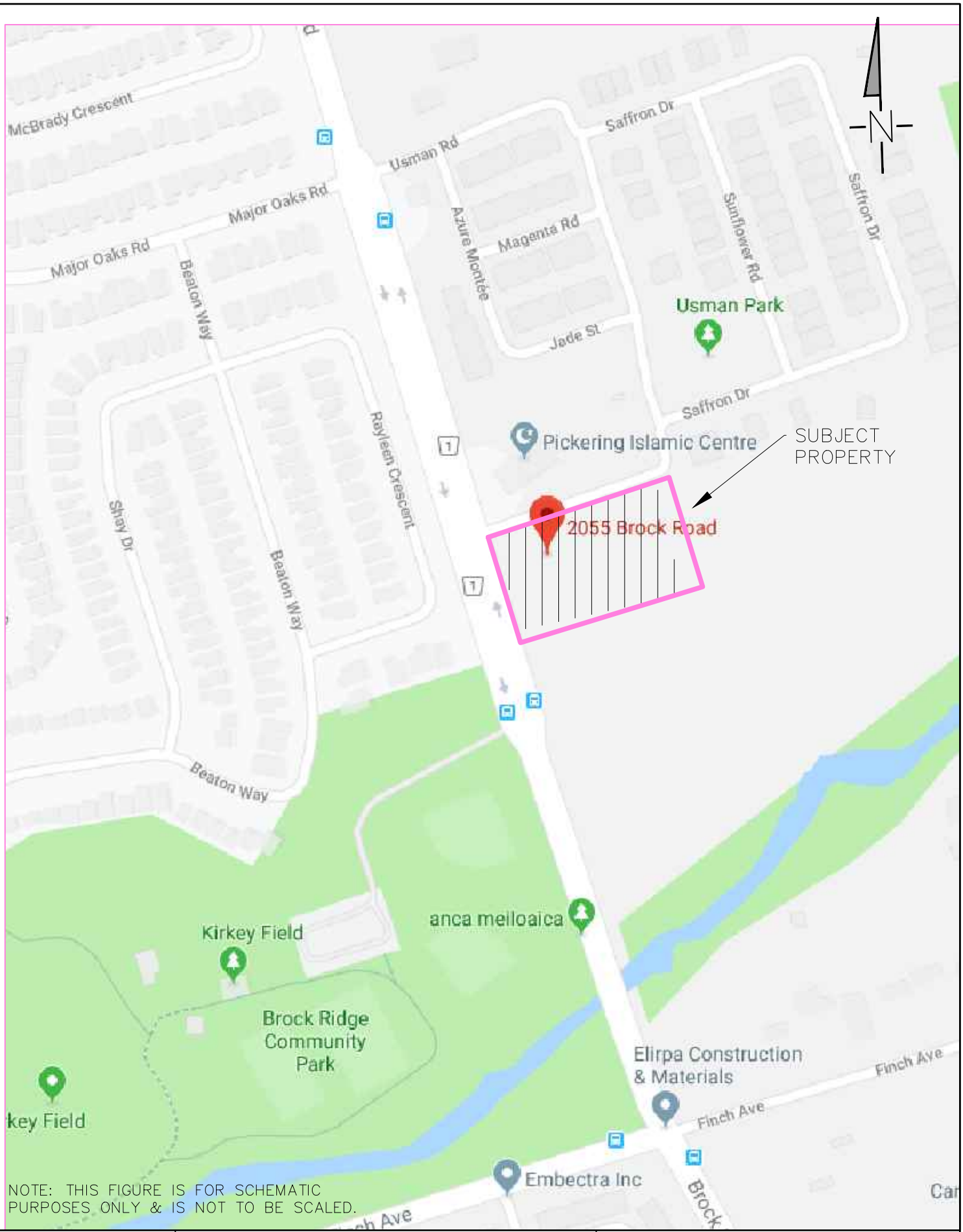
PICKERING ON

Drawing Title:
ENLARGED SITE PLAN & STATISTICS

Project Manager Team: ES
Project No.: 17-119
Date Plotted: 2021-09-08 3:49:12 PM
Scale: As indicated
Building No.:
Drawing No.: A1 01

FILE NAME:C:\Users\ahoofy\ina\Documents\17119_Brock Road_Phase 20_SITE_anastasiahoofy.rvt

A0



Legend

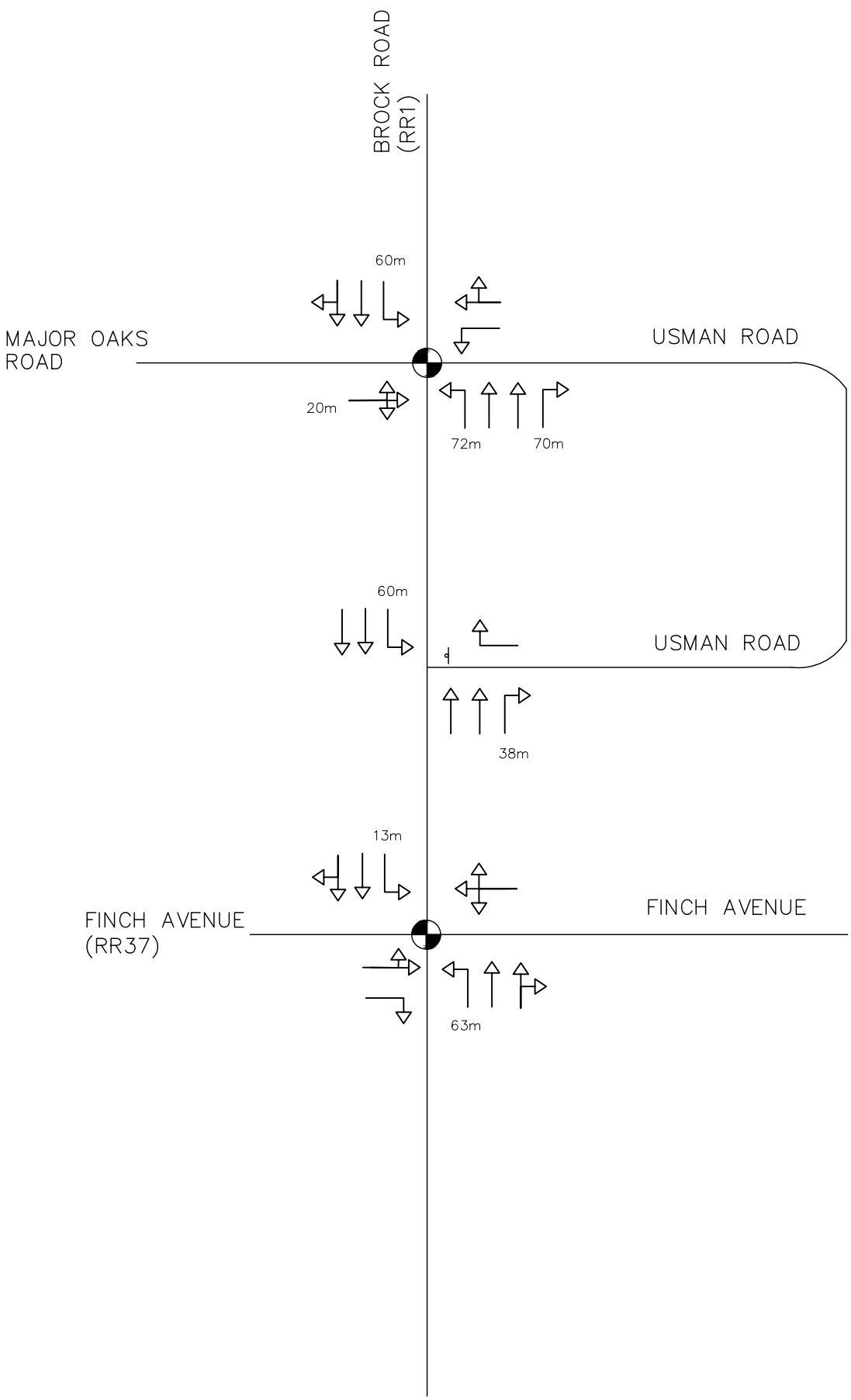
Project
2055 Brock Road Duffins Forest Inc.
2055 Brock Road

Drawing
SITE LOCATION

CROZIER & ASSOCIATES Consulting Engineers
THE HARBOUREDGE BUILDING,
40 HURON STREET, SUITE 301,
COLLINGWOOD, ON L9Y 4R3
705 446-3510 T
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Drawn By	Design By	Project
M.J.	M.J.	1807-5430

Scale	Date	Check By	Drawing
N.T.S.	OCT 4, 2019	M.C.	FIG. 2



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

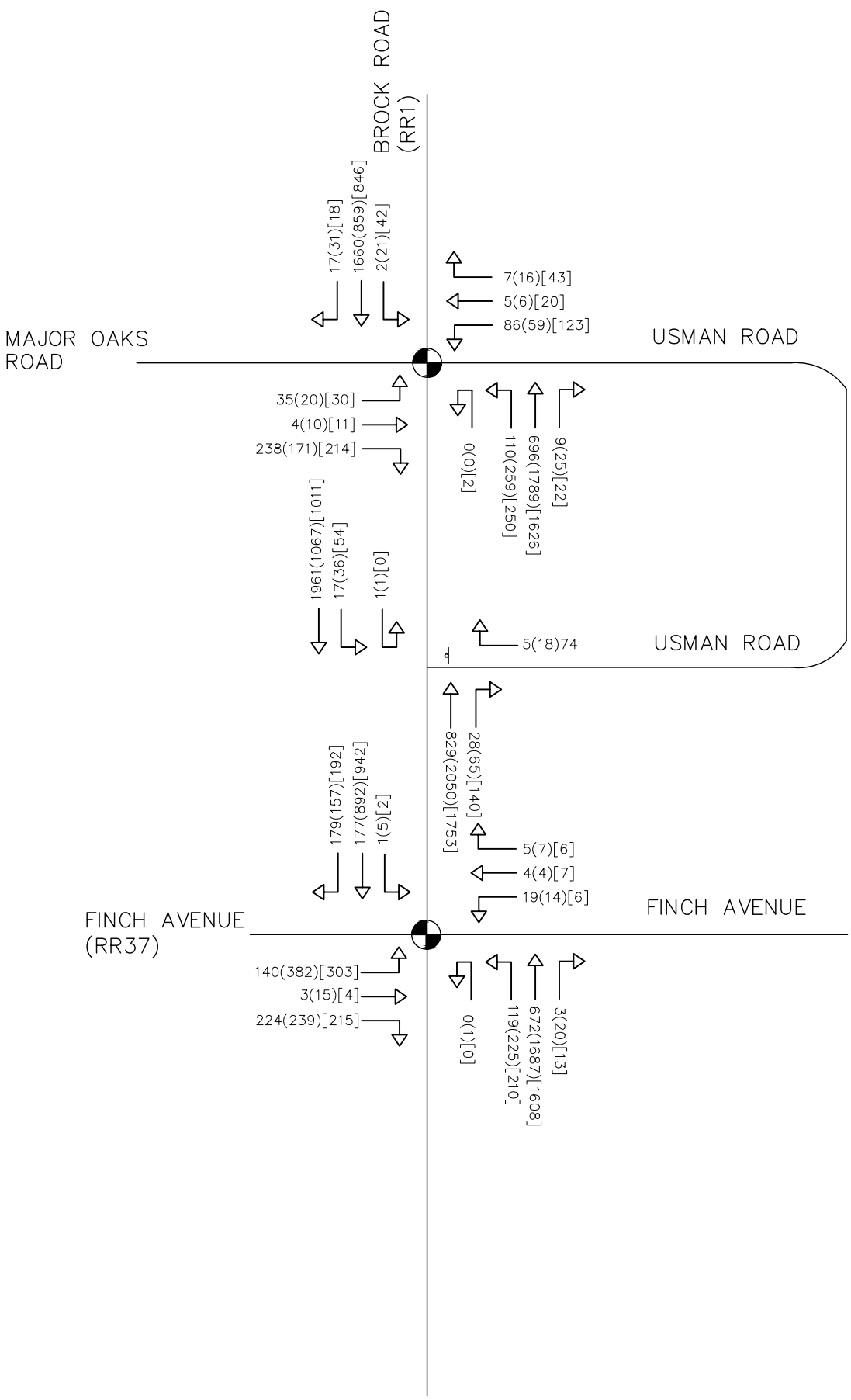
Project
2055 Brock Road Duffins Forest Inc.
2055 Brock Road

Drawing
Boundary Road Network

CROZIER & ASSOCIATES Consulting Engineers
THE HARBOUREDGE BUILDING,
40 HURON STREET, SUITE 301,
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Drawn By	Design By	Project
T.D.S.	K.H.	1807-5430

Scale	Date	Check By	Drawing
N.T.S.	2021/08/10	K.H.	FIG. 3



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

- SIGNAL CONTROL
- STOP CONTROL
- XX(YY) A.M. (P.M.) [FRIDAY] PEAK HOUR TRAFFIC VOLUMES

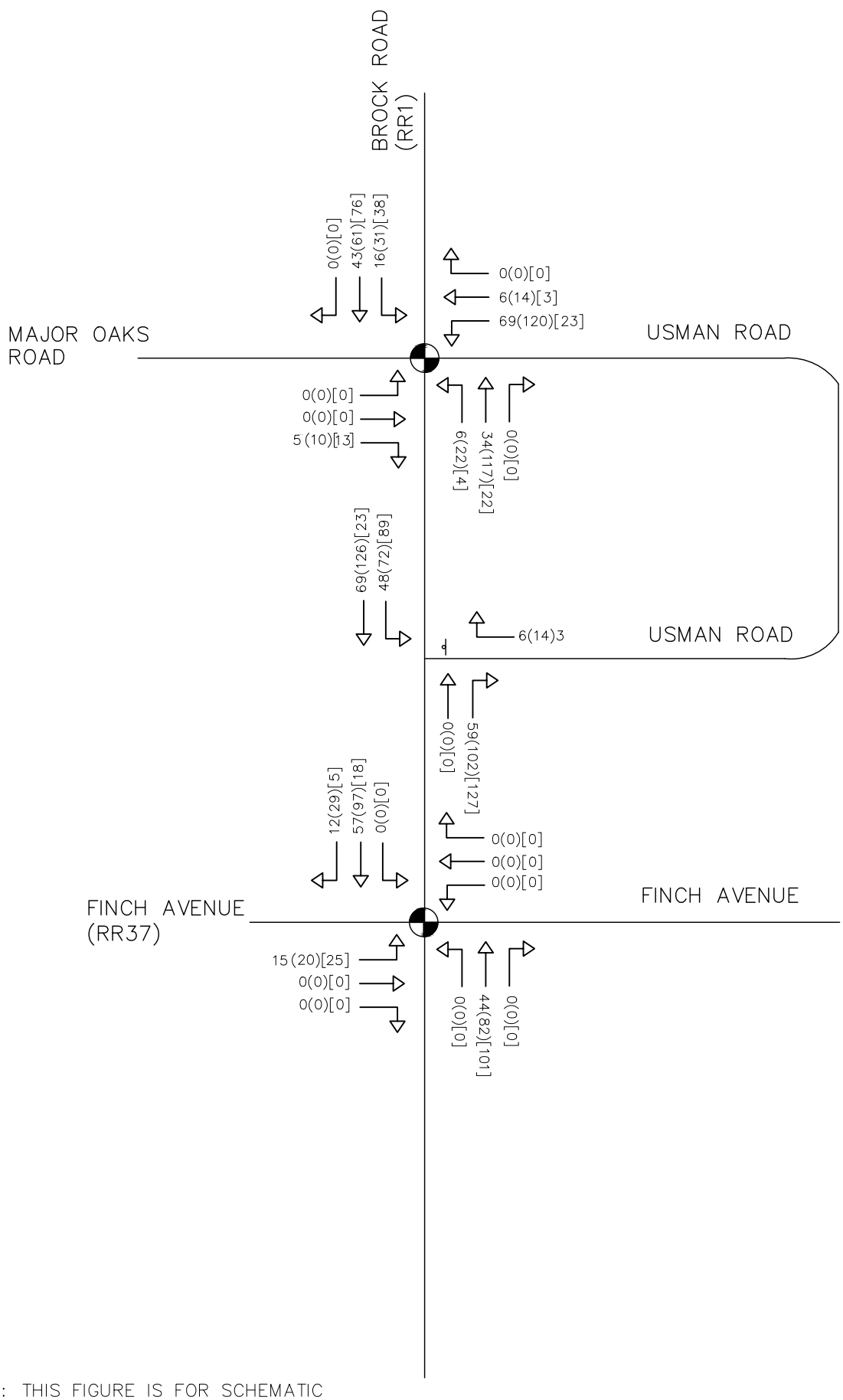
Project
2055 Brock Road Duffins Forest Inc.
2055 Brock Road

Drawing
2019 Existing Traffic

CROZIER & ASSOCIATES Consulting Engineers
THE HARBOUREDGE BUILDING,
40 HURON STREET, SUITE 301,
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Drawn By	Design By	Project
T.D.S.	K.H.	1807-5430

Scale	Date	Check By	Drawing
N.T.S.	2021/08/10	K.H.	FIG. 4



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

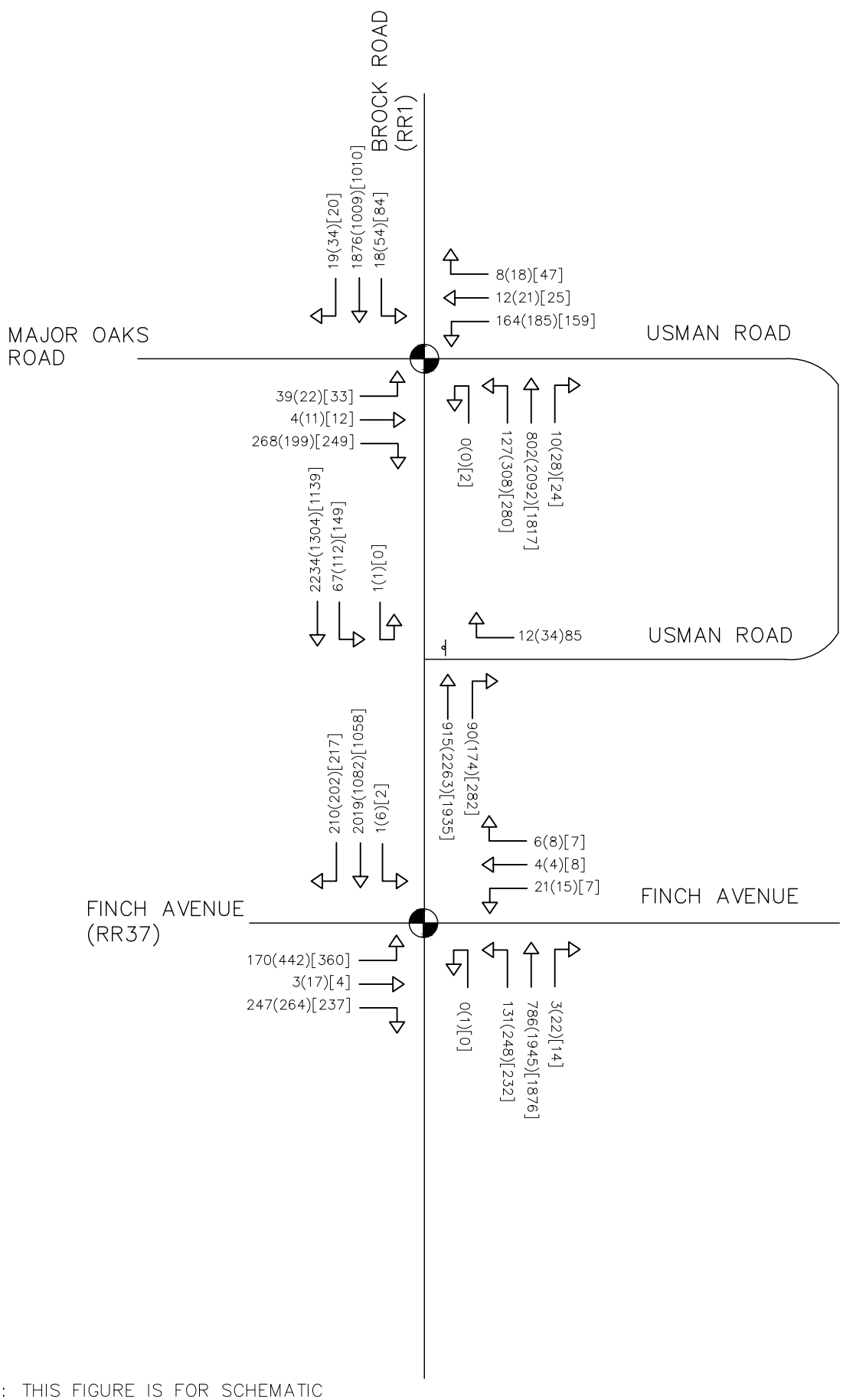
- SIGNAL CONTROL
- STOP CONTROL
- XX(YY) A.M. (P.M.) [FRIDAY] PEAK HOUR TRAFFIC VOLUMES

Project: 2055 Brock Road Duffins Forest Inc.
2055 Brock Road

Drawing: Background Development: 2071 Brock Road

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Drawn By	Design By	Project	Scale	Date	Check By	Drawing
S.A.	M.J.	1807-5430	N.T.S.	OCT 4, 2019	M.C.	FIG. 5



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

- SIGNAL CONTROL
- STOP CONTROL
- XX(YY) A.M. (P.M.) [FRIDAY] PEAK HOUR TRAFFIC VOLUMES

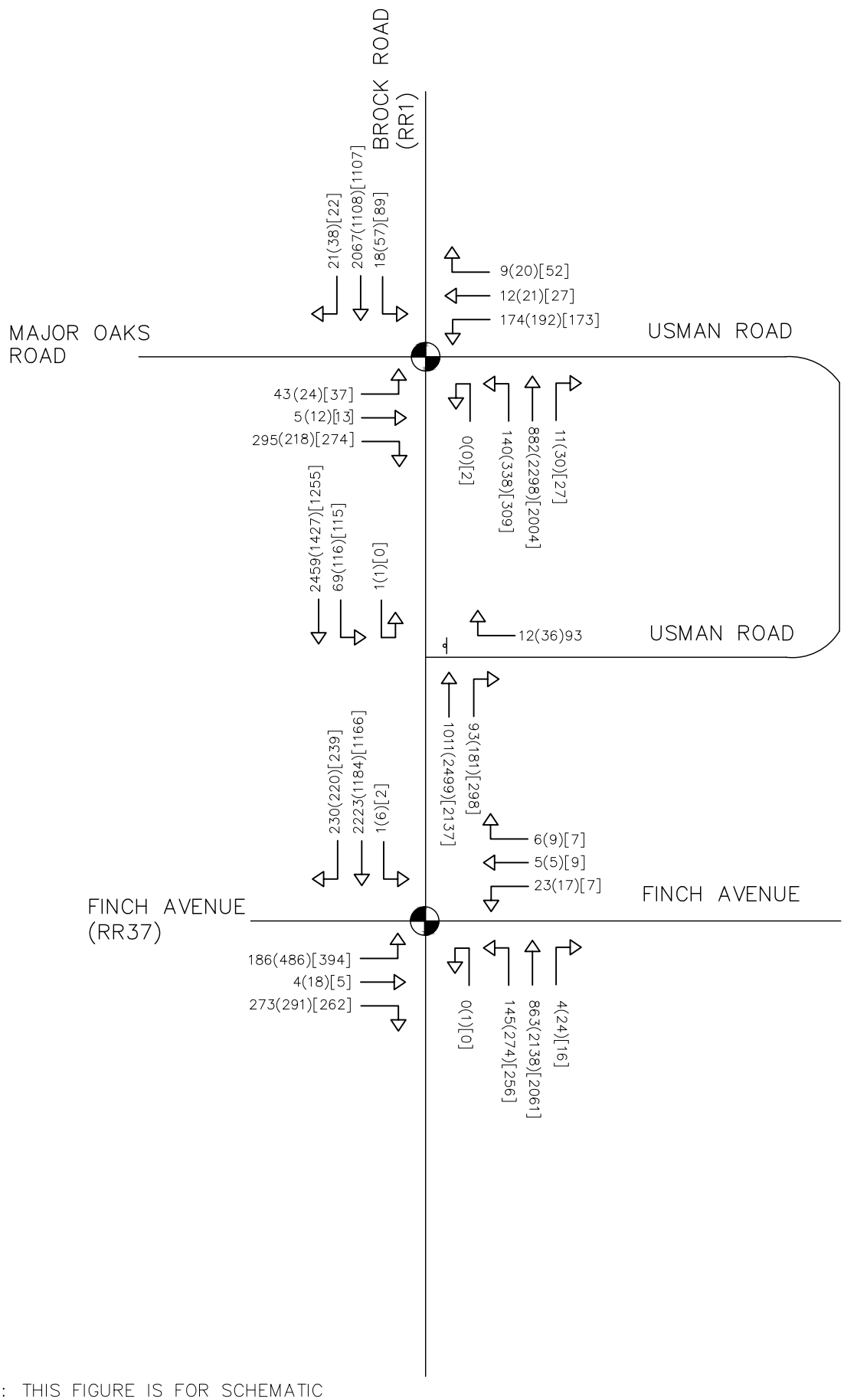
Project: 2055 Brock Road Duffins Forest Inc.
2055 Brock Road

Drawing: 2024 Future Background

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Drawn By	Design By	Project
T.D.S.	K.H.	1807-5430

Scale	Date	Check By	Drawing
N.T.S.	2021/08/10	K.H.	FIG. 6



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

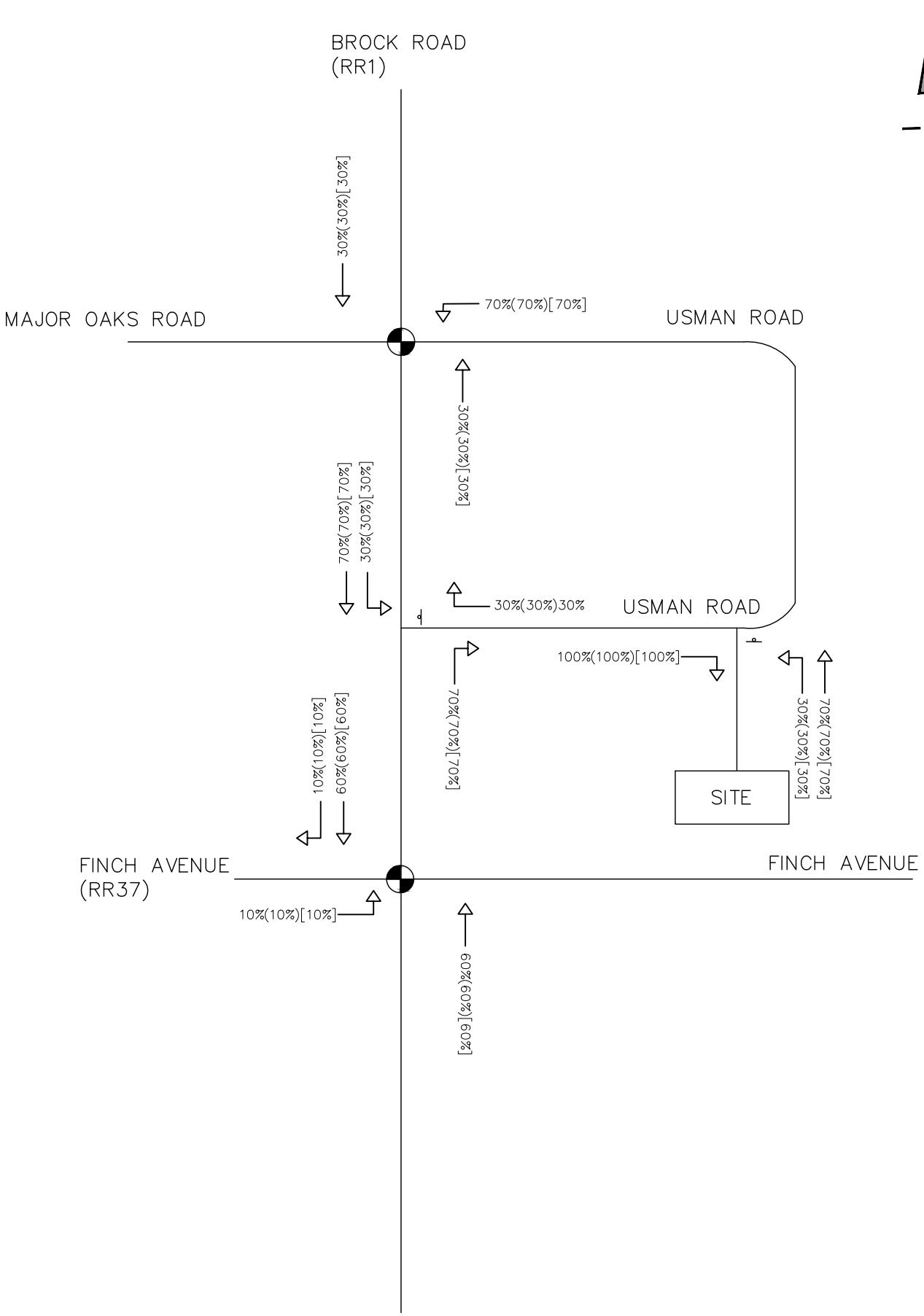
- SIGNAL CONTROL
- STOP CONTROL
- XX(YY) A.M. (P.M.) [FRIDAY] PEAK HOUR TRAFFIC VOLUMES

Project
2055 Brock Road Duffins Forest Inc.
2055 Brock Road

Drawing
2029 Future Background

CROZIER & ASSOCIATES Consulting Engineers
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Drawn By	Design By	Project	Scale	Date	Check By	Drawing
T.D.S.	K.H.	1807-5430	N.T.S.	2021/08/10	K.H.	FIG. 7



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

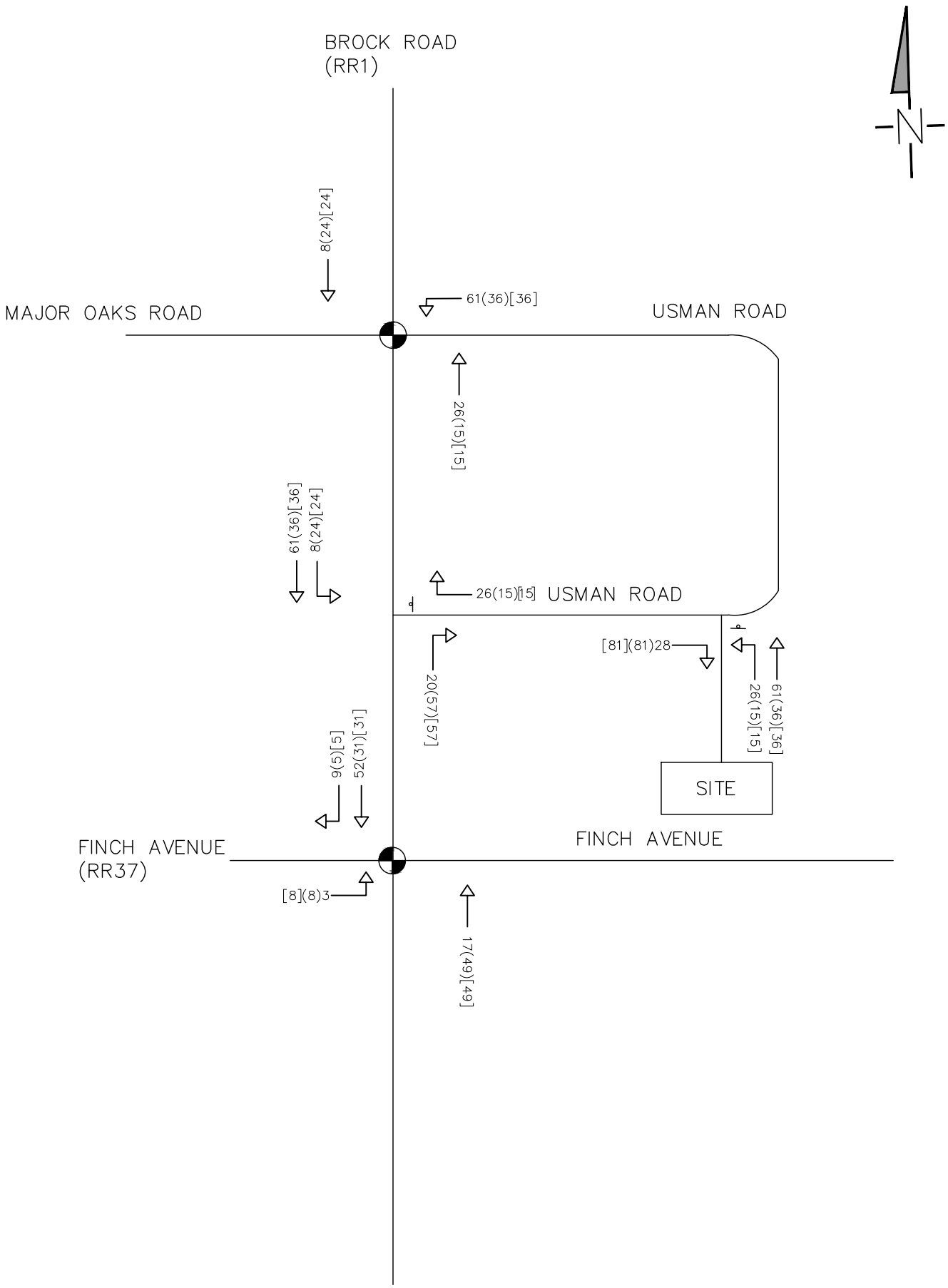
- SIGNAL CONTROL
- STOP CONTROL
- XX(YY) A.M. (P.M.) [FRIDAY] PEAK HOUR TRAFFIC VOLUMES

Project: 2055 Brock Road Duffins Forest Inc.
2055 Brock Road

Drawing: Trip Distribution

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Drawn By	Design By	Project	Scale	Date	Check By	Drawing
S.A.	M.J.	1807-5430	N.T.S.	OCT 4, 2019	M.C.	FIG. 8



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

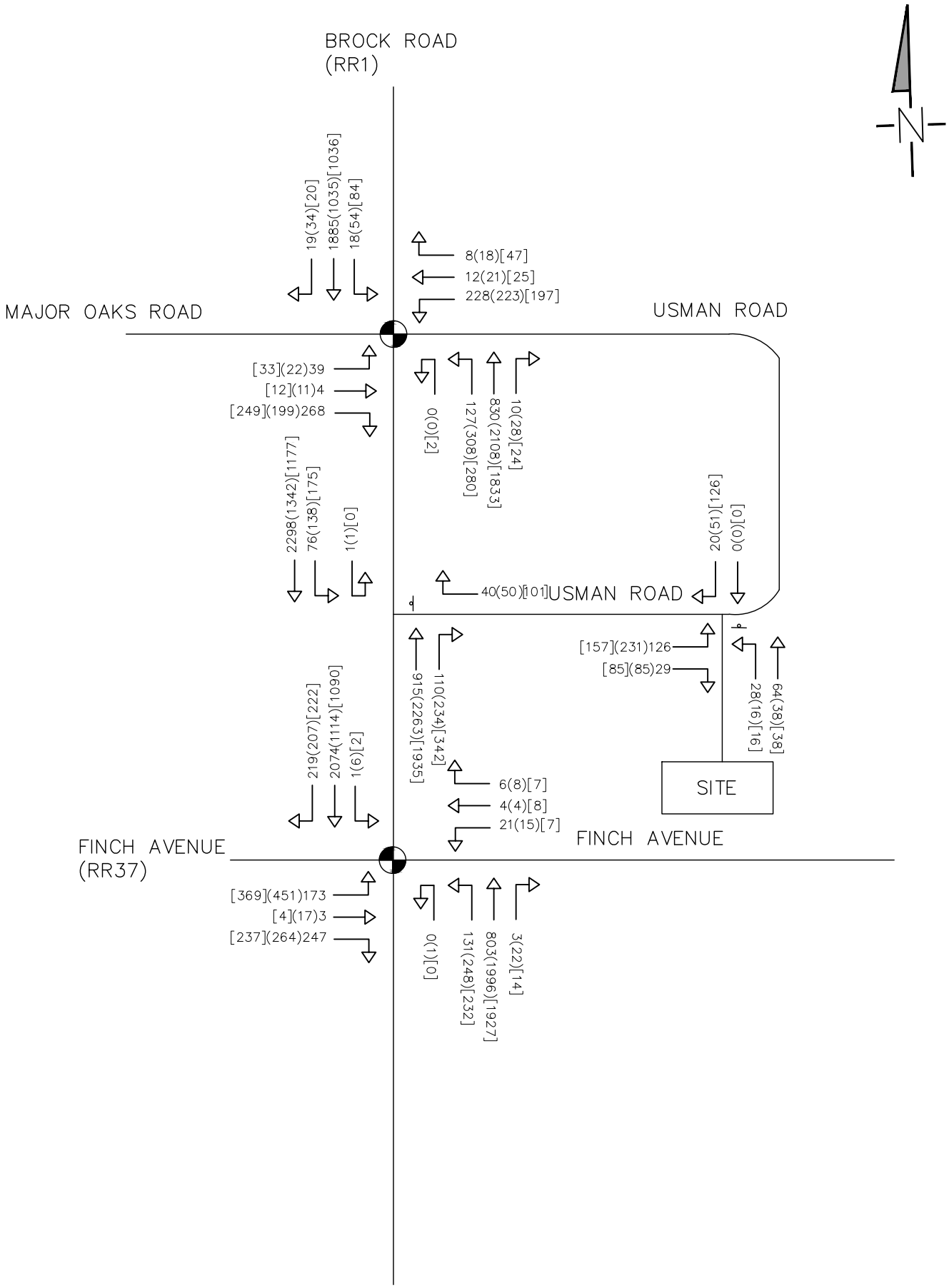
- SIGNAL CONTROL
- STOP CONTROL
- XX(YY) A.M. (P.M.) [FRIDAY] PEAK HOUR TRAFFIC VOLUMES

Project
2055 Brock Road Duffins Forest Inc.
2055 Brock Road

Drawing
Trip Assignment

CROZIER & ASSOCIATES Consulting Engineers
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Drawn By	Design By	Project	Scale	Date	Check By	Drawing
T.D.S.	K.H.	1807-5430	N.T.S.	2021/08/10	K.H.	FIG. 9



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

- SIGNAL CONTROL
- STOP CONTROL
- XX(YY) A.M. (P.M.) [FRIDAY] PEAK HOUR TRAFFIC VOLUMES

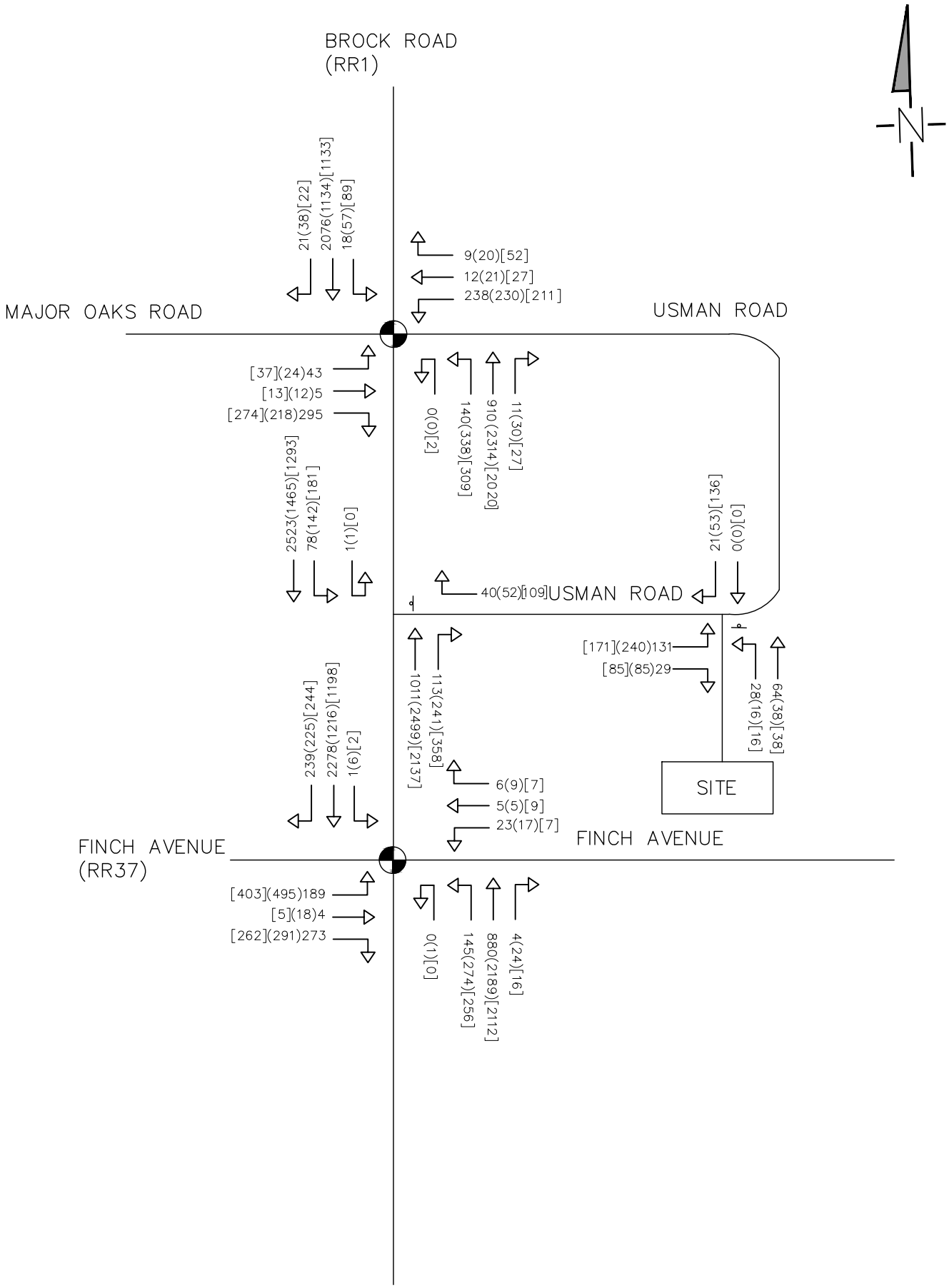
Project: 2055 Brock Road Duffins Forest Inc.
2055 Brock Road

Drawing: 2024 Future Total

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THE HARBOUREDGE BUILDING,
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Drawn By	Design By	Project
T.D.S.	K.H.	1807-5430

Scale	Date	Check By	Drawing
N.T.S.	2021/08/10	K.H.	FIG. 10



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

- SIGNAL CONTROL
- STOP CONTROL
- XX(YY) A.M. (P.M.) [FRIDAY] PEAK HOUR TRAFFIC VOLUMES

Project: 2055 Brock Road Duffins Forest Inc.
2055 Brock Road

Drawing: 2029 Future Total

CROZIER & ASSOCIATES Consulting Engineers
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Drawn By	Design By	Project	Scale	Date	Check By	Drawing
T.D.S.	K.H.	1807-5430	N.T.S.	2021/08/10	K.H.	FIG. 11