

Appendix C

Intersection Control Study



Hamilton Road & Gore Road

Preliminary Intersection Control Study

Project Location:

Hamilton Road & Gore Road, London ON

Prepared for:

City of London
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1.0 Introduction

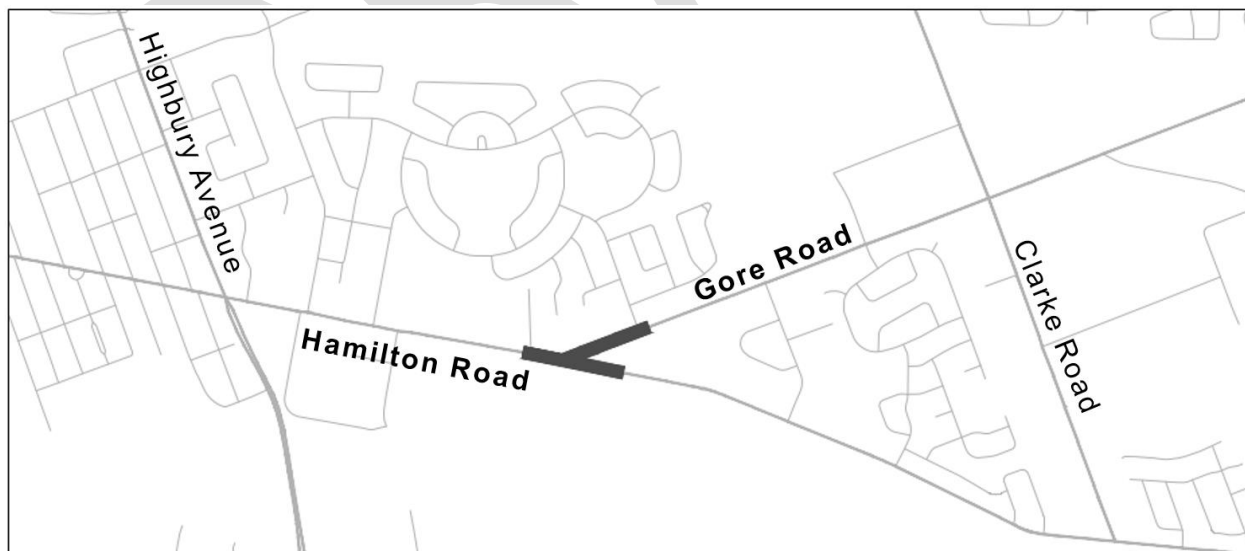
1.1 Overview

MTE Consultants Inc. was retained by the City of London to provide engineering services for conducting the Municipal Class Environmental Assessment (EA) for the reconstruction of the Hamilton Road and Gore Road intersection. As part of the assignment, a traffic study was required to analyze reconstruction alternatives, including signalized intersection and roundabout options.

Hamilton Road and Gore Road converge in the south eastern portion of London, where both roads act as routes into the downtown core. In recent years, the intersection has seen a number of collisions to go along with reports of near misses and excessive speeds. The City has initiated a Schedule 'B' Class EA to develop and evaluate alternatives for improving the safety and function of the intersection. Hamilton Road is currently a 2 lane roadway at the intersection of Gore Road, and widens to 4 lanes west of the intersection. The City's Transportation Master Plan indicates that Hamilton Road will undergo a separate EA to evaluate the need for widening to 4 lanes through the Gore Road intersection. Gore Road is currently a 2 lane road, and the City currently has no plans for widening. At the current stage, this EA will assume the results of the City's Transportation Master Plan which indicates possible widening to 4 lanes.

Currently, Hamilton Road and Gore Road meet at approximately a 45 degree angle, making vehicle movements at the intersection a challenge, specifically the left turn movement from Gore Road to Hamilton Road. Also included within the study area for this project is the driveway to the Adelaide Waste Water Treatment Plant, which also provides access to Pottersburg Park, Meadowlily trails, and a leash free dog park. Figure 1 shows the location of the study area within the City.

Figure 1: Location Plan



1.2 Purpose of Study

The City of London has identified the Hamilton Road and Gore Road intersection as an intersection that has a legacy design with regards to operating geometric characteristics, and has a history of rear end collisions. The City has initiated this study to evaluate alternatives for improvement at this intersection. Hamilton Road and Gore Road are classified as arterial roads with volumes exceeding 14,000 vehicles per day, and usage as a commuter route has grown in recent years. The Pottersburg Park and Meadowlily trail network have also become more frequently used, and are accessed through the entrance to the wastewater treatment plant. A technical review of the study area was completed by the City in 2011, which looked at the feasibility of intersection improvements. This study reviews the options for the Hamilton Road and Gore Road intersection with the objective of determining the most suitable alternative, which can then be carried forward to the detailed design phase.

Through the preliminary design process various intersection concepts were prepared in consultation with the City of London. An integral part of the assignment is the intersection control study (ICS), which has been prepared as part of evaluating the preferred intersection configuration.

This study evaluates both signalized and roundabout control alternatives using various criteria including construction costs, societal costs, traffic operations, property impacts, pedestrian and cyclist effects, speed control, fuel consumption and emissions, area land uses, construction staging, maintenance and aesthetics.

2.0 Intersection Control Alternatives

2.1 Analysis Inputs

Weekday peak hour forecasts for 2035 were prepared by Salvini Consulting in support of the Hamilton Road and Gore Road Intersection improvement EA. The forecasts were used to develop signalized and roundabout concept designs to accommodate the proposed interim 2 lane and future 4 lane configurations. Traffic volume calculations can be found in **Appendix B**.

The design concepts provided are considered adequate for the evaluation of the intersection functionality, as well as estimating construction costs and property impacts. The designs are considered part of the preliminary design process, and therefore require further refinement as the design process continues.

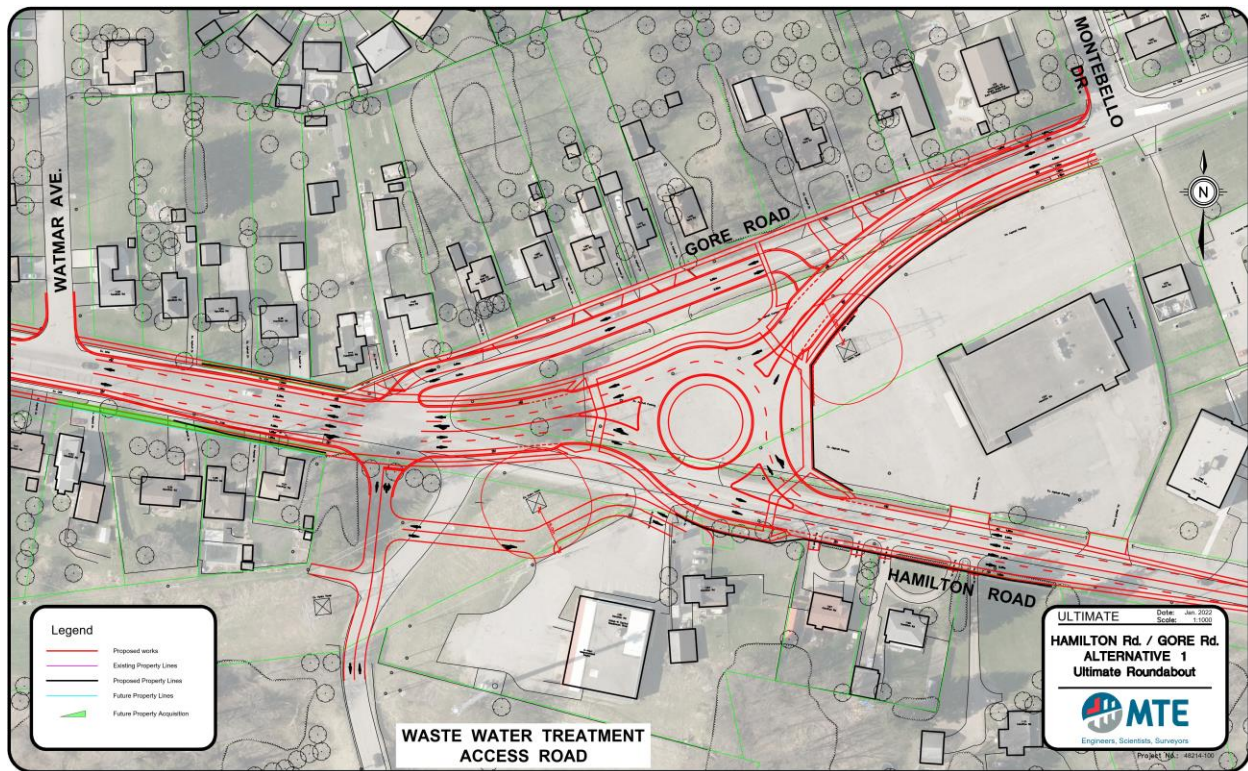
2.2 Roundabout Concept - Alternative 1

The roundabout design concept is based on the forecasted volumes input into roundabout flow sheets, preliminary modeling in Arcady and input from the design team, the details of which can be found in **Appendix B** at the end of the report.

The roundabout is a three leg design with single lane entries on the north and east legs and a dual lane entry on the west leg. The inscribed circle diameter (ICD) is 50m for the dual lane and 45m in the single lane portion, with circulatory road widths of 9.0m and 6.5m respectively. The design can accommodate a bus turning without rolling over the island curb and a WB-20 transport truck with the aid of the truck apron for the trailer tracking.

The roundabout alternative includes a new window street that runs alongside the roundabout approximately in the alignment of the current Gore Road. This street is included to allow driveway access for the residents of Gore Road, and would be right in and right out only on the Gore Road leg of the roundabout, and have full movement on the Hamilton Road end. The west end of the new road would be aligned with the plant entrance, and would be a stop controlled intersection. The preliminary functional design can be found in Figure 2, with larger scale drawings included in **Appendix D**.

Figure 2: Roundabout Concept - Alternative 1



2.3 Signalized Intersection Concepts

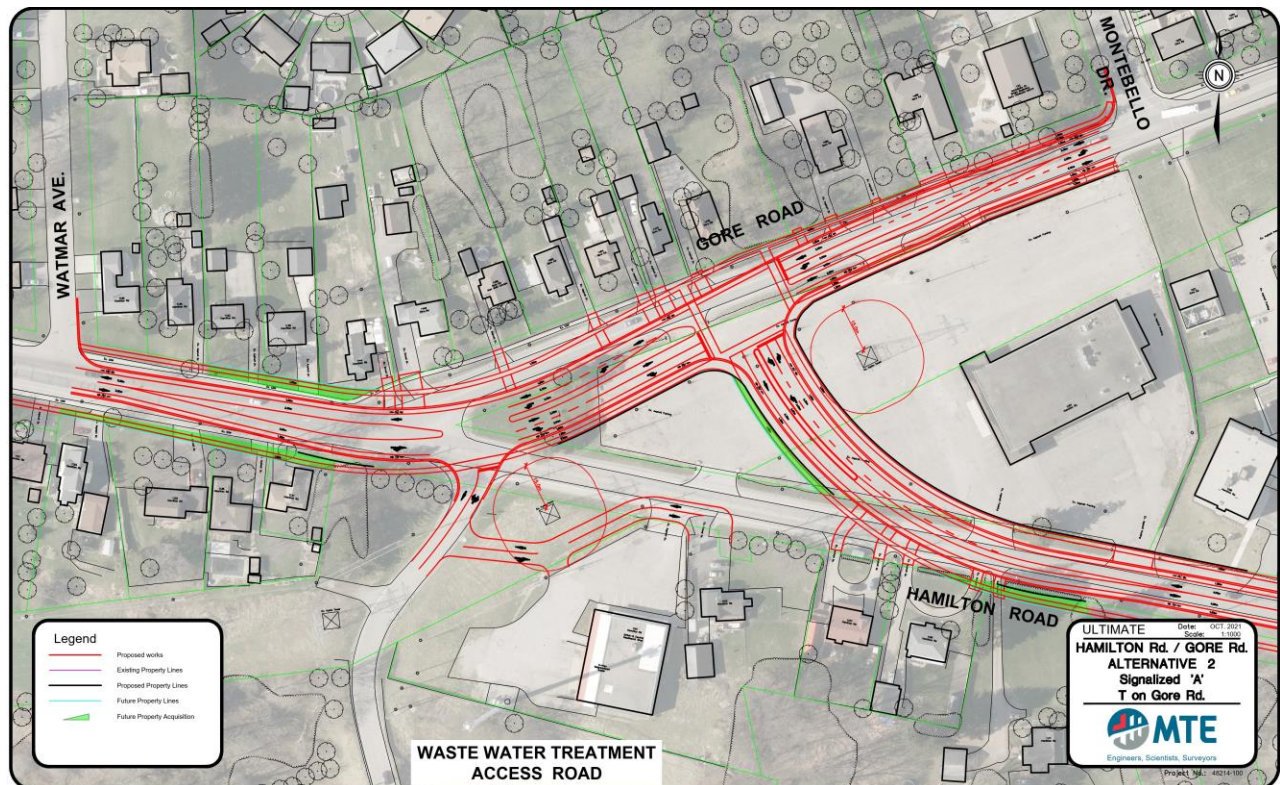
Two signalized design concepts were prepared as part of the evaluation of the Hamilton Road and Gore Road intersection improvements EA.

2.3.1 Realignment of Hamilton Road/Gore Road – Alternative 2

The first signalized design concept includes the realignment of Hamilton Road and Gore Road, as shown in Figure 3 below. The actual intersection would be shifted east, and Hamilton Road south would be realigned so that it would “tee” into Gore Road. This alternative was explored in the 2011 feasibility study, and was modified to accommodate the 2035 projected traffic flows. The alternative presented includes an eastbound right turn lane on Hamilton Road, as well as a single straight through lane. Westbound drivers on Hamilton Road would turn left to stay on Hamilton Road, or turn right onto Gore Road. The design includes a dedicated left turn and right turn lane in the northbound direction. In the westbound direction on Gore Road there will be a dedicated left turn lane onto Hamilton Road, as well as a straight through lane.

This signalized intersection design includes plans for future widening to 4 lanes, which is indicated in the City's Transportation Master Plan. As part of the evaluation, consideration is being given to land acquisitions associated with the future widening plans. Infrastructure, including sidewalk, and utility relocates will facilitate future widening plans. For larger scale drawings please see **Appendix D**.

Figure 3: Realignment of Hamilton/Gore Road - Alternative 2

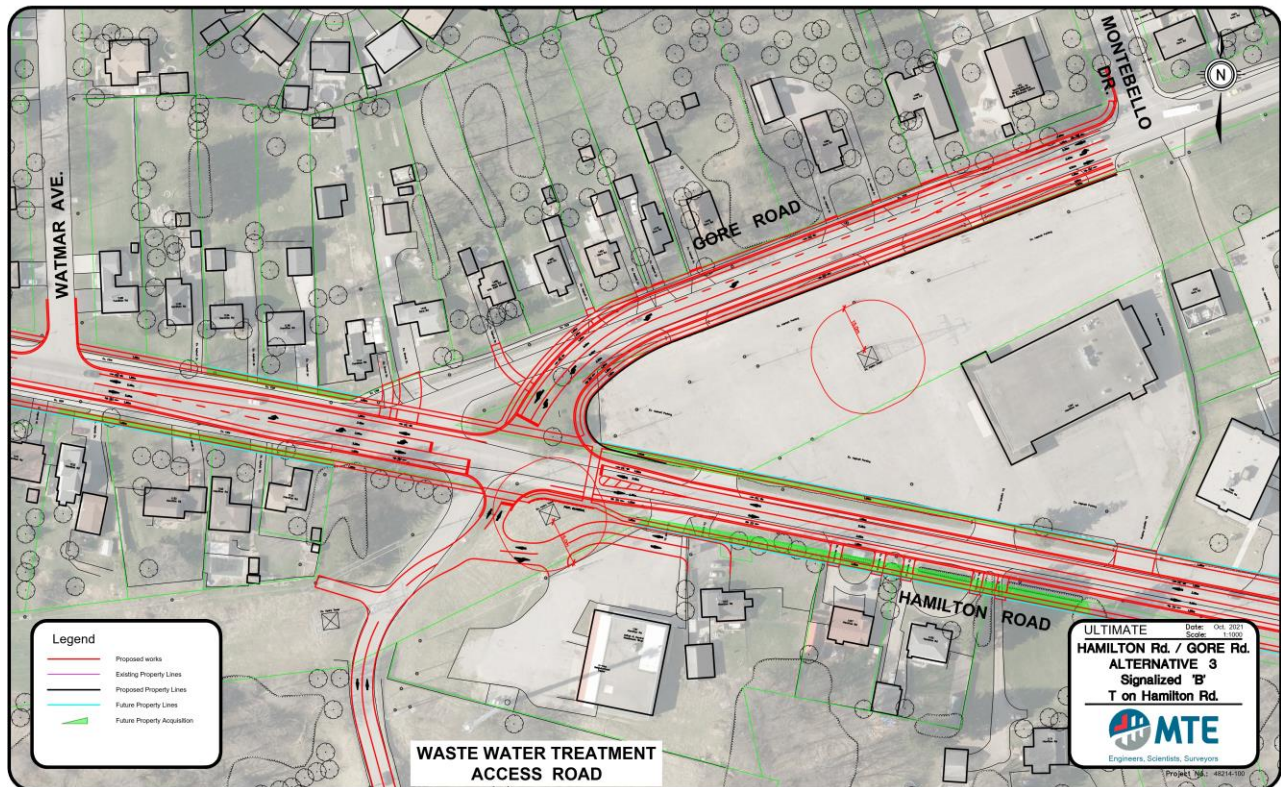


2.3.2 Minor Realignment of Gore Road – Alternative 3

The second signalized design concept includes minor realignment of Gore Road so that it lines up with the entrance to the wastewater treatment plant, as shown in Figure 4. A similar intersection concept was explored in the 2011 feasibility study, and was discarded due to sub-optimal geometry. The geometry that has been applied to this alternative still does not meet TAC guidelines for curvature in a roadway for the 50km/hr roadway. However, given that this intersection is signal controlled and has little to no through traffic between Gore Road and the Waste Water Treatment Plan, all drivers will be slowing down as they approach the intersection from the east and west. Therefore, we assert that the design speed of the approach can be reduced, making the curvature acceptable for lower speed traffic. This intersection alternative has been designed to accommodate the 2035 projected traffic flows. The alternative presented includes an eastbound left turn lane, as well as a through/right turn lane. Gore Road will have a dedicated left turn lane in the westbound direction, as well as a through and right turn lane, allowing the right turn movement onto Hamilton Road, as well as the through movement into the treatment plant entrance.

This signalized intersection design includes plans for future widening to 4 lanes, which is indicated in the City's Transportation Master Plan. As part of the evaluation, consideration is being given to land acquisitions associated with the future widening plans. Infrastructure, including sidewalk, and utility relocates will facilitate future widening plans. For larger scale drawings please see **Appendix D**.

Figure 4: Minor Realignment of Gore Road - Alternative 3



3.0 Quantitative Evaluation

3.1 Injury Collision Costs

Part of the evaluation and comparison of the roundabout alternatives and signalized alternatives is an estimate of the costs associated with collisions. MTE has worked extensively with the Region of Waterloo who has established their own safety assessment methodology based on the Highway Safety Manual (HSM). This approach evaluates the projected number of collisions at each type of intersection, and the expected types of collisions:

- Property Damage Only (PDO)
- Personal Injury
- Fatal

The analysis predicts the volume and severity of each collision, and assigns a 20-Year Net Present Value (NPV) societal cost of the collisions (**Appendix A**). These societal costs are not

necessarily borne by the City directly. The net value of the collision costs associated with each type of incident are as follows:

- Fatal - \$1,656,500
- Injury - \$60,500
- PDO_{Signalized} - \$5,000
- PDO_{Roundabout} - \$4,500

The injury collision costs are combined with the direct capital and maintenance costs of each alternative to develop a direct cost comparison. This approach allows for the increased safety associated with roundabouts to factor into the comparison of costs, which would otherwise not be considered. The Safety Assessment Methodology used is updated annually based on real world collision data and associated costs.

3.1.1 Traffic Signal Injury Collision Prediction

Based on the Safety Assessment Methodology, and applying the 10-Year AADT (10 times the PM Peak), Alternative 2 (realignment of Hamilton Road), is estimated to have 5.47 collisions per year, 3.55 PDO, and 1.92 injuries, while Alternative 3 (minor realignment of Gore Road), is estimated to have 6.52 collisions per year, 4.26 PDO, and 2.25 injury. (Appendix A)

3.1.2 Roundabout Injury Collision Prediction

Based on the Safety Assessment Methodology, and applying the 10-Year AADT, the roundabout is estimated to have 4.64 collisions per year, 4.17 PDO, and 0.46 injury.

3.1.3 Life Cycle Societal Costs

The annual societal costs for a signalized intersection and a roundabout were calculated in net present value terms. The 20-Year present value cost used a 6% discount rate. The results are summarized in Table 1 below.

Table 3.1: Estimated Annual Collisions (1-Year Only)

Future Expected Collisions by Severity	Total	PDO	Injury	Fatal
Roundabout (Alternative 1)	4.64	4.17	0.46	0.00
Signalized (Alternative 2)	5.47	3.55	1.92	0.00
Signalized (Alternative 3)	6.52	4.26	2.25	0.01

Table 3.2: Comparison of Annual Collision Performance

20-Year Present Value Collision Costs (DIRECT CAPITAL COSTS)				
Collisions by Severity	Total	PDO	Injury	Fatal
Roundabout (Alternative 1)	\$537,279.04	\$215,443.58	\$321,835.47	\$0.00
Signalized (Alternative 2)	\$1,611,936.85	\$203,591.10	\$1,332,346.05	\$75,999.70
Signalized (Alternative 3)	\$1,900,551.97	\$244,309.32	\$1,561,343.03	\$94,999.62

Table 3.1 does not include additional costs or any saving that may be associated with property damages. It is difficult to provide an estimate which represents property damage crash savings, and so societal costs are more difficult to obtain. The savings associated with roundabouts are generally societal savings.

3.2 Other Life Cycle Costs

In order to establish life cycle costing a number of assumptions surrounding maintenance costs are required. The present values of maintenance costs through 2041 are presented below:

Table 3.3: Life Cycle Costs

	Signalized Intersections	Roundabout
Maintenance Item		
Traffic Signals (Alt. 2 & 3)	\$7,300 / year	
Street Lighting (Assume 25 street lights)	\$225/light/ year	\$225/light/year
Total Life Cycle Cost	\$162,000	\$71,000

Present costs are over the 20-year period, and discount rate of 2.5% is assumed.

3.3 Capital Costs

The estimates that were developed for capital costs included costs for construction and engineering fees. Some assumptions made to establish the estimates are as follows:

- The design process has not progressed far enough to properly estimate the full extent of underground construction works. Therefore, while utility costs are provided, they are partial estimates.

- Full road reconstruction regardless of the option selected.
- Similar roundabout and intersection construction projects were used to develop these estimates. Unique features may arise during detailed design and may not be accounted for.
- Construction and property cost estimates include 20% for Engineering Fees and Miscellaneous, and 20% for Contingency.

A summary of the costs is provided below in Table 3.4. It should be noted that actual construction costs will depend on the timing of construction, contractor availability and scheduling, along with many other factors. At this time, there is minimal property acquisition required, and may not have any cost impact. For this comparison, property acquisition costs have not been included, and will be discussed separately.

See **Appendix C** for Detailed Cost Estimates.

Table 3.4: Summary of Construction Costs

Description	Roundabout (Alternative 1)	Signalized – Realignment of Hamilton Road (Alternative 2)	Signalized – Minor Realignment of Gore Road (Alternative 3)
Site Preparation and Removals	\$ 275,000	\$ 255,000	\$ 235,000
Road Works	\$ 960,000	\$ 690,000	\$ 630,000
Storm Sewers	\$ 485,000	\$ 255,000	\$ 250,000
Sanitary Sewers	\$ 150,000	\$ 200,000	\$ 90,000
Watermain	\$ 210,000	\$ 205,000	\$ 125,000
Utility Relocation	\$ 270,000	\$ 30,000	\$ 135,000
Miscellaneous	\$ 635,000	\$ 600,000	\$ 475,000
Sub-Total	\$ 2,985,000	\$ 2,235,000	\$ 1,940,000
Engineering (20%)	\$ 597,000	\$ 447,000	\$ 388,000
Contingency (20%)	\$ 597,000	\$ 447,000	\$ 388,000
Total	\$ 4,179,000	\$ 3,129,000	\$ 2,716,000

At the intersection of Hamilton Road and Gore Road, Alternative 3 is the less expensive of the two signalized alternatives, \$2,716,000, compared with \$3,129,000. The roundabout option is estimated at \$4,179,000, which is \$1,050,000 more than alternative 2, and \$1,463,000 more than alternative 3.

3.4 Results of Quantitative Evaluation

The table below summarizes the total capital, life cycle and collision cost estimates to establish a direct comparison of total costs associated with a roundabout and the signalized intersections. The total overall costs of the alternatives:

- Roundabout (Alternative 1) - \$4,788,000
- Signalized (Alternative 2) - \$4,903,000

- Signalized (Alternative 3) - \$4,779,000

What is observed in this analysis, is that once the societal costs of the roundabout are included, the cost of the roundabout becomes much more comparable to the cost of signalized intersections.

Table 3.5: Comparison of Capital and Life Cycle Costs

Cost Item	Roundabout (Alternative 1)	Signalized – Realignment of Hamilton Road (Alternative 2)	Signalized – Minor Realignment of Gore Road (Alternative 3)
Present Value Collision Costs	\$ 538,000	\$ 1,612,000	\$ 1,901,000
Other Life Cycle Costs	\$ 71,000	\$ 162,000	\$ 162,000
Capital Cost	\$ 4,179,000	\$ 3,129,000	\$ 2,716,000
Total	\$ 4,788,000	\$ 4,903,000	\$ 4,779,000

4.0 Qualitative Evaluation

4.1 Traffic Operations

An operational analysis was completed using the forecasted 2035 AM & PM peak volumes for both the signalized and roundabout design concepts to determine the level of service. The analysis was done using Synchro for the signalized concept and ARCADY for the roundabout concept. ARCADY Capacity intercept adjustments of 15% and 5% were utilized to represent opening capacity and 10+ year capacity respectively. The results for the PM peak operations are summarized in Table 4.1 below with detailed analysis output available in **Appendix B**.

Table 4.1: Alternative 1 2035 PM Peak Traffic Operations

Performance Measure	Roundabout	
	85% Intercept Adjustment	95% Intercept Adjustment
Avg. Approach Delay		
Gore Road	6.42s	5.42s
EB on Hamilton Road	7.18s	5.71s
WB on Hamilton Road	8.64s	6.90s
95th Percentile Queue		
Gore Road	<14m	<14m
EB on Hamilton Road	<14m	<14m
WB on Hamilton Road	<14m	<14m
Overall LOS	'A'	'A'

Table 4.2: Alternative 2 2035 Peak Traffic Operations

	Performance Measure	Direction/Approach/Lane					
		EBT	EBR	WBL	WBT	NBL	NBR
AM Peak Hour	Level of Service	B	A	B	B	B	A
	Delay (s)	18.9	3.6	12.2	15.7	19.9	5.4
	Volume/Capacity	0.64	0.27	0.03	0.47	0.69	0.04
	95 th Percentile Queue (m)	70.4	10.7	2.8	49.9	76.9	4.0
	Storage (m)	-	70	50	-	30	-
PM Peak Hour	Level of Service	B	A	A	B	B	A
	Delay (s)	15.0	3.8	8.5	16.4	12.2	5.0
	Volume/Capacity	0.61	0.56	0.01	0.67	0.43	0.02
	95 th Percentile Queue (m)	49.3	13.4	1.4	55.3	31.7	2.1
	Storage (m)	-	70	50	-	30	-

Table 4.3: Alternative 3 2035 Peak Traffic Operations

	Performance Measure	Direction/Approach/Lane					
		EBL	EBTR	WB	NB	SBL	SBTR
AM Peak Hour	Level of Service	A	A	C	A	C	A
	Delay (s)	4.2	1.8	23.0	0.4	22.0	1.1
	Volume/Capacity	0.48	0.13	0.75	0.06	0.03	0.36
	95 th Percentile Queue (m)	36.0	15.0	103.6	-	4.0	-
	Storage (m)	35	-	-	-	150	-
PM Peak Hour	Level of Service	A	A	B	B	B	A
	Delay (s)	2.9	2.1	18.3	19.7	19.5	2.2
	Volume/Capacity	0.45	0.31	0.59	0.01	0.01	0.49
	95 th Percentile Queue (m)	27.5	38.2	53.2	2.4	2.7	4.8
	Storage (m)	35	-	-	-	150	-

The signalized capacity analysis shows that in alternative 2, a minimum level of service B is maintained in both the AM and PM peak. In alternative 3, there is a slight drop in level of service, with the WB and SBL being a level C. The results from the ARCADY analysis for the roundabout indicate that the roundabout will operate at a level of service A in both the AM and PM peak.

Overall, the roundabout alternative functions with a level of service 'A', and provides the highest level of service of the alternatives presented.

4.2 Results of Qualitative Evaluation

The following table provides a summary of the qualitative evaluation of signals vs. roundabout, apart from traffic operations.

Table 4.4: Summary of Qualitative Comments

Evaluation Criteria	Comments		
	Roundabout – Alt. 1	Signalized – Alt. 2	Signalized – Alt. 3
Transit	At this location, the Downtown to Argyle Mall (3) route passes through the intersection. Current transit stops are east and west of the intersection, no concerns about stops located near roundabout.	At this location, the Downtown to Argyle Mall (3) route passes through the intersection. This route will now have to turn at the signalized intersection to stay on Hamilton Road, and will see increases in run time. Stop locations may require modification.	At this location, the Downtown to Argyle Mall (3) route passes through the intersection. This route may see a slight increase in run time due to the signal delay. No concerns about stop locations.
Emergency Services	With free flow of traffic and the ability to perform u-turns, emergency vehicles should be able to quickly and safely navigate the intersection.	While emergency vehicle pre-emption would be enabled at this intersection, during peak volumes navigation could become challenging.	Emergency vehicles will be able to navigate this intersection with emergency vehicle pre-emption.
Pedestrians and persons with disabilities	Crossing distances will be reduced to one vehicle direction at a time. Accessibility can be challenging at a roundabout. Consultations with stakeholders should take place prior to implementation.	Signal will require push button activation per AODA requirements with possible audible signals. Crossing distances are moderate with 3 travel lanes.	Signal will require push button activation per AODA requirements with possible audible signals. Crossing distances are moderate with 3 travel lanes. Crossing east/west on Hamilton Road will be a longer than desired pedestrian crossing.
Cyclists	A multi-use trail system is proposed around the roundabout to allow for cyclists to bypass the roundabout. Cyclists have the option to take a lane within the roadway or exit onto	An on road cycle lane is proposed on each side of Hamilton Road. Crossing and left turn movements are not accommodated with actuated signals. The detailed design will	An on road cycle lane is proposed on each side of Hamilton Road. Crossing and left turn movements are not accommodated with actuated signals. The detailed design will need to include complete

Evaluation Criteria	Comments		
	Roundabout – Alt. 1	Signalized – Alt. 2	Signalized – Alt. 3
	the MUT.	need to include complete streets and proper cycling infrastructure.	streets and proper cycling infrastructure.
Speed Control	Speeds are reduced with good deflection entering the roundabout.	Traffic speeds will be reduced under green condition, and those turning to remain on Hamilton Road will be slowed by turning movement.	Traffic speeds will remain high under green light conditions with the exception of peak conditions.
Compatibility	Lower speeds and less queueing should result in better access. Delays for people exiting the WWTP and the window road and wanting to turn left onto Hamilton Road. Additional routing for local residents.	Excessive queueing could cause access problems for WWTP traffic and window road traffic.	Excessive queueing could cause access problems for WWTP traffic and window road traffic.
Noise, Fuel Consumption, Emissions	Less delay than signals would result in decrease in fuel & emissions. Less stop & starts should decrease noise levels.	Since this is a new intersection there will be an increase in noise, fuel consumption and emissions due to both vehicle delay and increased stop/starts.	Since this is a new intersection there will be an increase in noise, fuel consumption and emissions due to both vehicle delay and increased stop/starts.
Maintenance	Work in circulatory roadway may require large vehicles to detour.	No change, lane closures possible.	No change, lane closures possible.
Construction Staging	More complicated, may require temporary roads.	Less complicated.	Less complicated.
Aesthetics	Decorative concrete and landscaped central island feature.	No change, possible decorative concrete.	No change, possible decorative concrete.
Corridor Control	A roundabout at this intersection will be the first along Hamilton	A signal is consistent with existing signals along Hamilton Road,	A signal is consistent with existing signals along Hamilton Road.

Evaluation Criteria	Comments		
	Roundabout – Alt. 1	Signalized – Alt. 2	Signalized – Alt. 3
	Road.	however, if Hamilton Road is widened to 4 lanes, the option with shifted intersection could have capacity constraints or require double right and left turn lanes to stay on Hamilton Road.	

5.0 Conclusions and Recommendations

Based on the foregoing analysis, it is concluded that:

- i) The quantitative analysis, which takes into account cost estimates for construction costs, life cycle costs and collision costs, and does not include property acquisition, favours Alternative 3 over Alternatives 1 and Alternative 2 by \$9,000 and \$124,000 respectively or 0.2% and 2.6%.
- ii) Alternative 3 has the lowest capital cost, with an estimate of \$2,716,000, which includes engineering and contingency. Alternative 1 (Roundabout) is approximately \$1,463,000 more than Alternative 3 (53%).
- iii) The qualitative analysis slightly favours the roundabout option over the signalized option in terms of operation, however, all three alternatives can be designed to operate in the 2035 horizon.
- iv) There are concerns with realigning Hamilton Road (Alternative 2 – signalized), in that should the City determine that widening Hamilton Road to 4 lanes is necessary, the geometry becomes a challenge, potentially requiring a second right turn lane, as well as a second left turn lane along Hamilton Road.
- v) The roundabout provides the highest level of service for the intersection based on traffic projections, and will also be suitable for future widening to 4 lanes.
- vi) Alternative 3 (minor realignment of Gore Road) will have the lowest construction cost.

It is recommended that:

- i) Based on the findings of this traffic control study, the roundabout alternative (Alternative 1), is considered the most appropriate alternative. While the overall cost of the roundabout is higher than the signalized alternatives, it provides excellent level of service in the short and long term scenarios. It also provides a high level of safety for all modes of transportation.

All of which is respectfully submitted,

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Appendix A

Safety Analysis Background

INTERSECTION CONTROL STUDIES SAFETY ASSESSMENT METHODOLOGY (HSM)

Last Rev JAN 2021

Scenario: **Hamilton Road & Gore Road ICS**

Major Road: **Hamilton Road**

Minor Road: **Gore Road**

Major Road Direction: East / West ▼
 Urban or Rural: Urban ▼
 Proposed Control: Signalized ▼
 Proposed Config: 4-Leg Intersection ▼

LT Lanes Proposed (non roundabout):			RT Lanes Proposed (non roundabout):		
Major	1 Approach	▼	Major	No RT Lanes	▼
Minor	1 Approach	▼	Minor	No RT Lanes	▼

Is there going to be any fully protected left-turn phasing? YES ▼

Number of approaches with FPLTP: 1 ▼

Is the proposed intersection "new" or is it existing: EXISTING ▼

Does control and number of approaches remain the same: NO ▼

Will the proposed intersection have illumination: YES ▼

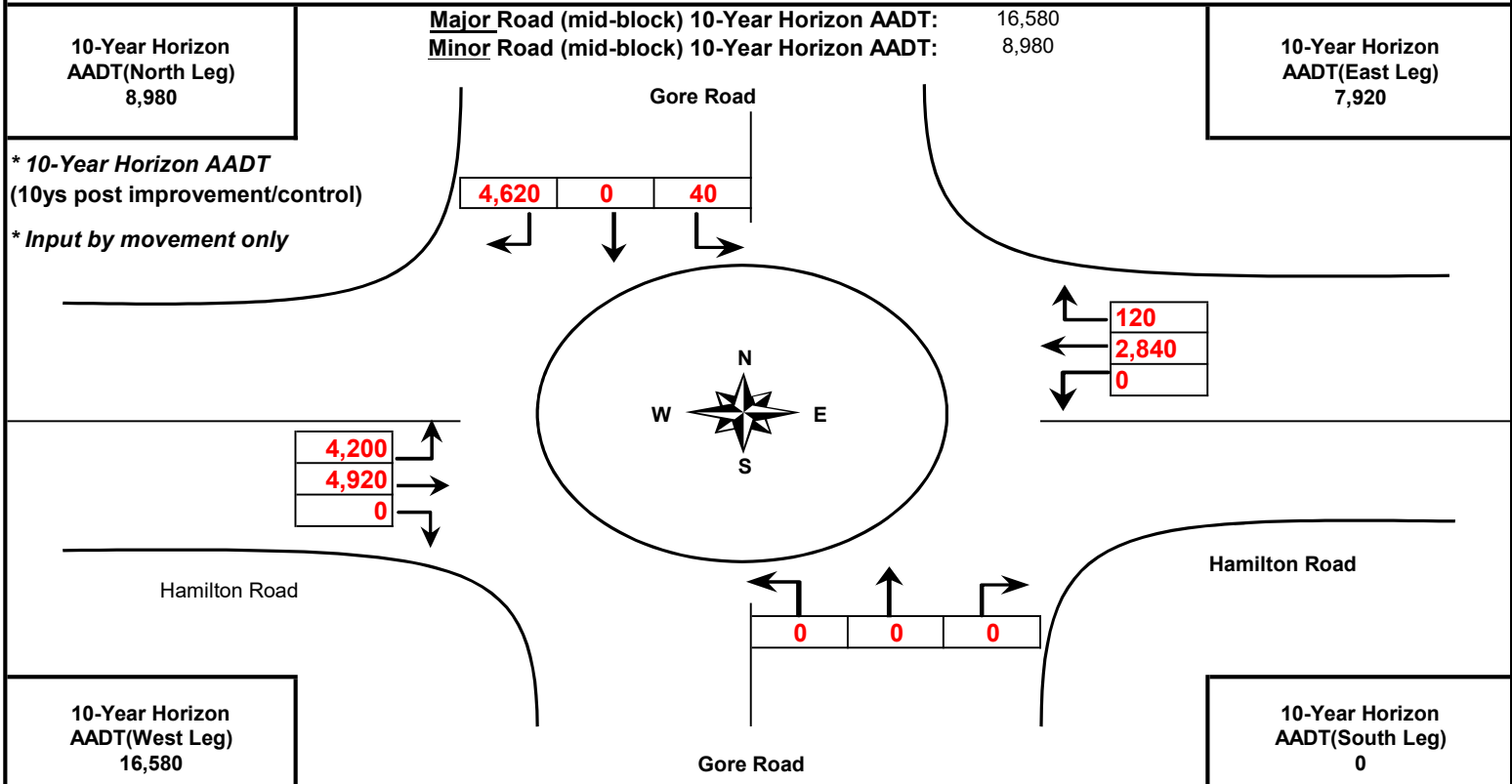
5-Year Total Collisions: **29**

5-Year PDO Collisions: **22**

Proposed RA Configuration?

SINGLE - 3 x 1 ▼

* Proposed RA config. - 1st number represents approaches while 2nd represents lanes



Direct Capital Costs

Fatal = \$1,656,500
 Injury = \$60,500
 PDO_{SIG} = \$5,000
 PDO_{RA} = \$4,500

Discount Rate = 0.06

20-Year Present Value Collision Costs (DIRECT CAPITAL COSTS)

Collisions by Severity	Total	PDO	Injury	Fatal
Signalized	\$1,900,651.97	\$244,309.32	\$1,561,343.03	\$94,999.62
Roundabout	\$537,279.04	\$215,443.58	\$321,835.47	\$0.00

* Roundabout calibration Factor - 0.9

INTERSECTION CONTROL STUDIES SAFETY ASSESSMENT METHODOLOGY (HSM)

Last Rev JAN 2021

Scenario:	Hamilton Road & Gore Road ICS	Major Road: Hamilton Road	
		Minor Road: Gore Road	
Major Road Direction:	East / West	Roundabout Conflicts:	8760
Urban or Rural:	Urban	5-Year Total Collisions:	29
Proposed Control:	Signalized	5-Year PDO Collisions:	22
Proposed Config.	4-Leg Intersection		

Estimated ANNUAL (1-YEAR ONLY) Collisions				
Future Expected Collisions by Severity	Total	PDO	Injury	Fatal
Signalized	6.52	4.26	2.25	0.01
Roundabout	4.64	4.17	0.46	0.00

TOTAL CRASH COEFFICIENTS USED IN CALCULATION						Fatal/Inj. Ratio	Collision Factor
Control	Intersection Config	Intercept	AADTmaj	AADTmin	Overdispersion		
Signalized	4-Leg Intersection	-10.99	1.07	0.23	N/A	0.002	n/a

PDO CRASH COEFFICIENTS USED IN CALCULATION						Fatal/Inj. Ratio	Collision Factor
Control	Intersection Config	Intercept	AADTmaj	AADTmin	Overdispersion		
Signalized	4-Leg Intersection	-11.02	1.02	0.24	N/A	0.002	n/a

Collision Modification Factors (cmf's)	Left Turn Lane	Right Turn Lane	Calibration Factor	Empirical Bays Weighting	
	0.81		2.1	Total	PDO
				N/A	N/A
	Illumination	Protected LT Phasing			
	0.91	0.94			

Comments:

INTERSECTION CONTROL STUDIES SAFETY ASSESSMENT METHODOLOGY (HSM)

Last Rev JAN 2021

Scenario: **Hamilton Road & Gore Road ICS**

Major Road: **Hamilton Road**

Minor Road: **Gore Road**

Major Road Direction: East / West ▼

Urban or Rural: Urban ▼

Proposed Control: Signalized ▼

Proposed Config: 4-Leg Intersection ▼

LT Lanes Proposed (non roundabout):			RT Lanes Proposed (non roundabout):		
Major	1 Approach	▼	Major	No RT Lanes	▼
Minor	1 Approach	▼	Minor	No RT Lanes	▼

Is there going to be any fully protected left-turn phasing? YES ▼

Number of approaches with FPLTP: 1 ▼

Is the proposed intersection "new" or is it existing: EXISTING ▼

Does control and number of approaches remain the same: NO ▼

Will the proposed intersection have illumination: YES ▼

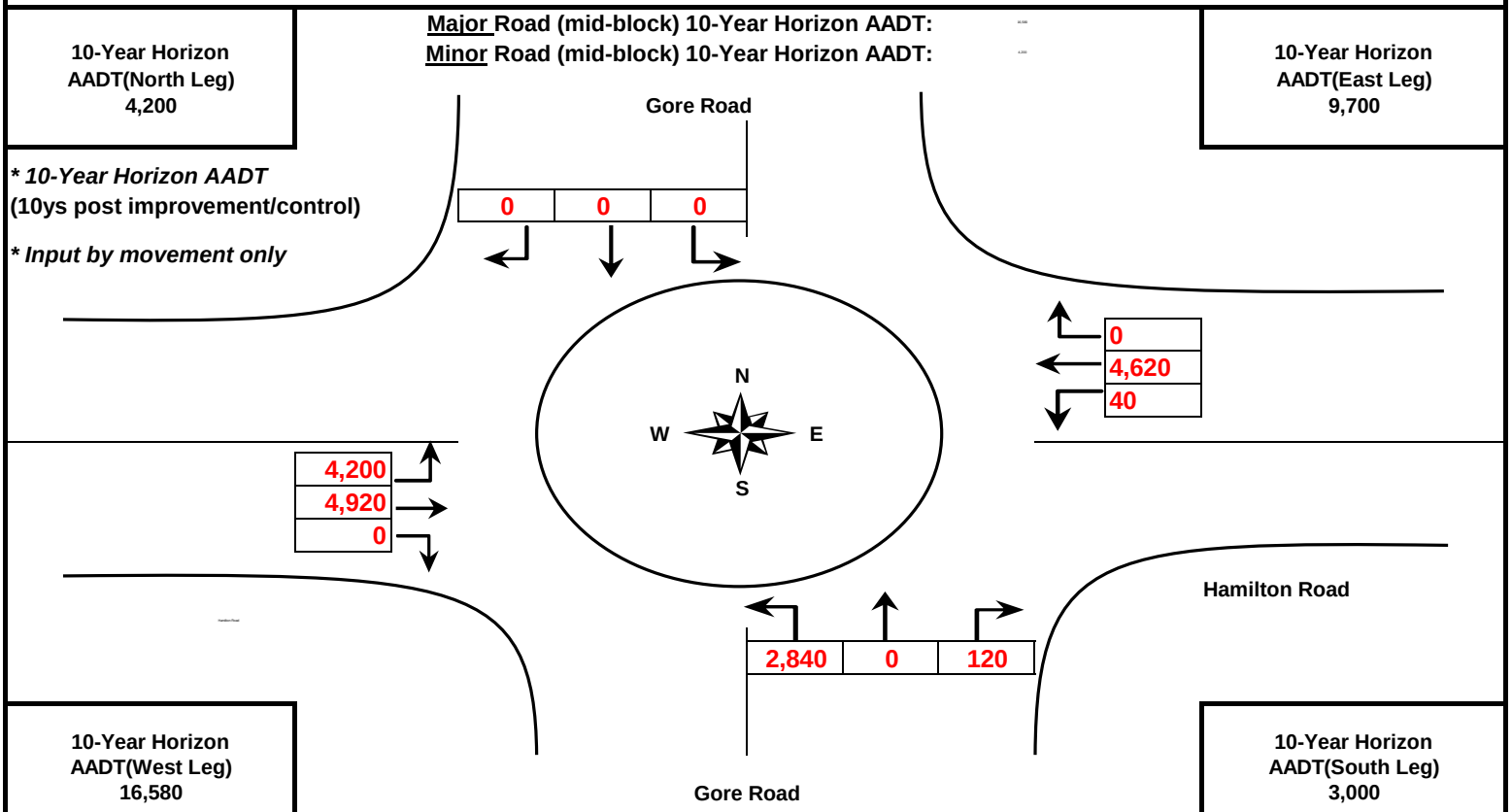
5-Year Total Collisions: **29**

Proposed RA Configuration?

SINGLE - 3 x 1 ▼

5-Year PDO Collisions: **22**

* Proposed RA config. - 1st number represents approaches while 2nd represents lanes



Direct Capital Costs

20-Year Present Value Collision Costs (DIRECT CAPITAL COSTS)

Collisions by Severity	Total	PDO	Injury	Fatal
Signalized	\$1,611,936.85	\$203,591.10	\$1,332,346.05	\$75,999.70

INTERSECTION CONTROL STUDIES SAFETY ASSESSMENT METHODOLOGY (HSM)

Last Rev JAN 2021

Scenario: Hamilton Road & Gore Road ICS

Major Road: Hamilton Road

Minor Road: Gore Road

Major Road Direction:

Urban or Rural:

Proposed Control:

Proposed Config.

Roundabout Conflicts: 15840

5-Year Total Collisions: 29

5-Year PDO Collisions: 22

Estimated ANNUAL (1-YEAR ONLY) Collisions				
Future Expected Collisions by Severity	Total	PDO	Injury	Fatal
Signalized	5.47	3.55	1.92	0.00
Roundabout				

TOTAL CRASH COEFFICIENTS USED IN CALCULATION						Fatal/Inj. Ratio	Collision Factor
Control	Intersection Config	Intercept	AADTmaj	AADTmin	Overdispersion		
Signalized	4-Leg Intersection	-10.99	1.07	0.23	N/A	0.002	n/a

PDO CRASH COEFFICIENTS USED IN CALCULATION						Fatal/Inj. Ratio	Collision Factor
Control	Intersection Config	Intercept	AADTmaj	AADTmin	Overdispersion		
Signalized	4-Leg Intersection	-11.02	1.02	0.24	N/A	0.002	n/a

Collision Modification Factors (cmf's)	Left Turn Lane	Right Turn Lane	Calibration Factor	Empirical Bays Weighting	
	0.81		2.1	Total	PDO
				N/A	N/A
	Illumination	Protected LT Phasing			
	0.91	0.94			

Comments:

Hamilton/Gore Environmental Assessment

Traffic Volume Calculations

AM Peak Hour

Existing Traffic

Thursday, April 9, 2015, 7:30 AM

			559			1049		
			233	326				
				↑	19			
			228	0	5	←	334	
			↓	↓	1	↓		
1019	568	←	304	↑	←	↑	→	354
	451		134	→	6	3	2	141
			13	↓				
			14	11				
			25					

Existing Traffic Distribution

		53%		100%		
		22%	31%			
			↑	2%		
		22%	0%	0%	←	32%
		↓	↓	0%	↓	
97%	54%	←	↓	→	34%	47%
	43%		29%	↑	13%	
			13%	→	1%	
			1%	↓	0%	
				↓	0%	
		1%	1%			
		2%				

Future Traffic 2021

				604		1134					
				252		352					
						↑		21			
				246		0		5		← 361	
				↓		↓		1		↓	
1101		614		←		328		↑		383	
		487						←		152	
						145		→		6	
						14		↓		3	
								↓		2	
						15		12			
						27					

Future Traffic 2030

			679			1273		
			283	396				
				↑	23			
			277	0	6	←	405	
			↓	↓	↓	1	↓	
1237	689	←	369	↑	←	↑	→	430
	547		163	→	7	4	2	601
			16	↓				
			17	13				
			30					

Future Traffic 2035

			724					1358	
			302		422				
					↑		25		
			295		0		6		
			←		↓		→		
1319			735		←		↓		
			584				394		
							↑		
							173		
							→		
							17		
							↓		
					18		14		
					32				

PM Peak Hour

Existing Traffic

Thursday, April 9, 2015, 4:30 PM

			695			1295		
			360	335				
				↑	9			
			357	0	3	←	219	
			↓	↓	↓	↓	0	
1281	576	←	324	↑	←	↑	→	228
	705		380	→	0	2	0	611
			1	↓				
			1	2				
			3					

Existing Traffic Distribution

			54%			100%								
			28%		26%									
					↑		1%							
			28%		←		17%							
			↓		↓		0%							
99%		44%		←		↓		→		18%		47%		
		54%				25%		↑		30%				
					29%		→		0%		0%		0%	
					0%		↓							
					0%		0%							
					0%									

Future Traffic 2021

			751			1399		
			389	362				
				↑	10			
			386	0	3	←	237	
			↓	↓	0	↓	0	
1384	622	←	350	↑	←	↑	→	246
	762		411	→	0	2	0	414
			1	↓				
			1	2				
			3					

Future Traffic 2030

			844			1572		
			437	407				
				↑	11			
			433	0	4	←	266	
			↓	↓	↓	↓	0	
1555	699	←		→			277	742
	856		393	↑	←	↑	→	465
			461	→	0	2	0	
			1	↓				
			1	2				
			4					

Future Traffic 2035

				900						1677	
				466		434					
						↑ 12					
				462		0		4		← 284	
				↓		↓		0		↓	
1659		746		←				→		295	
		913				420		↑		496	
						492		→		0	
						1		↓		3	
						1		3			
						4					

Appendix B

Capacity Analysis Output

Roundabout Capacity Analysis Summary

CAPACITY ANALYSIS SUMMARY

Project: Hamilton Rd. & Gore Rd. ICS
Project No.: 48214-100
Intersection: Hamilton Road & Gore Road
Date: October 2021

Drawn By: NPD
Sheet: 1 of 2



	Gore Rd.	Hamilton Rd.	Hamilton Rd.	
AM Peak - Single Lane (y-intercept = 95%)	SB	EB	WB	
Average Delay (s)	5	6	7	
Level of Service (LOS)	A	A	A	
Queue Length (m)	<14	<14	<14	
V/C Ratio	0.32	0.49	0.48	
Overall Delay (s)	5			
Overall LOS	A			
AM Peak - Single Lane (y-intercept = 85%)	SB	EB	NB	
Average Delay (s)	6	7	9	
Level of Service (LOS)	A	A	A	
Queue Length (m)	<14	<14	<14	
V/C Ratio	0.36	0.54	0.54	
Overall Delay (s)	6			
Overall LOS	A			
AM Peak - Dual Lane Hamilton Rd (y-int = 95%)	SB	EB	NB	
Average Delay (s)	5	2	3	
Level of Service (LOS)	A	A	A	
Queue Length (m)	<14	<14	<14	
V/C Ratio	0.32	0.27	0.25	
Overall Delay (s)	2			
Overall LOS	A			
AM Peak - Dual Lane Hamilton Rd (y-int = 85%)	SB	EB	NB	
Average Delay (s)	6	3	3	
Level of Service (LOS)	A	A	A	
Queue Length (m)	<14	<14	<14	
V/C Ratio	0.36	0.30	0.28	
Overall Delay (s)	3			
Overall LOS	A			
AM Peak - Dual Lane Ham. Rd EB (y-int = 95%)	SB	EB	NB	
Average Delay (s)	5	2	7	
Level of Service (LOS)	A	A	A	
Queue Length (m)	<14	<14	<14	
V/C Ratio	0.32	0.27	0.48	
Overall Delay (s)	4			
Overall LOS	A			
AM Peak - Dual Lane Ham. Rd EB (y-int = 85%)	SB	EB	NB	
Average Delay (s)	6	3	9	
Level of Service (LOS)	A	A	A	
Queue Length (m)	<14	<14	<14	
V/C Ratio	0.36	0.30	0.54	
Overall Delay (s)	5			
Overall LOS	A			

Notes:

- Values shown are the maximum values over all of the 15 minute time segments.
- Delays are the maximum value of average delay over all of the time segments
- Queue lengths are 95th percentile values and are based on an average vehicle length of 7 meters

CAPACITY ANALYSIS SUMMARY

Project: Hamilton Rd. & Gore Rd. ICS
Project No.: 48214-100
Intersection: Hamilton Road & Gore Road
Date: October 2021

Drawn By: NPD
Sheet: 2 of 2



	Gore Rd.	Hamilton Rd.	Hamilton Rd.	
PM Peak - Single Lane (y-intercept = 95%)	SB	EB	WB	
Average Delay (s)	6	13	5	
Level of Service (LOS)	A	B	A	
Queue Length (m)	<14	63	<14	
V/C Ratio	0.46	0.78	0.31	
Overall Delay (s)	8			
Overall LOS	A			
PM Peak - Single Lane (y-intercept = 85%)	SB	EB	NB	
Average Delay (s)	8	25	6	
Level of Service (LOS)	A	C	A	
Queue Length (m)	<14	161	<14	
V/C Ratio	0.51	0.87	0.35	
Overall Delay (s)	12			
Overall LOS	B			
PM Peak - Dual Lane Hamilton Rd (y-int = 95%)	SB	EB	NB	
Average Delay (s)	6	3	2	
Level of Service (LOS)	A	A	A	
Queue Length (m)	<14	<14	<14	
V/C Ratio	0.46	0.43	0.16	
Overall Delay (s)	4			
Overall LOS	A			
PM Peak - Dual Lane Hamilton Rd (y-int = 85%)	SB	EB	NB	
Average Delay (s)	8	4	3	
Level of Service (LOS)	A	A	A	
Queue Length (m)	<14	<14	<14	
V/C Ratio	0.51	0.49	0.18	
Overall Delay (s)	5			
Overall LOS	A			
PM Peak - Dual Lane Ham. Rd EB (y-int = 95%)	SB	EB	NB	
Average Delay (s)	6	3	5	
Level of Service (LOS)	A	A	A	
Queue Length (m)	<14	<14	<14	
V/C Ratio	0.46	0.43	0.31	
Overall Delay (s)	4			
Overall LOS	A			
PM Peak - Dual Lane Ham. Rd EB (y-int = 85%)	SB	EB	NB	
Average Delay (s)	8	4	6	
Level of Service (LOS)	A	A	A	
Queue Length (m)	<14	<14	<14	
V/C Ratio	0.51	0.49	0.35	
Overall Delay (s)	5			
Overall LOS	A			

Notes:

- Values shown are the maximum values over all of the 15 minute time segments.
- Delays are the maximum value of average delay over all of the time segments
- Queue lengths are 95th percentile values and are based on an average vehicle length of 7 meters

Synchro Analysis

Lanes, Volumes, Timings

3: Hamilton & Gore

11/11/2021

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
LOS	B	A	B	B	B	A
Approach Delay	14.3			15.6	19.1	
Approach LOS	B			B	B	
Queue Length 50th (m)	28.1	0.0	0.4	19.4	30.6	0.0
Queue Length 95th (m)	70.4	10.7	2.8	49.9	76.9	4.0
Internal Link Dist (m)	67.0			205.8	127.9	
Turn Bay Length (m)		70.0	50.0		30.0	
Base Capacity (vph)	1379	1224	556	1379	1310	1180
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.16	0.01	0.23	0.36	0.02

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 49.5

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 16.2

Intersection LOS: B

Intersection Capacity Utilization 54.9%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Hamilton & Gore

 Ø2	 Ø4
40 s	40 s
	 Ø8
	40 s

Lanes, Volumes, Timings
7: WWTP & Hamilton & Gore

11/11/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL2	SWL	SWR
Lane Configurations												
Traffic Volume (vph)	394	173	17	1	432	25	8	4	3	6	0	295
Future Volume (vph)	394	173	17	1	432	25	8	4	3	6	0	295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	0.0		0.0	0.0	0.0			150.0	0.0
Storage Lanes	1		0	0		0	1	0			1	1
Taper Length (m)	2.5			2.5			2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00							
Frt		0.987			0.993		0.941					0.850
Flt Protected	0.950						0.973			0.950		
Satd. Flow (prot)	1755	1649	0	0	1871	0	1387	0	0	1521	0	1526
Flt Permitted	0.294				0.999		0.973					
Satd. Flow (perm)	543	1649	0	0	1870	0	1387	0	0	1601	0	1526
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			4		95					534
Link Speed (k/h)		50			50		50				50	
Link Distance (m)		198.2			310.4		107.0				338.3	
Travel Time (s)		14.3			22.3		7.7				24.4	
Confl. Peds. (#/hr)	1					1						
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 (%)	4%	15%	15%	0%	1%	16%	33%	33%	0%	20%	0%	7%
Adj. Flow (vph)	428	188	18	1	470	27	9	4	3	7	0	321
Shared Lane Traffic (%)												
Lane Group Flow (vph)	428	206	0	0	498	0	16	0	0	7	0	321
Turn Type	pm+pt	NA		Perm	NA		Prot			Perm		Over
Protected Phases	7	4			8		2					7
Permitted Phases	4			8						6		
Detector Phase	7	4		8	8		2			6		7
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0			5.0		5.0
Minimum Split (s)	9.5	24.0		24.0	24.0		24.0			24.0		9.5
Total Split (s)	24.0	55.0		31.0	31.0		25.0			25.0		24.0
Total Split (%)	30.0%	68.8%		38.8%	38.8%		31.3%			31.3%		30.0%
Maximum Green (s)	20.0	49.0		25.0	25.0		19.0			19.0		20.0
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0			4.0		3.0
All-Red Time (s)	1.0	2.0		2.0	2.0		2.0			2.0		1.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0			0.0		0.0
Total Lost Time (s)	4.0	6.0			6.0		6.0			6.0		4.0
Lead/Lag	Lead			Lag	Lag							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
Recall Mode	None	Min		Min	Min		None			None		None
Walk Time (s)		7.0		7.0	7.0		7.0			7.0		
Flash Dont Walk (s)		11.0		11.0	11.0		11.0			11.0		
Pedestrian Calls (#/hr)		0		0	0		0			0		
Act Effct Green (s)	39.2	42.8			16.3		6.8			7.3		16.4
Actuated g/C Ratio	0.86	0.93			0.36		0.15			0.16		0.36
v/c Ratio	0.48	0.13			0.75		0.06			0.03		0.36

Lanes, Volumes, Timings
7: WWTP & Hamilton & Gore

11/11/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL2	SWL	SWR
Control Delay	4.2	1.8			23.0		0.4			22.0		1.1
Queue Delay	0.0	0.0			0.0		0.0			0.0		0.0
Total Delay	4.2	1.8			23.0		0.4			22.0		1.1
LOS	A	A			C		A			C		A
Approach Delay		3.4			23.0		0.4				1.6	
Approach LOS		A			C		A				A	
Queue Length 50th (m)	0.0	0.0			29.4		0.0			0.4		0.0
Queue Length 95th (m)	36.0	15.0			#103.6		0.0			4.0		0.0
Internal Link Dist (m)		174.2			286.4		83.0				314.3	
Turn Bay Length (m)	35.0									150.0		
Base Capacity (vph)	1042	1542			1115		679			724		1006
Starvation Cap Reductn	0	0			0		0			0		0
Spillback Cap Reductn	0	0			0		0			0		0
Storage Cap Reductn	0	0			0		0			0		0
Reduced v/c Ratio	0.41	0.13			0.45		0.02			0.01		0.32

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 45.8

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 9.6

Intersection LOS: A

Intersection Capacity Utilization 72.0%

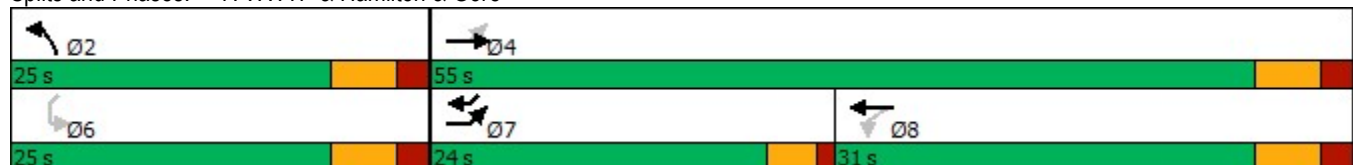
ICU Level of Service C

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 7: WWTP & Hamilton & Gore



Lanes, Volumes, Timings

3: Hamilton & Gore

11/11/2021

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	423	492	4	462	284	12
Future Volume (vph)	423	492	4	462	284	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		70.0	50.0		30.0	0.0
Storage Lanes		1	1		1	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1883	1601	1789	1883	1789	1601
Flt Permitted			0.366		0.950	
Satd. Flow (perm)	1883	1601	689	1883	1789	1601
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		535				13
Link Speed (k/h)	50			50	50	
Link Distance (m)	91.0			229.8	151.9	
Travel Time (s)	6.6			16.5	10.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	460	535	4	502	309	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	460	535	4	502	309	13
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Maximum Green (s)	18.0	18.0	18.0	18.0	18.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effect Green (s)	18.0	18.0	18.0	18.0	18.0	18.0
Actuated g/C Ratio	0.40	0.40	0.40	0.40	0.40	0.40
v/c Ratio	0.61	0.56	0.01	0.67	0.43	0.02
Control Delay	15.0	3.8	8.5	16.4	12.2	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.0	3.8	8.5	16.4	12.2	5.0
LOS	B	A	A	B	B	A
Approach Delay	9.0			16.4	11.9	
Approach LOS	A			B	B	
Queue Length 50th (m)	27.0	0.0	0.2	30.5	16.6	0.0
Queue Length 95th (m)	49.3	13.4	1.4	55.3	31.7	2.1

Lanes, Volumes, Timings

3: Hamilton & Gore

11/11/2021

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (m)	67.0			205.8	127.9	
Turn Bay Length (m)		70.0	50.0		30.0	
Base Capacity (vph)	753	961	275	753	715	648
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.56	0.01	0.67	0.43	0.02

Intersection Summary

Area Type: Other

Cycle Length: 45

Actuated Cycle Length: 45

Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green

Natural Cycle: 45

Control Type: Pretimed

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 11.5

Intersection LOS: B

Intersection Capacity Utilization 47.5%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Hamilton & Gore

 Ø2 (R)	 Ø4
22.5 s	22.5 s
	 Ø8
	22.5 s

Lanes, Volumes, Timings
7: WWTP & Hamilton & Gore

11/11/2021

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL2	SWL	SWR
Lane Configurations											
Traffic Volume (vph)	420	492	1	0	284	12	0	3	4	0	462
Future Volume (vph)	420	492	1	0	284	12	0	3	4	0	462
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	0.0		0.0	0.0	0.0		150.0	0.0
Storage Lanes	1		0	0		0	1	0		1	1
Taper Length (m)	2.5			2.5			2.5			2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.995		0.865				0.850
Flt Protected	0.950								0.950		
Satd. Flow (prot)	1789	1865	0	0	1912	0	1662	0	1825	0	1617
Flt Permitted	0.385										
Satd. Flow (perm)	725	1865	0	0	1912	0	1662	0	1921	0	1617
Right Turn on Red			Yes			Yes					Yes
Satd. Flow (RTOR)					3						642
Link Speed (k/h)		50			50		50			50	
Link Distance (m)		198.2			310.4		107.0			338.3	
Travel Time (s)		14.3			22.3		7.7			24.4	
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
Heavy Vehicles (%)	2%	3%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Adj. Flow (vph)	457	535	1	0	309	13	0	3	4	0	502
Shared Lane Traffic (%)											
Lane Group Flow (vph)	457	536	0	0	322	0	3	0	4	0	502
Turn Type	pm+pt	NA			NA		Prot		Perm		Over
Protected Phases	7	4			8		2				7
Permitted Phases	4			8					6		
Detector Phase	7	4		8	8		2		6		7
Switch Phase											
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0		5.0		5.0
Minimum Split (s)	9.5	24.0		24.0	24.0		24.0		24.0		9.5
Total Split (s)	24.0	55.0		31.0	31.0		25.0		25.0		24.0
Total Split (%)	30.0%	68.8%		38.8%	38.8%		31.3%		31.3%		30.0%
Maximum Green (s)	20.0	49.0		25.0	25.0		19.0		19.0		20.0
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0		4.0		3.0
All-Red Time (s)	1.0	2.0		2.0	2.0		2.0		2.0		1.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0		0.0
Total Lost Time (s)	4.0	6.0			6.0		6.0		6.0		4.0
Lead/Lag	Lead			Lag	Lag						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
Recall Mode	None	Min		Min	Min		None		None		None
Walk Time (s)		7.0		7.0	7.0		7.0		7.0		
Flash Dont Walk (s)		11.0		11.0	11.0		11.0		11.0		
Pedestrian Calls (#/hr)		0		0	0		0		0		
Act Effct Green (s)	32.5	36.2			11.0		6.5		6.7		14.9
Actuated g/C Ratio	0.84	0.94			0.28		0.17		0.17		0.39
v/c Ratio	0.45	0.31			0.59		0.01		0.01		0.49
Control Delay	2.9	2.1			18.3		19.7		19.5		2.2
Queue Delay	0.0	0.0			0.0		0.0		0.0		0.0

Lanes, Volumes, Timings
7: WWTP & Hamilton & Gore

11/11/2021

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL2	SWL	SWR
Total Delay	2.9	2.1			18.3		19.7		19.5		2.2
LOS	A	A			B		B		B		A
Approach Delay		2.5			18.3		19.7			2.4	
Approach LOS		A			B		B			A	
Queue Length 50th (m)	0.0	0.0			15.0		0.2		0.2		0.0
Queue Length 95th (m)	27.5	38.2			53.2		2.4		2.7		4.8
Internal Link Dist (m)		174.2			286.4		83.0			314.3	
Turn Bay Length (m)	35.0								150.0		
Base Capacity (vph)	1215	1772			1361		899		1039		1197
Starvation Cap Reductn	0	0			0		0		0		0
Spillback Cap Reductn	0	0			0		0		0		0
Storage Cap Reductn	0	0			0		0		0		0
Reduced v/c Ratio	0.38	0.30			0.24		0.00		0.00		0.42

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 38.7

Natural Cycle: 65

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 5.3

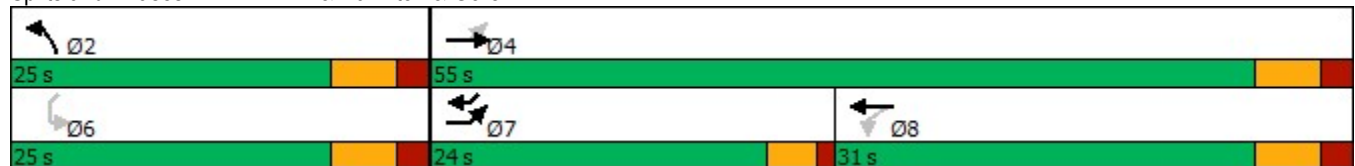
Intersection LOS: A

Intersection Capacity Utilization 67.5%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 7: WWTP & Hamilton & Gore



Lanes, Volumes, Timings

3: Hamilton & Gore

11/11/2021

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	398	176	6	295	433	25
Future Volume (vph)	398	176	6	295	433	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		70.0	50.0		30.0	0.0
Storage Lanes		1	1		1	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1883	1601	1789	1883	1789	1601
Flt Permitted			0.403		0.950	
Satd. Flow (perm)	1883	1601	759	1883	1789	1601
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		191				27
Link Speed (k/h)	50			50	50	
Link Distance (m)	91.0			229.8	151.9	
Travel Time (s)	6.6			16.5	10.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	433	191	7	321	471	27
Shared Lane Traffic (%)						
Lane Group Flow (vph)	433	191	7	321	471	27
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Detector Phase	4	4	8	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Maximum Green (s)	34.0	34.0	34.0	34.0	34.0	34.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Min	Min	Min	Min	Min	Min
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effect Green (s)	17.8	17.8	17.8	17.8	18.8	18.8
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.38	0.38
v/c Ratio	0.64	0.27	0.03	0.47	0.69	0.04
Control Delay	18.9	3.6	12.2	15.7	19.9	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	3.6	12.2	15.7	19.9	5.4

Arcady 7 Report

HAMILTON RD & GORE RD ROUNDABOUT CAPACITY

Version: 7.1.1.245 [9th June 2011]
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File: C:_Work\48214-100\ICS\Supporting Documentation\Hamilton & Gore_ARCADCY 7
Report\Hamilton & Gore.arc7
Report generation date: 10/5/2021 3:37:41 PM

Summary of roundabout performance

	AM				PM			
	Queue (PCE)	Delay (s)	RFC	LOS	Queue (PCE)	Delay (s)	RFC	LOS
Single Lane 95% - 2035								
Gore Road	0.50	5.42	0.32	A	0.89	6.25	0.46	A
Hamilton Road EB	0.98	5.71	0.49	A	3.61	13.28	0.78	B
Hamilton Road WB	0.96	6.90	0.48	A	0.48	5.33	0.31	A
Single Lane 85% - 2035								
Gore Road	0.59	6.42	0.36	A	1.10	7.76	0.51	A
Hamilton Road EB	1.23	7.18	0.54	A	6.50	24.59	0.87	C
Hamilton Road WB	1.20	8.64	0.54	A	0.57	6.29	0.35	A
Dual Lane Hamilton 95% - 2035								
Gore Road	0.50	5.42	0.32	A	0.89	6.25	0.46	A
Hamilton Road EB	0.39	2.24	0.27	A	0.80	2.89	0.43	A
Hamilton Road WB	0.35	2.50	0.25	A	0.20	2.26	0.16	A
Dual Lane Hamilton 85% - 2035								
Gore Road	0.59	6.42	0.36	A	1.10	7.76	0.51	A
Hamilton Road EB	0.45	2.62	0.30	A	0.99	3.55	0.49	A
Hamilton Road WB	0.41	2.90	0.28	A	0.23	2.59	0.18	A
Dual Lane Hamilton EB Only 95% - 2035								
Gore Road	0.50	5.42	0.32	A	0.89	6.25	0.46	A
Hamilton Road EB	0.39	2.24	0.27	A	0.80	2.89	0.43	A
Hamilton Road WB	0.96	6.90	0.48	A	0.48	5.33	0.31	A
Dual Lane Hamilton EB Only 85% - 2035								
Gore Road	0.59	6.42	0.36	A	1.10	7.76	0.51	A
Hamilton Road EB	0.45	2.62	0.30	A	0.99	3.55	0.49	A
Hamilton Road WB	1.20	8.64	0.54	A	0.57	6.29	0.35	A

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle.

2035 - AM runs from 07:45:00 to 09:15:00

2035 - PM runs from 16:45:00 to 18:15:00

File summary

File Description

Title	(untitled)
Location	
Site Number	
Date	9/20/2021
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	MTEDOMAIN\NDuimering
Description	

Analysis Options

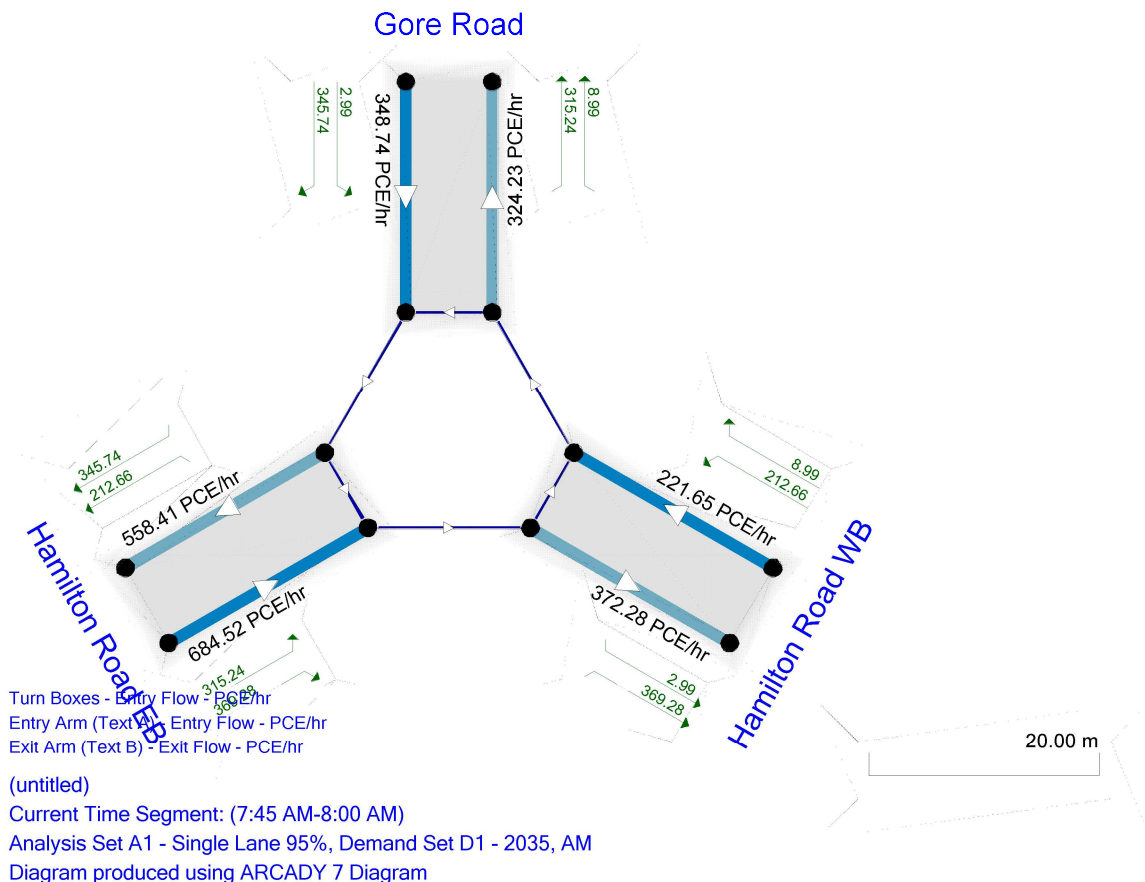
RFC Threshold	Vehicle Length (m)	Do Queue Variations
0.85	5.75	Yes

Sorting and Display

Show Arm Names	Arm Grouping	Sorting Direction	Sorting Type	Data Matrix Style	Time Style
Yes	Order	Ascending	Numerical	By Destination	Absolute Time

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCE	PCE	perHour	s	-Min	perMin



The intersection diagram reflects the last run of ARCADY.

A1 - Single Lane 95% - D1 - 2035, AM

Data Errors and Warnings
No errors or warnings

Analysis Set Details

Name	Description	Include In Report	Use Specific Demand Set	Demand Set	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
Single Lane 95%		Yes		(D1)		100.000	95.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Locked	Run Automatically	Use Relationship	Relationship	Start Time (HH:mm)	Finish Time (HH:mm)	Time Period Length (min)	Time Segment Length (min)	Traffic Profile Type
2035, AM	2035	AM			Yes			07:45	09:15	90	15	ONE HOUR

Roundabout Network

Roundabout Type(s)

ID	Name	Arm Order	Roundabout Type	Grade Separated	Large Roundabout	Do Geometric Delay
1	Hamilton & Gore	1,2,3	Standard			

Roundabout Network Options

Driving Side	Lighting	Road Surface	In London
Right	Normal/unknown	((Mini-roundabouts only))	

Arms

Arms

ID	Name	Description
1	Gore Road	
2	Hamilton Road EB	
3	Hamilton Road WB	

Capacity Options

Arm	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
Gore Road	0.00	99999.00		0.00
Hamilton Road EB	0.00	99999.00		0.00
Hamilton Road WB	0.00	99999.00		0.00

Standard Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
Gore Road	3.50	4.50	30.00	20.00	40.00	25.00	
Hamilton Road EB	3.50	4.50	30.00	20.00	40.00	25.00	
Hamilton Road WB	3.50	4.50	30.00	20.00	40.00	25.00	

Pedestrian Crossings

Arm	Crossing Type
Gore Road	None
Hamilton Road EB	None
Hamilton Road WB	None

Arm Slope/ Intercept and Capacity

Slope and Intercept used in model

Arm	Enter Directly	Slope	Intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
Gore Road		((calculated))	((calculated))	0.579	1357.445
Hamilton Road EB		((calculated))	((calculated))	0.579	1357.445
Hamilton Road WB		((calculated))	((calculated))	0.579	1357.445

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

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		Yes	Yes	Truck Percentages	2.00				Yes	Yes

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCE/hr)	Flow Scaling Factor (%)	PHF
Gore Road	ONE HOUR	Yes	301.00	100.000	N/A
Hamilton Road EB	ONE HOUR	Yes	567.00	100.000	N/A
Hamilton Road WB	ONE HOUR	Yes	457.00	100.000	N/A

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCE/hr)	DirectDemandEntryFlowInPCE (PCE/hr)	Direct Demand Exit Flow (PCE/hr)	Direct Demand Pedestrian Flow (Ped/hr)
1	Gore Road	226.61	226.61	N/A	N/A
1	Hamilton Road EB	426.87	426.87	N/A	N/A
1	Hamilton Road WB	344.05	344.05	N/A	N/A
2	Gore Road	270.59	270.59	N/A	N/A
2	Hamilton Road EB	509.72	509.72	N/A	N/A
2	Hamilton Road WB	410.83	410.83	N/A	N/A
3	Gore Road	331.41	331.41	N/A	N/A
3	Hamilton Road EB	624.28	624.28	N/A	N/A
3	Hamilton Road WB	503.17	503.17	N/A	N/A
4	Gore Road	331.41	331.41	N/A	N/A
4	Hamilton Road EB	624.28	624.28	N/A	N/A

4	Hamilton Road WB	503.17	503.17	N/A	N/A
5	Gore Road	270.59	270.59	N/A	N/A
5	Hamilton Road EB	509.72	509.72	N/A	N/A
5	Hamilton Road WB	410.83	410.83	N/A	N/A
6	Gore Road	226.61	226.61	N/A	N/A
6	Hamilton Road EB	426.87	426.87	N/A	N/A
6	Hamilton Road WB	344.05	344.05	N/A	N/A

Turning Proportions

Turning Counts or Proportions (PCE/hr) - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	0.000	295.000	6.000
	2	394.000	0.000	173.000
	3	25.000	432.000	0.000

Turning Proportions (PCE) - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	0.00	0.98	0.02
	2	0.69	0.00	0.31
	3	0.05	0.95	0.00

Vehicle Mix

Average PCE Per Vehicle - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	1.050	1.050	1.050
	2	1.050	1.050	1.050
	3	1.050	1.050	1.050

Truck Percentages - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	5.000	5.000	5.000
	2	5.000	5.000	5.000
	3	5.000	5.000	5.000

Results

Results Summary

Arm	Max RFC	Max Delay (s)	Max Queue (PCE)	Max LOS	Total Demand (PCE/hr)	Total Arrivals (PCE)	Total Queueing Delay (PCE-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCE-min/min)	Inclusive Queueing Total Delay (PCE-min)	Inclusive Queueing Average Delay (s)	Slope	Intercept (PCE/hr)
Gore Road	0.32	5.42	0.50	A	276.20	414.30	33.34	4.83	0.37	33.35	4.83	0.579	1357.445
Hamilton Road EB	0.49	5.71	0.98	A	520.29	780.43	65.29	5.02	0.73	65.30	5.02	0.579	1357.445
Hamilton Road WB	0.48	6.90	0.96	A	419.35	629.03	60.87	5.81	0.68	60.88	5.81	0.579	1357.445
						1824	159.50	5.25					

Main Results

Main results: (7:45 AM-8:00 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	226.61	56.65	225.54	313.91	323.50	0.00	1111.70	873.50	0.204	0.00	0.27
Hamilton Road EB	426.87	106.72	424.80	544.55	4.50	0.00	1287.10	1280.00	0.332	0.00	0.52
Hamilton Road WB	344.05	86.01	342.22	134.11	295.19	0.00	1127.27	800.53	0.305	0.00	0.46

Main results: (8:00 AM-8:15 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	270.59	67.65	270.26	376.18	387.73	0.00	1076.39	873.50	0.251	0.27	0.35
Hamilton Road EB	509.72	127.43	509.06	652.60	5.39	0.00	1286.61	1280.00	0.396	0.52	0.68
Hamilton Road WB	410.83	102.71	410.17	160.71	353.74	0.00	1095.08	800.53	0.375	0.46	0.62

Main results: (8:15 AM-8:30 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	331.41	82.85	330.83	460.43	474.41	0.00	1028.73	873.50	0.322	0.35	0.49
Hamilton Road EB	624.28	156.07	623.09	798.64	6.59	0.00	1285.95	1280.00	0.485	0.68	0.98
Hamilton Road WB	503.17	125.79	501.86	196.71	432.98	0.00	1051.51	800.53	0.479	0.62	0.95

Main results: (8:30 AM-8:45 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	331.41	82.85	331.40	461.31	475.61	0.00	1028.07	873.50	0.322	0.49	0.50
Hamilton Road EB	624.28	156.07	624.26	800.40	6.61	0.00	1285.94	1280.00	0.485	0.98	0.98
Hamilton Road WB	503.17	125.79	503.14	197.08	433.79	0.00	1051.07	800.53	0.479	0.95	0.96

Main results: (8:45 AM-9:00 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	270.59	67.65	271.16	377.55	389.57	0.00	1075.38	873.50	0.252	0.50	0.36
Hamilton Road EB	509.72	127.43	510.88	655.32	5.41	0.00	1286.60	1280.00	0.396	0.98	0.69
Hamilton Road WB	410.83	102.71	412.11	161.28	355.00	0.00	1094.38	800.53	0.375	0.96	0.64

Main results: (9:00 AM-9:15 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	226.61	56.65	226.95	315.96	325.88	0.00	1110.40	873.50	0.204	0.36	0.27
Hamilton Road EB	426.87	106.72	427.55	548.31	4.52	0.00	1287.09	1280.00	0.332	0.69	0.52
Hamilton Road WB	344.05	86.01	344.74	134.98	297.10	0.00	1126.22	800.53	0.305	0.64	0.47

Queueing Delay Results

Queueing Delay results: (7:45 AM-8:00 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	3.91	0.26	4.260	A	A
Hamilton Road EB	7.54	0.50	4.373	A	A
Hamilton Road WB	6.67	0.44	4.805	A	A

Queueing Delay results: (8:00 AM-8:15 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	5.16	0.34	4.686	A	A
Hamilton Road EB	10.02	0.67	4.857	A	A
Hamilton Road WB	9.15	0.61	5.512	A	A

Queueing Delay results: (8:15 AM-8:30 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	7.25	0.48	5.411	A	A
Hamilton Road EB	14.27	0.95	5.692	A	A
Hamilton Road WB	13.78	0.92	6.860	A	A

Queueing Delay results: (8:30 AM-8:45 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	7.44	0.50	5.425	A	A
Hamilton Road EB	14.74	0.98	5.712	A	A
Hamilton Road WB	14.32	0.95	6.898	A	A

Queueing Delay results: (8:45 AM-9:00 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	5.45	0.36	4.703	A	A
Hamilton Road EB	10.69	0.71	4.881	A	A
Hamilton Road WB	9.83	0.66	5.552	A	A

Queueing Delay results: (9:00 AM-9:15 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	4.13	0.28	4.281	A	A
Hamilton Road EB	8.03	0.54	4.400	A	A
Hamilton Road WB	7.14	0.48	4.840	A	A

Queue Variation Results

Queue Variation results: (7:45 AM-8:00 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.27	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.52	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.46	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (8:00 AM-8:15 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.35	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.68	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.62	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (8:15 AM-8:30 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.49	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.98	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.95	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (8:30 AM-8:45 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.50	0.00	0.00	0.00	1.05			N/A	N/A
Hamilton Road EB	0.98	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.96	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (8:45 AM-9:00 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.36	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.69	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.64	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (9:00 AM-9:15 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.27	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.52	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.47	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Overview: Standard Roundabout Geometry

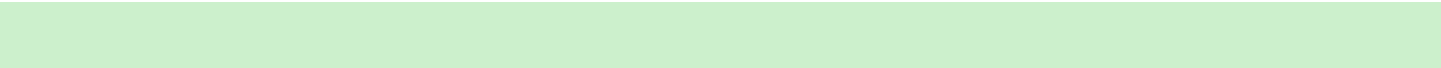
Standard Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only	Final Slope	Final Intercept (PCE/hr)
Gore Road	3.50	4.50	30.00	20.00	40.00	25.00		0.579	1357.445
Hamilton Road EB	3.50	4.50	30.00	20.00	40.00	25.00		0.579	1357.445
Hamilton Road WB	3.50	4.50	30.00	20.00	40.00	25.00		0.579	1357.445

Overview: Time Segment Results

Time Segment Results

Time Segment	Arm	Demand (PCE/hr)	Capacity (PCE/hr)	RFC	Pedestrian Demand (Ped/hr)	Start Queue (PCE)	End Queue (PCE)	Queueing Total Delay (PCE-min)	Geometric Total Delay (PCE-min)	Average Delay Per Arriving Vehicle (s)
1	Gore Road	226.61	1111.70	0.204	0.00	0.00	0.27	3.91	(0.02)	4.260
1	Hamilton Road EB	426.87	1287.10	0.332	0.00	0.00	0.52	7.54	(0.02)	4.373
1	Hamilton Road WB	344.05	1127.27	0.305	0.00	0.00	0.46	6.67	(0.02)	4.805
2	Gore Road	270.59	1076.39	0.251	0.00	0.27	0.35	5.16	(0.02)	4.686
2	Hamilton Road EB	509.72	1286.61	0.396	0.00	0.52	0.68	10.02	(0.02)	4.857
2	Hamilton Road WB	410.83	1095.08	0.375	0.00	0.46	0.62	9.15	(0.02)	5.512
3	Gore Road	331.41	1028.73	0.322	0.00	0.35	0.49	7.25	(0.02)	5.411
3	Hamilton Road EB	624.28	1285.95	0.485	0.00	0.68	0.98	14.27	(0.02)	5.692
3	Hamilton Road WB	503.17	1051.51	0.479	0.00	0.62	0.95	13.78	(0.02)	6.860
4	Gore Road	331.41	1028.07	0.322	0.00	0.49	0.50	7.44	(0.02)	5.425
4	Hamilton Road EB	624.28	1285.94	0.485	0.00	0.98	0.98	14.74	(0.02)	5.712
4	Hamilton Road WB	503.17	1051.07	0.479	0.00	0.95	0.96	14.32	(0.02)	6.898
5	Gore Road	270.59	1075.38	0.252	0.00	0.50	0.36	5.45	(0.02)	4.703
5	Hamilton Road EB	509.72	1286.60	0.396	0.00	0.98	0.69	10.69	(0.02)	4.881
5	Hamilton Road WB	410.83	1094.38	0.375	0.00	0.96	0.64	9.83	(0.02)	5.552
6	Gore Road	226.61	1110.40	0.204	0.00	0.36	0.27	4.13	(0.02)	4.281
6	Hamilton Road EB	426.87	1287.09	0.332	0.00	0.69	0.52	8.03	(0.02)	4.400
6	Hamilton Road WB	344.05	1126.22	0.305	0.00	0.64	0.47	7.14	(0.02)	4.840



A1 - Single Lane 95% - D2 - 2035, PM

Data Errors and Warnings
No errors or warnings

Analysis Set Details

Name	Description	Include In Report	Use Specific Demand Set	Demand Set	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
Single Lane 95%		Yes		(D1)		100.000	95.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Locked	Run Automatically	Use Relationship	Relationship	Start Time (HH:mm)	Finish Time (HH:mm)	Time Period Length (min)	Time Segment Length (min)	Traffic Profile Type
2035, PM	2035	PM			Yes			16:45	18:15	90	15	ONE HOUR

Roundabout Network

Roundabout Type(s)

ID	Name	Arm Order	Roundabout Type	Grade Separated	Large Roundabout	Do Geometric Delay
1	Hamilton & Gore	1,2,3	Standard			

Roundabout Network Options

Driving Side	Lighting	Road Surface	In London
Right	Normal/unknown	((Mini-roundabouts only))	

Arms

Arms

ID	Name	Description
1	Gore Road	
2	Hamilton Road EB	
3	Hamilton Road WB	

Capacity Options

Arm	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
Gore Road	0.00	99999.00		0.00
Hamilton Road EB	0.00	99999.00		0.00
Hamilton Road WB	0.00	99999.00		0.00

Standard Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
Gore Road	3.50	4.50	30.00	20.00	40.00	25.00	
Hamilton Road EB	3.50	4.50	30.00	20.00	40.00	25.00	
Hamilton Road WB	3.50	4.50	30.00	20.00	40.00	25.00	

Pedestrian Crossings

Arm	Crossing Type
Gore Road	None
Hamilton Road EB	None
Hamilton Road WB	None

Arm Slope/ Intercept and Capacity

Slope and Intercept used in model

Arm	Enter Directly	Slope	Intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
Gore Road		((calculated))	((calculated))	0.579	1357.445
Hamilton Road EB		((calculated))	((calculated))	0.579	1357.445
Hamilton Road WB		((calculated))	((calculated))	0.579	1357.445

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

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		Yes	Yes	Truck Percentages	2.00				Yes	Yes

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCE/hr)	Flow Scaling Factor (%)	PHF
Gore Road	ONE HOUR	Yes	466.00	100.000	N/A
Hamilton Road EB	ONE HOUR	Yes	912.00	100.000	N/A
Hamilton Road WB	ONE HOUR	Yes	296.00	100.000	N/A

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCE/hr)	DirectDemandEntryFlowInPCE (PCE/hr)	Direct Demand Exit Flow (PCE/hr)	Direct Demand Pedestrian Flow (Ped/hr)
1	Gore Road	350.83	350.83	N/A	N/A
1	Hamilton Road EB	686.60	686.60	N/A	N/A
1	Hamilton Road WB	222.84	222.84	N/A	N/A
2	Gore Road	418.92	418.92	N/A	N/A
2	Hamilton Road EB	819.87	819.87	N/A	N/A
2	Hamilton Road WB	266.10	266.10	N/A	N/A
3	Gore Road	513.08	513.08	N/A	N/A
3	Hamilton Road EB	1004.13	1004.13	N/A	N/A
3	Hamilton Road WB	325.90	325.90	N/A	N/A
4	Gore Road	513.08	513.08	N/A	N/A
4	Hamilton Road EB	1004.13	1004.13	N/A	N/A

4	Hamilton Road WB	325.90	325.90	N/A	N/A
5	Gore Road	418.92	418.92	N/A	N/A
5	Hamilton Road EB	819.87	819.87	N/A	N/A
5	Hamilton Road WB	266.10	266.10	N/A	N/A
6	Gore Road	350.83	350.83	N/A	N/A
6	Hamilton Road EB	686.60	686.60	N/A	N/A
6	Hamilton Road WB	222.84	222.84	N/A	N/A

Turning Proportions

Turning Counts or Proportions (PCE/hr) - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	0.000	462.000	4.000
	2	420.000	0.000	492.000
	3	12.000	284.000	0.000

Turning Proportions (PCE) - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	0.00	0.99	0.01
	2	0.46	0.00	0.54
	3	0.04	0.96	0.00

Vehicle Mix

Average PCE Per Vehicle - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	1.050	1.050	1.050
	2	1.050	1.050	1.050
	3	1.050	1.050	1.050

Truck Percentages - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	5.000	5.000	5.000
	2	5.000	5.000	5.000
	3	5.000	5.000	5.000

Results

Results Summary

Arm	Max RFC	Max Delay (s)	Max Queue (PCE)	Max LOS	Total Demand (PCE/hr)	Total Arrivals (PCE)	Total Queueing Delay (PCE-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCE-min/min)	Inclusive Queueing Total Delay (PCE-min)	Inclusive Queueing Average Delay (s)	Slope	Intercept (PCE/hr)
Gore Road	0.46	6.25	0.89	A	427.61	641.41	57.58	5.39	0.64	57.58	5.39	0.579	1357.445
Hamilton Road EB	0.78	13.28	3.61	B	836.87	1255.30	193.13	9.23	2.15	193.17	9.23	0.579	1357.445
Hamilton Road WB	0.31	5.33	0.48	A	271.61	407.42	32.32	4.76	0.36	32.32	4.76	0.579	1357.445
						2004	283.03	8.47					

Main Results

Main results: (4:45 PM-5:00 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	350.83	87.71	349.05	323.01	212.81	0.00	1172.56	781.04	0.299	0.00	0.45
Hamilton Road EB	686.60	171.65	681.88	558.86	3.00	0.00	1287.93	1285.89	0.533	0.00	1.18
Hamilton Road WB	222.84	55.71	221.80	370.85	314.02	0.00	1116.92	963.98	0.200	0.00	0.26

Main results: (5:00 PM-5:15 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	418.92	104.73	418.32	387.21	255.00	0.00	1149.37	781.04	0.364	0.45	0.60
Hamilton Road EB	819.87	204.97	817.40	669.73	3.59	0.00	1287.60	1285.89	0.637	1.18	1.80
Hamilton Road WB	266.10	66.52	265.78	444.56	376.44	0.00	1082.60	963.98	0.246	0.26	0.34

Main results: (5:15 PM-5:30 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	513.08	128.27	511.94	472.47	312.16	0.00	1117.94	781.04	0.459	0.60	0.88
Hamilton Road EB	1004.13	251.03	997.29	819.71	4.39	0.00	1287.16	1285.89	0.780	1.80	3.51
Hamilton Road WB	325.90	81.48	325.35	542.41	459.28	0.00	1037.05	963.98	0.314	0.34	0.48

Main results: (5:30 PM-5:45 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	513.08	128.27	513.05	475.45	312.68	0.00	1117.66	781.04	0.459	0.88	0.89
Hamilton Road EB	1004.13	251.03	1003.73	821.33	4.40	0.00	1287.15	1285.89	0.780	3.51	3.61
Hamilton Road WB	325.90	81.48	325.89	545.89	462.24	0.00	1035.42	963.98	0.315	0.48	0.48

Main results: (5:45 PM-6:00 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	418.92	104.73	420.03	391.56	255.83	0.00	1148.91	781.04	0.365	0.89	0.61
Hamilton Road EB	819.87	204.97	826.77	672.26	3.61	0.00	1287.59	1285.89	0.637	3.61	1.88
Hamilton Road WB	266.10	66.52	266.64	449.62	380.75	0.00	1080.23	963.98	0.246	0.48	0.35

Main results: (6:00 PM-6:15 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	350.83	87.71	351.45	326.48	214.12	0.00	1171.84	781.04	0.299	0.61	0.45
Hamilton Road EB	686.60	171.65	689.27	562.56	3.02	0.00	1287.91	1285.89	0.533	1.88	1.22
Hamilton Road WB	222.84	55.71	223.17	374.86	317.43	0.00	1115.04	963.98	0.200	0.35	0.26

Queueing Delay Results

Queueing Delay results: (4:45 PM-5:00 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	6.49	0.43	4.581	A	A
Hamilton Road EB	16.92	1.13	6.189	A	A
Hamilton Road WB	3.81	0.25	4.219	A	A

Queueing Delay results: (5:00 PM-5:15 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	8.76	0.58	5.166	A	A
Hamilton Road EB	25.76	1.72	7.996	A	A
Hamilton Road WB	5.01	0.33	4.624	A	A

Queueing Delay results: (5:15 PM-5:30 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	12.80	0.85	6.226	A	A
Hamilton Road EB	48.04	3.20	12.741	B	B
Hamilton Road WB	7.00	0.47	5.311	A	A

Queueing Delay results: (5:30 PM-5:45 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	13.25	0.88	6.251	A	A
Hamilton Road EB	53.53	3.57	13.284	B	B
Hamilton Road WB	7.18	0.48	5.327	A	A

Queueing Delay results: (5:45 PM-6:00 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	9.36	0.62	5.193	A	A
Hamilton Road EB	29.93	2.00	8.322	A	A
Hamilton Road WB	5.29	0.35	4.648	A	A

Queueing Delay results: (6:00 PM-6:15 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	6.92	0.46	4.610	A	A
Hamilton Road EB	18.95	1.26	6.341	A	A
Hamilton Road WB	4.03	0.27	4.239	A	A

Queue Variation Results

Queue Variation results: (4:45 PM-5:00 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.45	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	1.18	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.26	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (5:00 PM-5:15 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.60	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	1.80	0.00	0.00	3.15	5.25			N/A	N/A
Hamilton Road WB	0.34	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (5:15 PM-5:30 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.88	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	3.51	0.00	0.00	2.10	9.45			N/A	N/A
Hamilton Road WB	0.48	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (5:30 PM-5:45 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.89	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	3.61	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.48	0.00	0.00	0.00	1.05			N/A	N/A

Queue Variation results: (5:45 PM-6:00 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.61	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	1.88	0.00	0.00	3.15	6.30			N/A	N/A
Hamilton Road WB	0.35	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (6:00 PM-6:15 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.45	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	1.22	0.00	0.00	2.10	3.15			N/A	N/A
Hamilton Road WB	0.26	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Overview: Standard Roundabout Geometry

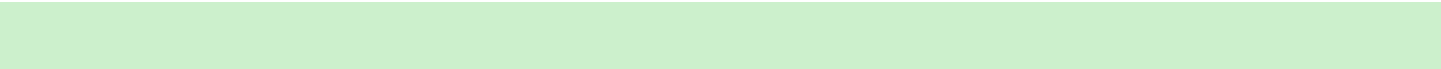
Standard Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only	Final Slope	Final Intercept (PCE/hr)
Gore Road	3.50	4.50	30.00	20.00	40.00	25.00		0.579	1357.445
Hamilton Road EB	3.50	4.50	30.00	20.00	40.00	25.00		0.579	1357.445
Hamilton Road WB	3.50	4.50	30.00	20.00	40.00	25.00		0.579	1357.445

Overview: Time Segment Results

Time Segment Results

Time Segment	Arm	Demand (PCE/hr)	Capacity (PCE/hr)	RFC	Pedestrian Demand (Ped/hr)	Start Queue (PCE)	End Queue (PCE)	Queueing Total Delay (PCE-min)	Geometric Total Delay (PCE-min)	Average Delay Per Arriving Vehicle (s)
1	Gore Road	350.83	1172.56	0.299	0.00	0.00	0.45	6.49	(0.02)	4.581
1	Hamilton Road EB	686.60	1287.93	0.533	0.00	0.00	1.18	16.92	(0.02)	6.189
1	Hamilton Road WB	222.84	1116.92	0.200	0.00	0.00	0.26	3.81	(0.02)	4.219
2	Gore Road	418.92	1149.37	0.364	0.00	0.45	0.60	8.76	(0.02)	5.166
2	Hamilton Road EB	819.87	1287.60	0.637	0.00	1.18	1.80	25.76	(0.02)	7.996
2	Hamilton Road WB	266.10	1082.60	0.246	0.00	0.26	0.34	5.01	(0.02)	4.624
3	Gore Road	513.08	1117.94	0.459	0.00	0.60	0.88	12.80	(0.02)	6.226
3	Hamilton Road EB	1004.13	1287.16	0.780	0.00	1.80	3.51	48.04	(0.02)	12.741
3	Hamilton Road WB	325.90	1037.05	0.314	0.00	0.34	0.48	7.00	(0.02)	5.311
4	Gore Road	513.08	1117.66	0.459	0.00	0.88	0.89	13.25	(0.02)	6.251
4	Hamilton Road EB	1004.13	1287.15	0.780	0.00	3.51	3.61	53.53	(0.02)	13.284
4	Hamilton Road WB	325.90	1035.42	0.315	0.00	0.48	0.48	7.18	(0.02)	5.327
5	Gore Road	418.92	1148.91	0.365	0.00	0.89	0.61	9.36	(0.02)	5.193
5	Hamilton Road EB	819.87	1287.59	0.637	0.00	3.61	1.88	29.93	(0.02)	8.322
5	Hamilton Road WB	266.10	1080.23	0.246	0.00	0.48	0.35	5.29	(0.02)	4.648
6	Gore Road	350.83	1171.84	0.299	0.00	0.61	0.45	6.92	(0.02)	4.610
6	Hamilton Road EB	686.60	1287.91	0.533	0.00	1.88	1.22	18.95	(0.02)	6.341
6	Hamilton Road WB	222.84	1115.04	0.200	0.00	0.35	0.26	4.03	(0.02)	4.239



A2 - Single Lane 85% - D1 - 2035, AM

Data Errors and Warnings
No errors or warnings

Analysis Set Details

Name	Description	Include In Report	Use Specific Demand Set	Demand Set	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
Single Lane 85%		Yes		(D1)		100.000	85.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Locked	Run Automatically	Use Relationship	Relationship	Start Time (HH:mm)	Finish Time (HH:mm)	Time Period Length (min)	Time Segment Length (min)	Traffic Profile Type
2035, AM	2035	AM			Yes			07:45	09:15	90	15	ONE HOUR

Roundabout Network

Roundabout Type(s)

ID	Name	Arm Order	Roundabout Type	Grade Separated	Large Roundabout	Do Geometric Delay
1	Hamilton & Gore	1,2,3	Standard			

Roundabout Network Options

Driving Side	Lighting	Road Surface	In London
Right	Normal/unknown	((Mini-roundabouts only))	

Arms

Arms

ID	Name	Description
1	Gore Road	
2	Hamilton Road EB	
3	Hamilton Road WB	

Capacity Options

Arm	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
Gore Road	0.00	99999.00		0.00
Hamilton Road EB	0.00	99999.00		0.00
Hamilton Road WB	0.00	99999.00		0.00

Standard Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
Gore Road	3.50	4.50	30.00	20.00	40.00	25.00	
Hamilton Road EB	3.50	4.50	30.00	20.00	40.00	25.00	
Hamilton Road WB	3.50	4.50	30.00	20.00	40.00	25.00	

Pedestrian Crossings

Arm	Crossing Type
Gore Road	None
Hamilton Road EB	None
Hamilton Road WB	None

Arm Slope/ Intercept and Capacity

Slope and Intercept used in model

Arm	Enter Directly	Slope	Intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
Gore Road		((calculated))	((calculated))	0.579	1357.445
Hamilton Road EB		((calculated))	((calculated))	0.579	1357.445
Hamilton Road WB		((calculated))	((calculated))	0.579	1357.445

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

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		Yes	Yes	Truck Percentages	2.00				Yes	Yes

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCE/hr)	Flow Scaling Factor (%)	PHF
Gore Road	ONE HOUR	Yes	301.00	100.000	N/A
Hamilton Road EB	ONE HOUR	Yes	567.00	100.000	N/A
Hamilton Road WB	ONE HOUR	Yes	457.00	100.000	N/A

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCE/hr)	DirectDemandEntryFlowInPCE (PCE/hr)	Direct Demand Exit Flow (PCE/hr)	Direct Demand Pedestrian Flow (Ped/hr)
1	Gore Road	226.61	226.61	N/A	N/A
1	Hamilton Road EB	426.87	426.87	N/A	N/A
1	Hamilton Road WB	344.05	344.05	N/A	N/A
2	Gore Road	270.59	270.59	N/A	N/A
2	Hamilton Road EB	509.72	509.72	N/A	N/A
2	Hamilton Road WB	410.83	410.83	N/A	N/A
3	Gore Road	331.41	331.41	N/A	N/A
3	Hamilton Road EB	624.28	624.28	N/A	N/A
3	Hamilton Road WB	503.17	503.17	N/A	N/A
4	Gore Road	331.41	331.41	N/A	N/A
4	Hamilton Road EB	624.28	624.28	N/A	N/A

4	Hamilton Road WB	503.17	503.17	N/A	N/A
5	Gore Road	270.59	270.59	N/A	N/A
5	Hamilton Road EB	509.72	509.72	N/A	N/A
5	Hamilton Road WB	410.83	410.83	N/A	N/A
6	Gore Road	226.61	226.61	N/A	N/A
6	Hamilton Road EB	426.87	426.87	N/A	N/A
6	Hamilton Road WB	344.05	344.05	N/A	N/A

Turning Proportions

Turning Counts or Proportions (PCE/hr) - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	0.000	295.000	6.000
	2	394.000	0.000	173.000
	3	25.000	432.000	0.000

Turning Proportions (PCE) - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	0.00	0.98	0.02
	2	0.69	0.00	0.31
	3	0.05	0.95	0.00

Vehicle Mix

Average PCE Per Vehicle - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	1.050	1.050	1.050
	2	1.050	1.050	1.050
	3	1.050	1.050	1.050

Truck Percentages - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	5.000	5.000	5.000
	2	5.000	5.000	5.000
	3	5.000	5.000	5.000

Results

Results Summary

Arm	Max RFC	Max Delay (s)	Max Queue (PCE)	Max LOS	Total Demand (PCE/hr)	Total Arrivals (PCE)	Total Queueing Delay (PCE-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCE-min/min)	Inclusive Queueing Total Delay (PCE-min)	Inclusive Queueing Average Delay (s)	Slope	Intercept (PCE/hr)
Gore Road	0.36	6.42	0.59	A	276.20	414.30	38.94	5.64	0.43	38.94	5.64	0.579	1357.445
Hamilton Road EB	0.54	7.18	1.23	A	520.29	780.43	79.77	6.13	0.89	79.78	6.13	0.579	1357.445
Hamilton Road WB	0.54	8.64	1.20	A	419.35	629.03	73.98	7.06	0.82	73.99	7.06	0.579	1357.445
						1824	192.69	6.34					

Main Results

Main results: (7:45 AM-8:00 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	226.61	56.65	225.38	313.62	323.20	0.00	994.83	799.44	0.228	0.00	0.31
Hamilton Road EB	426.87	106.72	424.42	544.08	4.49	0.00	1151.62	1145.99	0.371	0.00	0.61
Hamilton Road WB	344.05	86.01	341.90	133.99	294.92	0.00	1008.74	762.08	0.341	0.00	0.54

Main results: (8:00 AM-8:15 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	270.59	67.65	270.20	376.04	387.56	0.00	963.17	799.44	0.281	0.31	0.41
Hamilton Road EB	509.72	127.43	508.87	652.37	5.39	0.00	1151.18	1145.99	0.443	0.61	0.82
Hamilton Road WB	410.83	102.71	409.99	160.65	353.61	0.00	979.87	762.08	0.419	0.54	0.75

Main results: (8:15 AM-8:30 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	331.41	82.85	330.70	460.12	474.00	0.00	920.65	799.44	0.360	0.41	0.58
Hamilton Road EB	624.28	156.07	622.68	798.10	6.59	0.00	1150.59	1145.99	0.543	0.82	1.22
Hamilton Road WB	503.17	125.79	501.43	196.58	432.69	0.00	940.97	762.08	0.535	0.75	1.18

Main results: (8:30 AM-8:45 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	331.41	82.85	331.39	461.30	475.59	0.00	919.86	799.44	0.360	0.58	0.59
Hamilton Road EB	624.28	156.07	624.24	800.38	6.61	0.00	1150.58	1145.99	0.543	1.22	1.23
Hamilton Road WB	503.17	125.79	503.12	197.07	433.77	0.00	940.43	762.08	0.535	1.18	1.20

Main results: (8:45 AM-9:00 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	270.59	67.65	271.29	377.85	389.97	0.00	961.98	799.44	0.281	0.59	0.41
Hamilton Road EB	509.72	127.43	511.29	655.85	5.41	0.00	1151.17	1145.99	0.443	1.23	0.84
Hamilton Road WB	410.83	102.71	412.54	161.41	355.28	0.00	979.05	762.08	0.420	1.20	0.77

Main results: (9:00 AM-9:15 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	226.61	56.65	227.02	316.10	326.06	0.00	993.42	799.44	0.228	0.41	0.31
Hamilton Road EB	426.87	106.72	427.75	548.55	4.53	0.00	1151.60	1145.99	0.371	0.84	0.62
Hamilton Road WB	344.05	86.01	344.93	135.04	297.24	0.00	1007.60	762.08	0.341	0.77	0.55

Queueing Delay Results

Queueing Delay results: (7:45 AM-8:00 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	4.49	0.30	4.904	A	A
Hamilton Road EB	8.89	0.59	5.180	A	A
Hamilton Road WB	7.80	0.52	5.650	A	A

Queueing Delay results: (8:00 AM-8:15 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	5.98	0.40	5.453	A	A
Hamilton Road EB	12.05	0.80	5.878	A	A
Hamilton Road WB	10.92	0.73	6.623	A	A

Queueing Delay results: (8:15 AM-8:30 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	8.53	0.57	6.399	A	A
Hamilton Road EB	17.71	1.18	7.139	A	A
Hamilton Road WB	17.01	1.13	8.566	A	A

Queueing Delay results: (8:30 AM-8:45 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	8.80	0.59	6.422	A	A
Hamilton Road EB	18.46	1.23	7.181	A	A
Hamilton Road WB	17.86	1.19	8.640	A	A

Queueing Delay results: (8:45 AM-9:00 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	6.37	0.42	5.479	A	A
Hamilton Road EB	13.06	0.87	5.921	A	A
Hamilton Road WB	11.93	0.80	6.694	A	A

Queueing Delay results: (9:00 AM-9:15 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	4.78	0.32	4.934	A	A
Hamilton Road EB	9.59	0.64	5.230	A	A
Hamilton Road WB	8.46	0.56	5.711	A	A

Queue Variation Results

Queue Variation results: (7:45 AM-8:00 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.31	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.61	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.54	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (8:00 AM-8:15 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.41	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.82	0.00	0.00	0.00	1.05			N/A	N/A
Hamilton Road WB	0.75	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (8:15 AM-8:30 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.58	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	1.22	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	1.18	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (8:30 AM-8:45 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.59	0.00	0.00	0.00	1.05			N/A	N/A
Hamilton Road EB	1.23	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	1.20	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (8:45 AM-9:00 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.41	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.84	0.00	0.00	0.00	1.05			N/A	N/A
Hamilton Road WB	0.77	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (9:00 AM-9:15 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.31	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.62	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.55	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Overview: Standard Roundabout Geometry

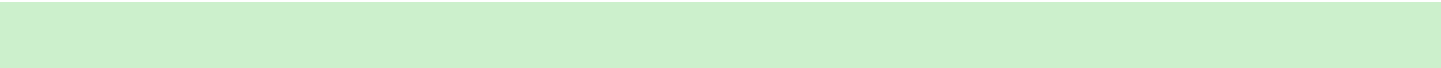
Standard Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only	Final Slope	Final Intercept (PCE/hr)
Gore Road	3.50	4.50	30.00	20.00	40.00	25.00		0.579	1357.445
Hamilton Road EB	3.50	4.50	30.00	20.00	40.00	25.00		0.579	1357.445
Hamilton Road WB	3.50	4.50	30.00	20.00	40.00	25.00		0.579	1357.445

Overview: Time Segment Results

Time Segment Results

Time Segment	Arm	Demand (PCE/hr)	Capacity (PCE/hr)	RFC	Pedestrian Demand (Ped/hr)	Start Queue (PCE)	End Queue (PCE)	Queueing Total Delay (PCE-min)	Geometric Total Delay (PCE-min)	Average Delay Per Arriving Vehicle (s)
1	Gore Road	226.61	994.83	0.228	0.00	0.00	0.31	4.49	(0.02)	4.904
1	Hamilton Road EB	426.87	1151.62	0.371	0.00	0.00	0.61	8.89	(0.02)	5.180
1	Hamilton Road WB	344.05	1008.74	0.341	0.00	0.00	0.54	7.80	(0.02)	5.650
2	Gore Road	270.59	963.17	0.281	0.00	0.31	0.41	5.98	(0.02)	5.453
2	Hamilton Road EB	509.72	1151.18	0.443	0.00	0.61	0.82	12.05	(0.02)	5.878
2	Hamilton Road WB	410.83	979.87	0.419	0.00	0.54	0.75	10.92	(0.02)	6.623
3	Gore Road	331.41	920.65	0.360	0.00	0.41	0.58	8.53	(0.02)	6.399
3	Hamilton Road EB	624.28	1150.59	0.543	0.00	0.82	1.22	17.71	(0.02)	7.139
3	Hamilton Road WB	503.17	940.97	0.535	0.00	0.75	1.18	17.01	(0.02)	8.566
4	Gore Road	331.41	919.86	0.360	0.00	0.58	0.59	8.80	(0.02)	6.422
4	Hamilton Road EB	624.28	1150.58	0.543	0.00	1.22	1.23	18.46	(0.02)	7.181
4	Hamilton Road WB	503.17	940.43	0.535	0.00	1.18	1.20	17.86	(0.02)	8.640
5	Gore Road	270.59	961.98	0.281	0.00	0.59	0.41	6.37	(0.02)	5.479
5	Hamilton Road EB	509.72	1151.17	0.443	0.00	1.23	0.84	13.06	(0.02)	5.921
5	Hamilton Road WB	410.83	979.05	0.420	0.00	1.20	0.77	11.93	(0.02)	6.694
6	Gore Road	226.61	993.42	0.228	0.00	0.41	0.31	4.78	(0.02)	4.934
6	Hamilton Road EB	426.87	1151.60	0.371	0.00	0.84	0.62	9.59	(0.02)	5.230
6	Hamilton Road WB	344.05	1007.60	0.341	0.00	0.77	0.55	8.46	(0.02)	5.711



A2 - Single Lane 85% - D2 - 2035, PM

Data Errors and Warnings
No errors or warnings

Analysis Set Details

Name	Description	Include In Report	Use Specific Demand Set	Demand Set	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
Single Lane 85%		Yes		(D1)		100.000	85.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Locked	Run Automatically	Use Relationship	Relationship	Start Time (HH:mm)	Finish Time (HH:mm)	Time Period Length (min)	Time Segment Length (min)	Traffic Profile Type
2035, PM	2035	PM			Yes			16:45	18:15	90	15	ONE HOUR

Roundabout Network

Roundabout Type(s)

ID	Name	Arm Order	Roundabout Type	Grade Separated	Large Roundabout	Do Geometric Delay
1	Hamilton & Gore	1,2,3	Standard			

Roundabout Network Options

Driving Side	Lighting	Road Surface	In London
Right	Normal/unknown	((Mini-roundabouts only))	

Arms

Arms

ID	Name	Description
1	Gore Road	
2	Hamilton Road EB	
3	Hamilton Road WB	

Capacity Options

Arm	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
Gore Road	0.00	99999.00		0.00
Hamilton Road EB	0.00	99999.00		0.00
Hamilton Road WB	0.00	99999.00		0.00

Standard Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
Gore Road	3.50	4.50	30.00	20.00	40.00	25.00	
Hamilton Road EB	3.50	4.50	30.00	20.00	40.00	25.00	
Hamilton Road WB	3.50	4.50	30.00	20.00	40.00	25.00	

Pedestrian Crossings

Arm	Crossing Type
Gore Road	None
Hamilton Road EB	None
Hamilton Road WB	None

Arm Slope/ Intercept and Capacity

Slope and Intercept used in model

Arm	Enter Directly	Slope	Intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
Gore Road		((calculated))	((calculated))	0.579	1357.445
Hamilton Road EB		((calculated))	((calculated))	0.579	1357.445
Hamilton Road WB		((calculated))	((calculated))	0.579	1357.445

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

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		Yes	Yes	Truck Percentages	2.00				Yes	Yes

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCE/hr)	Flow Scaling Factor (%)	PHF
Gore Road	ONE HOUR	Yes	466.00	100.000	N/A
Hamilton Road EB	ONE HOUR	Yes	912.00	100.000	N/A
Hamilton Road WB	ONE HOUR	Yes	296.00	100.000	N/A

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCE/hr)	DirectDemandEntryFlowInPCE (PCE/hr)	Direct Demand Exit Flow (PCE/hr)	Direct Demand Pedestrian Flow (Ped/hr)
1	Gore Road	350.83	350.83	N/A	N/A
1	Hamilton Road EB	686.60	686.60	N/A	N/A
1	Hamilton Road WB	222.84	222.84	N/A	N/A
2	Gore Road	418.92	418.92	N/A	N/A
2	Hamilton Road EB	819.87	819.87	N/A	N/A
2	Hamilton Road WB	266.10	266.10	N/A	N/A
3	Gore Road	513.08	513.08	N/A	N/A
3	Hamilton Road EB	1004.13	1004.13	N/A	N/A
3	Hamilton Road WB	325.90	325.90	N/A	N/A
4	Gore Road	513.08	513.08	N/A	N/A
4	Hamilton Road EB	1004.13	1004.13	N/A	N/A

4	Hamilton Road WB	325.90	325.90	N/A	N/A
5	Gore Road	418.92	418.92	N/A	N/A
5	Hamilton Road EB	819.87	819.87	N/A	N/A
5	Hamilton Road WB	266.10	266.10	N/A	N/A
6	Gore Road	350.83	350.83	N/A	N/A
6	Hamilton Road EB	686.60	686.60	N/A	N/A
6	Hamilton Road WB	222.84	222.84	N/A	N/A

Turning Proportions

Turning Counts or Proportions (PCE/hr) - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	0.000	462.000	4.000
	2	420.000	0.000	492.000
	3	12.000	284.000	0.000

Turning Proportions (PCE) - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	0.00	0.99	0.01
	2	0.46	0.00	0.54
	3	0.04	0.96	0.00

Vehicle Mix

Average PCE Per Vehicle - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	1.050	1.050	1.050
	2	1.050	1.050	1.050
	3	1.050	1.050	1.050

Truck Percentages - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	5.000	5.000	5.000
	2	5.000	5.000	5.000
	3	5.000	5.000	5.000

Results

Results Summary

Arm	Max RFC	Max Delay (s)	Max Queue (PCE)	Max LOS	Total Demand (PCE/hr)	Total Arrivals (PCE)	Total Queueing Delay (PCE-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCE-min/min)	Inclusive Queueing Total Delay (PCE-min)	Inclusive Queueing Average Delay (s)	Slope	Intercept (PCE/hr)
Gore Road	0.51	7.76	1.10	A	427.61	641.41	69.60	6.51	0.77	69.61	6.51	0.579	1357.445
Hamilton Road EB	0.87	24.59	6.50	C	836.87	1255.30	298.21	14.25	3.31	298.28	14.26	0.579	1357.445
Hamilton Road WB	0.35	6.29	0.57	A	271.61	407.42	37.67	5.55	0.42	37.67	5.55	0.579	1357.445
						2004	405.48	12.14					

Main Results

Main results: (4:45 PM-5:00 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	350.83	87.71	348.74	322.39	212.66	0.00	1049.21	732.27	0.334	0.00	0.52
Hamilton Road EB	686.60	171.65	680.54	558.41	2.99	0.00	1152.36	1150.74	0.596	0.00	1.51
Hamilton Road WB	222.84	55.71	221.65	370.13	313.41	0.00	999.65	893.12	0.223	0.00	0.30

Main results: (5:00 PM-5:15 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	418.92	104.73	418.16	386.55	254.94	0.00	1028.41	732.27	0.407	0.52	0.71
Hamilton Road EB	819.87	204.97	815.97	669.52	3.59	0.00	1152.06	1150.74	0.712	1.51	2.49
Hamilton Road WB	266.10	66.52	265.72	443.78	375.77	0.00	968.97	893.12	0.275	0.30	0.39

Main results: (5:15 PM-5:30 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	513.08	128.27	511.58	469.07	312.05	0.00	1000.32	732.27	0.513	0.71	1.09
Hamilton Road EB	1004.13	251.03	989.92	819.24	4.39	0.00	1151.67	1150.74	0.872	2.49	6.04
Hamilton Road WB	325.90	81.48	325.24	538.43	455.89	0.00	929.56	893.12	0.351	0.39	0.56

Main results: (5:30 PM-5:45 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	513.08	128.27	513.04	474.80	312.67	0.00	1000.01	732.27	0.513	1.09	1.10
Hamilton Road EB	1004.13	251.03	1002.30	821.30	4.40	0.00	1151.66	1150.74	0.872	6.04	6.50
Hamilton Road WB	325.90	81.48	325.88	545.12	461.59	0.00	926.75	893.12	0.352	0.56	0.57

Main results: (5:45 PM-6:00 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	418.92	104.73	420.39	395.38	255.93	0.00	1027.92	732.27	0.408	1.10	0.73
Hamilton Road EB	819.87	204.97	835.06	672.72	3.61	0.00	1152.05	1150.74	0.712	6.50	2.70
Hamilton Road WB	266.10	66.52	266.75	454.10	384.57	0.00	964.64	893.12	0.276	0.57	0.40

Main results: (6:00 PM-6:15 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	350.83	87.71	351.62	327.31	214.19	0.00	1048.46	732.27	0.335	0.73	0.53
Hamilton Road EB	686.60	171.65	691.08	562.79	3.02	0.00	1152.34	1150.74	0.596	2.70	1.58
Hamilton Road WB	222.84	55.71	223.24	375.84	318.26	0.00	997.26	893.12	0.223	0.40	0.30

Queueing Delay Results

Queueing Delay results: (4:45 PM-5:00 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	7.59	0.51	5.380	A	A
Hamilton Road EB	21.38	1.43	7.914	A	A
Hamilton Road WB	4.37	0.29	4.852	A	A

Queueing Delay results: (5:00 PM-5:15 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	10.42	0.69	6.186	A	A
Hamilton Road EB	34.95	2.33	11.113	B	B
Hamilton Road WB	5.79	0.39	5.373	A	A

Queueing Delay results: (5:15 PM-5:30 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	15.70	1.05	7.710	A	A
Hamilton Road EB	77.09	5.14	21.646	C	C
Hamilton Road WB	8.20	0.55	6.248	A	A

Queueing Delay results: (5:30 PM-5:45 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	16.39	1.09	7.761	A	A
Hamilton Road EB	94.66	6.31	24.590	C	C
Hamilton Road WB	8.46	0.56	6.290	A	A

Queueing Delay results: (5:45 PM-6:00 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	11.31	0.75	6.238	A	A
Hamilton Road EB	45.16	3.01	12.447	B	B
Hamilton Road WB	6.19	0.41	5.422	A	A

Queueing Delay results: (6:00 PM-6:15 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	8.19	0.55	5.432	A	A
Hamilton Road EB	24.97	1.66	8.274	A	A
Hamilton Road WB	4.65	0.31	4.887	A	A

Queue Variation Results

Queue Variation results: (4:45 PM-5:00 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.52	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	1.51	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.30	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (5:00 PM-5:15 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.71	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	2.49	0.00	0.00	5.25	8.40			N/A	N/A
Hamilton Road WB	0.39	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (5:15 PM-5:30 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	1.09	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	6.04	0.00	0.00	11.55	23.10			N/A	N/A
Hamilton Road WB	0.56	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (5:30 PM-5:45 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	1.10	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	6.50	0.00	0.00	6.30	21.00			N/A	N/A
Hamilton Road WB	0.57	0.00	0.00	0.00	1.05			N/A	N/A

Queue Variation results: (5:45 PM-6:00 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.73	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	2.70	0.00	0.00	5.25	9.45			N/A	N/A
Hamilton Road WB	0.40	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (6:00 PM-6:15 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.53	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	1.58	0.00	0.00	1.05	4.20			N/A	N/A
Hamilton Road WB	0.30	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Overview: Standard Roundabout Geometry

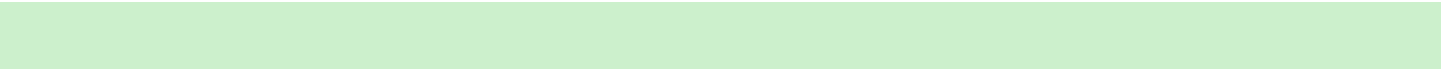
Standard Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only	Final Slope	Final Intercept (PCE/hr)
Gore Road	3.50	4.50	30.00	20.00	40.00	25.00		0.579	1357.445
Hamilton Road EB	3.50	4.50	30.00	20.00	40.00	25.00		0.579	1357.445
Hamilton Road WB	3.50	4.50	30.00	20.00	40.00	25.00		0.579	1357.445

Overview: Time Segment Results

Time Segment Results

Time Segment	Arm	Demand (PCE/hr)	Capacity (PCE/hr)	RFC	Pedestrian Demand (Ped/hr)	Start Queue (PCE)	End Queue (PCE)	Queueing Total Delay (PCE-min)	Geometric Total Delay (PCE-min)	Average Delay Per Arriving Vehicle (s)
1	Gore Road	350.83	1049.21	0.334	0.00	0.00	0.52	7.59	(0.02)	5.380
1	Hamilton Road EB	686.60	1152.36	0.596	0.00	0.00	1.51	21.38	(0.02)	7.914
1	Hamilton Road WB	222.84	999.65	0.223	0.00	0.00	0.30	4.37	(0.02)	4.852
2	Gore Road	418.92	1028.41	0.407	0.00	0.52	0.71	10.42	(0.02)	6.186
2	Hamilton Road EB	819.87	1152.06	0.712	0.00	1.51	2.49	34.95	(0.02)	11.113
2	Hamilton Road WB	266.10	968.97	0.275	0.00	0.30	0.39	5.79	(0.02)	5.373
3	Gore Road	513.08	1000.32	0.513	0.00	0.71	1.09	15.70	(0.02)	7.710
3	Hamilton Road EB	1004.13	1151.67	0.872	0.00	2.49	6.04	77.09	(0.02)	21.646
3	Hamilton Road WB	325.90	929.56	0.351	0.00	0.39	0.56	8.20	(0.02)	6.248
4	Gore Road	513.08	1000.01	0.513	0.00	1.09	1.10	16.39	(0.02)	7.761
4	Hamilton Road EB	1004.13	1151.66	0.872	0.00	6.04	6.50	94.66	(0.02)	24.590
4	Hamilton Road WB	325.90	926.75	0.352	0.00	0.56	0.57	8.46	(0.02)	6.290
5	Gore Road	418.92	1027.92	0.408	0.00	1.10	0.73	11.31	(0.02)	6.238
5	Hamilton Road EB	819.87	1152.05	0.712	0.00	6.50	2.70	45.16	(0.02)	12.447
5	Hamilton Road WB	266.10	964.64	0.276	0.00	0.57	0.40	6.19	(0.02)	5.422
6	Gore Road	350.83	1048.46	0.335	0.00	0.73	0.53	8.19	(0.02)	5.432
6	Hamilton Road EB	686.60	1152.34	0.596	0.00	2.70	1.58	24.97	(0.02)	8.274
6	Hamilton Road WB	222.84	997.26	0.223	0.00	0.40	0.30	4.65	(0.02)	4.887



A3 - Dual Lane Hamilton 95% - D1 - 2035, AM

Data Errors and Warnings
No errors or warnings

Analysis Set Details

Name	Description	Include In Report	Use Specific Demand Set	Demand Set	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
Dual Lane Hamilton 95%		Yes		(D1)		100.000	95.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Locked	Run Automatically	Use Relationship	Relationship	Start Time (HH:mm)	Finish Time (HH:mm)	Time Period Length (min)	Time Segment Length (min)	Traffic Profile Type
2035, AM	2035	AM			Yes			07:45	09:15	90	15	ONE HOUR

Roundabout Network

Roundabout Type(s)

ID	Name	Arm Order	Roundabout Type	Grade Separated	Large Roundabout	Do Geometric Delay
1	Hamilton & Gore	1,2,3	Standard			

Roundabout Network Options

Driving Side	Lighting	Road Surface	In London
Right	Normal/unknown	((Mini-roundabouts only))	

Arms

Arms

ID	Name	Description
1	Gore Road	
2	Hamilton Road EB	
3	Hamilton Road WB	

Capacity Options

Arm	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
Gore Road	0.00	99999.00		0.00
Hamilton Road EB	0.00	99999.00		0.00
Hamilton Road WB	0.00	99999.00		0.00

Standard Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
Gore Road	3.50	4.50	30.00	20.00	40.00	25.00	
Hamilton Road EB	7.00	8.00	30.00	20.00	55.00	25.00	
Hamilton Road WB	7.00	8.00	30.00	20.00	55.00	25.00	

Pedestrian Crossings

Arm	Crossing Type
Gore Road	None
Hamilton Road EB	None
Hamilton Road WB	None

Arm Slope/ Intercept and Capacity

Slope and Intercept used in model

Arm	Enter Directly	Slope	Intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
Gore Road		((calculated))	((calculated))	0.579	1357.445
Hamilton Road EB		((calculated))	((calculated))	0.723	2436.345
Hamilton Road WB		((calculated))	((calculated))	0.723	2436.345

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

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		Yes	Yes	Truck Percentages	2.00				Yes	Yes

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCE/hr)	Flow Scaling Factor (%)	PHF
Gore Road	ONE HOUR	Yes	301.00	100.000	N/A
Hamilton Road EB	ONE HOUR	Yes	567.00	100.000	N/A
Hamilton Road WB	ONE HOUR	Yes	457.00	100.000	N/A

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCE/hr)	DirectDemandEntryFlowInPCE (PCE/hr)	Direct Demand Exit Flow (PCE/hr)	Direct Demand Pedestrian Flow (Ped/hr)
1	Gore Road	226.61	226.61	N/A	N/A
1	Hamilton Road EB	426.87	426.87	N/A	N/A
1	Hamilton Road WB	344.05	344.05	N/A	N/A
2	Gore Road	270.59	270.59	N/A	N/A
2	Hamilton Road EB	509.72	509.72	N/A	N/A
2	Hamilton Road WB	410.83	410.83	N/A	N/A
3	Gore Road	331.41	331.41	N/A	N/A
3	Hamilton Road EB	624.28	624.28	N/A	N/A
3	Hamilton Road WB	503.17	503.17	N/A	N/A
4	Gore Road	331.41	331.41	N/A	N/A
4	Hamilton Road EB	624.28	624.28	N/A	N/A

4	Hamilton Road WB	503.17	503.17	N/A	N/A
5	Gore Road	270.59	270.59	N/A	N/A
5	Hamilton Road EB	509.72	509.72	N/A	N/A
5	Hamilton Road WB	410.83	410.83	N/A	N/A
6	Gore Road	226.61	226.61	N/A	N/A
6	Hamilton Road EB	426.87	426.87	N/A	N/A
6	Hamilton Road WB	344.05	344.05	N/A	N/A

Turning Proportions

Turning Counts or Proportions (PCE/hr) - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	0.000	295.000	6.000
	2	394.000	0.000	173.000
	3	25.000	432.000	0.000

Turning Proportions (PCE) - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	0.00	0.98	0.02
	2	0.69	0.00	0.31
	3	0.05	0.95	0.00

Vehicle Mix

Average PCE Per Vehicle - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	1.050	1.050	1.050
	2	1.050	1.050	1.050
	3	1.050	1.050	1.050

Truck Percentages - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	5.000	5.000	5.000
	2	5.000	5.000	5.000
	3	5.000	5.000	5.000

Results

Results Summary

Arm	Max RFC	Max Delay (s)	Max Queue (PCE)	Max LOS	Total Demand (PCE/hr)	Total Arrivals (PCE)	Total Queueing Delay (PCE-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCE-min/min)	Inclusive Queueing Total Delay (PCE-min)	Inclusive Queueing Average Delay (s)	Slope	Intercept (PCE/hr)
Gore Road	0.32	5.42	0.50	A	276.20	414.30	33.35	4.83	0.37	33.35	4.83	0.579	1357.445
Hamilton Road EB	0.27	2.24	0.39	A	520.29	780.43	27.61	2.12	0.31	27.61	2.12	0.723	2436.345
Hamilton Road WB	0.25	2.50	0.35	A	419.35	629.03	24.30	2.32	0.27	24.30	2.32	0.723	2436.345
						1824	75.26	2.48					

Main Results

Main results: (7:45 AM-8:00 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	226.61	56.65	225.54	314.74	324.46	0.00	1111.18	658.49	0.204	0.00	0.27
Hamilton Road EB	426.87	106.72	425.92	545.50	4.50	0.00	2311.44	2305.51	0.185	0.00	0.24
Hamilton Road WB	344.05	86.01	343.24	134.45	295.96	0.00	2111.26	1214.22	0.163	0.00	0.20

Main results: (8:00 AM-8:15 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	270.59	67.65	270.26	376.50	388.15	0.00	1076.16	658.49	0.251	0.27	0.35
Hamilton Road EB	509.72	127.43	509.48	653.02	5.39	0.00	2310.83	2305.51	0.221	0.24	0.30
Hamilton Road WB	410.83	102.71	410.61	160.84	354.03	0.00	2071.38	1214.22	0.198	0.20	0.26

Main results: (8:15 AM-8:30 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	331.41	82.85	330.83	461.05	475.31	0.00	1028.24	658.49	0.322	0.35	0.50
Hamilton Road EB	624.28	156.07	623.91	799.54	6.59	0.00	2310.00	2305.51	0.270	0.30	0.39
Hamilton Road WB	503.17	125.79	502.81	196.96	433.55	0.00	2016.77	1214.22	0.249	0.26	0.35

Main results: (8:30 AM-8:45 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	331.41	82.85	331.40	461.33	475.64	0.00	1028.06	658.49	0.322	0.50	0.50
Hamilton Road EB	624.28	156.07	624.28	800.43	6.61	0.00	2309.99	2305.51	0.270	0.39	0.39
Hamilton Road WB	503.17	125.79	503.16	197.08	433.80	0.00	2016.59	1214.22	0.250	0.35	0.35

Main results: (8:45 AM-9:00 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	270.59	67.65	271.16	376.94	388.69	0.00	1075.86	658.49	0.252	0.50	0.36
Hamilton Road EB	509.72	127.43	510.08	654.45	5.41	0.00	2310.82	2305.51	0.221	0.39	0.30
Hamilton Road WB	410.83	102.71	411.18	161.04	354.45	0.00	2071.09	1214.22	0.198	0.35	0.26

Main results: (9:00 AM-9:15 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	226.61	56.65	226.95	315.62	325.44	0.00	1110.64	658.49	0.204	0.36	0.27
Hamilton Road EB	426.87	106.72	427.11	547.87	4.52	0.00	2311.42	2305.51	0.185	0.30	0.24
Hamilton Road WB	344.05	86.01	344.28	134.84	296.79	0.00	2110.69	1214.22	0.163	0.26	0.21

Queueing Delay Results

Queueing Delay results: (7:45 AM-8:00 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	3.91	0.26	4.262	A	A
Hamilton Road EB	3.51	0.23	2.003	A	A
Hamilton Road WB	3.02	0.20	2.136	A	A

Queueing Delay results: (8:00 AM-8:15 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	5.16	0.34	4.688	A	A
Hamilton Road EB	4.40	0.29	2.098	A	A
Hamilton Road WB	3.84	0.26	2.275	A	A

Queueing Delay results: (8:15 AM-8:30 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	7.26	0.48	5.415	A	A
Hamilton Road EB	5.75	0.38	2.241	A	A
Hamilton Road WB	5.15	0.34	2.496	A	A

Queueing Delay results: (8:30 AM-8:45 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	7.45	0.50	5.425	A	A
Hamilton Road EB	5.82	0.39	2.242	A	A
Hamilton Road WB	5.22	0.35	2.497	A	A

Queueing Delay results: (8:45 AM-9:00 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	5.44	0.36	4.700	A	A
Hamilton Road EB	4.52	0.30	2.100	A	A
Hamilton Road WB	3.95	0.26	2.277	A	A

Queueing Delay results: (9:00 AM-9:15 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	4.13	0.28	4.280	A	A
Hamilton Road EB	3.61	0.24	2.007	A	A
Hamilton Road WB	3.11	0.21	2.141	A	A

Queue Variation Results

Queue Variation results: (7:45 AM-8:00 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.27	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.24	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.20	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (8:00 AM-8:15 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.35	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.30	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.26	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (8:15 AM-8:30 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.50	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.39	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.35	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (8:30 AM-8:45 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.50	0.00	0.00	0.00	1.05			N/A	N/A
Hamilton Road EB	0.39	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.35	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (8:45 AM-9:00 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.36	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.30	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.26	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (9:00 AM-9:15 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.27	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.24	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.21	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Overview: Standard Roundabout Geometry

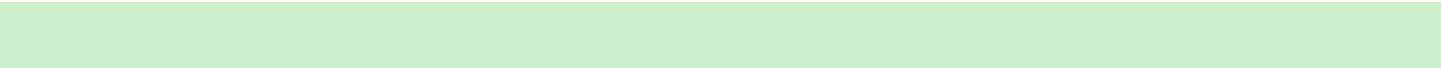
Standard Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only	Final Slope	Final Intercept (PCE/hr)
Gore Road	3.50	4.50	30.00	20.00	40.00	25.00		0.579	1357.445
Hamilton Road EB	7.00	8.00	30.00	20.00	55.00	25.00		0.723	2436.345
Hamilton Road WB	7.00	8.00	30.00	20.00	55.00	25.00		0.723	2436.345

Overview: Time Segment Results

Time Segment Results

Time Segment	Arm	Demand (PCE/hr)	Capacity (PCE/hr)	RFC	Pedestrian Demand (Ped/hr)	Start Queue (PCE)	End Queue (PCE)	Queueing Total Delay (PCE-min)	Geometric Total Delay (PCE-min)	Average Delay Per Arriving Vehicle (s)
1	Gore Road	226.61	1111.18	0.204	0.00	0.00	0.27	3.91	(0.02)	4.262
1	Hamilton Road EB	426.87	2311.44	0.185	0.00	0.00	0.24	3.51	(0.02)	2.003
1	Hamilton Road WB	344.05	2111.26	0.163	0.00	0.00	0.20	3.02	(0.02)	2.136
2	Gore Road	270.59	1076.16	0.251	0.00	0.27	0.35	5.16	(0.02)	4.688
2	Hamilton Road EB	509.72	2310.83	0.221	0.00	0.24	0.30	4.40	(0.02)	2.098
2	Hamilton Road WB	410.83	2071.38	0.198	0.00	0.20	0.26	3.84	(0.02)	2.275
3	Gore Road	331.41	1028.24	0.322	0.00	0.35	0.50	7.26	(0.02)	5.415
3	Hamilton Road EB	624.28	2310.00	0.270	0.00	0.30	0.39	5.75	(0.02)	2.241
3	Hamilton Road WB	503.17	2016.77	0.249	0.00	0.26	0.35	5.15	(0.02)	2.496
4	Gore Road	331.41	1028.06	0.322	0.00	0.50	0.50	7.45	(0.02)	5.425
4	Hamilton Road EB	624.28	2309.99	0.270	0.00	0.39	0.39	5.82	(0.02)	2.242
4	Hamilton Road WB	503.17	2016.59	0.250	0.00	0.35	0.35	5.22	(0.02)	2.497
5	Gore Road	270.59	1075.86	0.252	0.00	0.50	0.36	5.44	(0.02)	4.700
5	Hamilton Road EB	509.72	2310.82	0.221	0.00	0.39	0.30	4.52	(0.02)	2.100
5	Hamilton Road WB	410.83	2071.09	0.198	0.00	0.35	0.26	3.95	(0.02)	2.277
6	Gore Road	226.61	1110.64	0.204	0.00	0.36	0.27	4.13	(0.02)	4.280
6	Hamilton Road EB	426.87	2311.42	0.185	0.00	0.30	0.24	3.61	(0.02)	2.007
6	Hamilton Road WB	344.05	2110.69	0.163	0.00	0.26	0.21	3.11	(0.02)	2.141



A3 - Dual Lane Hamilton 95% - D2 - 2035, PM

Data Errors and Warnings
No errors or warnings

Analysis Set Details

Name	Description	Include In Report	Use Specific Demand Set	Demand Set	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
Dual Lane Hamilton 95%		Yes		(D1)		100.000	95.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Locked	Run Automatically	Use Relationship	Relationship	Start Time (HH:mm)	Finish Time (HH:mm)	Time Period Length (min)	Time Segment Length (min)	Traffic Profile Type
2035, PM	2035	PM			Yes			16:45	18:15	90	15	ONE HOUR

Roundabout Network

Roundabout Type(s)

ID	Name	Arm Order	Roundabout Type	Grade Separated	Large Roundabout	Do Geometric Delay
1	Hamilton & Gore	1,2,3	Standard			

Roundabout Network Options

Driving Side	Lighting	Road Surface	In London
Right	Normal/unknown	((Mini-roundabouts only))	

Arms

Arms

ID	Name	Description
1	Gore Road	
2	Hamilton Road EB	
3	Hamilton Road WB	

Capacity Options

Arm	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
Gore Road	0.00	99999.00		0.00
Hamilton Road EB	0.00	99999.00		0.00
Hamilton Road WB	0.00	99999.00		0.00

Standard Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
Gore Road	3.50	4.50	30.00	20.00	40.00	25.00	
Hamilton Road EB	7.00	8.00	30.00	20.00	55.00	25.00	
Hamilton Road WB	7.00	8.00	30.00	20.00	55.00	25.00	

Pedestrian Crossings

Arm	Crossing Type
Gore Road	None
Hamilton Road EB	None
Hamilton Road WB	None

Arm Slope/ Intercept and Capacity

Slope and Intercept used in model

Arm	Enter Directly	Slope	Intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
Gore Road		((calculated))	((calculated))	0.579	1357.445
Hamilton Road EB		((calculated))	((calculated))	0.723	2436.345
Hamilton Road WB		((calculated))	((calculated))	0.723	2436.345

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

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		Yes	Yes	Truck Percentages	2.00				Yes	Yes

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCE/hr)	Flow Scaling Factor (%)	PHF
Gore Road	ONE HOUR	Yes	466.00	100.000	N/A
Hamilton Road EB	ONE HOUR	Yes	912.00	100.000	N/A
Hamilton Road WB	ONE HOUR	Yes	296.00	100.000	N/A

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCE/hr)	DirectDemandEntryFlowInPCE (PCE/hr)	Direct Demand Exit Flow (PCE/hr)	Direct Demand Pedestrian Flow (Ped/hr)
1	Gore Road	350.83	350.83	N/A	N/A
1	Hamilton Road EB	686.60	686.60	N/A	N/A
1	Hamilton Road WB	222.84	222.84	N/A	N/A
2	Gore Road	418.92	418.92	N/A	N/A
2	Hamilton Road EB	819.87	819.87	N/A	N/A
2	Hamilton Road WB	266.10	266.10	N/A	N/A
3	Gore Road	513.08	513.08	N/A	N/A
3	Hamilton Road EB	1004.13	1004.13	N/A	N/A
3	Hamilton Road WB	325.90	325.90	N/A	N/A
4	Gore Road	513.08	513.08	N/A	N/A
4	Hamilton Road EB	1004.13	1004.13	N/A	N/A

4	Hamilton Road WB	325.90	325.90	N/A	N/A
5	Gore Road	418.92	418.92	N/A	N/A
5	Hamilton Road EB	819.87	819.87	N/A	N/A
5	Hamilton Road WB	266.10	266.10	N/A	N/A
6	Gore Road	350.83	350.83	N/A	N/A
6	Hamilton Road EB	686.60	686.60	N/A	N/A
6	Hamilton Road WB	222.84	222.84	N/A	N/A

Turning Proportions

Turning Counts or Proportions (PCE/hr) - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	0.000	462.000	4.000
	2	420.000	0.000	492.000
	3	12.000	284.000	0.000

Turning Proportions (PCE) - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	0.00	0.99	0.01
	2	0.46	0.00	0.54
	3	0.04	0.96	0.00

Vehicle Mix

Average PCE Per Vehicle - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	1.050	1.050	1.050
	2	1.050	1.050	1.050
	3	1.050	1.050	1.050

Truck Percentages - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	5.000	5.000	5.000
	2	5.000	5.000	5.000
	3	5.000	5.000	5.000

Results

Results Summary

Arm	Max RFC	Max Delay (s)	Max Queue (PCE)	Max LOS	Total Demand (PCE/hr)	Total Arrivals (PCE)	Total Queueing Delay (PCE-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCE-min/min)	Inclusive Queueing Total Delay (PCE-min)	Inclusive Queueing Average Delay (s)	Slope	Intercept (PCE/hr)
Gore Road	0.46	6.25	0.89	A	427.61	641.41	57.58	5.39	0.64	57.59	5.39	0.579	1357.445
Hamilton Road EB	0.43	2.89	0.80	A	836.87	1255.30	54.48	2.60	0.61	54.48	2.60	0.723	2436.345
Hamilton Road WB	0.16	2.26	0.20	A	271.61	407.42	14.52	2.14	0.16	14.52	2.14	0.723	2436.345
						2004	126.58	3.79					

Main Results

Main results: (4:45 PM-5:00 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	350.83	87.71	349.05	324.40	213.33	0.00	1172.28	454.33	0.299	0.00	0.45
Hamilton Road EB	686.60	171.65	684.83	559.38	3.00	0.00	2312.47	2311.85	0.297	0.00	0.44
Hamilton Road WB	222.84	55.71	222.35	372.45	315.38	0.00	2097.92	1583.31	0.106	0.00	0.12

Main results: (5:00 PM-5:15 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	418.92	104.73	418.32	388.11	255.19	0.00	1149.26	454.33	0.365	0.45	0.60
Hamilton Road EB	819.87	204.97	819.34	669.92	3.59	0.00	2312.06	2311.85	0.355	0.44	0.57
Hamilton Road WB	266.10	66.52	265.97	445.60	377.33	0.00	2055.38	1583.31	0.129	0.12	0.16

Main results: (5:15 PM-5:30 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	513.08	128.27	511.94	475.21	312.50	0.00	1117.75	454.28	0.459	0.60	0.88
Hamilton Road EB	1004.13	251.03	1003.22	820.05	4.39	0.00	2311.51	2311.85	0.434	0.57	0.80
Hamilton Road WB	325.90	81.48	325.71	545.61	462.01	0.00	1997.22	1583.31	0.163	0.16	0.20

Main results: (5:30 PM-5:45 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	513.08	128.27	513.05	475.64	312.69	0.00	1117.65	454.28	0.459	0.88	0.89
Hamilton Road EB	1004.13	251.03	1004.12	821.34	4.40	0.00	2311.50	2311.85	0.434	0.80	0.80
Hamilton Road WB	325.90	81.48	325.90	546.10	462.42	0.00	1996.93	1583.31	0.163	0.20	0.20

Main results: (5:45 PM-6:00 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	418.92	104.73	420.04	388.78	255.49	0.00	1149.10	454.33	0.365	0.89	0.61
Hamilton Road EB	819.87	204.97	820.77	671.92	3.61	0.00	2312.05	2311.85	0.355	0.80	0.58
Hamilton Road WB	266.10	66.52	266.29	446.39	377.99	0.00	2054.93	1583.31	0.129	0.20	0.16

Main results: (6:00 PM-6:15 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	350.83	87.71	351.45	325.48	213.93	0.00	1171.95	454.33	0.299	0.61	0.45
Hamilton Road EB	686.60	171.65	687.14	562.37	3.02	0.00	2312.46	2311.85	0.297	0.58	0.45
Hamilton Road WB	222.84	55.71	222.97	373.71	316.45	0.00	2097.19	1583.31	0.106	0.16	0.13

Queueing Delay Results

Queueing Delay results: (4:45 PM-5:00 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	6.49	0.43	4.583	A	A
Hamilton Road EB	6.52	0.43	2.320	A	A
Hamilton Road WB	1.84	0.12	2.015	A	A

Queueing Delay results: (5:00 PM-5:15 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	8.76	0.58	5.167	A	A
Hamilton Road EB	8.50	0.57	2.532	A	A
Hamilton Road WB	2.31	0.15	2.112	A	A

Queueing Delay results: (5:15 PM-5:30 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	12.80	0.85	6.228	A	A
Hamilton Road EB	11.83	0.79	2.888	A	A
Hamilton Road WB	3.03	0.20	2.261	A	A

Queueing Delay results: (5:30 PM-5:45 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	13.25	0.88	6.251	A	A
Hamilton Road EB	12.05	0.80	2.890	A	A
Hamilton Road WB	3.07	0.20	2.261	A	A

Queueing Delay results: (5:45 PM-6:00 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	9.36	0.62	5.194	A	A
Hamilton Road EB	8.82	0.59	2.537	A	A
Hamilton Road WB	2.37	0.16	2.114	A	A

Queueing Delay results: (6:00 PM-6:15 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	6.92	0.46	4.610	A	A
Hamilton Road EB	6.76	0.45	2.327	A	A
Hamilton Road WB	1.89	0.13	2.016	A	A

Queue Variation Results

Queue Variation results: (4:45 PM-5:00 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.45	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.44	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.12	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (5:00 PM-5:15 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.60	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.57	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.16	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (5:15 PM-5:30 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.88	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.80	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.20	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (5:30 PM-5:45 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.89	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.80	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.20	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (5:45 PM-6:00 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.61	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.58	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.16	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (6:00 PM-6:15 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.45	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.45	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.13	N/A	N/A	N/A	N/A	Percentiles could		N/A	N/A

						not be calculated			
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Overview: Standard Roundabout Geometry

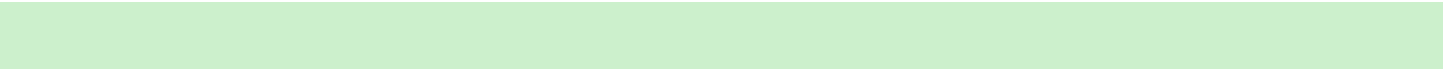
Standard Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only	Final Slope	Final Intercept (PCE/hr)
Gore Road	3.50	4.50	30.00	20.00	40.00	25.00		0.579	1357.445
Hamilton Road EB	7.00	8.00	30.00	20.00	55.00	25.00		0.723	2436.345
Hamilton Road WB	7.00	8.00	30.00	20.00	55.00	25.00		0.723	2436.345

Overview: Time Segment Results

Time Segment Results

Time Segment	Arm	Demand (PCE/hr)	Capacity (PCE/hr)	RFC	Pedestrian Demand (Ped/hr)	Start Queue (PCE)	End Queue (PCE)	Queueing Total Delay (PCE-min)	Geometric Total Delay (PCE-min)	Average Delay Per Arriving Vehicle (s)
1	Gore Road	350.83	1172.28	0.299	0.00	0.00	0.45	6.49	(0.02)	4.583
1	Hamilton Road EB	686.60	2312.47	0.297	0.00	0.00	0.44	6.52	(0.02)	2.320
1	Hamilton Road WB	222.84	2097.92	0.106	0.00	0.00	0.12	1.84	(0.02)	2.015
2	Gore Road	418.92	1149.26	0.365	0.00	0.45	0.60	8.76	(0.02)	5.167
2	Hamilton Road EB	819.87	2312.06	0.355	0.00	0.44	0.57	8.50	(0.02)	2.532
2	Hamilton Road WB	266.10	2055.38	0.129	0.00	0.12	0.16	2.31	(0.02)	2.112
3	Gore Road	513.08	1117.75	0.459	0.00	0.60	0.88	12.80	(0.02)	6.228
3	Hamilton Road EB	1004.13	2311.51	0.434	0.00	0.57	0.80	11.83	(0.02)	2.888
3	Hamilton Road WB	325.90	1997.22	0.163	0.00	0.16	0.20	3.03	(0.02)	2.261
4	Gore Road	513.08	1117.65	0.459	0.00	0.88	0.89	13.25	(0.02)	6.251
4	Hamilton Road EB	1004.13	2311.50	0.434	0.00	0.80	0.80	12.05	(0.02)	2.890
4	Hamilton Road WB	325.90	1996.93	0.163	0.00	0.20	0.20	3.07	(0.02)	2.261
5	Gore Road	418.92	1149.10	0.365	0.00	0.89	0.61	9.36	(0.02)	5.194
5	Hamilton Road EB	819.87	2312.05	0.355	0.00	0.80	0.58	8.82	(0.02)	2.537
5	Hamilton Road WB	266.10	2054.93	0.129	0.00	0.20	0.16	2.37	(0.02)	2.114
6	Gore Road	350.83	1171.95	0.299	0.00	0.61	0.45	6.92	(0.02)	4.610
6	Hamilton Road EB	686.60	2312.46	0.297	0.00	0.58	0.45	6.76	(0.02)	2.327
6	Hamilton Road WB	222.84	2097.19	0.106	0.00	0.16	0.13	1.89	(0.02)	2.016



A4 - Dual Lane Hamilton 85% - D1 - 2035, AM

Data Errors and Warnings
No errors or warnings

Analysis Set Details

Name	Description	Include In Report	Use Specific Demand Set	Demand Set	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
Dual Lane Hamilton 85%		Yes		(D1)		100.000	85.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Locked	Run Automatically	Use Relationship	Relationship	Start Time (HH:mm)	Finish Time (HH:mm)	Time Period Length (min)	Time Segment Length (min)	Traffic Profile Type
2035, AM	2035	AM			Yes			07:45	09:15	90	15	ONE HOUR

Roundabout Network

Roundabout Type(s)

ID	Name	Arm Order	Roundabout Type	Grade Separated	Large Roundabout	Do Geometric Delay
1	Hamilton & Gore	1,2,3	Standard			

Roundabout Network Options

Driving Side	Lighting	Road Surface	In London
Right	Normal/unknown	((Mini-roundabouts only))	

Arms

Arms

ID	Name	Description
1	Gore Road	
2	Hamilton Road EB	
3	Hamilton Road WB	

Capacity Options

Arm	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
Gore Road	0.00	99999.00		0.00
Hamilton Road EB	0.00	99999.00		0.00
Hamilton Road WB	0.00	99999.00		0.00

Standard Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
Gore Road	3.50	4.50	30.00	20.00	40.00	25.00	
Hamilton Road EB	7.00	8.00	30.00	20.00	55.00	25.00	
Hamilton Road WB	7.00	8.00	30.00	20.00	55.00	25.00	

Pedestrian Crossings

Arm	Crossing Type
Gore Road	None
Hamilton Road EB	None
Hamilton Road WB	None

Arm Slope/ Intercept and Capacity

Slope and Intercept used in model

Arm	Enter Directly	Slope	Intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
Gore Road		((calculated))	((calculated))	0.579	1357.445
Hamilton Road EB		((calculated))	((calculated))	0.723	2436.345
Hamilton Road WB		((calculated))	((calculated))	0.723	2436.345

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

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		Yes	Yes	Truck Percentages	2.00				Yes	Yes

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCE/hr)	Flow Scaling Factor (%)	PHF
Gore Road	ONE HOUR	Yes	301.00	100.000	N/A
Hamilton Road EB	ONE HOUR	Yes	567.00	100.000	N/A
Hamilton Road WB	ONE HOUR	Yes	457.00	100.000	N/A

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCE/hr)	DirectDemandEntryFlowInPCE (PCE/hr)	Direct Demand Exit Flow (PCE/hr)	Direct Demand Pedestrian Flow (Ped/hr)
1	Gore Road	226.61	226.61	N/A	N/A
1	Hamilton Road EB	426.87	426.87	N/A	N/A
1	Hamilton Road WB	344.05	344.05	N/A	N/A
2	Gore Road	270.59	270.59	N/A	N/A
2	Hamilton Road EB	509.72	509.72	N/A	N/A
2	Hamilton Road WB	410.83	410.83	N/A	N/A
3	Gore Road	331.41	331.41	N/A	N/A
3	Hamilton Road EB	624.28	624.28	N/A	N/A
3	Hamilton Road WB	503.17	503.17	N/A	N/A
4	Gore Road	331.41	331.41	N/A	N/A
4	Hamilton Road EB	624.28	624.28	N/A	N/A

4	Hamilton Road WB	503.17	503.17	N/A	N/A
5	Gore Road	270.59	270.59	N/A	N/A
5	Hamilton Road EB	509.72	509.72	N/A	N/A
5	Hamilton Road WB	410.83	410.83	N/A	N/A
6	Gore Road	226.61	226.61	N/A	N/A
6	Hamilton Road EB	426.87	426.87	N/A	N/A
6	Hamilton Road WB	344.05	344.05	N/A	N/A

Turning Proportions

Turning Counts or Proportions (PCE/hr) - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	0.000	295.000	6.000
	2	394.000	0.000	173.000
	3	25.000	432.000	0.000

Turning Proportions (PCE) - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	0.00	0.98	0.02
	2	0.69	0.00	0.31
	3	0.05	0.95	0.00

Vehicle Mix

Average PCE Per Vehicle - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	1.050	1.050	1.050
	2	1.050	1.050	1.050
	3	1.050	1.050	1.050

Truck Percentages - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	5.000	5.000	5.000
	2	5.000	5.000	5.000
	3	5.000	5.000	5.000

Results

Results Summary

Arm	Max RFC	Max Delay (s)	Max Queue (PCE)	Max LOS	Total Demand (PCE/hr)	Total Arrivals (PCE)	Total Queueing Delay (PCE-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCE-min/min)	Inclusive Queueing Total Delay (PCE-min)	Inclusive Queueing Average Delay (s)	Slope	Intercept (PCE/hr)
Gore Road	0.36	6.42	0.59	A	276.20	414.30	38.95	5.64	0.43	38.95	5.64	0.579	1357.445
Hamilton Road EB	0.30	2.62	0.45	A	520.29	780.43	31.99	2.46	0.36	31.99	2.46	0.723	2436.345
Hamilton Road WB	0.28	2.90	0.41	A	419.35	629.03	28.03	2.67	0.31	28.03	2.67	0.723	2436.345
						1824	98.97	3.26					

Main Results

Main results: (7:45 AM-8:00 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	226.61	56.65	225.38	314.64	324.35	0.00	994.27	600.56	0.228	0.00	0.31
Hamilton Road EB	426.87	106.72	425.78	545.24	4.49	0.00	2068.13	2063.54	0.206	0.00	0.27
Hamilton Road WB	344.05	86.01	343.12	134.40	295.87	0.00	1889.08	1189.74	0.182	0.00	0.23

Main results: (8:00 AM-8:15 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	270.59	67.65	270.20	376.46	388.11	0.00	962.90	600.56	0.281	0.31	0.41
Hamilton Road EB	509.72	127.43	509.44	652.92	5.39	0.00	2067.58	2063.54	0.247	0.27	0.34
Hamilton Road WB	410.83	102.71	410.57	160.82	354.00	0.00	1853.36	1189.74	0.222	0.23	0.30

Main results: (8:15 AM-8:30 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	331.41	82.85	330.70	461.00	475.24	0.00	920.04	600.56	0.360	0.41	0.58
Hamilton Road EB	624.28	156.07	623.84	799.34	6.59	0.00	2066.84	2063.54	0.302	0.34	0.45
Hamilton Road WB	503.17	125.79	502.74	196.93	433.50	0.00	1804.51	1189.74	0.279	0.30	0.40

Main results: (8:30 AM-8:45 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	331.41	82.85	331.39	461.32	475.64	0.00	919.84	600.56	0.360	0.58	0.59
Hamilton Road EB	624.28	156.07	624.27	800.43	6.61	0.00	2066.83	2063.54	0.302	0.45	0.45
Hamilton Road WB	503.17	125.79	503.16	197.08	433.80	0.00	1804.32	1189.74	0.279	0.40	0.41

Main results: (8:45 AM-9:00 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	270.59	67.65	271.29	377.00	388.76	0.00	962.58	600.56	0.281	0.59	0.41
Hamilton Road EB	509.72	127.43	510.16	654.64	5.41	0.00	2067.57	2063.54	0.247	0.45	0.34
Hamilton Road WB	410.83	102.71	411.25	161.06	354.50	0.00	1853.05	1189.74	0.222	0.41	0.30

Main results: (9:00 AM-9:15 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	226.61	56.65	227.02	315.66	325.48	0.00	993.71	600.56	0.228	0.41	0.31
Hamilton Road EB	426.87	106.72	427.15	547.97	4.53	0.00	2068.11	2063.54	0.206	0.34	0.27
Hamilton Road WB	344.05	86.01	344.32	134.86	296.82	0.00	1888.49	1189.74	0.182	0.30	0.23

Queueing Delay Results

Queueing Delay results: (7:45 AM-8:00 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	4.49	0.30	4.908	A	A
Hamilton Road EB	4.02	0.27	2.300	A	A
Hamilton Road WB	3.44	0.23	2.444	A	A

Queueing Delay results: (8:00 AM-8:15 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	5.98	0.40	5.455	A	A
Hamilton Road EB	5.08	0.34	2.425	A	A
Hamilton Road WB	4.42	0.29	2.619	A	A

Queueing Delay results: (8:15 AM-8:30 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	8.54	0.57	6.405	A	A
Hamilton Road EB	6.70	0.45	2.619	A	A
Hamilton Road WB	5.98	0.40	2.904	A	A

Queueing Delay results: (8:30 AM-8:45 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	8.80	0.59	6.423	A	A
Hamilton Road EB	6.80	0.45	2.619	A	A
Hamilton Road WB	6.07	0.40	2.904	A	A

Queueing Delay results: (8:45 AM-9:00 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	6.36	0.42	5.472	A	A
Hamilton Road EB	5.24	0.35	2.429	A	A
Hamilton Road WB	4.56	0.30	2.621	A	A

Queueing Delay results: (9:00 AM-9:15 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	4.78	0.32	4.934	A	A
Hamilton Road EB	4.15	0.28	2.305	A	A
Hamilton Road WB	3.56	0.24	2.447	A	A

Queue Variation Results

Queue Variation results: (7:45 AM-8:00 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.31	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.27	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.23	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (8:00 AM-8:15 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.41	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.34	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.30	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (8:15 AM-8:30 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.58	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.45	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.40	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (8:30 AM-8:45 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.59	0.00	0.00	0.00	1.05			N/A	N/A
Hamilton Road EB	0.45	0.00	0.00	0.00	1.05			N/A	N/A
Hamilton Road WB	0.41	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (8:45 AM-9:00 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.41	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.34	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.30	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (9:00 AM-9:15 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.31	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.27	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.23	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Overview: Standard Roundabout Geometry

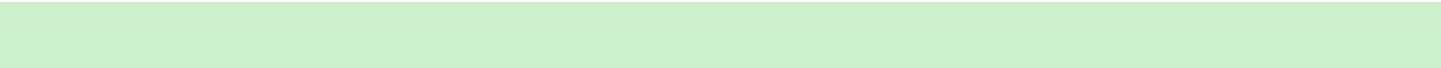
Standard Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only	Final Slope	Final Intercept (PCE/hr)
Gore Road	3.50	4.50	30.00	20.00	40.00	25.00		0.579	1357.445
Hamilton Road EB	7.00	8.00	30.00	20.00	55.00	25.00		0.723	2436.345
Hamilton Road WB	7.00	8.00	30.00	20.00	55.00	25.00		0.723	2436.345

Overview: Time Segment Results

Time Segment Results

Time Segment	Arm	Demand (PCE/hr)	Capacity (PCE/hr)	RFC	Pedestrian Demand (Ped/hr)	Start Queue (PCE)	End Queue (PCE)	Queueing Total Delay (PCE-min)	Geometric Total Delay (PCE-min)	Average Delay Per Arriving Vehicle (s)
1	Gore Road	226.61	994.27	0.228	0.00	0.00	0.31	4.49	(0.02)	4.908
1	Hamilton Road EB	426.87	2068.13	0.206	0.00	0.00	0.27	4.02	(0.02)	2.300
1	Hamilton Road WB	344.05	1889.08	0.182	0.00	0.00	0.23	3.44	(0.02)	2.444
2	Gore Road	270.59	962.90	0.281	0.00	0.31	0.41	5.98	(0.02)	5.455
2	Hamilton Road EB	509.72	2067.58	0.247	0.00	0.27	0.34	5.08	(0.02)	2.425
2	Hamilton Road WB	410.83	1853.36	0.222	0.00	0.23	0.30	4.42	(0.02)	2.619
3	Gore Road	331.41	920.04	0.360	0.00	0.41	0.58	8.54	(0.02)	6.405
3	Hamilton Road EB	624.28	2066.84	0.302	0.00	0.34	0.45	6.70	(0.02)	2.619
3	Hamilton Road WB	503.17	1804.51	0.279	0.00	0.30	0.40	5.98	(0.02)	2.904
4	Gore Road	331.41	919.84	0.360	0.00	0.58	0.59	8.80	(0.02)	6.423
4	Hamilton Road EB	624.28	2066.83	0.302	0.00	0.45	0.45	6.80	(0.02)	2.619
4	Hamilton Road WB	503.17	1804.32	0.279	0.00	0.40	0.41	6.07	(0.02)	2.904
5	Gore Road	270.59	962.58	0.281	0.00	0.59	0.41	6.36	(0.02)	5.472
5	Hamilton Road EB	509.72	2067.57	0.247	0.00	0.45	0.34	5.24	(0.02)	2.429
5	Hamilton Road WB	410.83	1853.05	0.222	0.00	0.41	0.30	4.56	(0.02)	2.621
6	Gore Road	226.61	993.71	0.228	0.00	0.41	0.31	4.78	(0.02)	4.934
6	Hamilton Road EB	426.87	2068.11	0.206	0.00	0.34	0.27	4.15	(0.02)	2.305
6	Hamilton Road WB	344.05	1888.49	0.182	0.00	0.30	0.23	3.56	(0.02)	2.447



A4 - Dual Lane Hamilton 85% - D2 - 2035, PM

Data Errors and Warnings
No errors or warnings

Analysis Set Details

Name	Description	Include In Report	Use Specific Demand Set	Demand Set	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
Dual Lane Hamilton 85%		Yes		(D1)		100.000	85.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Locked	Run Automatically	Use Relationship	Relationship	Start Time (HH:mm)	Finish Time (HH:mm)	Time Period Length (min)	Time Segment Length (min)	Traffic Profile Type
2035, PM	2035	PM			Yes			16:45	18:15	90	15	ONE HOUR

Roundabout Network

Roundabout Type(s)

ID	Name	Arm Order	Roundabout Type	Grade Separated	Large Roundabout	Do Geometric Delay
1	Hamilton & Gore	1,2,3	Standard			

Roundabout Network Options

Driving Side	Lighting	Road Surface	In London
Right	Normal/unknown	((Mini-roundabouts only))	

Arms

Arms

ID	Name	Description
1	Gore Road	
2	Hamilton Road EB	
3	Hamilton Road WB	

Capacity Options

Arm	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
Gore Road	0.00	99999.00		0.00
Hamilton Road EB	0.00	99999.00		0.00
Hamilton Road WB	0.00	99999.00		0.00

Standard Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
Gore Road	3.50	4.50	30.00	20.00	40.00	25.00	
Hamilton Road EB	7.00	8.00	30.00	20.00	55.00	25.00	
Hamilton Road WB	7.00	8.00	30.00	20.00	55.00	25.00	

Pedestrian Crossings

Arm	Crossing Type
Gore Road	None
Hamilton Road EB	None
Hamilton Road WB	None

Arm Slope/ Intercept and Capacity

Slope and Intercept used in model

Arm	Enter Directly	Slope	Intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
Gore Road		((calculated))	((calculated))	0.579	1357.445
Hamilton Road EB		((calculated))	((calculated))	0.723	2436.345
Hamilton Road WB		((calculated))	((calculated))	0.723	2436.345

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

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		Yes	Yes	Truck Percentages	2.00				Yes	Yes

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCE/hr)	Flow Scaling Factor (%)	PHF
Gore Road	ONE HOUR	Yes	466.00	100.000	N/A
Hamilton Road EB	ONE HOUR	Yes	912.00	100.000	N/A
Hamilton Road WB	ONE HOUR	Yes	296.00	100.000	N/A

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCE/hr)	DirectDemandEntryFlowInPCE (PCE/hr)	Direct Demand Exit Flow (PCE/hr)	Direct Demand Pedestrian Flow (Ped/hr)
1	Gore Road	350.83	350.83	N/A	N/A
1	Hamilton Road EB	686.60	686.60	N/A	N/A
1	Hamilton Road WB	222.84	222.84	N/A	N/A
2	Gore Road	418.92	418.92	N/A	N/A
2	Hamilton Road EB	819.87	819.87	N/A	N/A
2	Hamilton Road WB	266.10	266.10	N/A	N/A
3	Gore Road	513.08	513.08	N/A	N/A
3	Hamilton Road EB	1004.13	1004.13	N/A	N/A
3	Hamilton Road WB	325.90	325.90	N/A	N/A
4	Gore Road	513.08	513.08	N/A	N/A
4	Hamilton Road EB	1004.13	1004.13	N/A	N/A

4	Hamilton Road WB	325.90	325.90	N/A	N/A
5	Gore Road	418.92	418.92	N/A	N/A
5	Hamilton Road EB	819.87	819.87	N/A	N/A
5	Hamilton Road WB	266.10	266.10	N/A	N/A
6	Gore Road	350.83	350.83	N/A	N/A
6	Hamilton Road EB	686.60	686.60	N/A	N/A
6	Hamilton Road WB	222.84	222.84	N/A	N/A

Turning Proportions

Turning Counts or Proportions (PCE/hr) - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	0.000	462.000	4.000
	2	420.000	0.000	492.000
	3	12.000	284.000	0.000

Turning Proportions (PCE) - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	0.00	0.99	0.01
	2	0.46	0.00	0.54
	3	0.04	0.96	0.00

Vehicle Mix

Average PCE Per Vehicle - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	1.050	1.050	1.050
	2	1.050	1.050	1.050
	3	1.050	1.050	1.050

Truck Percentages - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	5.000	5.000	5.000
	2	5.000	5.000	5.000
	3	5.000	5.000	5.000

Results

Results Summary

Arm	Max RFC	Max Delay (s)	Max Queue (PCE)	Max LOS	Total Demand (PCE/hr)	Total Arrivals (PCE)	Total Queueing Delay (PCE-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCE-min/min)	Inclusive Queueing Total Delay (PCE-min)	Inclusive Queueing Average Delay (s)	Slope	Intercept (PCE/hr)
Gore Road	0.51	7.76	1.10	A	427.61	641.41	69.61	6.51	0.77	69.62	6.51	0.579	1357.445
Hamilton Road EB	0.49	3.55	0.99	A	836.87	1255.30	65.55	3.13	0.73	65.55	3.13	0.723	2436.345
Hamilton Road WB	0.18	2.59	0.23	A	271.61	407.42	16.53	2.44	0.18	16.54	2.44	0.723	2436.345
						2004	151.69	4.54					

Main Results

Main results: (4:45 PM-5:00 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	350.83	87.71	348.74	324.25	213.27	0.00	1048.91	452.63	0.334	0.00	0.52
Hamilton Road EB	686.60	171.65	684.52	559.01	2.99	0.00	2069.05	2068.51	0.332	0.00	0.52
Hamilton Road WB	222.84	55.71	222.28	372.28	315.24	0.00	1877.17	1485.51	0.119	0.00	0.14

Main results: (5:00 PM-5:15 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	418.92	104.73	418.16	388.05	255.17	0.00	1028.30	452.66	0.407	0.52	0.71
Hamilton Road EB	819.87	204.97	819.20	669.74	3.59	0.00	2068.69	2068.51	0.396	0.52	0.69
Hamilton Road WB	266.10	66.52	265.95	445.53	377.26	0.00	1839.06	1485.51	0.145	0.14	0.18

Main results: (5:15 PM-5:30 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	513.08	128.27	511.58	475.08	312.47	0.00	1000.11	452.66	0.513	0.71	1.09
Hamilton Road EB	1004.13	251.03	1002.94	819.66	4.39	0.00	2068.19	2068.51	0.486	0.69	0.98
Hamilton Road WB	325.90	81.48	325.68	545.45	461.88	0.00	1787.06	1485.51	0.182	0.18	0.23

Main results: (5:30 PM-5:45 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	513.08	128.27	513.04	475.63	312.69	0.00	1000.00	452.66	0.513	1.09	1.10
Hamilton Road EB	1004.13	251.03	1004.12	821.32	4.40	0.00	2068.19	2068.51	0.486	0.98	0.99
Hamilton Road WB	325.90	81.48	325.90	546.10	462.42	0.00	1786.73	1485.51	0.182	0.23	0.23

Main results: (5:45 PM-6:00 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	418.92	104.73	420.39	388.91	255.52	0.00	1028.12	452.66	0.407	1.10	0.73
Hamilton Road EB	819.87	204.97	821.05	672.31	3.61	0.00	2068.68	2068.51	0.396	0.99	0.69
Hamilton Road WB	266.10	66.52	266.32	446.54	378.11	0.00	1838.54	1485.51	0.145	0.23	0.18

Main results: (6:00 PM-6:15 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	350.83	87.71	351.62	325.55	213.95	0.00	1048.58	452.63	0.335	0.73	0.53
Hamilton Road EB	686.60	171.65	687.28	562.55	3.02	0.00	2069.04	2068.51	0.332	0.69	0.52
Hamilton Road WB	222.84	55.71	222.99	373.79	316.51	0.00	1876.40	1485.51	0.119	0.18	0.14

Queueing Delay Results

Queueing Delay results: (4:45 PM-5:00 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	7.59	0.51	5.382	A	A
Hamilton Road EB	7.64	0.51	2.727	A	A
Hamilton Road WB	2.09	0.14	2.284	A	A

Queueing Delay results: (5:00 PM-5:15 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	10.43	0.70	6.187	A	A
Hamilton Road EB	10.12	0.67	3.023	A	A
Hamilton Road WB	2.63	0.18	2.402	A	A

Queueing Delay results: (5:15 PM-5:30 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	15.71	1.05	7.714	A	A
Hamilton Road EB	14.44	0.96	3.545	A	A
Hamilton Road WB	3.46	0.23	2.586	A	A

Queueing Delay results: (5:30 PM-5:45 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	16.40	1.09	7.761	A	A
Hamilton Road EB	14.79	0.99	3.551	A	A
Hamilton Road WB	3.50	0.23	2.587	A	A

Queueing Delay results: (5:45 PM-6:00 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	11.31	0.75	6.234	A	A
Hamilton Road EB	10.59	0.71	3.031	A	A
Hamilton Road WB	2.70	0.18	2.404	A	A

Queueing Delay results: (6:00 PM-6:15 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	8.19	0.55	5.429	A	A
Hamilton Road EB	7.97	0.53	2.738	A	A
Hamilton Road WB	2.15	0.14	2.286	A	A

Queue Variation Results

Queue Variation results: (4:45 PM-5:00 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.52	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.52	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.14	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (5:00 PM-5:15 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.71	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.69	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.18	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (5:15 PM-5:30 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	1.09	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.98	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.23	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (5:30 PM-5:45 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	1.10	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.99	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.23	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (5:45 PM-6:00 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.73	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.69	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.18	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (6:00 PM-6:15 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.53	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.52	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.14	N/A	N/A	N/A	N/A	Percentiles could		N/A	N/A

						not be calculated			
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Overview: Standard Roundabout Geometry

Standard Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only	Final Slope	Final Intercept (PCE/hr)
Gore Road	3.50	4.50	30.00	20.00	40.00	25.00		0.579	1357.445
Hamilton Road EB	7.00	8.00	30.00	20.00	55.00	25.00		0.723	2436.345
Hamilton Road WB	7.00	8.00	30.00	20.00	55.00	25.00		0.723	2436.345

Overview: Time Segment Results

Time Segment Results

Time Segment	Arm	Demand (PCE/hr)	Capacity (PCE/hr)	RFC	Pedestrian Demand (Ped/hr)	Start Queue (PCE)	End Queue (PCE)	Queueing Total Delay (PCE-min)	Geometric Total Delay (PCE-min)	Average Delay Per Arriving Vehicle (s)
1	Gore Road	350.83	1048.91	0.334	0.00	0.00	0.52	7.59	(0.02)	5.382
1	Hamilton Road EB	686.60	2069.05	0.332	0.00	0.00	0.52	7.64	(0.02)	2.727
1	Hamilton Road WB	222.84	1877.17	0.119	0.00	0.00	0.14	2.09	(0.02)	2.284
2	Gore Road	418.92	1028.30	0.407	0.00	0.52	0.71	10.43	(0.02)	6.187
2	Hamilton Road EB	819.87	2068.69	0.396	0.00	0.52	0.69	10.12	(0.02)	3.023
2	Hamilton Road WB	266.10	1839.06	0.145	0.00	0.14	0.18	2.63	(0.02)	2.402
3	Gore Road	513.08	1000.11	0.513	0.00	0.71	1.09	15.71	(0.02)	7.714
3	Hamilton Road EB	1004.13	2068.19	0.486	0.00	0.69	0.98	14.44	(0.02)	3.545
3	Hamilton Road WB	325.90	1787.06	0.182	0.00	0.18	0.23	3.46	(0.02)	2.586
4	Gore Road	513.08	1000.00	0.513	0.00	1.09	1.10	16.40	(0.02)	7.761
4	Hamilton Road EB	1004.13	2068.19	0.486	0.00	0.98	0.99	14.79	(0.02)	3.551
4	Hamilton Road WB	325.90	1786.73	0.182	0.00	0.23	0.23	3.50	(0.02)	2.587
5	Gore Road	418.92	1028.12	0.407	0.00	1.10	0.73	11.31	(0.02)	6.234
5	Hamilton Road EB	819.87	2068.68	0.396	0.00	0.99	0.69	10.59	(0.02)	3.031
5	Hamilton Road WB	266.10	1838.54	0.145	0.00	0.23	0.18	2.70	(0.02)	2.404
6	Gore Road	350.83	1048.58	0.335	0.00	0.73	0.53	8.19	(0.02)	5.429
6	Hamilton Road EB	686.60	2069.04	0.332	0.00	0.69	0.52	7.97	(0.02)	2.738
6	Hamilton Road WB	222.84	1876.40	0.119	0.00	0.18	0.14	2.15	(0.02)	2.286

A5 - Dual Lane Hamilton EB Only 95% - D1 - 2035, AM

Data Errors and Warnings
No errors or warnings

Analysis Set Details

Name	Description	Include In Report	Use Specific Demand Set	Demand Set	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
Dual Lane Hamilton EB Only 95%		Yes		(D1)		100.000	95.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Locked	Run Automatically	Use Relationship	Relationship	Start Time (HH:mm)	Finish Time (HH:mm)	Time Period Length (min)	Time Segment Length (min)	Traffic Profile Type
2035, AM	2035	AM			Yes			07:45	09:15	90	15	ONE HOUR

Roundabout Network

Roundabout Type(s)

ID	Name	Arm Order	Roundabout Type	Grade Separated	Large Roundabout	Do Geometric Delay
1	Hamilton & Gore	1,2,3	Standard			

Roundabout Network Options

Driving Side	Lighting	Road Surface	In London
Right	Normal/unknown	((Mini-roundabouts only))	

Arms

Arms

ID	Name	Description
1	Gore Road	
2	Hamilton Road EB	
3	Hamilton Road WB	

Capacity Options

Arm	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
Gore Road	0.00	99999.00		0.00
Hamilton Road EB	0.00	99999.00		0.00
Hamilton Road WB	0.00	99999.00		0.00

Standard Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
Gore Road	3.50	4.50	30.00	20.00	40.00	25.00	
Hamilton Road EB	7.00	8.00	30.00	20.00	55.00	25.00	

Hamilton Road WB	3.50	4.50	30.00	20.00	40.00	25.00	
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Pedestrian Crossings

Arm	Crossing Type
Gore Road	None
Hamilton Road EB	None
Hamilton Road WB	None

Arm Slope/ Intercept and Capacity

Slope and Intercept used in model

Arm	Enter Directly	Slope	Intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
Gore Road		((calculated))	((calculated))	0.579	1357.445
Hamilton Road EB		((calculated))	((calculated))	0.723	2436.345
Hamilton Road WB		((calculated))	((calculated))	0.579	1357.445

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

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		Yes	Yes	Truck Percentages	2.00				Yes	Yes

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCE/hr)	Flow Scaling Factor (%)	PHF
Gore Road	ONE HOUR	Yes	301.00	100.000	N/A
Hamilton Road EB	ONE HOUR	Yes	567.00	100.000	N/A
Hamilton Road WB	ONE HOUR	Yes	457.00	100.000	N/A

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCE/hr)	DirectDemandEntryFlowInPCE (PCE/hr)	Direct Demand Exit Flow (PCE/hr)	Direct Demand Pedestrian Flow (Ped/hr)
1	Gore Road	226.61	226.61	N/A	N/A
1	Hamilton Road EB	426.87	426.87	N/A	N/A
1	Hamilton Road WB	344.05	344.05	N/A	N/A
2	Gore Road	270.59	270.59	N/A	N/A
2	Hamilton Road EB	509.72	509.72	N/A	N/A
2	Hamilton Road WB	410.83	410.83	N/A	N/A
3	Gore Road	331.41	331.41	N/A	N/A
3	Hamilton Road EB	624.28	624.28	N/A	N/A

3	Hamilton Road WB	503.17	503.17	N/A	N/A
4	Gore Road	331.41	331.41	N/A	N/A
4	Hamilton Road EB	624.28	624.28	N/A	N/A
4	Hamilton Road WB	503.17	503.17	N/A	N/A
5	Gore Road	270.59	270.59	N/A	N/A
5	Hamilton Road EB	509.72	509.72	N/A	N/A
5	Hamilton Road WB	410.83	410.83	N/A	N/A
6	Gore Road	226.61	226.61	N/A	N/A
6	Hamilton Road EB	426.87	426.87	N/A	N/A
6	Hamilton Road WB	344.05	344.05	N/A	N/A

Turning Proportions

Turning Counts or Proportions (PCE/hr) - Hamilton & Gore (for whole period)

	To		
	1	2	3
From	1	0.000	295.000
	2	394.000	0.000
	3	25.000	432.000

Turning Proportions (PCE) - Hamilton & Gore (for whole period)

	To		
	1	2	3
From	1	0.00	0.98
	2	0.69	0.00
	3	0.05	0.95

Vehicle Mix

Average PCE Per Vehicle - Hamilton & Gore (for whole period)

	To		
	1	2	3
From	1	1.050	1.050
	2	1.050	1.050
	3	1.050	1.050

Truck Percentages - Hamilton & Gore (for whole period)

	To		
	1	2	3
From	1	5.000	5.000
	2	5.000	5.000
	3	5.000	5.000

Results

Results Summary

Arm	Max RFC	Max Delay (s)	Max Queue (PCE)	Max LOS	Total Demand (PCE/hr)	Total Arrivals (PCE)	Total Queueing Delay (PCE-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCE-min/min)	Inclusive Queueing Total Delay (PCE-min)	Inclusive Queueing Average Delay (s)	Slope	Intercept (PCE/hr)
Gore Road	0.32	5.42	0.50	A	276.20	414.30	33.34	4.83	0.37	33.35	4.83	0.579	1357.445
Hamilton Road EB	0.27	2.24	0.39	A	520.29	780.43	27.61	2.12	0.31	27.61	2.12	0.723	2436.345
Hamilton Road WB	0.48	6.90	0.96	A	419.35	629.03	60.88	5.81	0.68	60.89	5.81	0.579	1357.445
						1824	121.83	4.01					

Main Results

Main results: (7:45 AM-8:00 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	226.61	56.65	225.54	314.69	323.50	0.00	1111.71	1076.01	0.204	0.00	0.27
Hamilton Road EB	426.87	106.72	425.92	544.54	4.50	0.00	2311.44	2299.80	0.185	0.00	0.24
Hamilton Road WB	344.05	86.01	342.22	134.45	295.96	0.00	1126.85	410.91	0.305	0.00	0.46

Main results: (8:00 AM-8:15 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	270.59	67.65	270.26	376.47	387.73	0.00	1076.39	1076.01	0.251	0.27	0.35
Hamilton Road EB	509.72	127.43	509.48	652.60	5.39	0.00	2310.83	2299.80	0.221	0.24	0.30
Hamilton Road WB	410.83	102.71	410.17	160.84	354.03	0.00	1094.92	410.91	0.375	0.46	0.62

Main results: (8:15 AM-8:30 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	331.41	82.85	330.83	461.00	474.41	0.00	1028.73	1076.01	0.322	0.35	0.49
Hamilton Road EB	624.28	156.07	623.91	798.64	6.59	0.00	2310.00	2299.80	0.270	0.30	0.39
Hamilton Road WB	503.17	125.79	501.86	196.96	433.55	0.00	1051.20	410.91	0.479	0.62	0.95

Main results: (8:30 AM-8:45 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	331.41	82.85	331.40	461.32	475.62	0.00	1028.07	1076.01	0.322	0.49	0.50
Hamilton Road EB	624.28	156.07	624.28	800.41	6.61	0.00	2309.99	2299.80	0.270	0.39	0.39
Hamilton Road WB	503.17	125.79	503.14	197.08	433.80	0.00	1051.06	410.91	0.479	0.95	0.96

Main results: (8:45 AM-9:00 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	270.59	67.65	271.16	376.99	389.57	0.00	1075.38	1076.01	0.252	0.50	0.36
Hamilton Road EB	509.72	127.43	510.08	655.33	5.41	0.00	2310.82	2299.80	0.221	0.39	0.30
Hamilton Road WB	410.83	102.71	412.12	161.04	354.45	0.00	1094.69	410.91	0.375	0.96	0.64

Main results: (9:00 AM-9:15 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	226.61	56.65	226.95	315.65	325.88	0.00	1110.40	1076.01	0.204	0.36	0.27
Hamilton Road EB	426.87	106.72	427.11	548.30	4.52	0.00	2311.42	2299.80	0.185	0.30	0.24
Hamilton Road WB	344.05	86.01	344.74	134.84	296.79	0.00	1126.39	410.91	0.305	0.64	0.47

Queueing Delay Results

Queueing Delay results: (7:45 AM-8:00 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	3.91	0.26	4.260	A	A
Hamilton Road EB	3.51	0.23	2.003	A	A
Hamilton Road WB	6.67	0.44	4.807	A	A

Queueing Delay results: (8:00 AM-8:15 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	5.16	0.34	4.686	A	A
Hamilton Road EB	4.40	0.29	2.098	A	A
Hamilton Road WB	9.15	0.61	5.514	A	A

Queueing Delay results: (8:15 AM-8:30 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	7.25	0.48	5.411	A	A
Hamilton Road EB	5.75	0.38	2.241	A	A
Hamilton Road WB	13.78	0.92	6.864	A	A

Queueing Delay results: (8:30 AM-8:45 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	7.44	0.50	5.425	A	A
Hamilton Road EB	5.82	0.39	2.242	A	A
Hamilton Road WB	14.32	0.95	6.898	A	A

Queueing Delay results: (8:45 AM-9:00 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	5.45	0.36	4.703	A	A
Hamilton Road EB	4.52	0.30	2.099	A	A
Hamilton Road WB	9.83	0.66	5.549	A	A

Queueing Delay results: (9:00 AM-9:15 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	4.13	0.28	4.280	A	A
Hamilton Road EB	3.61	0.24	2.006	A	A
Hamilton Road WB	7.13	0.48	4.839	A	A

Queue Variation Results

Queue Variation results: (7:45 AM-8:00 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.27	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.24	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.46	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (8:00 AM-8:15 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.35	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.30	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.62	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (8:15 AM-8:30 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.49	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.39	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.95	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (8:30 AM-8:45 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.50	0.00	0.00	0.00	1.05			N/A	N/A
Hamilton Road EB	0.39	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.96	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (8:45 AM-9:00 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.36	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.30	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.64	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (9:00 AM-9:15 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.27	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.24	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.47	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Overview: Standard Roundabout Geometry

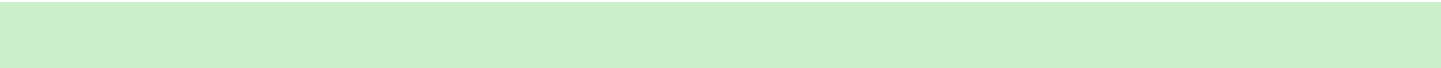
Standard Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only	Final Slope	Final Intercept (PCE/hr)
Gore Road	3.50	4.50	30.00	20.00	40.00	25.00		0.579	1357.445
Hamilton Road EB	7.00	8.00	30.00	20.00	55.00	25.00		0.723	2436.345
Hamilton Road WB	3.50	4.50	30.00	20.00	40.00	25.00		0.579	1357.445

Overview: Time Segment Results

Time Segment Results

Time Segment	Arm	Demand (PCE/hr)	Capacity (PCE/hr)	RFC	Pedestrian Demand (Ped/hr)	Start Queue (PCE)	End Queue (PCE)	Queueing Total Delay (PCE-min)	Geometric Total Delay (PCE-min)	Average Delay Per Arriving Vehicle (s)
1	Gore Road	226.61	1111.71	0.204	0.00	0.00	0.27	3.91	(0.02)	4.260
1	Hamilton Road EB	426.87	2311.44	0.185	0.00	0.00	0.24	3.51	(0.02)	2.003
1	Hamilton Road WB	344.05	1126.85	0.305	0.00	0.00	0.46	6.67	(0.02)	4.807
2	Gore Road	270.59	1076.39	0.251	0.00	0.27	0.35	5.16	(0.02)	4.686
2	Hamilton Road EB	509.72	2310.83	0.221	0.00	0.24	0.30	4.40	(0.02)	2.098
2	Hamilton Road WB	410.83	1094.92	0.375	0.00	0.46	0.62	9.15	(0.02)	5.514
3	Gore Road	331.41	1028.73	0.322	0.00	0.35	0.49	7.25	(0.02)	5.411
3	Hamilton Road EB	624.28	2310.00	0.270	0.00	0.30	0.39	5.75	(0.02)	2.241
3	Hamilton Road WB	503.17	1051.20	0.479	0.00	0.62	0.95	13.78	(0.02)	6.864
4	Gore Road	331.41	1028.07	0.322	0.00	0.49	0.50	7.44	(0.02)	5.425
4	Hamilton Road EB	624.28	2309.99	0.270	0.00	0.39	0.39	5.82	(0.02)	2.242
4	Hamilton Road WB	503.17	1051.06	0.479	0.00	0.95	0.96	14.32	(0.02)	6.898
5	Gore Road	270.59	1075.38	0.252	0.00	0.50	0.36	5.45	(0.02)	4.703
5	Hamilton Road EB	509.72	2310.82	0.221	0.00	0.39	0.30	4.52	(0.02)	2.099
5	Hamilton Road WB	410.83	1094.69	0.375	0.00	0.96	0.64	9.83	(0.02)	5.549
6	Gore Road	226.61	1110.40	0.204	0.00	0.36	0.27	4.13	(0.02)	4.280
6	Hamilton Road EB	426.87	2311.42	0.185	0.00	0.30	0.24	3.61	(0.02)	2.006
6	Hamilton Road WB	344.05	1126.39	0.305	0.00	0.64	0.47	7.13	(0.02)	4.839



A5 - Dual Lane Hamilton EB Only 95% - D2 - 2035, PM

Data Errors and Warnings
No errors or warnings

Analysis Set Details

Name	Description	Include In Report	Use Specific Demand Set	Demand Set	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
Dual Lane Hamilton EB Only 95%		Yes		(D1)		100.000	95.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Locked	Run Automatically	Use Relationship	Relationship	Start Time (HH:mm)	Finish Time (HH:mm)	Time Period Length (min)	Time Segment Length (min)	Traffic Profile Type
2035, PM	2035	PM			Yes			16:45	18:15	90	15	ONE HOUR

Roundabout Network

Roundabout Type(s)

ID	Name	Arm Order	Roundabout Type	Grade Separated	Large Roundabout	Do Geometric Delay
1	Hamilton & Gore	1,2,3	Standard			

Roundabout Network Options

Driving Side	Lighting	Road Surface	In London
Right	Normal/unknown	((Mini-roundabouts only))	

Arms

Arms

ID	Name	Description
1	Gore Road	
2	Hamilton Road EB	
3	Hamilton Road WB	

Capacity Options

Arm	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
Gore Road	0.00	99999.00		0.00
Hamilton Road EB	0.00	99999.00		0.00
Hamilton Road WB	0.00	99999.00		0.00

Standard Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
Gore Road	3.50	4.50	30.00	20.00	40.00	25.00	
Hamilton Road EB	7.00	8.00	30.00	20.00	55.00	25.00	

Hamilton Road WB	3.50	4.50	30.00	20.00	40.00	25.00	
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Pedestrian Crossings

Arm	Crossing Type
Gore Road	None
Hamilton Road EB	None
Hamilton Road WB	None

Arm Slope/ Intercept and Capacity

Slope and Intercept used in model

Arm	Enter Directly	Slope	Intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
Gore Road		((calculated))	((calculated))	0.579	1357.445
Hamilton Road EB		((calculated))	((calculated))	0.723	2436.345
Hamilton Road WB		((calculated))	((calculated))	0.579	1357.445

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

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		Yes	Yes	Truck Percentages	2.00				Yes	Yes

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCE/hr)	Flow Scaling Factor (%)	PHF
Gore Road	ONE HOUR	Yes	466.00	100.000	N/A
Hamilton Road EB	ONE HOUR	Yes	912.00	100.000	N/A
Hamilton Road WB	ONE HOUR	Yes	296.00	100.000	N/A

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCE/hr)	DirectDemandEntryFlowInPCE (PCE/hr)	Direct Demand Exit Flow (PCE/hr)	Direct Demand Pedestrian Flow (Ped/hr)
1	Gore Road	350.83	350.83	N/A	N/A
1	Hamilton Road EB	686.60	686.60	N/A	N/A
1	Hamilton Road WB	222.84	222.84	N/A	N/A
2	Gore Road	418.92	418.92	N/A	N/A
2	Hamilton Road EB	819.87	819.87	N/A	N/A
2	Hamilton Road WB	266.10	266.10	N/A	N/A
3	Gore Road	513.08	513.08	N/A	N/A
3	Hamilton Road EB	1004.13	1004.13	N/A	N/A

3	Hamilton Road WB	325.90	325.90	N/A	N/A
4	Gore Road	513.08	513.08	N/A	N/A
4	Hamilton Road EB	1004.13	1004.13	N/A	N/A
4	Hamilton Road WB	325.90	325.90	N/A	N/A
5	Gore Road	418.92	418.92	N/A	N/A
5	Hamilton Road EB	819.87	819.87	N/A	N/A
5	Hamilton Road WB	266.10	266.10	N/A	N/A
6	Gore Road	350.83	350.83	N/A	N/A
6	Hamilton Road EB	686.60	686.60	N/A	N/A
6	Hamilton Road WB	222.84	222.84	N/A	N/A

Turning Proportions

Turning Counts or Proportions (PCE/hr) - Hamilton & Gore (for whole period)

	To			
From		1	2	3
	1	0.000	462.000	4.000
	2	420.000	0.000	492.000
	3	12.000	284.000	0.000

Turning Proportions (PCE) - Hamilton & Gore (for whole period)

	To			
From		1	2	3
	1	0.00	0.99	0.01
	2	0.46	0.00	0.54
	3	0.04	0.96	0.00

Vehicle Mix

Average PCE Per Vehicle - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	1.050	1.050	1.050
	2	1.050	1.050	1.050
	3	1.050	1.050	1.050

Truck Percentages - Hamilton & Gore (for whole period)

	To			
From		1	2	3
	1	5.000	5.000	5.000
	2	5.000	5.000	5.000
	3	5.000	5.000	5.000

Results

Results Summary

Arm	Max RFC	Max Delay (s)	Max Queue (PCE)	Max LOS	Total Demand (PCE/hr)	Total Arrivals (PCE)	Total Queueing Delay (PCE-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCE-min/min)	Inclusive Queueing Total Delay (PCE-min)	Inclusive Queueing Average Delay (s)	Slope	Intercept (PCE/hr)
Gore Road	0.46	6.25	0.89	A	427.61	641.41	57.58	5.39	0.64	57.58	5.39	0.579	1357.445
Hamilton Road EB	0.43	2.89	0.80	A	836.87	1255.30	54.48	2.60	0.61	54.48	2.60	0.723	2436.345
Hamilton Road WB	0.31	5.33	0.48	A	271.61	407.42	32.33	4.76	0.36	32.33	4.76	0.579	1357.445
						2004	144.39	4.32					

Main Results

Main results: (4:45 PM-5:00 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	350.83	87.71	349.05	324.38	212.81	0.00	1172.56	917.72	0.299	0.00	0.45
Hamilton Road EB	686.60	171.65	684.83	558.86	3.00	0.00	2312.47	2309.12	0.297	0.00	0.44
Hamilton Road WB	222.84	55.71	221.80	372.45	315.38	0.00	1116.17	704.89	0.200	0.00	0.26

Main results: (5:00 PM-5:15 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	418.92	104.73	418.32	388.10	255.00	0.00	1149.37	917.72	0.364	0.45	0.60
Hamilton Road EB	819.87	204.97	819.34	669.73	3.59	0.00	2312.06	2309.12	0.355	0.44	0.57
Hamilton Road WB	266.10	66.52	265.78	445.60	377.33	0.00	1082.11	704.89	0.246	0.26	0.34

Main results: (5:15 PM-5:30 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	513.08	128.27	511.94	475.20	312.16	0.00	1117.94	917.72	0.459	0.60	0.88
Hamilton Road EB	1004.13	251.03	1003.22	819.71	4.39	0.00	2311.51	2309.12	0.434	0.57	0.80
Hamilton Road WB	325.90	81.48	325.35	545.61	462.01	0.00	1035.55	704.89	0.315	0.34	0.48

Main results: (5:30 PM-5:45 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	513.08	128.27	513.05	475.64	312.68	0.00	1117.65	917.72	0.459	0.88	0.89
Hamilton Road EB	1004.13	251.03	1004.12	821.33	4.40	0.00	2311.50	2309.12	0.434	0.80	0.80
Hamilton Road WB	325.90	81.48	325.89	546.10	462.42	0.00	1035.32	704.89	0.315	0.48	0.48

Main results: (5:45 PM-6:00 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	418.92	104.73	420.03	388.80	255.83	0.00	1148.91	917.72	0.365	0.89	0.61
Hamilton Road EB	819.87	204.97	820.77	672.26	3.61	0.00	2312.05	2309.12	0.355	0.80	0.58
Hamilton Road WB	266.10	66.52	266.64	446.39	377.99	0.00	1081.75	704.89	0.246	0.48	0.34

Main results: (6:00 PM-6:15 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	350.83	87.71	351.45	325.49	214.12	0.00	1171.84	917.72	0.299	0.61	0.45
Hamilton Road EB	686.60	171.65	687.14	562.56	3.02	0.00	2312.46	2309.12	0.297	0.58	0.45
Hamilton Road WB	222.84	55.71	223.17	373.71	316.45	0.00	1115.58	704.89	0.200	0.34	0.26

Queueing Delay Results

Queueing Delay results: (4:45 PM-5:00 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	6.49	0.43	4.581	A	A
Hamilton Road EB	6.52	0.43	2.320	A	A
Hamilton Road WB	3.81	0.25	4.222	A	A

Queueing Delay results: (5:00 PM-5:15 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	8.76	0.58	5.166	A	A
Hamilton Road EB	8.50	0.57	2.532	A	A
Hamilton Road WB	5.01	0.33	4.627	A	A

Queueing Delay results: (5:15 PM-5:30 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	12.80	0.85	6.226	A	A
Hamilton Road EB	11.83	0.79	2.888	A	A
Hamilton Road WB	7.01	0.47	5.314	A	A

Queueing Delay results: (5:30 PM-5:45 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	13.25	0.88	6.251	A	A
Hamilton Road EB	12.05	0.80	2.890	A	A
Hamilton Road WB	7.19	0.48	5.327	A	A

Queueing Delay results: (5:45 PM-6:00 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	9.36	0.62	5.195	A	A
Hamilton Road EB	8.82	0.59	2.537	A	A
Hamilton Road WB	5.28	0.35	4.641	A	A

Queueing Delay results: (6:00 PM-6:15 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	6.92	0.46	4.610	A	A
Hamilton Road EB	6.76	0.45	2.327	A	A
Hamilton Road WB	4.02	0.27	4.238	A	A

Queue Variation Results

Queue Variation results: (4:45 PM-5:00 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.45	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.44	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.26	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (5:00 PM-5:15 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.60	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.57	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.34	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (5:15 PM-5:30 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.88	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.80	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.48	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (5:30 PM-5:45 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.89	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.80	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.48	0.00	0.00	0.00	1.05			N/A	N/A

Queue Variation results: (5:45 PM-6:00 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.61	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.58	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.34	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (6:00 PM-6:15 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.45	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.45	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.26	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Overview: Standard Roundabout Geometry

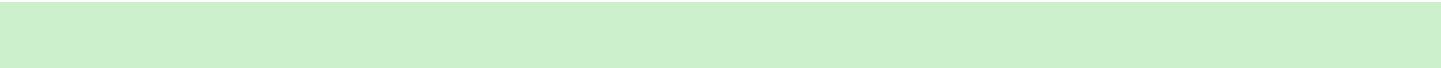
Standard Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only	Final Slope	Final Intercept (PCE/hr)
Gore Road	3.50	4.50	30.00	20.00	40.00	25.00		0.579	1357.445
Hamilton Road EB	7.00	8.00	30.00	20.00	55.00	25.00		0.723	2436.345
Hamilton Road WB	3.50	4.50	30.00	20.00	40.00	25.00		0.579	1357.445

Overview: Time Segment Results

Time Segment Results

Time Segment	Arm	Demand (PCE/hr)	Capacity (PCE/hr)	RFC	Pedestrian Demand (Ped/hr)	Start Queue (PCE)	End Queue (PCE)	Queueing Total Delay (PCE-min)	Geometric Total Delay (PCE-min)	Average Delay Per Arriving Vehicle (s)
1	Gore Road	350.83	1172.56	0.299	0.00	0.00	0.45	6.49	(0.02)	4.581
1	Hamilton Road EB	686.60	2312.47	0.297	0.00	0.00	0.44	6.52	(0.02)	2.320
1	Hamilton Road WB	222.84	1116.17	0.200	0.00	0.00	0.26	3.81	(0.02)	4.222
2	Gore Road	418.92	1149.37	0.364	0.00	0.45	0.60	8.76	(0.02)	5.166
2	Hamilton Road EB	819.87	2312.06	0.355	0.00	0.44	0.57	8.50	(0.02)	2.532
2	Hamilton Road WB	266.10	1082.11	0.246	0.00	0.26	0.34	5.01	(0.02)	4.627
3	Gore Road	513.08	1117.94	0.459	0.00	0.60	0.88	12.80	(0.02)	6.226
3	Hamilton Road EB	1004.13	2311.51	0.434	0.00	0.57	0.80	11.83	(0.02)	2.888
3	Hamilton Road WB	325.90	1035.55	0.315	0.00	0.34	0.48	7.01	(0.02)	5.314
4	Gore Road	513.08	1117.65	0.459	0.00	0.88	0.89	13.25	(0.02)	6.251
4	Hamilton Road EB	1004.13	2311.50	0.434	0.00	0.80	0.80	12.05	(0.02)	2.890
4	Hamilton Road WB	325.90	1035.32	0.315	0.00	0.48	0.48	7.19	(0.02)	5.327
5	Gore Road	418.92	1148.91	0.365	0.00	0.89	0.61	9.36	(0.02)	5.195
5	Hamilton Road EB	819.87	2312.05	0.355	0.00	0.80	0.58	8.82	(0.02)	2.537
5	Hamilton Road WB	266.10	1081.75	0.246	0.00	0.48	0.34	5.28	(0.02)	4.641
6	Gore Road	350.83	1171.84	0.299	0.00	0.61	0.45	6.92	(0.02)	4.610
6	Hamilton Road EB	686.60	2312.46	0.297	0.00	0.58	0.45	6.76	(0.02)	2.327
6	Hamilton Road WB	222.84	1115.58	0.200	0.00	0.34	0.26	4.02	(0.02)	4.238



A6 - Dual Lane Hamilton EB Only 85% - D1 - 2035, AM

Data Errors and Warnings
No errors or warnings

Analysis Set Details

Name	Description	Include In Report	Use Specific Demand Set	Demand Set	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
Dual Lane Hamilton EB Only 85%		Yes		(D1)		100.000	85.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Locked	Run Automatically	Use Relationship	Relationship	Start Time (HH:mm)	Finish Time (HH:mm)	Time Period Length (min)	Time Segment Length (min)	Traffic Profile Type
2035, AM	2035	AM			Yes			07:45	09:15	90	15	ONE HOUR

Roundabout Network

Roundabout Type(s)

ID	Name	Arm Order	Roundabout Type	Grade Separated	Large Roundabout	Do Geometric Delay
1	Hamilton & Gore	1,2,3	Standard			

Roundabout Network Options

Driving Side	Lighting	Road Surface	In London
Right	Normal/unknown	((Mini-roundabouts only))	

Arms

Arms

ID	Name	Description
1	Gore Road	
2	Hamilton Road EB	
3	Hamilton Road WB	

Capacity Options

Arm	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
Gore Road	0.00	99999.00		0.00
Hamilton Road EB	0.00	99999.00		0.00
Hamilton Road WB	0.00	99999.00		0.00

Standard Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
Gore Road	3.50	4.50	30.00	20.00	40.00	25.00	
Hamilton Road EB	7.00	8.00	30.00	20.00	55.00	25.00	

Hamilton Road WB	3.50	4.50	30.00	20.00	40.00	25.00	
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Pedestrian Crossings

Arm	Crossing Type
Gore Road	None
Hamilton Road EB	None
Hamilton Road WB	None

Arm Slope/ Intercept and Capacity

Slope and Intercept used in model

Arm	Enter Directly	Slope	Intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
Gore Road		((calculated))	((calculated))	0.579	1357.445
Hamilton Road EB		((calculated))	((calculated))	0.723	2436.345
Hamilton Road WB		((calculated))	((calculated))	0.579	1357.445

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

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		Yes	Yes	Truck Percentages	2.00				Yes	Yes

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCE/hr)	Flow Scaling Factor (%)	PHF
Gore Road	ONE HOUR	Yes	301.00	100.000	N/A
Hamilton Road EB	ONE HOUR	Yes	567.00	100.000	N/A
Hamilton Road WB	ONE HOUR	Yes	457.00	100.000	N/A

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCE/hr)	DirectDemandEntryFlowInPCE (PCE/hr)	Direct Demand Exit Flow (PCE/hr)	Direct Demand Pedestrian Flow (Ped/hr)
1	Gore Road	226.61	226.61	N/A	N/A
1	Hamilton Road EB	426.87	426.87	N/A	N/A
1	Hamilton Road WB	344.05	344.05	N/A	N/A
2	Gore Road	270.59	270.59	N/A	N/A
2	Hamilton Road EB	509.72	509.72	N/A	N/A
2	Hamilton Road WB	410.83	410.83	N/A	N/A
3	Gore Road	331.41	331.41	N/A	N/A
3	Hamilton Road EB	624.28	624.28	N/A	N/A

3	Hamilton Road WB	503.17	503.17	N/A	N/A
4	Gore Road	331.41	331.41	N/A	N/A
4	Hamilton Road EB	624.28	624.28	N/A	N/A
4	Hamilton Road WB	503.17	503.17	N/A	N/A
5	Gore Road	270.59	270.59	N/A	N/A
5	Hamilton Road EB	509.72	509.72	N/A	N/A
5	Hamilton Road WB	410.83	410.83	N/A	N/A
6	Gore Road	226.61	226.61	N/A	N/A
6	Hamilton Road EB	426.87	426.87	N/A	N/A
6	Hamilton Road WB	344.05	344.05	N/A	N/A

Turning Proportions

Turning Counts or Proportions (PCE/hr) - Hamilton & Gore (for whole period)

	To		
	1	2	3
From	1	0.000	295.000
	2	394.000	0.000
	3	25.000	432.000

Turning Proportions (PCE) - Hamilton & Gore (for whole period)

	To		
	1	2	3
From	1	0.00	0.98
	2	0.69	0.00
	3	0.05	0.95

Vehicle Mix

Average PCE Per Vehicle - Hamilton & Gore (for whole period)

	To		
	1	2	3
From	1	1.050	1.050
	2	1.050	1.050
	3	1.050	1.050

Truck Percentages - Hamilton & Gore (for whole period)

	To		
	1	2	3
From	1	5.000	5.000
	2	5.000	5.000
	3	5.000	5.000

Results

Results Summary

Arm	Max RFC	Max Delay (s)	Max Queue (PCE)	Max LOS	Total Demand (PCE/hr)	Total Arrivals (PCE)	Total Queueing Delay (PCE-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCE-min/min)	Inclusive Queueing Total Delay (PCE-min)	Inclusive Queueing Average Delay (s)	Slope	Intercept (PCE/hr)
Gore Road	0.36	6.42	0.59	A	276.20	414.30	38.94	5.64	0.43	38.94	5.64	0.579	1357.445
Hamilton Road EB	0.30	2.62	0.45	A	520.29	780.43	31.99	2.46	0.36	31.99	2.46	0.723	2436.345
Hamilton Road WB	0.54	8.64	1.20	A	419.35	629.03	74.00	7.06	0.82	74.01	7.06	0.579	1357.445
						1824	144.93	4.77					

Main Results

Main results: (7:45 AM-8:00 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	226.61	56.65	225.38	314.57	323.20	0.00	994.83	944.63	0.228	0.00	0.31
Hamilton Road EB	426.87	106.72	425.78	544.08	4.49	0.00	2068.13	2059.32	0.206	0.00	0.27
Hamilton Road WB	344.05	86.01	341.90	134.40	295.87	0.00	1008.28	449.86	0.341	0.00	0.54

Main results: (8:00 AM-8:15 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	270.59	67.65	270.20	376.43	387.56	0.00	963.17	944.63	0.281	0.31	0.41
Hamilton Road EB	509.72	127.43	509.44	652.37	5.39	0.00	2067.58	2059.32	0.247	0.27	0.34
Hamilton Road WB	410.83	102.71	409.99	160.82	354.00	0.00	979.68	449.86	0.419	0.54	0.75

Main results: (8:15 AM-8:30 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	331.41	82.85	330.70	460.93	474.00	0.00	920.65	944.63	0.360	0.41	0.58
Hamilton Road EB	624.28	156.07	623.84	798.10	6.59	0.00	2066.84	2059.32	0.302	0.34	0.45
Hamilton Road WB	503.17	125.79	501.43	196.93	433.50	0.00	940.57	449.86	0.535	0.75	1.18

Main results: (8:30 AM-8:45 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	331.41	82.85	331.39	461.32	475.60	0.00	919.86	944.63	0.360	0.58	0.59
Hamilton Road EB	624.28	156.07	624.27	800.38	6.61	0.00	2066.83	2059.32	0.302	0.45	0.45
Hamilton Road WB	503.17	125.79	503.12	197.08	433.80	0.00	940.42	449.86	0.535	1.18	1.20

Main results: (8:45 AM-9:00 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	270.59	67.65	271.29	377.07	389.98	0.00	961.98	944.63	0.281	0.59	0.41
Hamilton Road EB	509.72	127.43	510.16	655.86	5.41	0.00	2067.57	2059.32	0.247	0.45	0.34
Hamilton Road WB	410.83	102.71	412.55	161.06	354.50	0.00	979.43	449.86	0.419	1.20	0.77

Main results: (9:00 AM-9:15 AM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	226.61	56.65	227.02	315.69	326.06	0.00	993.42	944.63	0.228	0.41	0.31
Hamilton Road EB	426.87	106.72	427.15	548.55	4.53	0.00	2068.11	2059.32	0.206	0.34	0.27
Hamilton Road WB	344.05	86.01	344.93	134.86	296.82	0.00	1007.81	449.86	0.341	0.77	0.55

Queueing Delay Results

Queueing Delay results: (7:45 AM-8:00 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	4.49	0.30	4.904	A	A
Hamilton Road EB	4.02	0.27	2.300	A	A
Hamilton Road WB	7.81	0.52	5.654	A	A

Queueing Delay results: (8:00 AM-8:15 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	5.98	0.40	5.453	A	A
Hamilton Road EB	5.08	0.34	2.425	A	A
Hamilton Road WB	10.92	0.73	6.626	A	A

Queueing Delay results: (8:15 AM-8:30 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	8.53	0.57	6.399	A	A
Hamilton Road EB	6.70	0.45	2.619	A	A
Hamilton Road WB	17.02	1.13	8.574	A	A

Queueing Delay results: (8:30 AM-8:45 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	8.80	0.59	6.422	A	A
Hamilton Road EB	6.80	0.45	2.619	A	A
Hamilton Road WB	17.87	1.19	8.641	A	A

Queueing Delay results: (8:45 AM-9:00 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	6.37	0.42	5.479	A	A
Hamilton Road EB	5.24	0.35	2.427	A	A
Hamilton Road WB	11.93	0.80	6.687	A	A

Queueing Delay results: (9:00 AM-9:15 AM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	4.78	0.32	4.934	A	A
Hamilton Road EB	4.15	0.28	2.305	A	A
Hamilton Road WB	8.46	0.56	5.709	A	A

Queue Variation Results

Queue Variation results: (7:45 AM-8:00 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.31	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.27	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.54	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (8:00 AM-8:15 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.41	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.34	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.75	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (8:15 AM-8:30 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.58	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.45	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	1.18	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (8:30 AM-8:45 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.59	0.00	0.00	0.00	1.05			N/A	N/A
Hamilton Road EB	0.45	0.00	0.00	0.00	1.05			N/A	N/A
Hamilton Road WB	1.20	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (8:45 AM-9:00 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.41	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.34	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.77	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (9:00 AM-9:15 AM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.31	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.27	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.55	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Overview: Standard Roundabout Geometry

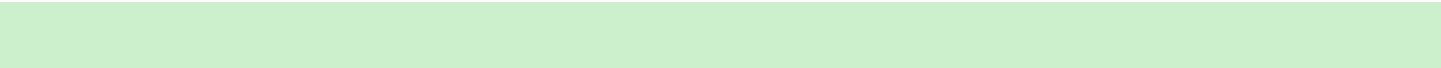
Standard Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only	Final Slope	Final Intercept (PCE/hr)
Gore Road	3.50	4.50	30.00	20.00	40.00	25.00		0.579	1357.445
Hamilton Road EB	7.00	8.00	30.00	20.00	55.00	25.00		0.723	2436.345
Hamilton Road WB	3.50	4.50	30.00	20.00	40.00	25.00		0.579	1357.445

Overview: Time Segment Results

Time Segment Results

Time Segment	Arm	Demand (PCE/hr)	Capacity (PCE/hr)	RFC	Pedestrian Demand (Ped/hr)	Start Queue (PCE)	End Queue (PCE)	Queueing Total Delay (PCE-min)	Geometric Total Delay (PCE-min)	Average Delay Per Arriving Vehicle (s)
1	Gore Road	226.61	994.83	0.228	0.00	0.00	0.31	4.49	(0.02)	4.904
1	Hamilton Road EB	426.87	2068.13	0.206	0.00	0.00	0.27	4.02	(0.02)	2.300
1	Hamilton Road WB	344.05	1008.28	0.341	0.00	0.00	0.54	7.81	(0.02)	5.654
2	Gore Road	270.59	963.17	0.281	0.00	0.31	0.41	5.98	(0.02)	5.453
2	Hamilton Road EB	509.72	2067.58	0.247	0.00	0.27	0.34	5.08	(0.02)	2.425
2	Hamilton Road WB	410.83	979.68	0.419	0.00	0.54	0.75	10.92	(0.02)	6.626
3	Gore Road	331.41	920.65	0.360	0.00	0.41	0.58	8.53	(0.02)	6.399
3	Hamilton Road EB	624.28	2066.84	0.302	0.00	0.34	0.45	6.70	(0.02)	2.619
3	Hamilton Road WB	503.17	940.57	0.535	0.00	0.75	1.18	17.02	(0.02)	8.574
4	Gore Road	331.41	919.86	0.360	0.00	0.58	0.59	8.80	(0.02)	6.422
4	Hamilton Road EB	624.28	2066.83	0.302	0.00	0.45	0.45	6.80	(0.02)	2.619
4	Hamilton Road WB	503.17	940.42	0.535	0.00	1.18	1.20	17.87	(0.02)	8.641
5	Gore Road	270.59	961.98	0.281	0.00	0.59	0.41	6.37	(0.02)	5.479
5	Hamilton Road EB	509.72	2067.57	0.247	0.00	0.45	0.34	5.24	(0.02)	2.427
5	Hamilton Road WB	410.83	979.43	0.419	0.00	1.20	0.77	11.93	(0.02)	6.687
6	Gore Road	226.61	993.42	0.228	0.00	0.41	0.31	4.78	(0.02)	4.934
6	Hamilton Road EB	426.87	2068.11	0.206	0.00	0.34	0.27	4.15	(0.02)	2.305
6	Hamilton Road WB	344.05	1007.81	0.341	0.00	0.77	0.55	8.46	(0.02)	5.709



A6 - Dual Lane Hamilton EB Only 85% - D2 - 2035, PM

Data Errors and Warnings
No errors or warnings

Analysis Set Details

Name	Description	Include In Report	Use Specific Demand Set	Demand Set	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
Dual Lane Hamilton EB Only 85%		Yes		(D1)		100.000	85.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Locked	Run Automatically	Use Relationship	Relationship	Start Time (HH:mm)	Finish Time (HH:mm)	Time Period Length (min)	Time Segment Length (min)	Traffic Profile Type
2035, PM	2035	PM			Yes			16:45	18:15	90	15	ONE HOUR

Roundabout Network

Roundabout Type(s)

ID	Name	Arm Order	Roundabout Type	Grade Separated	Large Roundabout	Do Geometric Delay
1	Hamilton & Gore	1,2,3	Standard			

Roundabout Network Options

Driving Side	Lighting	Road Surface	In London
Right	Normal/unknown	((Mini-roundabouts only))	

Arms

Arms

ID	Name	Description
1	Gore Road	
2	Hamilton Road EB	
3	Hamilton Road WB	

Capacity Options

Arm	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
Gore Road	0.00	99999.00		0.00
Hamilton Road EB	0.00	99999.00		0.00
Hamilton Road WB	0.00	99999.00		0.00

Standard Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
Gore Road	3.50	4.50	30.00	20.00	40.00	25.00	
Hamilton Road EB	7.00	8.00	30.00	20.00	55.00	25.00	

Hamilton Road WB	3.50	4.50	30.00	20.00	40.00	25.00	
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Pedestrian Crossings

Arm	Crossing Type
Gore Road	None
Hamilton Road EB	None
Hamilton Road WB	None

Arm Slope/ Intercept and Capacity

Slope and Intercept used in model

Arm	Enter Directly	Slope	Intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
Gore Road		((calculated))	((calculated))	0.579	1357.445
Hamilton Road EB		((calculated))	((calculated))	0.723	2436.345
Hamilton Road WB		((calculated))	((calculated))	0.579	1357.445

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

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		Yes	Yes	Truck Percentages	2.00				Yes	Yes

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCE/hr)	Flow Scaling Factor (%)	PHF
Gore Road	ONE HOUR	Yes	466.00	100.000	N/A
Hamilton Road EB	ONE HOUR	Yes	912.00	100.000	N/A
Hamilton Road WB	ONE HOUR	Yes	296.00	100.000	N/A

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCE/hr)	DirectDemandEntryFlowInPCE (PCE/hr)	Direct Demand Exit Flow (PCE/hr)	Direct Demand Pedestrian Flow (Ped/hr)
1	Gore Road	350.83	350.83	N/A	N/A
1	Hamilton Road EB	686.60	686.60	N/A	N/A
1	Hamilton Road WB	222.84	222.84	N/A	N/A
2	Gore Road	418.92	418.92	N/A	N/A
2	Hamilton Road EB	819.87	819.87	N/A	N/A
2	Hamilton Road WB	266.10	266.10	N/A	N/A
3	Gore Road	513.08	513.08	N/A	N/A
3	Hamilton Road EB	1004.13	1004.13	N/A	N/A

3	Hamilton Road WB	325.90	325.90	N/A	N/A
4	Gore Road	513.08	513.08	N/A	N/A
4	Hamilton Road EB	1004.13	1004.13	N/A	N/A
4	Hamilton Road WB	325.90	325.90	N/A	N/A
5	Gore Road	418.92	418.92	N/A	N/A
5	Hamilton Road EB	819.87	819.87	N/A	N/A
5	Hamilton Road WB	266.10	266.10	N/A	N/A
6	Gore Road	350.83	350.83	N/A	N/A
6	Hamilton Road EB	686.60	686.60	N/A	N/A
6	Hamilton Road WB	222.84	222.84	N/A	N/A

Turning Proportions

Turning Counts or Proportions (PCE/hr) - Hamilton & Gore (for whole period)

	To			
From		1	2	3
	1	0.000	462.000	4.000
	2	420.000	0.000	492.000
	3	12.000	284.000	0.000

Turning Proportions (PCE) - Hamilton & Gore (for whole period)

	To			
From		1	2	3
	1	0.00	0.99	0.01
	2	0.46	0.00	0.54
	3	0.04	0.96	0.00

Vehicle Mix

Average PCE Per Vehicle - Hamilton & Gore (for whole period)

		To		
From		1	2	3
	1	1.050	1.050	1.050
	2	1.050	1.050	1.050
	3	1.050	1.050	1.050

Truck Percentages - Hamilton & Gore (for whole period)

	To			
From		1	2	3
	1	5.000	5.000	5.000
	2	5.000	5.000	5.000
	3	5.000	5.000	5.000

Results

Results Summary

Arm	Max RFC	Max Delay (s)	Max Queue (PCE)	Max LOS	Total Demand (PCE/hr)	Total Arrivals (PCE)	Total Queueing Delay (PCE-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCE-min/min)	Inclusive Queueing Total Delay (PCE-min)	Inclusive Queueing Average Delay (s)	Slope	Intercept (PCE/hr)
Gore Road	0.51	7.76	1.10	A	427.61	641.41	69.60	6.51	0.77	69.61	6.51	0.579	1357.445
Hamilton Road EB	0.49	3.55	0.99	A	836.87	1255.30	65.55	3.13	0.73	65.55	3.13	0.723	2436.345
Hamilton Road WB	0.35	6.29	0.57	A	271.61	407.42	37.71	5.55	0.42	37.71	5.55	0.579	1357.445
						2004	166.86	5.00					

Main Results

Main results: (4:45 PM-5:00 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	350.83	87.71	348.74	324.23	212.66	0.00	1049.21	830.20	0.334	0.00	0.52
Hamilton Road EB	686.60	171.65	684.52	558.41	2.99	0.00	2069.05	2066.51	0.332	0.00	0.52
Hamilton Road WB	222.84	55.71	221.65	372.28	315.24	0.00	998.75	685.65	0.223	0.00	0.30

Main results: (5:00 PM-5:15 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	418.92	104.73	418.16	388.04	254.94	0.00	1028.41	830.20	0.407	0.52	0.71
Hamilton Road EB	819.87	204.97	819.20	669.52	3.59	0.00	2068.69	2066.51	0.396	0.52	0.69
Hamilton Road WB	266.10	66.52	265.72	445.53	377.26	0.00	968.23	685.65	0.275	0.30	0.39

Main results: (5:15 PM-5:30 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	513.08	128.27	511.58	475.06	312.04	0.00	1000.32	830.20	0.513	0.71	1.09
Hamilton Road EB	1004.13	251.03	1002.94	819.23	4.39	0.00	2068.19	2066.51	0.486	0.69	0.98
Hamilton Road WB	325.90	81.48	325.23	545.45	461.88	0.00	926.61	685.65	0.352	0.39	0.56

Main results: (5:30 PM-5:45 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	513.08	128.27	513.04	475.63	312.68	0.00	1000.01	830.20	0.513	1.09	1.10
Hamilton Road EB	1004.13	251.03	1004.12	821.31	4.40	0.00	2068.19	2066.51	0.486	0.98	0.99
Hamilton Road WB	325.90	81.48	325.89	546.10	462.42	0.00	926.34	685.65	0.352	0.56	0.57

Main results: (5:45 PM-6:00 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	418.92	104.73	420.39	388.93	255.95	0.00	1027.92	830.20	0.408	1.10	0.73
Hamilton Road EB	819.87	204.97	821.05	672.73	3.61	0.00	2068.68	2066.51	0.396	0.99	0.69
Hamilton Road WB	266.10	66.52	266.76	446.54	378.11	0.00	967.82	685.65	0.275	0.57	0.40

Main results: (6:00 PM-6:15 PM)

Arm	Demand (PCE/hr)	Arrivals (PCE)	Entry Flow (PCE/hr)	Exit Flow (PCE/hr)	Circulating Flow (PCE/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCE/hr)	Saturation Capacity (PCE/hr)	RFC	Start Queue (PCE)	End Queue (PCE)
Gore Road	350.83	87.71	351.62	325.56	214.18	0.00	1048.46	830.20	0.335	0.73	0.53
Hamilton Road EB	686.60	171.65	687.28	562.79	3.02	0.00	2069.04	2066.51	0.332	0.69	0.52
Hamilton Road WB	222.84	55.71	223.23	373.79	316.51	0.00	998.12	685.65	0.223	0.40	0.30

Queueing Delay Results

Queueing Delay results: (4:45 PM-5:00 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	7.59	0.51	5.380	A	A
Hamilton Road EB	7.64	0.51	2.727	A	A
Hamilton Road WB	4.37	0.29	4.857	A	A

Queueing Delay results: (5:00 PM-5:15 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	10.42	0.69	6.186	A	A
Hamilton Road EB	10.12	0.67	3.023	A	A
Hamilton Road WB	5.80	0.39	5.378	A	A

Queueing Delay results: (5:15 PM-5:30 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	15.70	1.05	7.710	A	A
Hamilton Road EB	14.44	0.96	3.545	A	A
Hamilton Road WB	8.23	0.55	6.279	A	A

Queueing Delay results: (5:30 PM-5:45 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	16.39	1.09	7.761	A	A
Hamilton Road EB	14.79	0.99	3.551	A	A
Hamilton Road WB	8.48	0.57	6.294	A	A

Queueing Delay results: (5:45 PM-6:00 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	11.31	0.75	6.238	A	A
Hamilton Road EB	10.59	0.71	3.034	A	A
Hamilton Road WB	6.17	0.41	5.396	A	A

Queueing Delay results: (6:00 PM-6:15 PM)

Arm	Queueing Total Delay (PCE-min)	Queueing Rate Of Delay (PCE-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
Gore Road	8.19	0.55	5.430	A	A
Hamilton Road EB	7.97	0.53	2.738	A	A
Hamilton Road WB	4.65	0.31	4.880	A	A

Queue Variation Results

Queue Variation results: (4:45 PM-5:00 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.52	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.52	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.30	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (5:00 PM-5:15 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.71	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.69	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.39	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (5:15 PM-5:30 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	1.09	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.98	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.56	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (5:30 PM-5:45 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	1.10	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.99	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.57	0.00	0.00	0.00	1.05			N/A	N/A

Queue Variation results: (5:45 PM-6:00 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.73	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.69	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.40	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Queue Variation results: (6:00 PM-6:15 PM)

Arm	Mean (PCE)	Q05 (PCE)	Q50 (PCE)	Q90 (PCE)	Q95 (PCE)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
Gore Road	0.53	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road EB	0.52	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A
Hamilton Road WB	0.30	N/A	N/A	N/A	N/A	Percentiles could not be calculated		N/A	N/A

Overview: Standard Roundabout Geometry

Standard Geometry

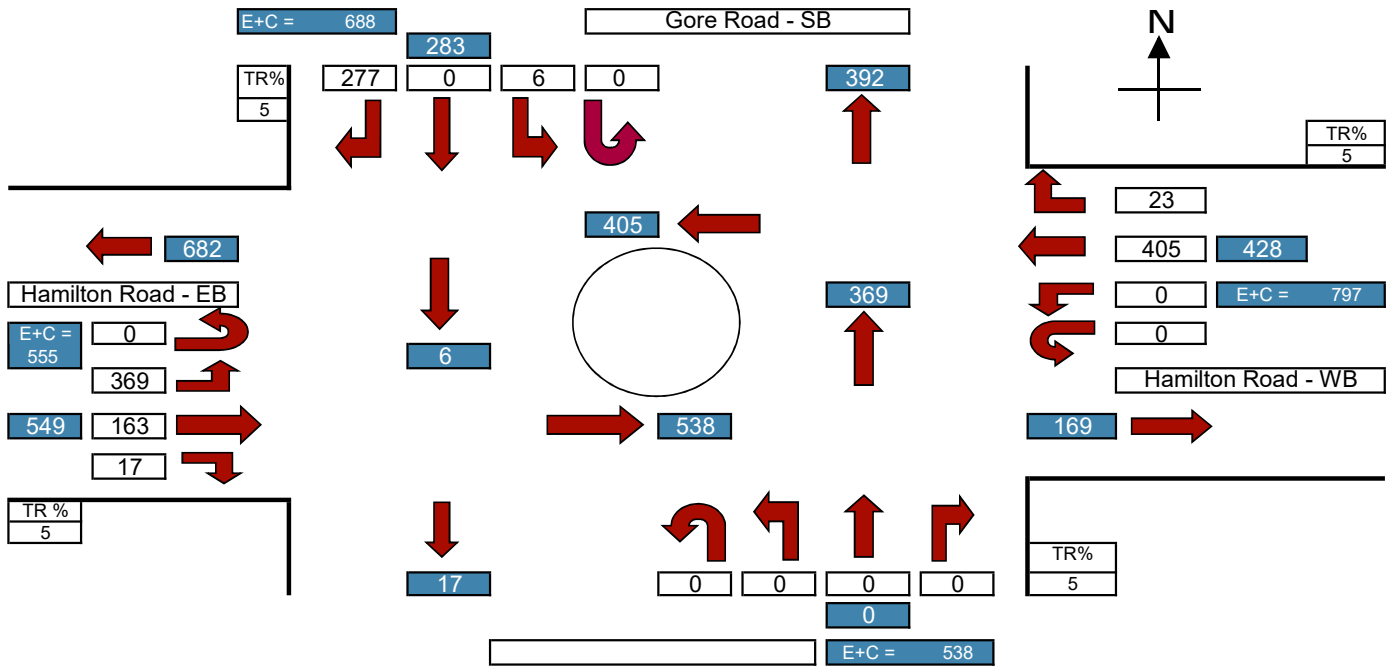
Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only	Final Slope	Final Intercept (PCE/hr)
Gore Road	3.50	4.50	30.00	20.00	40.00	25.00		0.579	1357.445
Hamilton Road EB	7.00	8.00	30.00	20.00	55.00	25.00		0.723	2436.345
Hamilton Road WB	3.50	4.50	30.00	20.00	40.00	25.00		0.579	1357.445

Overview: Time Segment Results

Time Segment Results

Time Segment	Arm	Demand (PCE/hr)	Capacity (PCE/hr)	RFC	Pedestrian Demand (Ped/hr)	Start Queue (PCE)	End Queue (PCE)	Queueing Total Delay (PCE-min)	Geometric Total Delay (PCE-min)	Average Delay Per Arriving Vehicle (s)
1	Gore Road	350.83	1049.21	0.334	0.00	0.00	0.52	7.59	(0.02)	5.380
1	Hamilton Road EB	686.60	2069.05	0.332	0.00	0.00	0.52	7.64	(0.02)	2.727
1	Hamilton Road WB	222.84	998.75	0.223	0.00	0.00	0.30	4.37	(0.02)	4.857
2	Gore Road	418.92	1028.41	0.407	0.00	0.52	0.71	10.42	(0.02)	6.186
2	Hamilton Road EB	819.87	2068.69	0.396	0.00	0.52	0.69	10.12	(0.02)	3.023
2	Hamilton Road WB	266.10	968.23	0.275	0.00	0.30	0.39	5.80	(0.02)	5.378
3	Gore Road	513.08	1000.32	0.513	0.00	0.71	1.09	15.70	(0.02)	7.710
3	Hamilton Road EB	1004.13	2068.19	0.486	0.00	0.69	0.98	14.44	(0.02)	3.545
3	Hamilton Road WB	325.90	926.61	0.352	0.00	0.39	0.56	8.23	(0.02)	6.279
4	Gore Road	513.08	1000.01	0.513	0.00	1.09	1.10	16.39	(0.02)	7.761
4	Hamilton Road EB	1004.13	2068.19	0.486	0.00	0.98	0.99	14.79	(0.02)	3.551
4	Hamilton Road WB	325.90	926.34	0.352	0.00	0.56	0.57	8.48	(0.02)	6.294
5	Gore Road	418.92	1027.92	0.408	0.00	1.10	0.73	11.31	(0.02)	6.238
5	Hamilton Road EB	819.87	2068.68	0.396	0.00	0.99	0.69	10.59	(0.02)	3.034
5	Hamilton Road WB	266.10	967.82	0.275	0.00	0.57	0.40	6.17	(0.02)	5.396
6	Gore Road	350.83	1048.46	0.335	0.00	0.73	0.53	8.19	(0.02)	5.430
6	Hamilton Road EB	686.60	2069.04	0.332	0.00	0.69	0.52	7.97	(0.02)	2.738
6	Hamilton Road WB	222.84	998.12	0.223	0.00	0.40	0.30	4.65	(0.02)	4.880

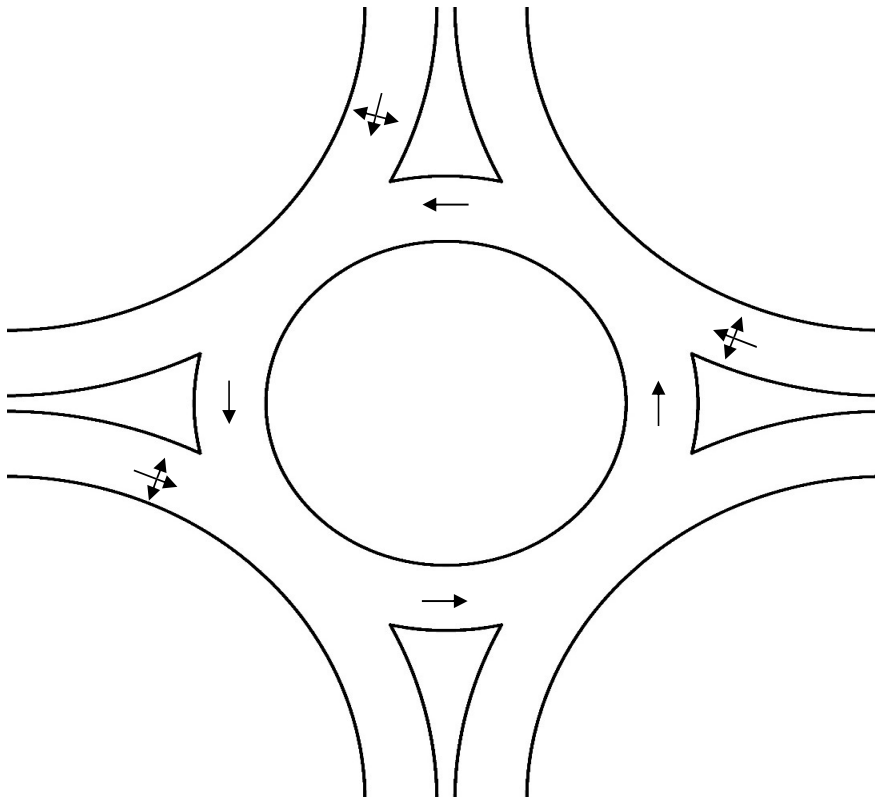
Roundabout Traffic Worksheets



Capacity Guidelines

1. Single Lane service volumes < 900vph - 1200 vph
2. Exit flow < 900vph - 1200 vph for single lane exit
3. Entry flow + circulating flow < 1400vph use single lane entry
4. 1400 vph < Entry + Circ. flow < 2200vph use two-lane entry
5. Entry flow + circulating flow > 2200vph use three-lane entry

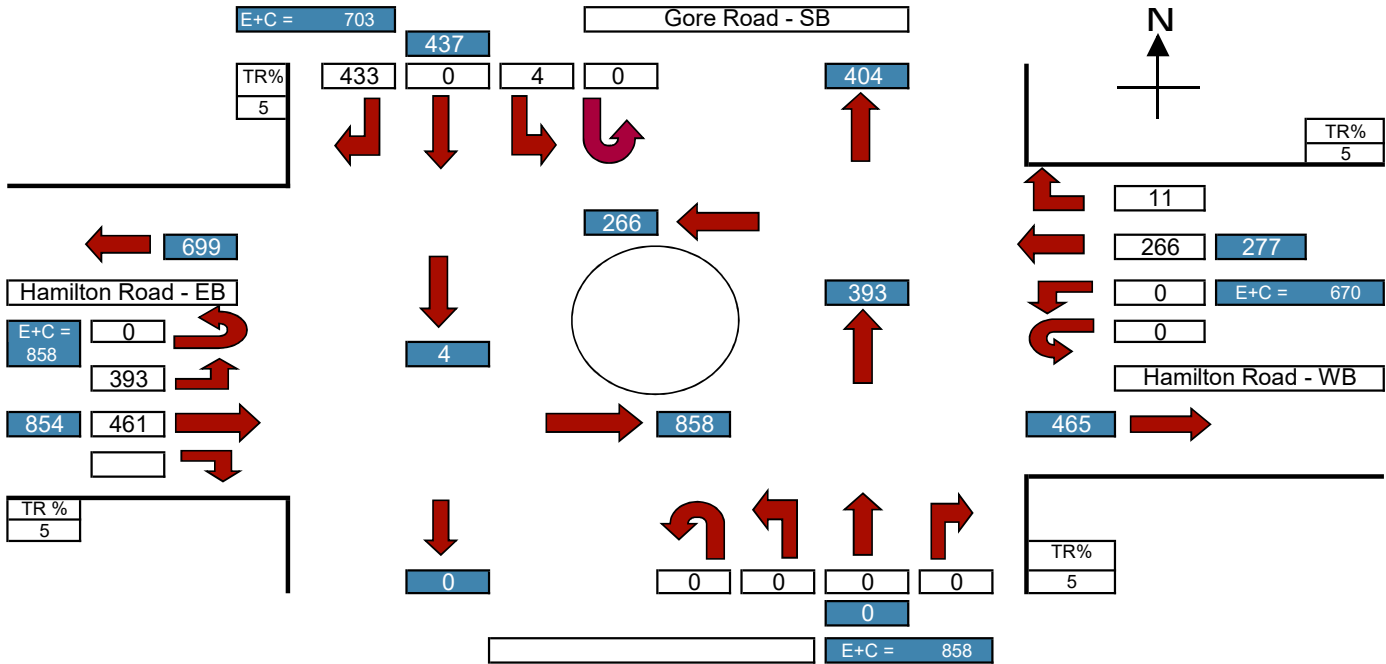
Leg	PCU	Model Inputs			
		1st Exit	2nd Exit	3rd Exit	U-turn
Gore Road - SB	1.05	277	0	6	0
Hamilton Road - EE	1.05	17	163	369	0
	1.05	0	0	0	0
Hamilton Road - WB	1.05	23	405	0	0



ROUNDABOUT TRAFFIC FLOW SHEET

Project: Hamilton/Gore Intersection
Project No.: 48215-100
Intersection: Hamilton Road and Gore Road
Time Period: PM PEAK 2031

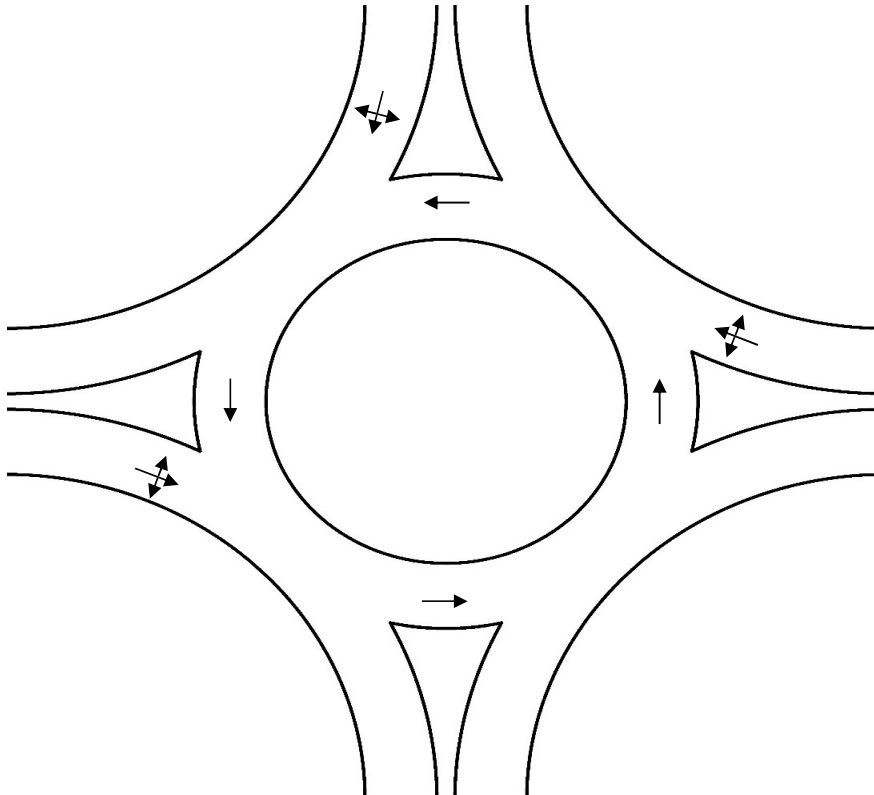
Prepared By: NPD
Sheet: 2 of 4



Capacity Guidelines

1. Single Lane service volumes < 900vph - 1200 vph
2. Exit flow < 900vph - 1200 vph for single lane exit
3. Entry flow + circulating flow < 1400vph use single lane entry
4. 1400 vph < Entry + Circ. flow < 2200vph use two-lane entry
3. Entry flow + circulating flow > 2200vph use three-lane entry

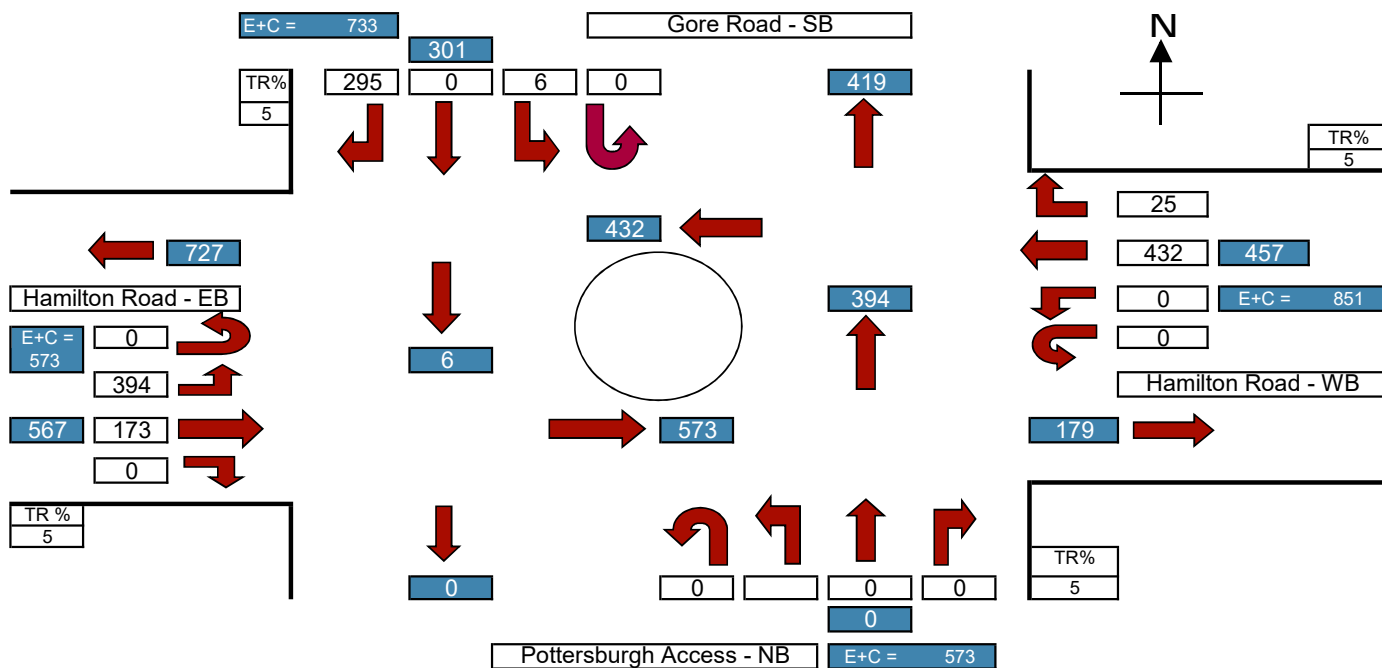
Leg	Model Inputs				
	PCU	1st Exit	2nd Exit	3rd Exit	U-turn
Gore Road - SB	1.05	433	0	4	0
Hamilton Road - EB	1.05	0	461	393	0
Gore Road - NB	1.05	0	0	0	0
Hamilton Road - WB	1.05	11	266	0	0



ROUNDABOUT **TRAFFIC** **FLOW SHEET**

Project: Hamilton/Gore Intersection
Project No.: 48215-100
Intersection: Hamilton Road and Gore Road
Time Period: AM PEAK 2035

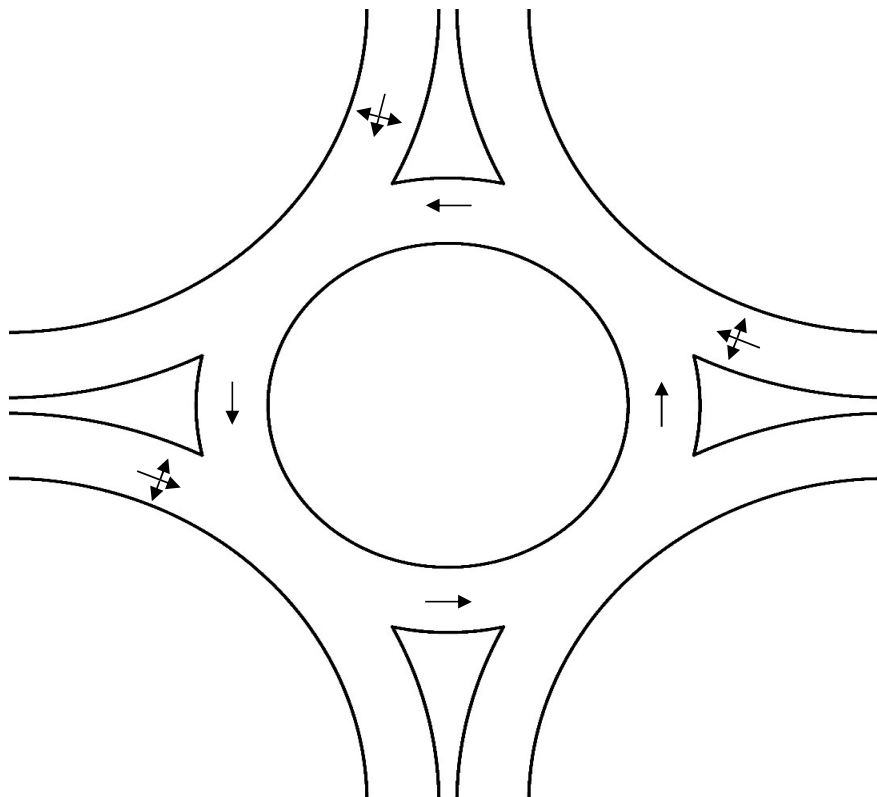
Prepared By: NPD
Sheet: 3 of 4



Capacity Guidelines

1. Single Lane service volumes < 900vph - 1200 vph
2. Exit flow < 900vph - 1200 vph for single lane exit
3. Entry flow + circulating flow < 1400vph use single lane entry
4. 1400 vph < Entry + Circ. flow < 2200vph use two-lane entry
5. Entry flow + circulating flow > 2200vph use three-lane entry

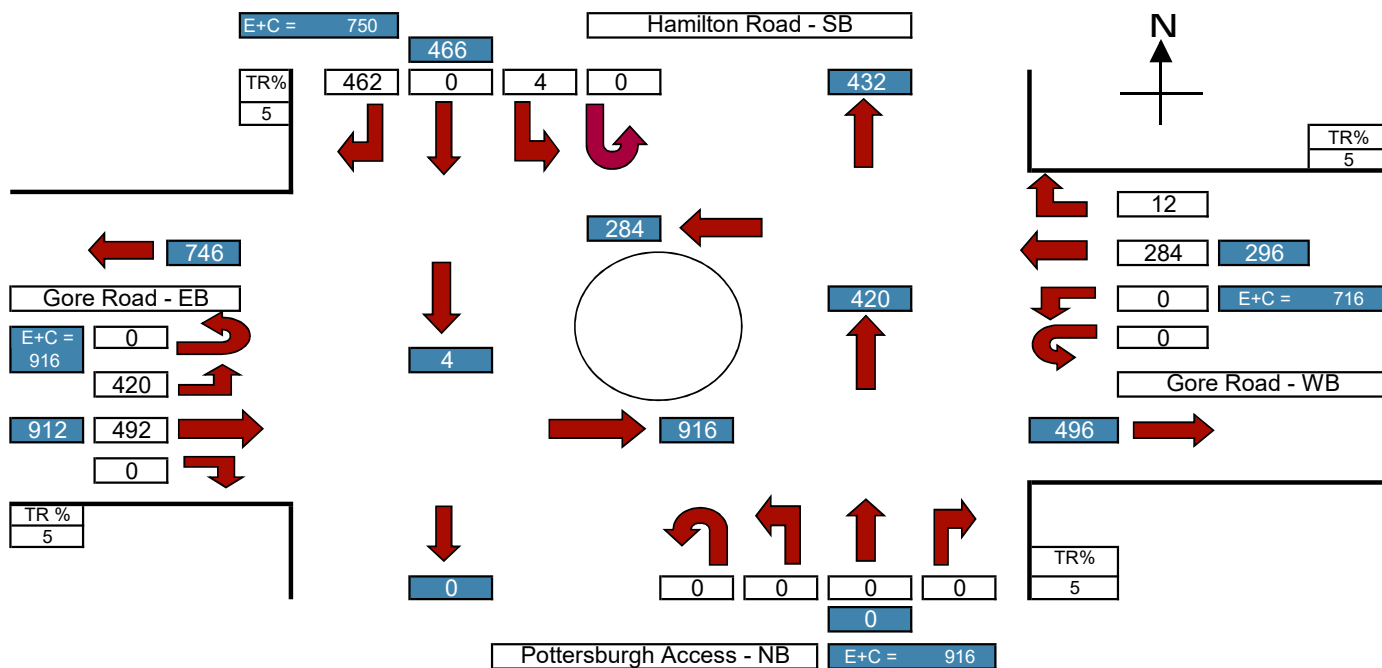
Leg	Model Inputs				
	PCU	1st Exit	2nd Exit	3rd Exit	U-turn
Gore Road - SB	1.05	295	0	6	0
Hamilton Road - EB	1.05	0	173	394	0
Pottersburgh Access - NB	1.05	0	0	0	0
Hamilton Road - WB	1.05	25	432	0	0



ROUNDABOUT TRAFFIC FLOW SHEET

Project: Hamilton/Gore Intersection
Project No.: 48215-100
Intersection: Hamilton Road and Gore Road

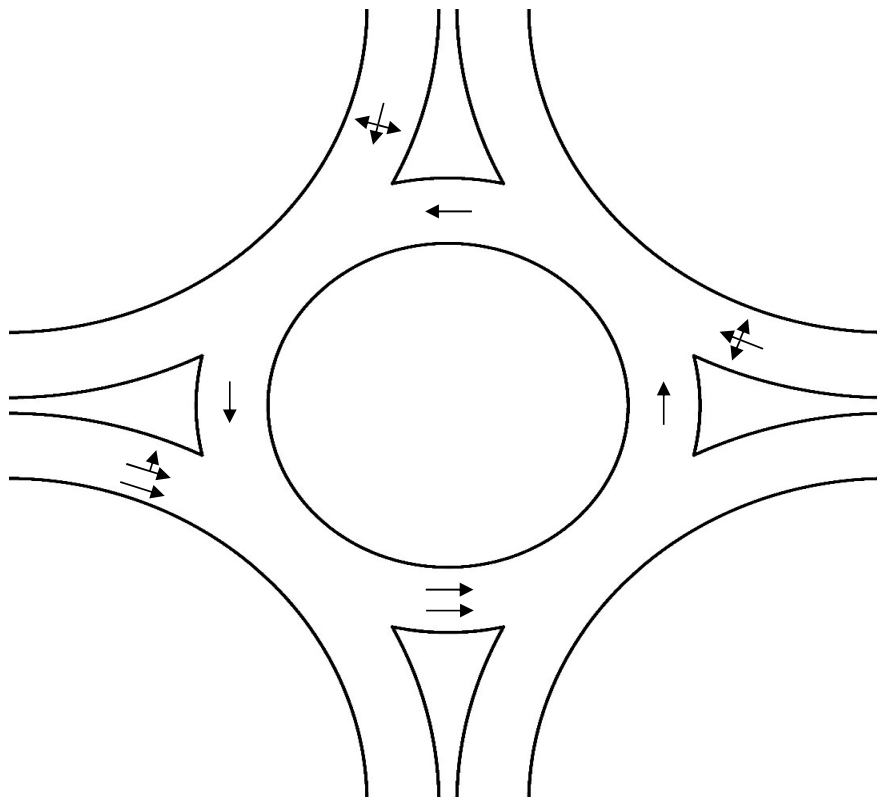
Prepared By: NPD
Sheet: 4 of 4



Capacity Guidelines

1. Single Lane service volumes < 900vph - 1200 vph
2. Exit flow < 900vph - 1200 vph for single lane exit
3. Entry flow + circulating flow < 1400vph use single lane entry
4. 1400 vph < Entry + Circ. flow < 2200vph use two-lane entry
3. Entry flow + circulating flow > 2200vph use three-lane entry

Leg	Model Inputs				
	PCU	1st Exit	2nd Exit	3rd Exit	U-turn
Hamilton Road - SE	1.05	462	0	4	0
Gore Road - EB	1.05	0	492	420	0
Pottersburgh Access -	1.05	0	0	0	0
Gore Road - WB	1.05	12	284	0	0



Appendix C

Capital Cost Estimates

Alternative 1 - Roundabout

TABLE 1 - PRELIMINARY CONSTRUCTION COST ESTIMATE

Hamilton Road and Gore Road Intersection

Intersection Improvements EA

Project No. 48214-100

January 18, 2022



Item No.	Description	Unit	Unit Price	Estimated Quantity	Total Cost
A1 - Site Preparation & Removals					
A1.1	Bonding, Insurance, Etc.	lump sum	\$45,000.00	1	\$45,000.00
A1.2	Mobilization/Demobilization	lump sum	\$20,000.00	1	\$20,000.00
A1.3	Pre-condition Survey	lump sum	\$8,000.00	1	\$8,000.00
A1.4	Site Office	lump sum	\$25,000.00	1	\$25,000.00
A1.5	Traffic control	lump sum	\$25,000.00	1	\$25,000.00
A1.6	Construction layout	lump sum	\$18,000.00	1	\$18,000.00
A1.7	Remove & dispose of existing asphalt	m ²	\$6.50	4900	\$31,850.00
A1.8	Remove & dispose of existing sidewalk	m ²	\$11.00	130	\$1,430.00
A1.9	Remove & dispose of existing curb & gutter	m	\$8.00	225	\$1,800.00
A1.10	Remove & dispose of existing storm sewers				
A1.11	Pipes & leads	m	\$40.00	1125	\$45,000.00
A1.12	Manholes and catchbasins	each	\$1,200.00	12	\$14,400.00
A1.13	Tree removals, protection, maintain & relocate as required	lump sum	\$12,000.00	1	\$12,000.00
A1.14	Miscellaneous removals (pillars, signs etc.)	lump sum	\$20,000.00	1	\$20,000.00
Subtotal Section A1 - Site Preparation & Removals					\$267,480.00
A2 - Road Works					
A2.1	Excavate to subgrade	m ³	\$14.00	\$6,813.60	\$95,390.40
A2.2	Roadway Paving			10,500	
A2.2.1	Granular 'B' (450mm)	tonnes	\$15.00	11,813	\$177,187.50
A2.2.2	Granular 'A' (150mm)	tonnes	\$20.00	3,938	\$78,750.00
A2.2.3	HL8 binder asphalt for road construction	tonnes	\$95.00	2,625	\$249,375.00
A2.2.4	HL3 surface asphalt for road restoration	tonnes	\$120.00	1,313	\$157,500.00
A2.3	Concrete Curb & Gutter (OPSD 600.040)	m	\$55.00	1,500	\$82,500.00
A2.4	Asphalt Multi-Use Trail	m ²	\$58.00	675	\$39,150.00
A2.5	Concrete sidewalk and island infill	m ²	\$60.00	525	\$31,500.00
A2.6	Stamped coloured concrete infill	m ²	\$80.00	180	\$14,400.00
A2.7	Boulevard restoration - topsoil & sod	m ³	\$16.00	1,300	\$20,800.00
A2.8	Truncated Dome Plates	each	\$300.00	27	\$8,100.00
Subtotal Section A2 - Road Works					\$954,652.90
A4 - Storm Sewers					
A4.1	New Storm Sewer (leads)	m	\$300.00	400	\$120,000.00
A4.2	Watermain	m	\$372.00	400	\$148,800.00
A4.3	Maintenance holes	ea	\$4,800.00	8	\$38,400.00
A4.4	Catch basins with leads	ea	\$4,000.00	16	\$64,000.00
A4.5	Miscellaneous storm connections and adjustments	lump sum	\$65,000.00	1	\$65,000.00
A4.6	OGS Unit	lump sum	\$45,000.00	1	\$45,000.00
A4.7	Sewer Main Testing	m	\$15.00	400	\$6,000.00
Subtotal Section A4 - Storm Sewers					\$487,200.00
A5 - Sanitary Sewers					
A4.1	New Sewer Main (200mm diameter)	m	\$450.00	150	\$67,500.00
A4.2	Sanitary Manholes	ea	\$4,800.00	3	\$14,400.00
A4.3	Sanitary services (open cut)	ea	\$4,000.00	13	\$52,000.00
A4.4	Connection to Existing Structures	ea	\$4,000.00	3	\$12,000.00
A4.5	Sewer Main Testing	m	\$15.00	150	\$2,250.00
Subtotal Section A4 - Storm Sewers					\$148,150.00
A6 - Watermain					
A6.1	New Watermain - Assume 200mm Dia.	m	\$372.00	400	\$148,800.00
A6.2	Supply and Install Hydrants and Leads	ea	\$6,500.00	2	\$13,000.00
A6.3	Supply and Install water services	ea	\$3,500.00	13	\$45,500.00
Subtotal Section A4 - Storm Sewers					\$207,300.00
A6 - Miscellaneous/Provisional Items - Design					
A6.1	Linepainting Allowance	lump sum	\$105,000.00	1	\$105,000.00
A6.2	Allowance for contaminated material remediation	lump sum	\$85,000.00	1	\$85,000.00
A6.3	Utility Relocation	lump sum	\$270,000.00	1	\$270,000.00
A6.4	Property Acquisition	lump sum	\$1,500,000.00	1	\$1,500,000.00
A6.5	Streetlighting and Traffic Signal Allowance	lump sum	\$85,000.00	1	\$85,000.00
A6.6	15% Miscellaneous	lump sum	\$359,460.58	1	\$359,460.58
Subtotal Section A6 - Miscellaneous/Provisional Items					\$904,460.58
Total Estimated Construction Cost					\$2,969,243.48

Alternative 2 – Signalized

TABLE 1 - PRELIMINARY CONSTRUCTION COST ESTIMATE

Hamilton Road and Gore Road Intersection

Intersection Improvements EA

Project No. 48214-100

January 18, 2022



Item No.	Description	Unit	Unit Price	Estimated Quantity	Total Cost
A1 - Site Preparation & Removals					
A1.1	Bonding, Insurance, Etc.	lump sum	\$45,000.00	1	\$45,000.00
A1.2	Mobilization/Demobilization	lump sum	\$20,000.00	1	\$20,000.00
A1.3	Pre-condition Survey	lump sum	\$8,000.00	1	\$8,000.00
A1.4	Site Office	lump sum	\$25,000.00	1	\$25,000.00
A1.5	Traffic control	lump sum	\$25,000.00	1	\$25,000.00
A1.6	Construction layout	lump sum	\$18,000.00	1	\$18,000.00
A1.7	Remove & dispose of existing asphalt	m ²	\$6.50	4700	\$30,550.00
A1.8	Remove & dispose of existing sidewalk	m ²	\$11.00	200	\$2,200.00
A1.9	Remove & dispose of existing curb & gutter	m	\$12.00	250	\$3,000.00
A1.10	Remove & dispose of existing storm sewers				
A1.11	Pipes & leads	m	\$40.00	750	\$30,000.00
A1.12	Manholes and catchbasins	each	\$1,200.00	12	\$14,400.00
A1.13	Tree removals, protection, maintain & relocate as required	lump sum	\$12,000.00	1	\$12,000.00
A1.14	Miscellaneous removals (pillars, signs etc.)	lump sum	\$20,000.00	1	\$20,000.00
Subtotal Section A1 - Site Preparation & Removals					\$253,150.00
A2 - Road Works					
A2.1	Excavate to subgrade	m3	\$14.00	4,323	\$60,522.00
A2.2	Roadway Paving			7,205	
A2.2.1	Granular 'B' (450mm)	tonnes	\$15.00	8,106	\$121,584.38
A2.2.2	Granular 'A' (150mm)	tonnes	\$20.00	2,702	\$54,037.50
A2.2.3	HL8 binder asphalt for road construction	tonnes	\$100.00	1,801	\$180,125.00
A2.2.4	HL3 surface asphalt for road restoration	tonnes	\$150.00	901	\$135,093.75
A2.3	Concrete Curb & Gutter (OPSD 600.040)	m	\$55.00	1,165	\$64,075.00
A2.4	Asphalt Multi-Use Trail	m ²	\$58.00	450	\$26,100.00
A2.5	Concrete sidewalk and island infill	m ²	\$60.00	650	\$39,000.00
A2.6	Boulevard restoration - topsoil & sod	m ³	\$16.00	188	\$3,000.00
A2.7	Truncated Dome Plates	each	\$300.00	18	\$5,400.00
Subtotal Section A2 - Road Works					\$688,937.63
A4 - Storm Sewers					
A4.1	New Storm Sewer (leads)	m	\$300.00	250	\$75,000.00
A4.2	Maintenance holes	ea	\$4,800.00	5	\$24,000.00
A4.3	Catch basins with leads	ea	\$4,000.00	10	\$40,000.00
A4.4	Miscellaneous storm connections and adjustments	lump sum	\$65,000.00	1	\$65,000.00
A4.5	Supply and install OGS Unit		\$45,000.00	1	\$45,000.00
A4.6	Sewer Main Testing	m	\$15.00	250	\$3,750.00
Subtotal Section A4 - Storm Sewers					\$252,750.00
A5 - Sanitary Sewers					
A4.1	New Sewer Main (200mm diameter)	m	\$450.00	250	\$112,500.00
A4.2	Sanitary Manholes	ea	\$4,800.00	5	\$24,000.00
A4.3	Sanitary services (open cut)	ea	\$4,000.00	12	\$48,000.00
A4.4	Connection to Existing Structures	ea	\$4,000.00	3	\$12,000.00
A4.5	Sewer Main Testing	m	\$15.00	250	\$3,750.00
Subtotal Section A4 - Storm Sewers					\$200,250.00
A6 - Watermain					
A6.1	New Watermain - Assume 200mm Dia.	m	\$372.00	400	\$148,800.00
A6.2	Supply and Install Hydrants and Leads	ea	\$6,500.00	2	\$13,000.00
A6.3	Supply and Install water services	ea	\$3,500.00	12	\$42,000.00
Subtotal Section A4 - Storm Sewers					\$203,800.00
A7 - Miscellaneous/Provisional Items - Design					
A7.1	Linepainting Allowance	lump sum	\$95,000.00	1	\$95,000.00
A7.2	Allowance for contaminated material remediation	lump sum	\$85,000.00	1	\$85,000.00
A7.3	Utility Relocation	lump sum	\$30,000.00	1	\$30,000.00
A7.4	Property Acquisition	lump sum	\$1,500,000.00	1	\$1,500,000.00
A7.5	Streetlighting Allowance and Traffic Signals	lump sum	\$180,000.00	1	\$180,000.00
A7.6	15% Miscellaneous	lump sum	\$239,833.14	1	\$239,833.14
Subtotal Section A6 - Miscellaneous/Provisional Items					\$629,833.14
Total Estimated Construction Cost					\$2,228,720.77

Alternative 3 - Signalized

TABLE 1 - PRELIMINARY CONSTRUCTION COST ESTIMATE

Hamilton Road and Gore Road Intersection

Intersection Improvements EA

Project No. 48214-100

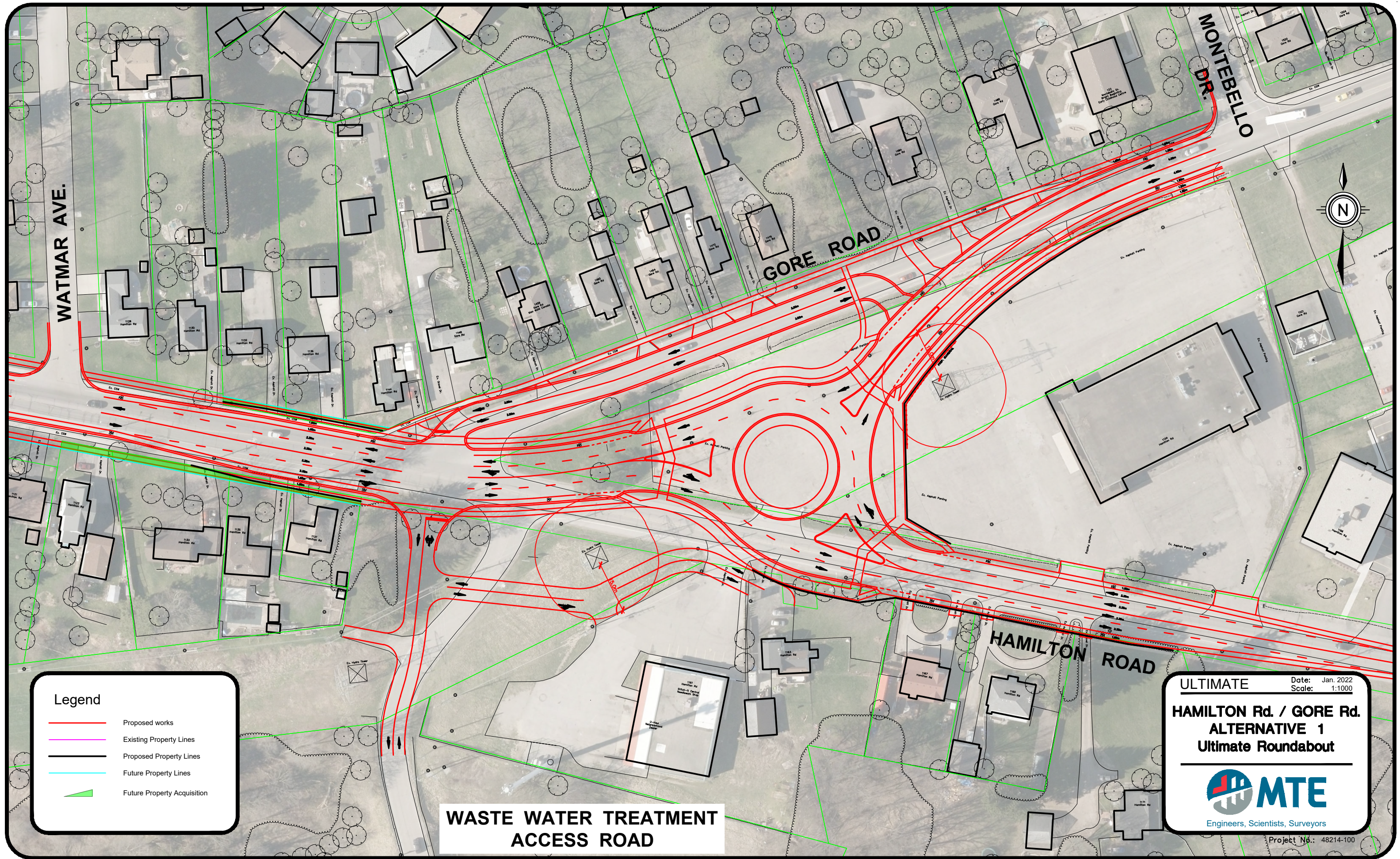
January 18, 2022

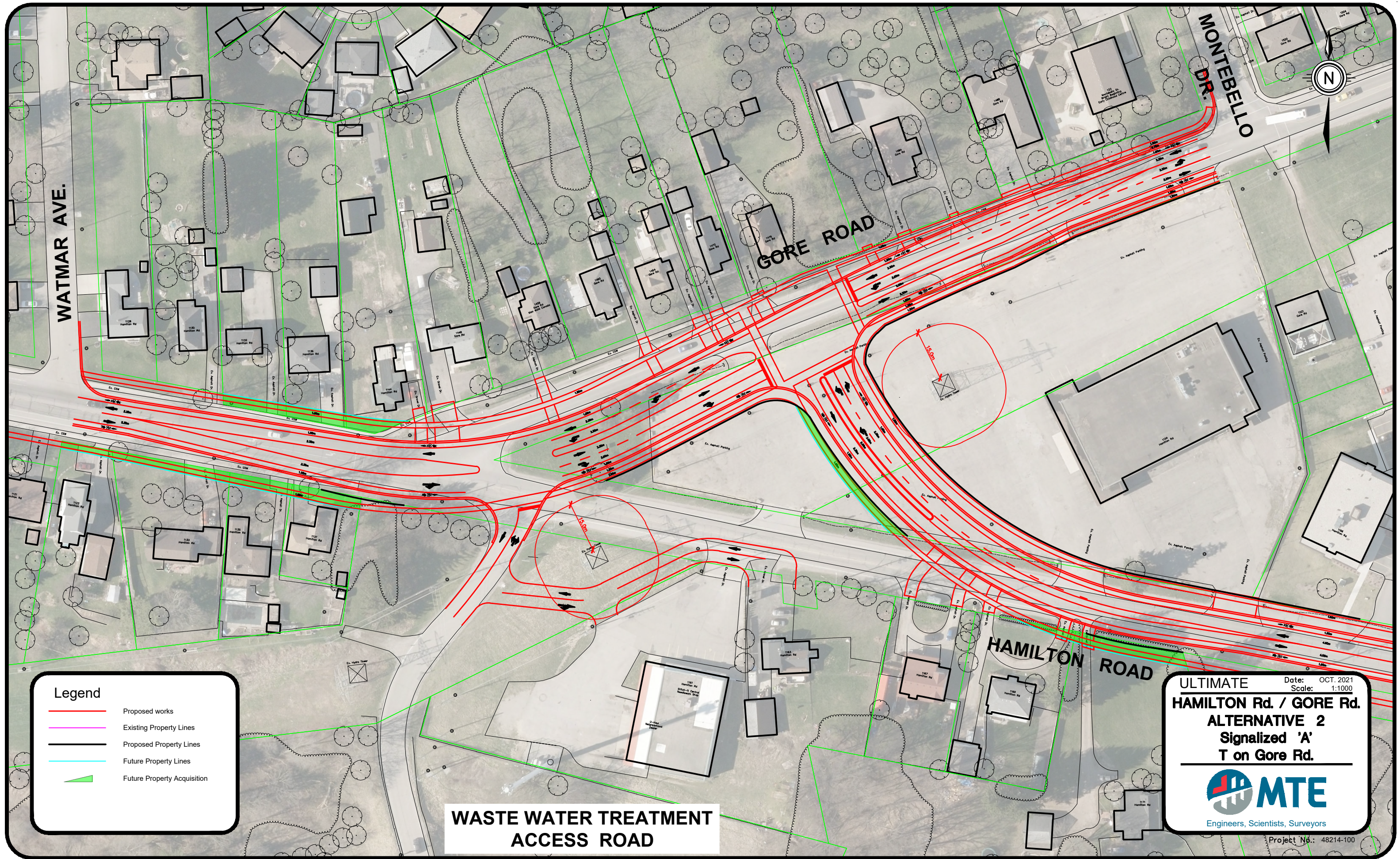


Item No.	Description	Unit	Unit Price	Estimated Quantity	Total Cost
A1 - Site Preparation & Removals					
A1.1	Bonding, Insurance, Etc.	lump sum	\$45,000.00	1	\$45,000.00
A1.2	Mobilization/Demobilization	lump sum	\$20,000.00	1	\$20,000.00
A1.3	Pre-condition Survey	lump sum	\$8,000.00	1	\$8,000.00
A1.4	Site Office	lump sum	\$25,000.00	1	\$25,000.00
A1.5	Traffic control	lump sum	\$25,000.00	1	\$25,000.00
A1.6	Construction layout	lump sum	\$18,000.00	1	\$18,000.00
A1.7	Remove & dispose of existing asphalt	m ²	\$6.50	2600	\$16,900.00
A1.8	Remove & dispose of existing sidewalk	m ²	\$11.00	90	\$990.00
A1.9	Remove & dispose of existing curb & gutter	m	\$8.00	90	\$720.00
A1.10	Remove & dispose of existing storm sewers				
A1.11	Pipes & leads	m	\$40.00	780	\$31,200.00
A1.12	Manholes and catchbasins	each	\$1,200.00	8	\$9,600.00
A1.13	Tree removals, protection, maintain & relocate as required	lump sum	\$12,000.00	1	\$12,000.00
A1.14	Miscellaneous removals (pillars, signs etc.)	lump sum	\$20,000.00	1	\$20,000.00
Subtotal Section A1 - Site Preparation & Removals					\$232,410.00
A2 - Road Works					
A2.1	Excavate to subgrade	m3	\$14.00	4,068	\$56,952.00
A2.2	Roadway Paving			6,780	
A2.2.1	Granular 'B' (450mm)	tonnes	\$15.00	7,628	\$114,412.50
A2.2.2	Granular 'A' (150mm)	tonnes	\$20.00	2,543	\$50,850.00
A2.2.3	HL8 binder asphalt for road construction	tonnes	\$100.00	1,695	\$169,500.00
A2.2.4	HL3 surface asphalt for road restoration	tonnes	\$150.00	848	\$127,125.00
A2.3	Concrete Curb & Gutter (OPSD 600.040)	m	\$55.00	1,100	\$60,500.00
A2.4	Concrete Curb & Gutter (OPSD 600.080)	m	\$45.00	0	\$0.00
A2.5	Asphalt Multi-Use Trail	m ²	\$58.00	0	\$0.00
A2.6	Concrete sidewalk and island infill	m ²	\$60.00	600	\$36,000.00
A2.7	Boulevard restoration - topsoil & sod	m ³	\$16.00	645	\$10,320.00
A2.8	Truncated Dome Plates	each	\$300.00	12	\$3,600.00
Subtotal Section A2 - Road Works					\$629,259.50
A4 - Storm Sewers					
A4.1	Supply and install storm Sewer	m	\$425.00	200	\$85,000.00
A4.2	Maintenance holes	ea	\$4,800.00	4	\$19,200.00
A4.3	Catch basins with leads	ea	\$4,000.00	8	\$32,000.00
A4.4	Supply and Install OGS Unit	ea	\$45,000.00	1	\$45,000.00
A4.5	Miscellaneous storm connections and adjustments	lump sum	\$65,000.00	1	\$65,000.00
A4.6	Sewer Main Testing	m	\$15.00	200	\$3,000.00
Subtotal Section A4 - Storm Sewers					\$249,200.00
A5 - Sanitary Sewers					
A4.1	New Sewer Main (200mm diameter)	m	\$450.00	75	\$33,750.00
A4.2	Sanitary Manholes	ea	\$4,800.00	2	\$9,600.00
A4.3	Sanitary services (open cut)	ea	\$4,000.00	8	\$32,000.00
A4.4	Connection to Existing Structures	ea	\$4,000.00	3	\$12,000.00
A4.5	Sewer Main Testing	m	\$15.00	75	\$1,125.00
Subtotal Section A4 - Storm Sewers					\$88,475.00
A6 - Watermain					
A6.1	New Watermain - Assume 200mm Dia.	m	\$372.00	200	\$74,400.00
A6.2	Supply and Install Hydrants and Leads	ea	\$6,500.00	2	\$13,000.00
A6.3	Supply and Install water services	ea	\$3,500.00	10	\$35,000.00
Subtotal Section A6 - Watermain					\$122,400.00
A7 - Miscellaneous/Provisional Items - Design					
A7.1	Linepainting Allowance	lump sum	\$60,000.00	1	\$60,000.00
A7.2	Allowance for contaminated material remediation	lump sum	\$75,000.00	1	\$75,000.00
A7.3	Utility Relocation	lump sum	\$135,000.00	1	\$135,000.00
A7.4	Property Acquisition	lump sum	\$1,000,000.00	1	\$750,000.00
A7.5	Streetlighting and Traffic Signal Allowance	lump sum	\$140,000.00	1	\$140,000.00
A7.6	15% Miscellaneous	lump sum	\$198,261.68	1	\$198,261.68
Subtotal Section A6 - Miscellaneous/Provisional Items					\$608,261.68
Total Estimated Construction Cost					\$1,930,006.18

Appendix D

Functional Design Drawings





Legend

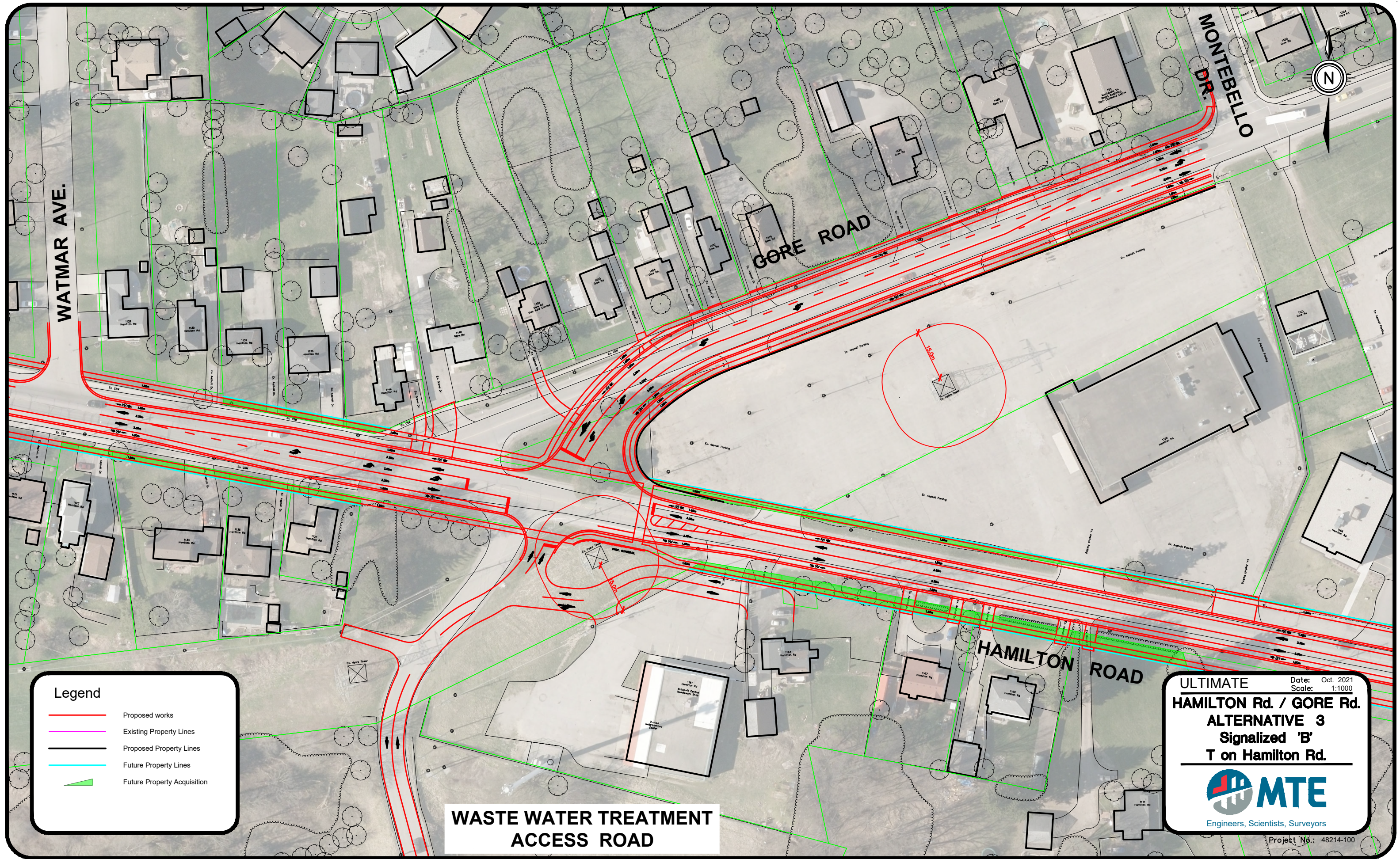
- Proposed works
- Existing Property Lines
- Proposed Property Lines
- Future Property Lines
- Future Property Acquisition

WASTE WATER TREATMENT
ACCESS ROAD

ULTIMATE Date: OCT. 2021
Scale: 1:1000
HAMILTON Rd. / GORE Rd.
ALTERNATIVE 2
Signalized 'A'
T on Gore Rd.



Project No.: 48214-100



- Legend**
- Proposed works
 - Existing Property Lines
 - Proposed Property Lines
 - Future Property Lines
 - Future Property Acquisition

**WASTE WATER TREATMENT
ACCESS ROAD**

ULTIMATE

Date: Oct. 2021
Scale: 1:1000

**HAMILTON Rd. / GORE Rd.
ALTERNATIVE 3
Signalized 'B'
T on Hamilton Rd.**

**MTE**
Engineers, Scientists, Surveyors

Pedestrian Count and Signal Study

CITY OF LONDON - ROADWAY LIGHTING & TRAFFIC CONTROL DIVISION													CURRENT DATE:	1/11/2024
INTERSECTION PEDESTRIAN SIGNAL SUMMARY SHEET														
LOCATION: Hamilton Rd @ Gore Rd							8-HR TRAFFIC VOLUME:		8300		Distance to Nearest Controlled Intersection (m)			745
WEATHER: Sunny		DATE: 2023-06-21		COUNTED BY: TF							Traffic Volume Warrant			WARRANTED
											Pedestrian Volume Warrant:			NOT WARRANTED
											Distance Warant			WARRANTED
1. PEDESTRIAN DELAY														
TIME ENDING	CHILD AGE <13	ASSITED CHILD	YOUTH AGE 13-18	ADULT	SENIOR/ DISABLED	TOTAL PEDS								
START 7:00														
7:00-8:00					1	1								
8:00-9:00					1	1								
11:00-12:00					1	1								
12:00-13:00				2		2								
13:00-14:00						0								
15:00-16:00			1	2		3								
16:00-17:00				3	1	4								
17:00-18:00						0								
TOTAL PEDS	0	0	1	7	4	12								
8-HR ADJ. TOT	0	0	1	7	4	12								
PERCENT	0	0	8.3	58.3	33.3	100								
ADJUST. FACTOR	0	NA	NA	NA	4									
TOTAL ADJUSTED VOLUME	0	0	1	7	8	16								
PERCENT	0	0	6.3	43.8	50	100								

[illegible]