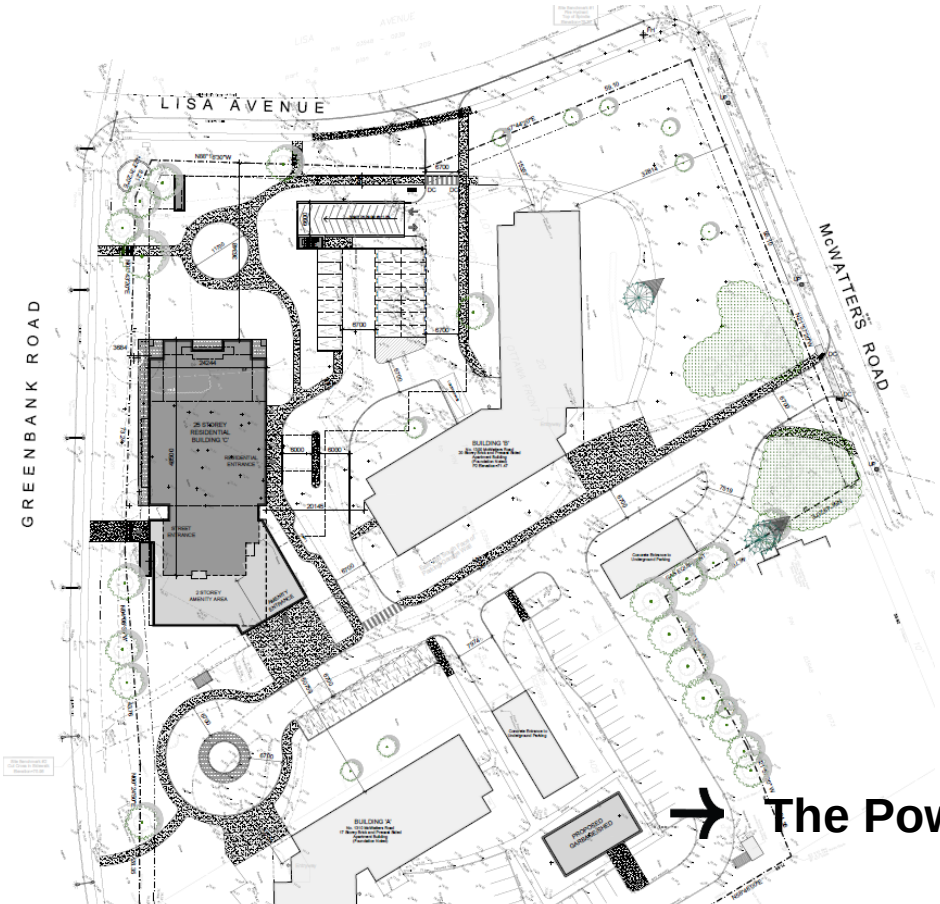
Residential Development at 1300 McWatters Road, Ottawa

Traffic Impact Assessment – Strategy Report

Homestead Land Holdings Limited

15 December 2021



The Power of Commitment

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1. Screening Form

GHD prepared a Transportation Impact Assessment (TIA) to support the new residential development at 1300 McWatters, Ottawa, Ontario. The TIA was completed according to the City of Ottawa's Transportation Impact Assessment Guidelines (2017). This study consists of the five mandatory steps which are screening, scoping, forecasting, analysis, and reporting. All steps and their respective modules are completed in sequence. The purpose of this study is to forecast the potential impacts of the new development on the existing transportation network and determine any improvements needed to mitigate these impacts. The Screening form has been prepared and is included as Appendix A. As shown in the Screening form, the Trip Generation and Safety Triggers are satisfied, and the TIA study must proceed into the next step.

2. Scoping

2.1 Description of Proposed Development

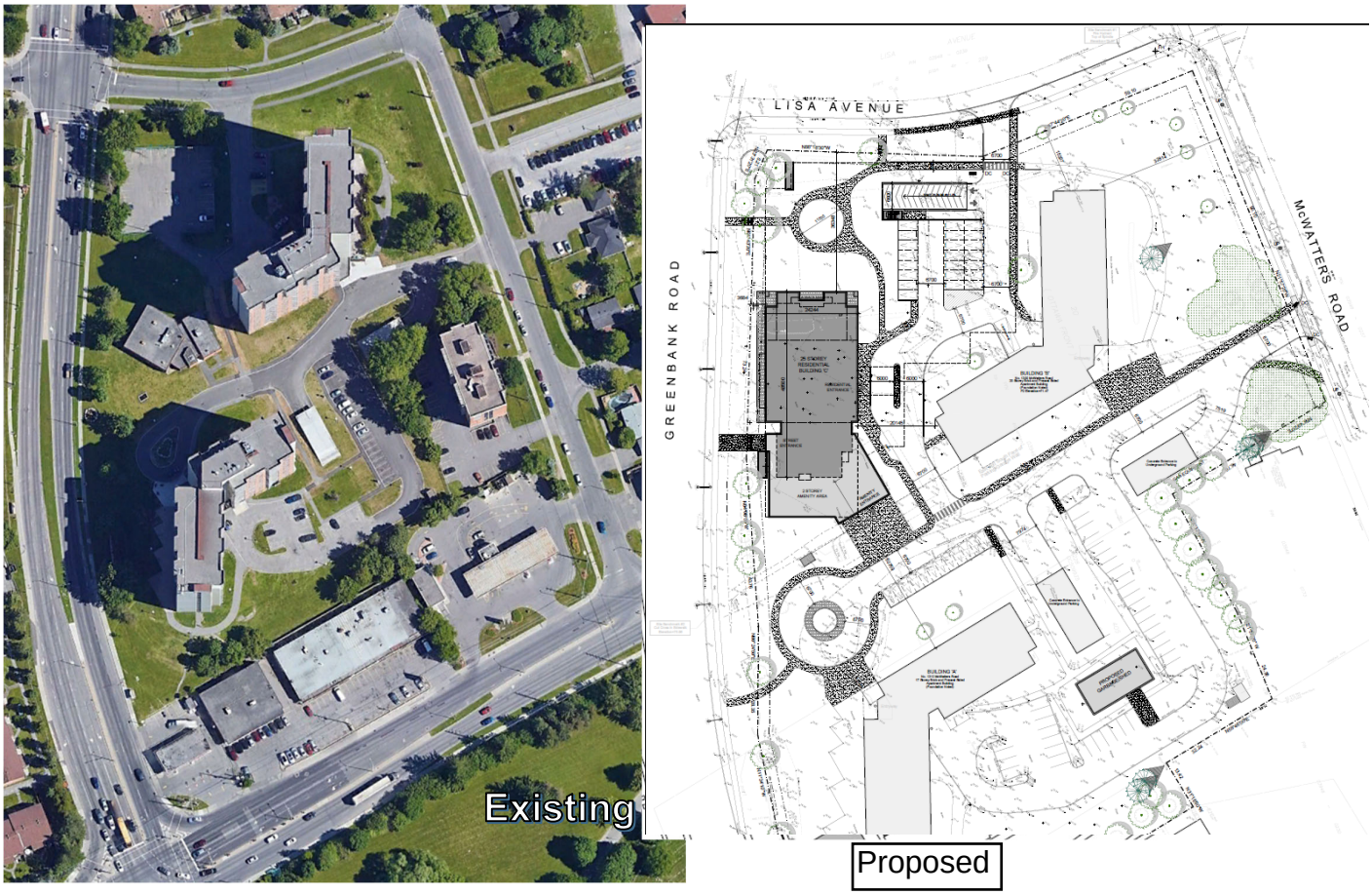
The proposed development is located on the corner of Greenbank Road and Lisa Avenue with a civic address of 1300 McWatters Road. The subject lands are designated General Urban Area in the City's Official Plan and are zoned R5B H18. According to the Official Plan's draft, the subjected lands are identified as being in the Outer Urban Transect and Greenbank Road and Baseline Road are both main street corridors. The proposed residential site plan is shown in Figure 1.

The proposed development involves converting the existing parking lot at Greenbank Road into a 25-storey high-rise residential building, and the redevelopment of the existing recreation center. A full-movement access is provided to the surface and underground parking from Lisa Avenue, a secondary access to the building is through McWatters Road. The existing accesses on Lisa Avenue and McWatters Road will be used for the development.

Pedestrians can access the building using an east-facing entrance connected to the parking area or a west-facing entrance connected by a pathway to the sidewalk on Greenbank Road. The proposed development is not within a Design Priority Area but because the project is the construction of a high-rise tower, it triggers the Urban Design and Compatibility guidelines for a High-Rise building, according to the City of Ottawa Official Plan.

The building will contain 235 residential units and provide 260 parking spaces in two underground parking levels and 29 surface parking spaces. The construction is planned to start in spring 2022 and be completed by the end of the year 2024 with occupancy in the same year.

Figure 1 – Existing site and proposed plan



2.2 Existing Conditions

2.2.1 Area Multi-Modal Network

Greenbank Road is a north-south arterial road. Within the study area it is a four-lane divided roadway with two lanes in each direction and a posted speed limit of 60 km/hr. There are sidewalks on both sides of the road.

Baseline Road is an east-west arterial road. Within the study area it is a four-lane divided roadway with two lanes in each direction with a posted speed limit of 60 km/hr. There are sidewalks on both sides of the road and a cycle lane in both directions west of Greenbank Road.

Lisa Avenue is a residential undivided two-lane, east-west local road with an unposted speed limit of 40 km/hr. There are sidewalks on both sides of the street.

Iris Street is an undivided two-lane, east-west major collector road with an unposted speed limit of 40 km/hr. There is a sidewalk on the north side of the road and a paved strip on the south side of the road.

McWatters Road is an undivided two-lane, north-south local road with a posted speed limit of 50 km/hr. There are sidewalks on both sides of the street.

Highway 417 (Queensway) is a provincial highway. The entrance and exit ramps to the highway are located on Greenbank Road and Pinecrest Road.

There are no traffic management measures existing in the study area. Baseline Road and Greenbank Road, north of Baseline Road, are full-load truck routes. The road classification is shown in Figure 2.

2.2.2 Intersections

Greenbank Rd / Iris St & Hwy 417 W-NS Off-Ramp is a signalized intersection. The northbound approach consists of three through lanes and a right-turn lane. The southbound approach consists of a channelized right-turn lane for buses, two left-turn lanes and two through lanes. The eastbound approach consists of a through lane, a channelized right-turn lane and two left-turn lanes. The westbound approach consists of two right-turn lanes and two left-turn lanes. The through movement on this approach is not allowed.

Lisa Avenue / Greenbank Road is a signalized intersection. The northbound approach consists of a left-turn lane, a through lane and a shared through/right turn lane. The southbound approach consists of left and right-turn lanes and two through lanes. The westbound and eastbound approaches have a shared through/left-turn/right-turn lane.

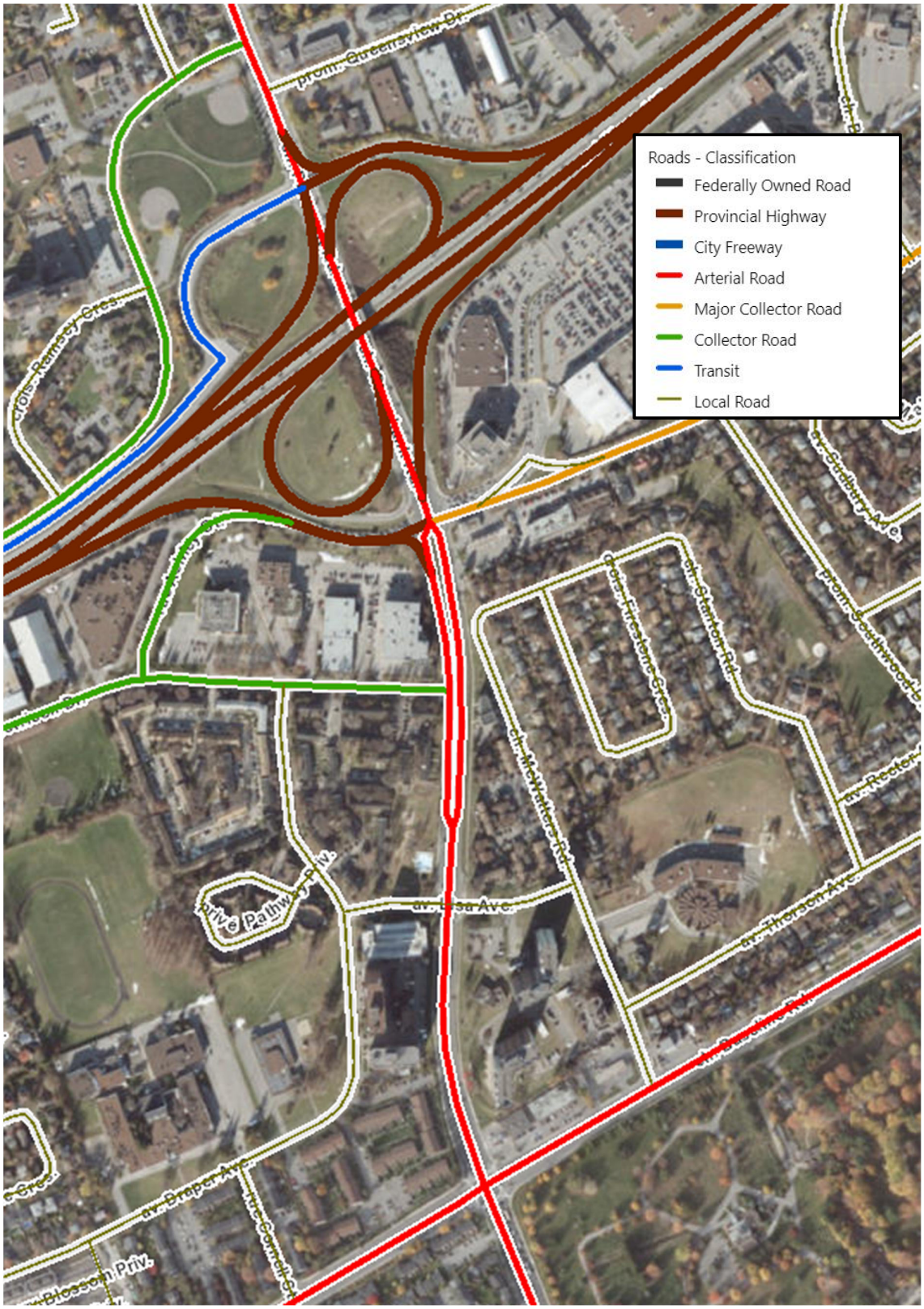
Greenbank Road / Baseline Road is a signalized intersection. The northbound approach consists of a left-turn lane, two through lanes and a channelized right turn lane. The southbound approach consists of a channelized right-turn lane, two left-turn lanes and two through lanes. The eastbound approach consists of a left-turn lane, a through lane and a shared through/right-turn lane. The westbound approach consists of two through lanes, two left-turn lanes and a channelized right turn lane.

McWatters Road / Baseline Road is controlled with a stop sign for southbound vehicles. The southbound approach consists of a right-turn only lane. Vehicles traveling westbound on Baseline Road have two travel lanes. Right-turning movements are permitted, except between 7AM and 9AM on weekdays. Eastbound on Baseline Road, there is a left-turn lane towards McWatters Road and two through lanes.

The intersection of McWatters Road and Lisa Avenue is controlled by a stop sign for all approaches. All the approaches have only one lane that is shared for all movements.

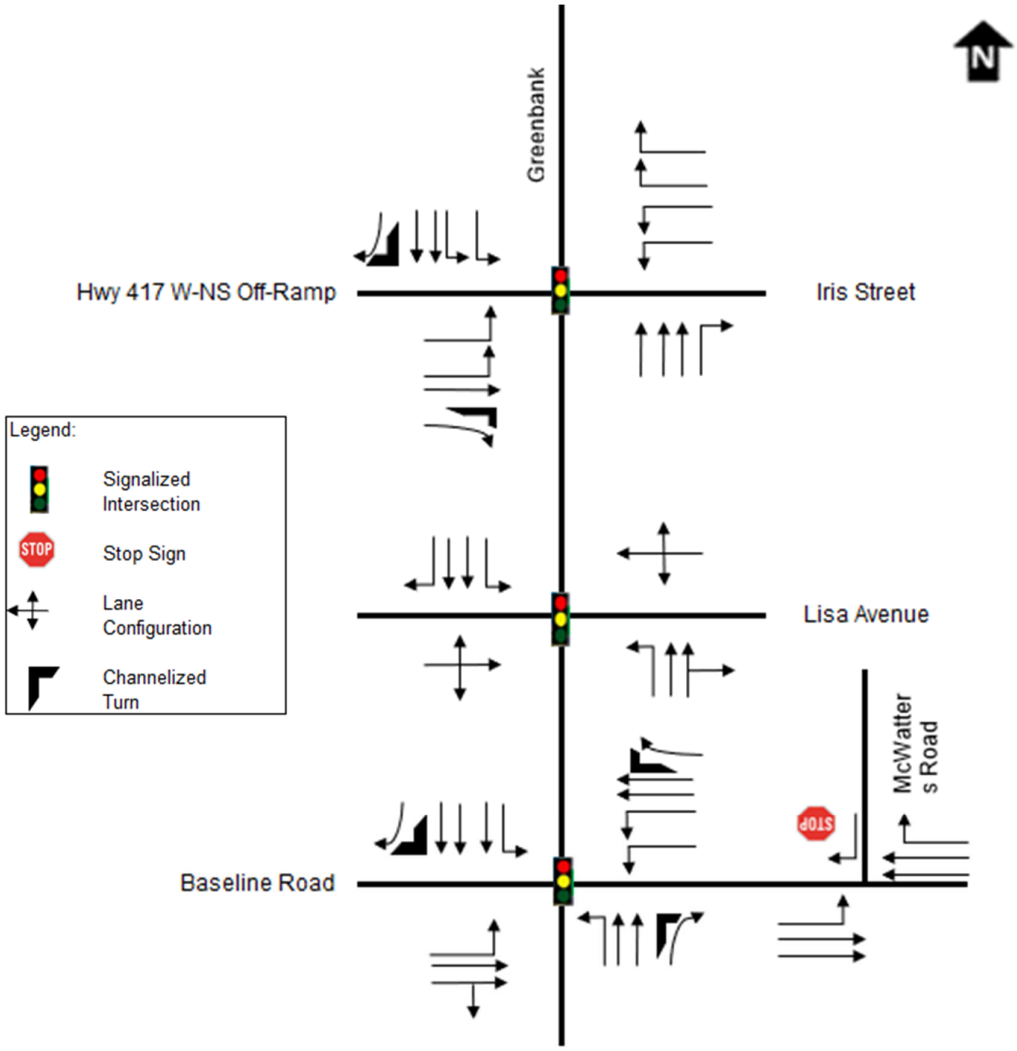
The intersection configuration is shown in Figure 3.

Figure 2 – Road Classification



Source: geoOttawa

Figure 3 – Intersection configuration



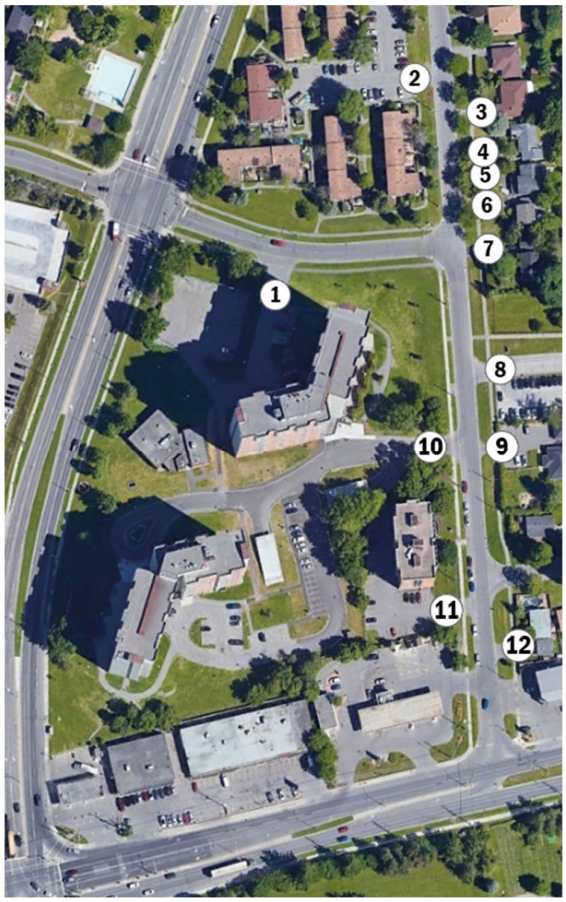
2.2.3 Driveways

Two existing driveways will provide vehicular access to the site. The locations of driveways in the study area are summarized in Table 1. Due to the low traffic volumes generated by the development, there are no concerns with the locations of the existing driveways.

Table 1 – Existing Driveways

ID	Land use	Location
1	Residential (proposed development main access)	Lisa Avenue – South side
2	Residential	McWatters Road – West side
3	Individual house	McWatters Road – East side
4	Individual house	McWatters Road – East side
5	Individual house	McWatters Road – East side
6	Individual house	McWatters Road – East side
7	Individual house	McWatters Road – East side
8	Institutional (Pinecrest Public School)	McWatters Road – East side
9	Private language school	McWatters Road – East side
10	Residential (proposed development secondary access)	McWatters Road – West side
11	Residential	McWatters Road – West side
12	Individual house	McWatters Road – East side

Figure 4 – Access locations

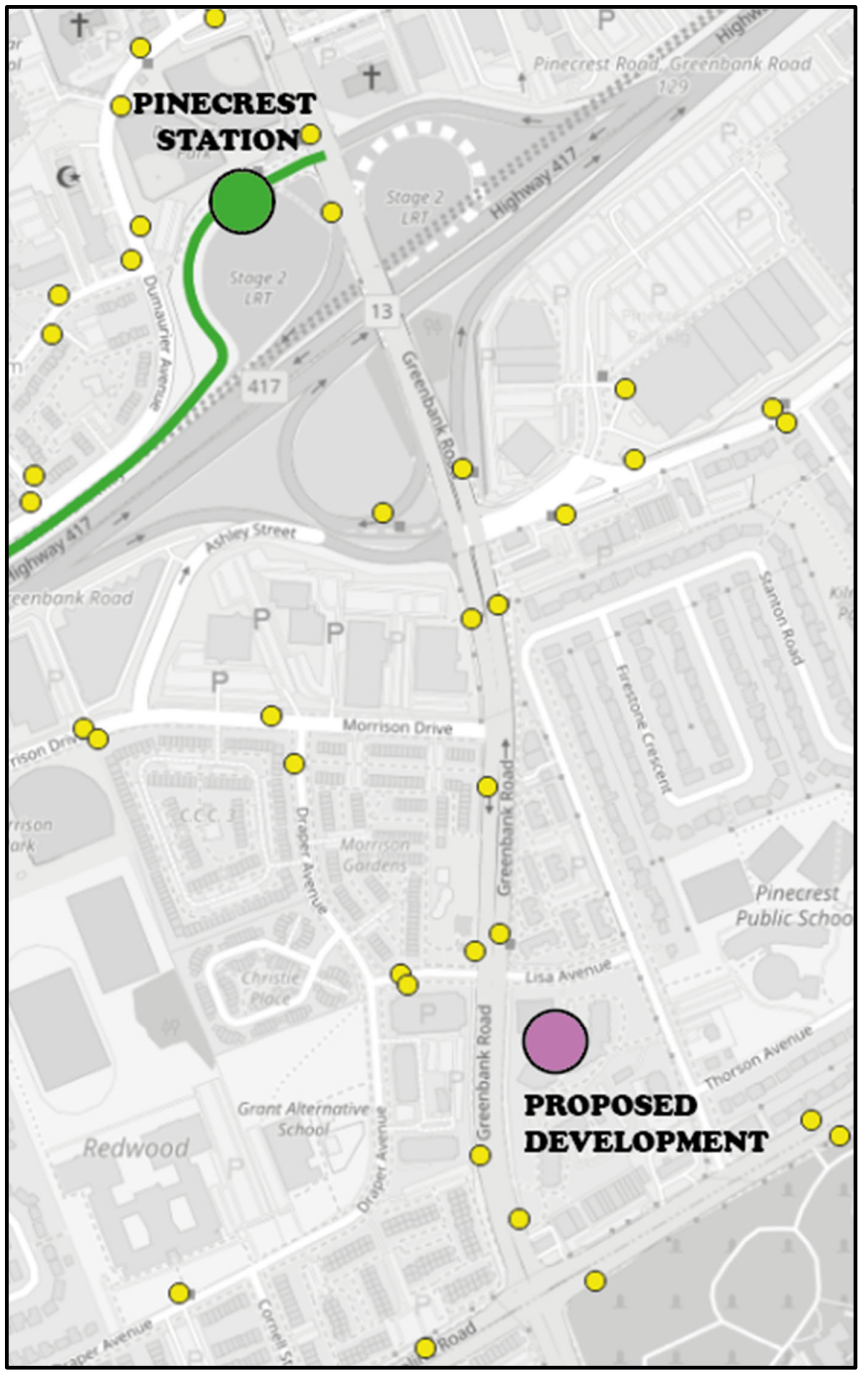


2.2.4 Transit

Within the study area, routes # 58, 82, 173, 282 and 691 have stops on Greenbank Road in the northbound and southbound directions. There are 16 bus stops on Greenbank Road between Queensview Dr and Meadowbank Drive. The nearest bus stop to the proposed development is at the corner of Greenbank Road and Lisa Avenue, which is approximately 110 meters from the entrance of the building. Route 88 is on Baseline Road. The location of the bus stops in the study area are shown in yellow in Figure 6, the bus routes in the study area are shown in Figure 6, and the bus schedules are provided in Appendix B.

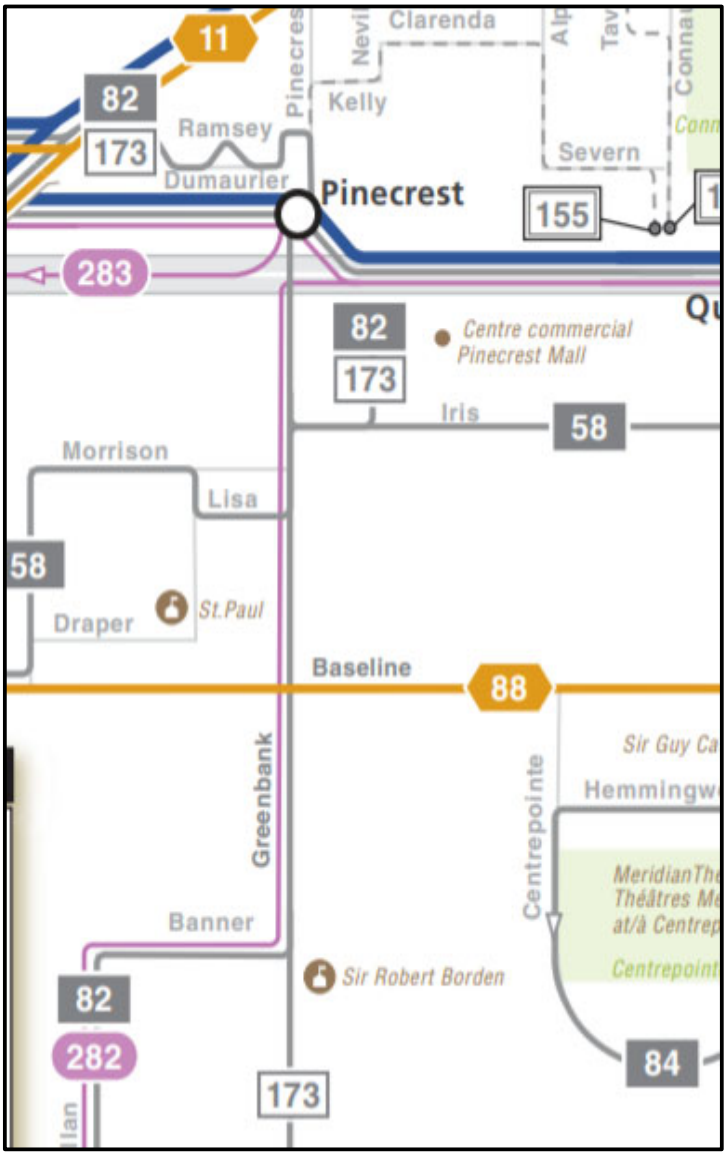
The nearest transitway station to the proposed development is Pinecrest Station.

Figure 5 – Transit facilities and bus stops



Source: OC Transpo GTFS

Figure 6 – Transit routes



Source: https://www.octranspo.com/images/files/maps/systemmap.pdf

2.2.5 Peak Hour Travel Demand

The existing traffic counts were acquired from the City of Ottawa for the intersections within the study area. The traffic data's date and peak hour time are summarized in Table 2. The traffic volumes used in the TIA are shown in Figures 6 and 7 and are provided in Appendix C.

Table 2 – Intersection Count Data

Intersection	Count Date	AM Peak Hour	PM Peak Hour
Baseline Rd/ McWatters Rd	Tuesday, May 25, 2021	08:00 - 09:00	16:00 - 17:00
Greenbank Rd / Iris St	Wednesday, January 16, 2019	07:45 - 08:45	16:00 - 17:00
Greenbank Rd / Lisa Ave	Thursday, August 11, 2016	08:00 - 09:00	16:00 -17:00
Greenbank Rd / Baseline Rd	Thursday, August 11, 2016	07:45 - 08:45	16:15 - 17:15

Figure 7 – Vehicular volumes at the intersections

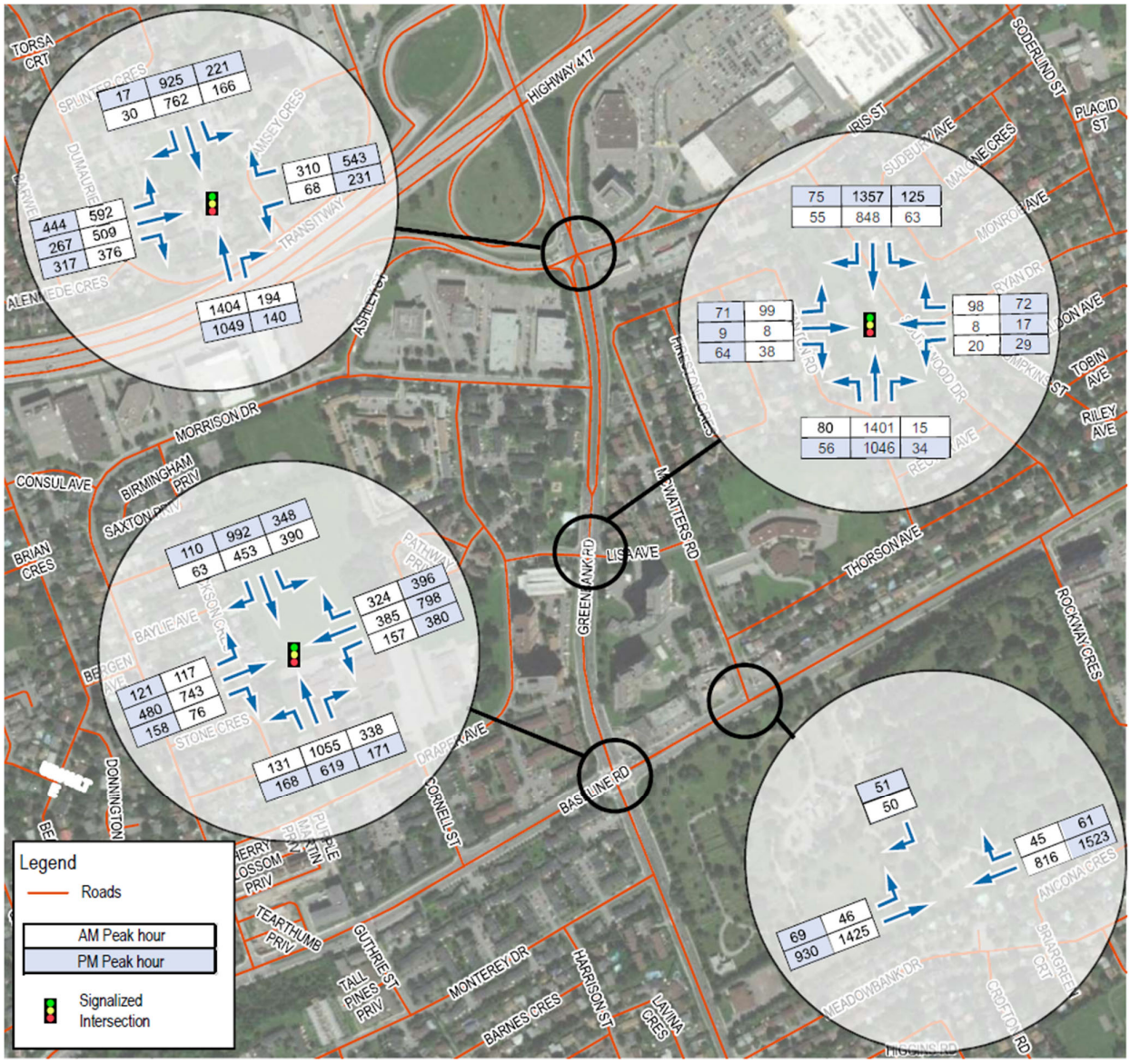
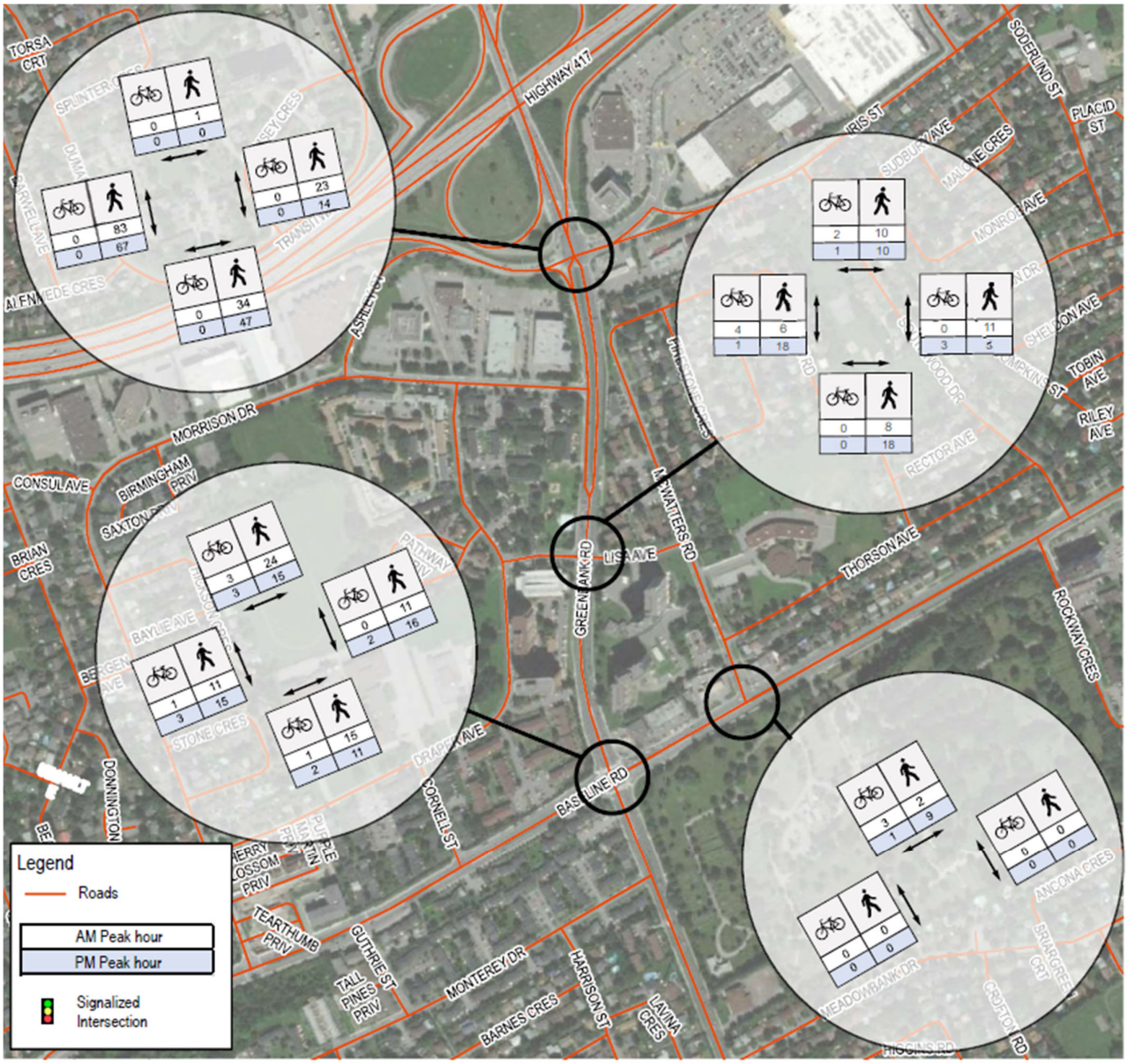


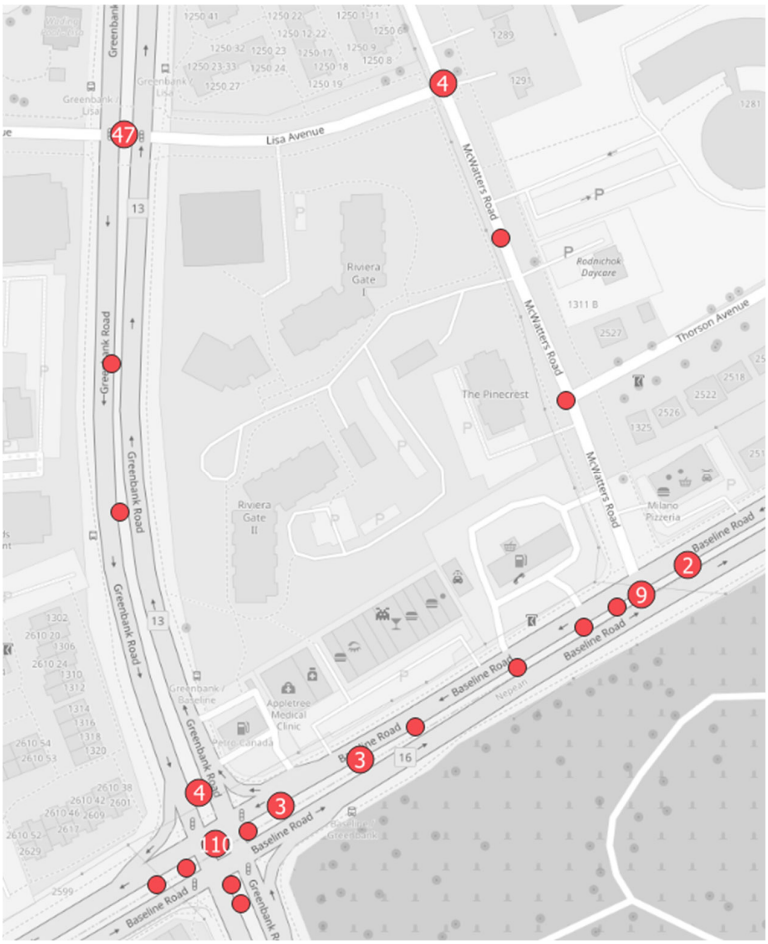
Figure 8 – Pedestrian and cyclist volumes at the intersections



2.2.6 Collision Analysis

Collision data was received from the Transportation Data Collection & Analytics Group within the Transportation Services Division at the City of Ottawa. Additional collision data was accessed through the City of Ottawa's Open Data Portal. The reviewed data spans the most-recent, complete five-year period from 2015 to 2019. In total, 171 collisions occurred at the intersections of Greenbank Road / Lisa Avenue, Greenbank Road / Baseline Road, McWatters Road / Lisa Avenue and McWatters Road / Baseline Road and the roadway segments between these intersections. The locations of the collisions are illustrated in Figure 9 and the collision data has been provided in Appendix D.

Figure 9 – Collision locations within the study area between 2015 and 2019



Source: City of Ottawa's Open Data Portal

GREENBANK ROAD / LISA AVENUE

Between 2015 and 2019, a total of 47 collisions occurred within the intersection with over half (24) being rear-end collisions. With respect to the initial direction of vehicle one, 49% of collisions involved southbound motorists and 32% involved northbound motorists. Most of the collisions occurred during daylight and while the pavement was dry. 23% of the collisions resulted in non-fatal injuries. There were no cyclist collisions and two pedestrian collisions.

LISA AVENUE / MCWATTERS ROAD

At this intersection, there were four collisions over the five-year period and they were all property damage only collisions. Although the intersection is stop-controlled on all approaches, 50% of the collisions are classified as angle collisions. No collisions were documented with cyclists or pedestrians.

BASELINE ROAD / MCWATTERS ROAD

Of the nine collisions that happened between 2015 and 2019, 44% were angle or turning movement collisions. All collisions occurred during clear weather and 44% of them resulted in non-fatal injuries. One collision involved a pedestrian.

BASELINE ROAD / GREENBANK ROAD

A total of 110 collisions were reported at the intersection of Greenbank Road and Baseline Road between 2015 and 2019. Approximately 20% were non-fatal injury collisions with the remaining being property damage only. With respect to the initial direction of vehicle one, collisions were uniformly distributed amongst all intersection approaches. A majority of collisions (68%) were classified as rear-end collisions while 20% were sideswipe collisions. Almost 42% of collisions occurred between 3:00 pm and 7:00 pm. Two collisions were reported involving cyclists and only one collision involved a pedestrian.

BASELINE ROAD (BETWEEN MCWATTERS ROAD AND GREENBANK ROAD)

There were 11 collisions between 2015 and 2019 along this section of Baseline Road with 57% rear-end collisions. All of the collisions were vehicular collisions and resulted in property damage only. No collisions were documented with cyclists or pedestrians.

MCWATTERS ROAD (BETWEEN LISA AVENUE AND BASELINE ROAD)

There were two collisions on this segment with one at the intersection of Thorson Avenue. Both collisions were property damage only, were at different locations, happened with different lighting and weather conditions, thus there are no similarities. No collisions were documented with cyclists or pedestrians.

GREENBANK ROAD (BETWEEN BASELINE ROAD AND LISA AVENUE)

6 collisions were registered on this road segment with four happening during dark conditions. All collisions were property damage only and no collisions were documented with cyclists or pedestrians.

2.3 Planned Conditions

2.3.1 Changes to the Area Transportation Network

The new Pinecrest LRT station will be built 700 meters from the proposed development. The new transit station is part of the Confederation Line West extension project in which 11 new or converted stations will be added to the City's overall light rail transit network. It will be located on the north side of Highway 417 west of Pinecrest Road. The main access to the station will be on Dumaurier Avenue which will be connected to Pinecrest Road through a multi-use pathway. To support the new station, a pedestrian crosswalk is planned to be built from Pinecrest Road to the station's entrance. To ensure that the cyclist network is integrated with the project, a bidirectional cycle tracks will be added along the west side of Pinecrest Road, from station entrance to Queensview Drive. The station is planned to be in service by 2025. The new stations and the pedestrian projects in the area are shown in Figure 6, attached.

The City of Ottawa is planning to construct a Bus Rapid Transit (BRT) corridor between Bayshore station and Heron station along Baseline Road and will include dedicated bus-only lanes along the length of the 14 km corridor. The project is part of the City's Transportation Master Plan (TMP) Network Concept, therefore will not be in place until post-2031. Baseline Road has been identified as a Transit Priority Corridor with isolated measures as part of the Affordable Network in the TMP. The new development that is the subject of this TIA is 300 meters away from Baseline Road and therefore will be served by both a new LRT station and a BRT corridor within a distance of less than 1 km.

A cycling link is planned in the Ottawa Cycling Plan on Baseline Road, between Greenbank Road and the existing cycling facilities west of the transitway at Baseline Station.

2.3.2 Other Study Area Developments

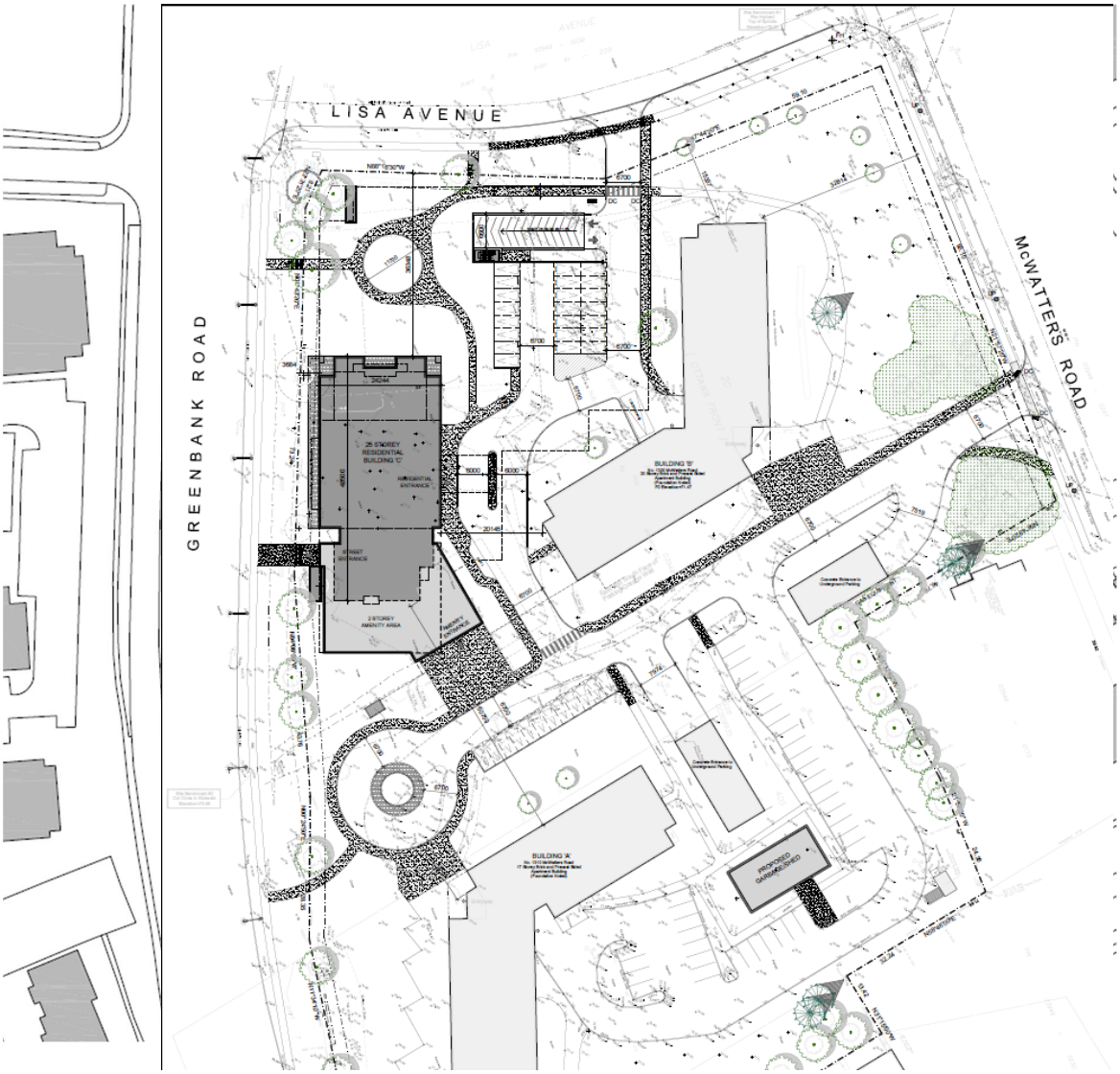
At the time the study was prepared, there were no other planned developments within the study area.

2.4 Study Area

The proposed development is located at the corner of Greenbank Road and Lisa Avenue. The building will contain 235 residential units, 260 underground parking spaces and 29 surface parking spaces. The proposed development will have its own underground parking and will not be connected to the existing underground parking.

The proposed development will be connected to the existing road and pedestrian network using the existing accesses on Lisa Avenue and McWatters Road. Another pedestrian connection will be constructed between the building and Greenbank Road.

Figure 10 – Site Plan



The development should generate low traffic volumes given its type and location. Thus, we reviewed the intersections that could be impacted by the new trips. There are 12 intersections with arterial roads that are within 1 km from the proposed development, as measured along roadways. However, it was found that there were only a few intersections that were impacted by the development. After calculating the trip distribution, few vehicles are expected to travel through the majority of the intersections within the 1 km distance. A comparison of the existing total traffic volumes entering each intersection during the PM peak hour and the new trips entering each intersection is shown in Table 3. The new traffic volumes at these intersections will have minimal impact on the overall traffic operations.

Table 3 – Intersections Minimally Impacted by Development

Intersection	Existing intersection volumes (PM)	Maximum new vehicles at intersection
Pinecrest Rd / Queensview Dr	2470	Maximum 5 vehicles travel southbound through the intersection
Hwy 417 E-NS Off-Ramp / Pinecrest Rd & Greenbank Rd	3020	Maximum 7 vehicles travel through the intersection
Greenbank Rd / Morrison Dr	1420	Maximum 12 vehicles travel southbound through the intersection
Greenbank Rd / Baseline Rd	4690	Maximum 8 vehicles southbound split between through, right-turn and left-turn directions
Greenbank Rd / Monterey Rd	1480	Maximum 6 vehicles southbound on Greenbank Road
Greenbank Rd / Meadowbank Rd	2100	Maximum 6 vehicles southbound on Greenbank Road
Baseline Rd / Cornell St	1840	Maximum 5 vehicles travel through intersection on Baseline Road
Baseline Rd / Guthrie St	1840	Maximum 5 vehicles travel through intersection on Baseline Road
Baseline Rd / Morrison Dr	1840	Maximum 5 vehicles travel through intersection on Baseline Road
Baseline Rd / McWatters Rd	2540	Maximum 6 vehicles travel through intersection; only possible movement related to development is the southbound or eastbound right turn

The intersections that will be directly impacted by the development are identified in the table below. The primary access to the apartment building will be Lisa Avenue, which means most vehicles exiting and entering the building will travel through the intersection of Lisa Avenue / Greenbank Road because Greenbank Rd gives access to Highway 417.

Table 4 – Impacted Intersections Within the Study Area

Intersection	Description
Greenbank Rd / Iris St & Hwy 417 W-NS Off-Ramp	Additional 20 vehicles travel through intersection at peak hour
Lisa Ave / Greenbank Rd	Adjacent to development
McWatters Rd / Baseline Rd	Within 150m of the development access
Greenbank Rd / Baseline Rd	Within 350m of the development access

2.5 Time Periods

The proposed development is a High-Rise residential building therefore the AM and PM peak hours will be examined since these times represent the peak travel time scenario.

2.6 Horizon Years

The planned year of development build-out is 2022 and full occupancy is predicted for 2025. Therefore, the build-out plus five years horizon is 2030. The analysis will be completed for 2021 (existing), 2025 and 2030.

2.7 Exemptions Review

Table 5 summarizes the possible exemptions for a Traffic Impact Analysis.

Table 5 – Exemptions Review

Module	Element	Exemption Considerations
4.1 Development Design	4.1.3 New Street Networks	Only required for plans of subdivision
4.2 Parking	4.2.2 Spillover Parking	Only required for site plans where parking supply is 15% below unconstrained demand
4.6 Neighborhood Traffic Management	4.6.1 Adjacent Neighborhoods	Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds
4.8 Network Concept		Only required when proposed development generates more than 200 person-trips during the peak hour in the excess of the equivalent volume permitted by established zoning

Based on the development proposed and following the Transportation Impact Assessment Guidelines (2017), this TIA is exempted from:

- Module 4.1.3: This development is not a subdivision
- Module 4.2.2: The parking supply meets the demand
- Module 4.6: The additional 36 vehicles generated in AM peak hour or 37 vehicles in the PM peak hour will not change the existing classification of the road
- Module 4.8: The development generates fewer than 100 person-trips in the peak hour

3. Forecasting

3.1 Development-generated Traffic

3.1.1 Trip Generation and Mode Shares

No trip reduction factor was applied.

3.1.1.1 Trip Generation Rates

The projected site trips were estimated based on TRANS Trip Generation Manual October 2020. The person-trip rates for a multi-unit high-rise dwelling Unit (Land Use Code 221 and 222) is 0.80 for AM peak period and 0.90 for PM peak period. Thus, for the project, the total person-trips generated is 184 during AM peak period and 207 during PM peak period.

3.1.1.2 Mode Shares

The recommended mode shares by TRANS district for high-rise multi family dwelling are summarized in Table 6. After the application of modal share, the peak hour trips were calculated for the person and vehicle trips.

Table 6 – Residential Mode Share for High-Rise Housing in the Bayshore/ Cedarview District

Travel Mode	Mode Share AM	Mode Share PM
Auto-Driver	40 %	40 %
Auto Passenger	12 %	15 %
Transit	38 %	33 %
Cycling	2 %	1 %
Walking	8 %	11 %

Using the mode share, the number of generated trips per mode were calculated. The peak period to peak hour adjustment provided in the TRANS Trip Generation Manual October 2020 was used to calculate the number of trips that the proposed development will generate, per mode, per period. The recommended vehicle directional split for multi-unit high-rise is 31% inbound during AM Peak and 58% inbound during PM Peak. The trip generation by mode is summarized in Table 7.

Table 7 – Trip Generation by Mode

Period	Travel Mode	Mode share	Trips Peak Period	Peak period to peak hour factor	Trips Peak Hour	In	Out
AM	Auto Driver	40 %	74	0.48	36	11	25
	Auto Passenger	12 %	22	0.48	11	3	8
	Transit	38 %	70	0.55	39	12	27
	Active	10 %	18	0.58	10	3	7
	Total		**184**		**96**	**29**	**67**
PM	Auto Driver	40 %	83	0.44	37	21	16
	Auto Passenger	15 %	31	0.44	14	8	6
	Transit	33 %	68	0.47	32	19	13
	Active	12 %	25	0.5	13	8	5
	Total		**207**		**96**	**56**	**40**

The proposed development will generate 36 vehicle trips in the AM peak hour and 37 vehicle trips in the PM peak hour since we assume that the “auto passenger” mode are passengers to the “auto driver” mode.

3.1.2 Trip distribution

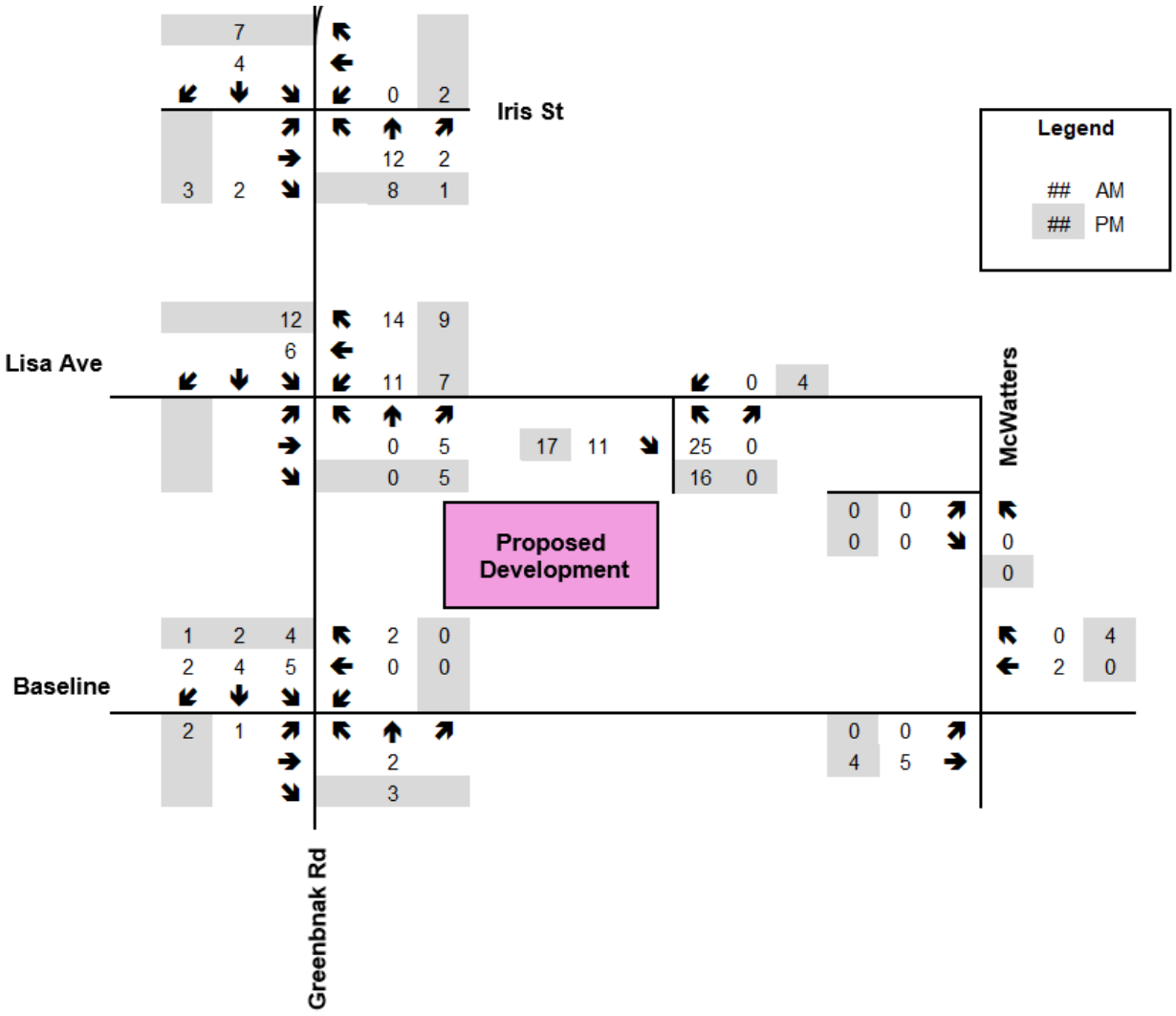
The trip distribution was completed using the existing travel patterns in the study area. Hence, the trip distribution is as follow for vehicles exiting the development in the AM peak hour. We assume the same proportions in the opposite direction for the PM peak hour.

- To the north using Greenbank Road towards Highway 417: 56%
- To the south using Greenbank Road: 16%
- To the west using Baseline Road: 8%
- To the east using Baseline Road: 20%

3.1.3 Trip assignment

Using the distribution above and the existing turning movement splits, the trips generated were assigned to the road network. Although there are accesses to the development on both Lisa Avenue and McWatters Road, no traffic has been assigned to the McWatters Road access, because it does not provide a logical path for drivers. The undergound parking access to the proposed building is located near the Lisa Avenue access and drivers using the McWatters Road access would have to drive through the parking area in a convoluted pattern at slow speed and complete a 180º turn to enter the parking garage. In addition, at McWatters Road/Baseline Road, a southbound right-turn only movement is permitted and therefore all exiting traffic must travel through the intersection of Greenbank Road/ Baseline Road, which has long delays. Drivers using the Lisa Avenue access travel through the intersection of Lisa Avenue/ Greenbank Road where the intersection operates with minimal delay. Figure 11 shows the new trips assigned on the road network.

Figure 11 – Development New Trips Assignment



3.2 Background Network Traffic

3.2.1 Changes to the Background Transportation Network

The transportation network plans were discussed in the Scoping Report. No changes are planned on the road network.

3.2.2 General Background Growth Rates

The background growth rates were calculated using data from the TRANS Regional Model. GHD was provided snapshots for horizons 2011 and 2031. From the volumes estimated for both horizons, the growth was calculated on each road within the study area on a yearly basis. These annual growth rates were then used to expand the traffic counts, from the year they were completed to the forecasted horizons 2025 and 2031. The annual growth rates are the following:

- 0.5% on Greenbank Road;
- 0.1% on Baseline Road;
- 0.6% on Iris Street;

- 0.1% on Highway 417 Ramps;
- 1.5% on Lisa Street, east of Greenbank Road and 0.1% on Lisa Street, west of Greenbank Road.

Figure 12 and Figure 13 show the projected background volumes for 2025 and 2030.

Figure 12 – 2025 Background Volumes

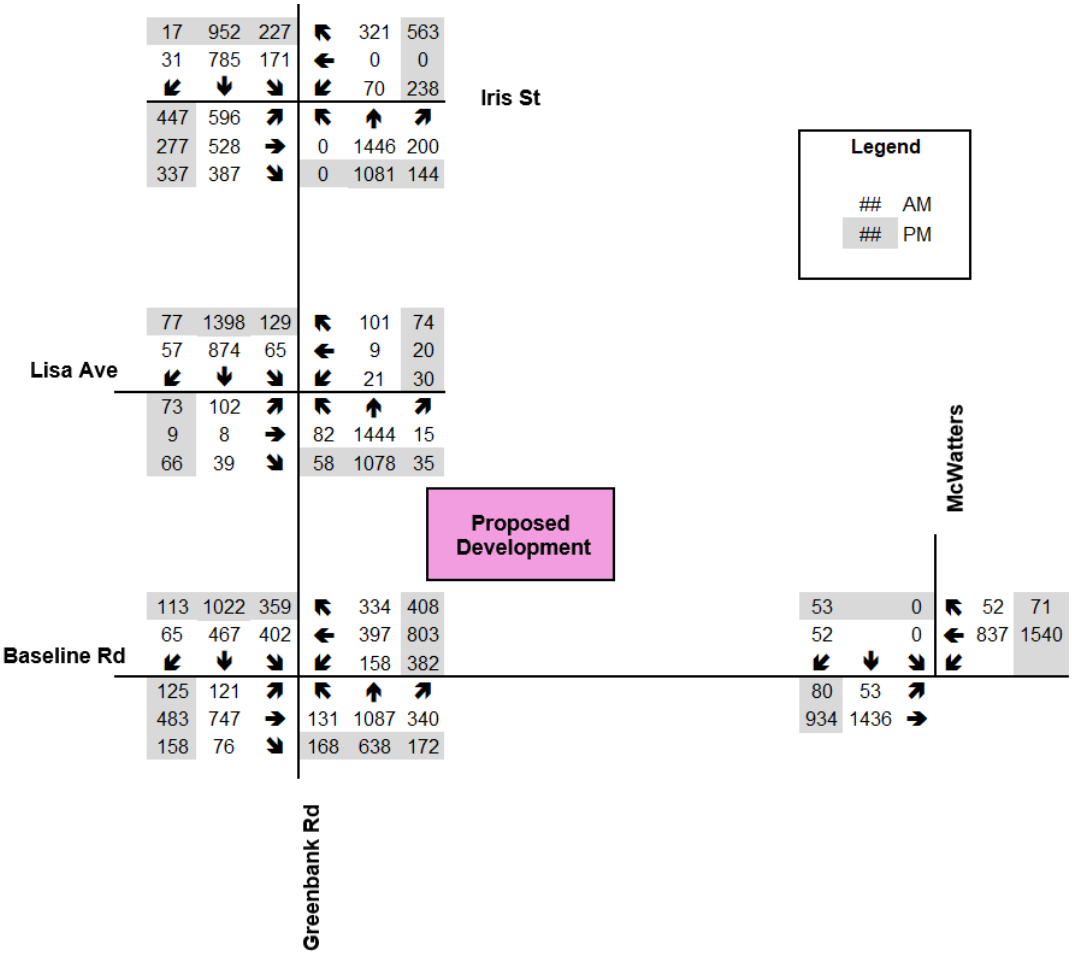
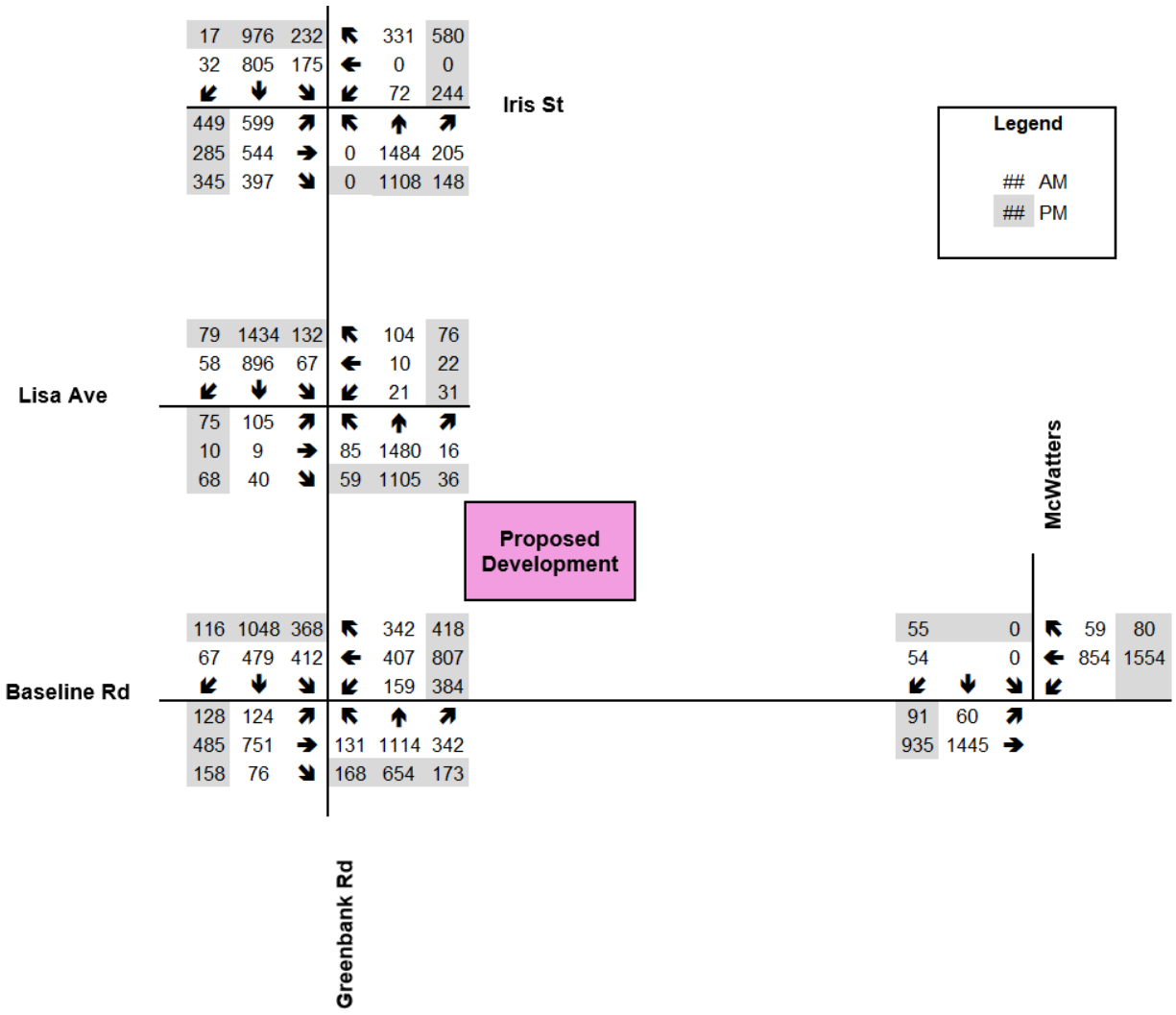


Figure 13 – 2030 Background Volumes



3.2.3 Other Area Development

At the time the study was prepared, there were no other planned developments within the study area.

3.3 Demand Rationalization

The trip generation is consistent with the procedure set by the City of Ottawa and since the traffic generated by the project is low, no adjustments are required.

Due to the low volume of traffic generated by the development, we reviewed the intersections that would be impacted by the new trips. There are 12 intersections with arterial roads that are within 1 km from the proposed development, as measured along roadways. However, it was found that there were only a few intersections that were impacted by the development. After calculating the trip distribution, few vehicles are expected to travel through the majority of the intersections within the 1 km distance. A comparison of the existing total traffic volumes entering each intersection during the PM peak hour and the new trips entering each intersection is shown in Table 8.

Table 8 – Intersections Minimally Impacted by Development

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Pinecrest Rd / Queensview Dr	2470	Maximum 5 vehicles travel southbound through the intersection
Hwy 417 E-NS Off-Ramp / Pinecrest Rd & Greenbank Rd	3020	Maximum 7 vehicles travel through the intersection
Greenbank Rd / Morrison Dr	1420	Maximum 12 vehicles travel southbound through the intersection
Greenbank Rd / Baseline Rd	4740	Maximum 8 vehicles southbound split between through, right-turn and left-turn directions
Greenbank Rd / Monterey Rd	1480	Maximum 6 vehicles southbound on Greenbank Road
Greenbank Rd / Meadowbank Rd	2100	Maximum 6 vehicles southbound on Greenbank Road
Baseline Rd / Cornell St	1840	Maximum 5 vehicles travel through intersection on Baseline Road
Baseline Rd / Guthrie St	1840	Maximum 5 vehicles travel through intersection on Baseline Road
Baseline Rd / Morrison Dr	1840	Maximum 5 vehicles travel through intersection on Baseline Road
Baseline Rd / McWatters Rd	2540	Maximum 6 vehicles travel through intersection; only possible movement related to development is the southbound or eastbound right turn

The intersections that will be directly impacted by the development are identified in the table below. The primary access to the apartment building will be Lisa Avenue, which means most vehicles exiting and entering the building will travel through the intersection of Lisa Avenue / Greenbank Road because Greenbank Rd gives access to Highway 417.

Table 9 – Impacted Intersections Within the Study Area

Intersection	Description
Greenbank Rd / Iris St & Hwy 417 W-NS Off-Ramp	Additional 20 vehicles travel through intersection at peak hour
Lisa Ave / Greenbank Rd	Adjacent to development
McWatters Rd / Baseline Rd	Within 150m of the development access
Greenbank Rd / Baseline Rd	Within 350m of the development access

Despite existing capacity and delay issues at some study intersections, various City projects are planned or underway in the study area to mitigate traffic issues. The LRT line is to be extended west and an LRT station is to be constructed at Pinecrest Road. According to OC Transpo website, the O-Train Confederation Line is planned to have a capacity of 10,700 passengers per hour in each direction, during peak hours with a potential growth to 18,000 passenger per hour in each direction by 2031 and eventually reaching a maximum capacity of 24,000 passengers per hour in each direction. As part of the LRT work, an intersection improvement study was completed by the City at Iris Street/Greenbank Road and some of the improvements proposed include a bi-directional bicyle track on Greenbank Road to connect to other active transportation facilities on Iris Street and north of the Highway 417 interchange.In addition, the Baseline BRT is planned as part of the TMP affordable network. A previous study completed for a development in the same area (1357 Baseline Road Transportation Impact Assessment) indicated

that the transit modal share is expected to increase by 20% for the high-rise development in that study after the implementation of the Baseline BRT. We assume the same shift in modal share for this development. With the LRT, BRT and active transportation projects in the study area, it can be reasonably assumed that the City is addressing the existing traffic operational problems by investing in transit and active transportation. Therefore, the background traffic is expected to be reduced by at least 20% and the traffic issues presented in the existing conditions and in future conditions will be sufficiently addressed.

Figure 14 and Figure 15 show the total projected volumes, including the background traffic and development generated trips, for 2025 and 2030.

Figure 14 –2025 Total Volumes (Background Plus Development New Trips)

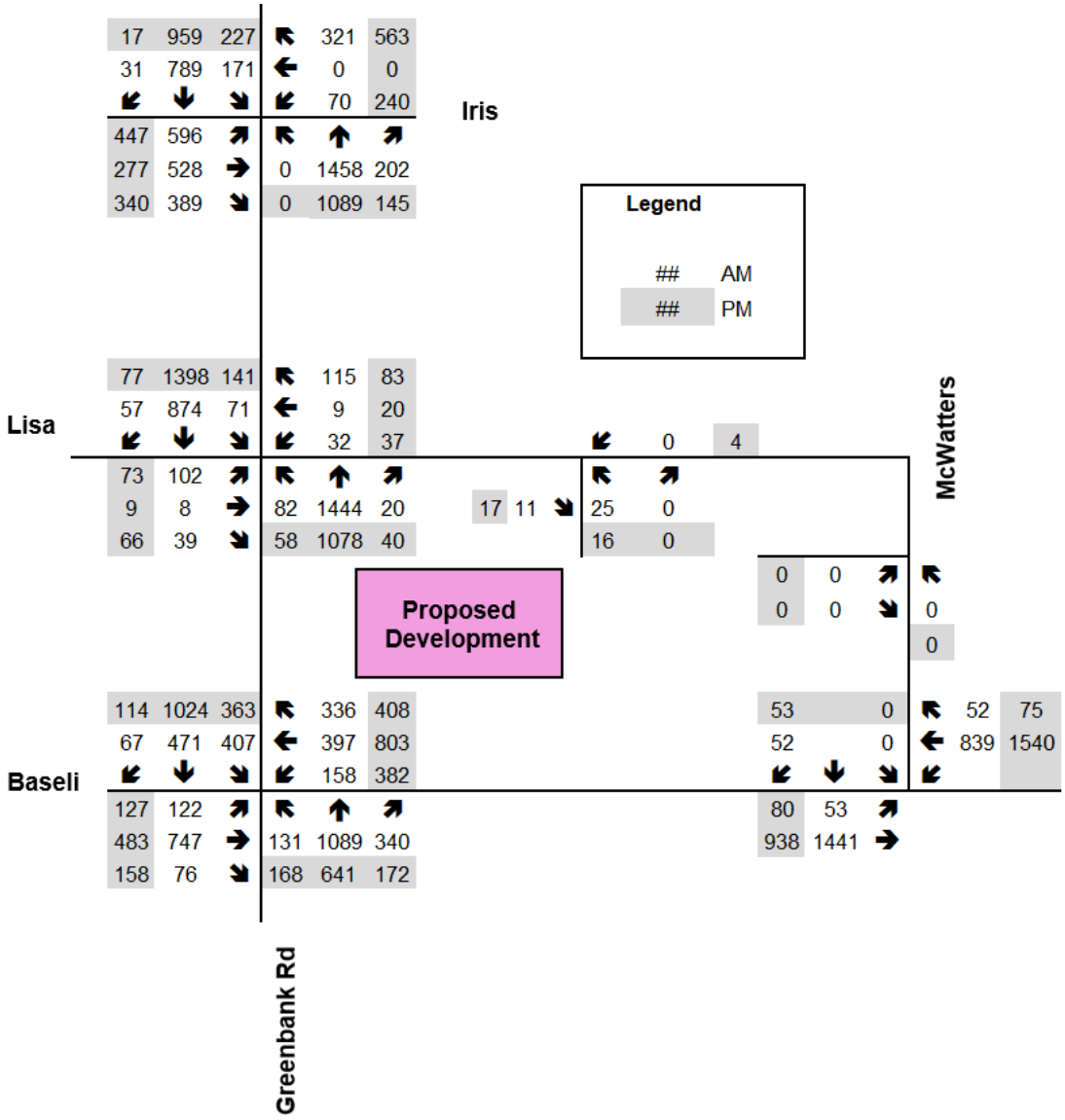
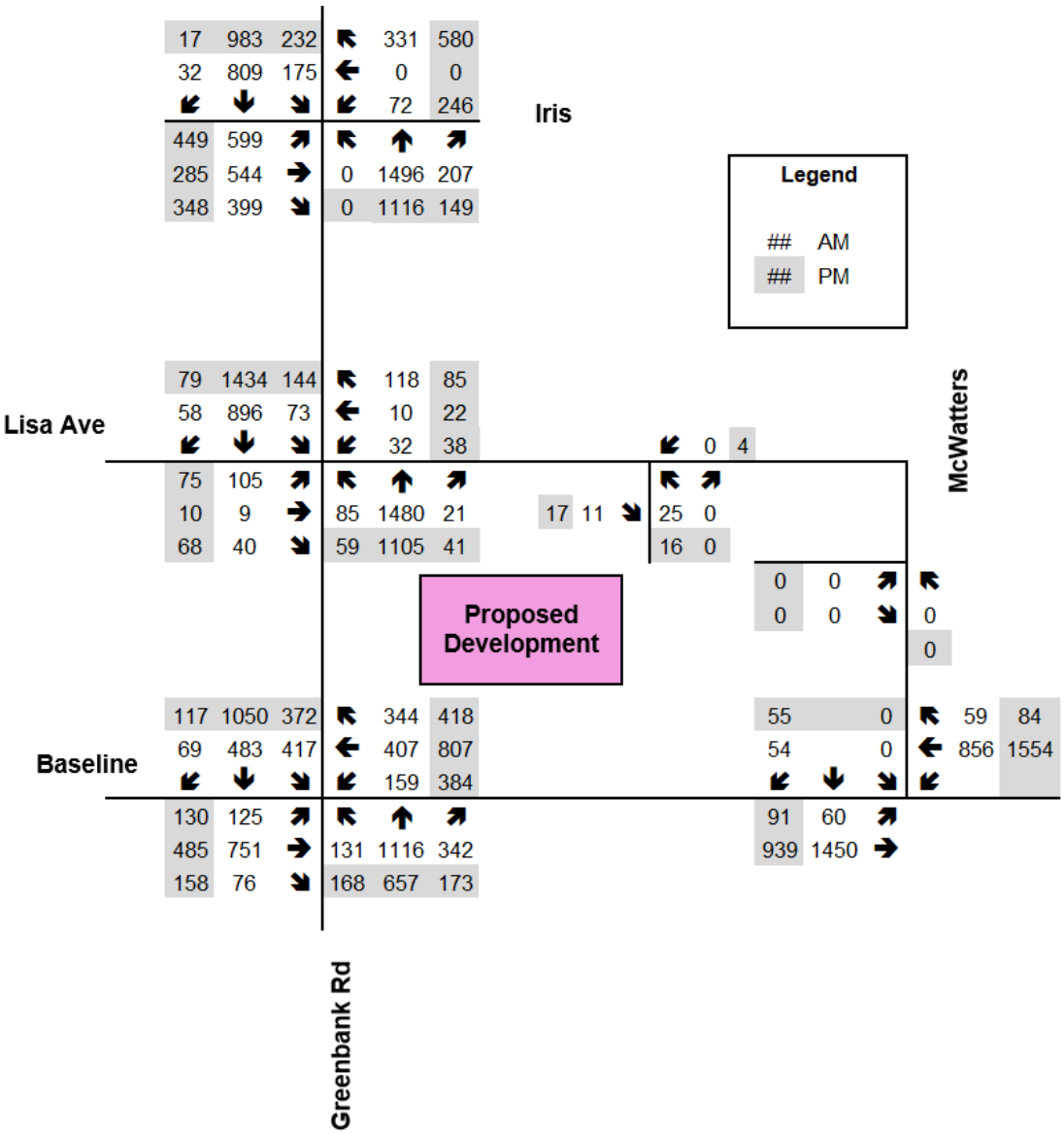


Figure 15 –2030 Total Volumes (Background Plus Development New Trips)



4. Strategy

4.1 Development Design

Module 4.1.3 is exempt because this development is not a subdivision. The remainder of Module 4.1 is not required for a zoning application. These modules will be completed at the site plan application stage.

4.2 Parking

Module 4.2.2 is exempt because the parking supply meets the demand. The remainder of Module 4.2 is not required for a zoning application. These modules will be completed at the site plan application stage.

4.3 Boundary Streets

Module 4.3 is not required for a zoning application. This module will be completed at the site plan application stage.

4.4 Access Intersections

Module 4.4 is not required for a zoning application. This module will be completed at the site plan application stage.

4.5 Transportation Demand Management

4.5.1 Context for TDM

The mode share used within the TIA represent the travel trends for this area of the City with auto and transit being the most important modes. Parking is planned in the development for the residents.

The development is not located within a Design Priority Area or a Transit-oriented Development zone. Homestead Land Holdings will be the property owner and property manager of the apartment building.

The total number of bedrooms will be reviewed once the zoning amendment is approved and confirmed during site plan. A total of 235 units are projected and there are no age restrictions.

4.5.2 Need and Opportunity

The auto and transit modes will be the main modes of travel for the development but given the size of the project, the volumes generated are low. To encourage active travel, there are 128 parking spaces planned for bicycles, which is more than the number required by the zoning.

4.5.3 TDM Program

The TDM Measures Checklist was completed and can be found in Appendix E. The key TDM measure for this development is to unbundle parking cost from monthly rent. Other measures to be put in place are:

- Bike parking locations in proximity to the entrances and that are easily accessible and connected to the surrounding network
- Connectivity for pedestrians to the adjacent network

4.6 Neighbourhood Traffic Management

This section is intentionally left blank as this module is exempt from the present study as agreed to with the City.

4.7 Transit

The expected transit volumes from the development are low with less than 40 new trips during peak hours.

According to the Transportation Master Plan Affordable Network, different measures are to be put in place in the vicinity of the project to increase the transit modal share. An LRT station is planned less than a kilometer from the site and Baseline Road is to become a transit priority corridor with the addition of transit signal priority and queue jump lanes.

According to OC Transpo website, the O-Train Confederation Line is planned to have a capacity of 10,700 passengers per hour in each direction, during peak hours with a potential growth to 18,000 passenger per hour in each direction by 2031 and eventually reaching a maximum capacity of 24,000 passengers per hour in each direction. There are 0 passengers on the LRT currently, therefore the 40 transit trips anticipated from this development should not negatively impact the 10,700 available capacity on the LRT.

Given that there are currently 5 bus routes in the area surrounding the development and that new transit infrastructure will be put in place to improve transit in the area, the addition of 40 new trips in the transit system at peak hours should not be an issue. The current average load on the buses in the vicinity of the development during the AM and PM peak hour are between 6 passengers and 33 passengers. The standard OC Transpo bus has a capacity of 68 passengers according the OC Transpo website. Therefore, even if 88% of all expected transit passengers boarded a single bus in the peak hour, the transit passengers from this development would be accommodated.

4.8 Review of Network Concept

This section is intentionally left blank as this module is exempt from the present study.

4.9 Intersection Design

4.9.1 Existing Intersection Operations

On Greenbank Road, the intersections at Lisa Avenue and at Baseline Road are coordinated. During the AM peak, they operate with a special phasing plan with a 140 second cycle length to maximize throughput. During PM peak, the signals operate with a 110 second cycle length. The intersection of Greenbank Rd / Iris St / Highway 417 operates with a 130 second cycle length during both AM and PM peak and is therefore not synchronized with the other intersections to the south. The level of service (LOS) is based on the volume to capacity ratio (v/c) according to the guidelines from the City's Multimodal level of Service (MMLOS) Guide, as shown in Table 10. The results of the operational analysis at each intersection during AM and PM peak hours are shown in Table 11. The detailed performance results are provided in Appendix F.

Table 10 - Level of Service

Level of Service	Volume to Capacity Ratio
A	0 to 0.60
B	0.61 to 0.70
C	0.71 to 0.80
D	0.81 to 0.90
E	0.91 to 1.00
F	>1.00

Table 11 – Existing intersection operations

Intersection	Movement	AM		PM	
		V/C	LOS	V/C	LOS
Greenbank Rd & Baseline Rd (signalized)	EBL	0.96	E	0.83	D
	EBT	0.93	E	0.84	D
	EBR	0.93	E	0.84	D
	WBL	0.79	C	1.14	F
	WBT	0.46	A	0.97	E
	NBL	0.78	C	1.15	F
	NBT	1.02	F	0.67	B
	SBL	1.20	F	1.24	F
	SBT	0.44	A	1.07	F
	Overall	**1.00**	**E**	**1.02**	**F**
Greenbank Rd & Lisa Ave (signalized)	EBL/T/R	0.62	B	0.23	A
	WBL/T/R	0.52	A	0.30	A
	NBL	0.21	A	0.36	A
	NBT	0.60	A	0.56	A

	NBR	0.60	A	0.56	A
	SBL	0.30	A	0.52	A
	SBT	0.37	A	0.71	C
	SBR	0.06	A	0.09	A
	Overall	**0.58**	**A**	**0.64**	**B**
Greenbank Rd & Iris St & Highway 417 Ramp (signalized)	EBL	0.45	A	0.41	A
	EBT	0.90	D	0.82	D
	WBL	0.65	B	0.82	D
	NBT	0.94	E	0.60	C
	NBR	0.43	A	0.26	A
	SBL	1.36	F	1.17	F
	SBT	0.57	A	0.58	A
	Overall	**0.91**	**E**	**0.74**	**C**
Baseline Rd & McWatters Rd (unsignalized)	EBL	0.07	A	0.07	A
	SBR	0.10	A	0.10	A
	Overall		**A**		**A**

Note: saturation flow rate of 1800 veh/h/lane and PHF of 0.90

Most intersections within the study area show good overall performance with LOS 'A' to 'D', although there are a few movements that are close to or at capacity. A v/c ratio over 1.0 is not possible since the traffic volumes that travel through an intersection during the peak hour indicate that the volume capacity is at or above the number of vehicles counted. Therefore, the suggested saturation flow rate and PHF do not match the actual conditions. Using a saturation flow rate of 2000 veh/h/lane and a PHF of 1.0 provides a more realistic situation at the intersections. The results of the analysis indicate that:

- At Greenbank Road / Baseline Road, the eastbound movements southbound left movement and are close to capacity. Furthermore, northbound through and southbound left have high demand and are conflicting movements.
- At Greenbank Road / Iris Street / Highway 417 Ramp, the southbound left and the northbound through are the most critical movements.

4.9.2 Network Intersection MMLOS

Table 12 summarizes the MMLOS analysis for the network intersections. The MMLOS detailed worksheet is presented in Appendix G.

Table 12 – Network Intersection MMLOS Analysis

Intersection	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS		Auto LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target	ALOS	Target
Greenbank Road & Baseline Road	F	A	F	C	B	D	B	D	E	E
	✗		✗		✓		✓		✓	
Greenbank Road & Lisa Avenue	F	A	F	B	N/A	D	E	D	A	E
	✗		✗		-		✗		✓	
Greenbank Road & Iris Street & Highway 417 Ramp	F	A	F	B	N/A	D	B	D	C	E
	✗		✗		-		✓		✓	

The pedestrian level of service target is not met at any of the studied intersections as there are many lanes for pedestrians to cross at the Greenbank Road intersections. The bicycle level of service is not met at any of the studied intersections in the study area because the presence of many lanes for cyclists to cross with a posted speed of 50 km/h, or the presence of either a long right-turning lanes or dual right-turn lanes. The truck level of service is met at the two intersections with truck routes. The truck level of service is not met for approaches with local streets that are not truck routes. The auto level of service is met at all the intersections. The transit level of service was not assessed except at the Greenbank Road and Baseline Road intersection because the MMLOS guidelines indicate that the TLOS is intended to be applied along rapid transit corridors or corridors with transit priority measures, and only the Baseline Road corridor is expected to have transit priority measures prior to 2031.

4.9.3 Future Intersection Operations - 2025

The results of the operational analysis at each intersection during AM and PM peak hours are shown in Table 13. The detailed results are provided in Appendix H.

Table 13 - 2025 Intersection Operations

Intersection	Movement	Background Traffic				Total Traffic			
		AM		PM		AM		PM	
		V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
Greenbank Rd & Baseline Rd (signalized)	EBL	0.83	D	0.80	C	0.84	D	0.80	C
	EBT	0.88	D	0.75	C	0.88	D	0.75	C
	EBR	0.89	D	0.75	C	0.89	D	0.75	C
	WBL	0.75	C	0.93	E	0.75	C	0.93	E
	WBT	0.47	A	0.82	D	0.47	A	0.83	D
	NBL	0.63	B	0.93	E	0.63	B	0.93	E
	NBT	0.74	C	0.52	A	0.74	C	0.53	A
	SBL	1.01	F	1.03	F	1.02	F	1.05	F
	SBT	0.32	A	0.83	D	0.32	A	0.83	D
	Overall	**0.83**	**D**	**0.83**	**D**	**0.83**	**D**	**0.84**	**D**
Greenbank Rd & Lisa Ave (signalized)	EBL/T/R	0.59	A	0.20	A	0.59	A	0.19	A
	WBL/T/R	0.52	A	0.26	A	0.58	A	0.29	A
	NBL	0.17	A	0.27	A	0.16	A	0.26	A
	NBT	0.48	A	0.46	A	0.49	A	0.47	A
	NBR	0.48	A	0.46	A	0.49	A	0.47	A
	SBL	0.23	A	0.42	A	0.23	B	0.43	A
	SBT	0.30	A	0.59	A	0.30	A	0.59	B
	SBR	0.05	A	0.08	A	0.05	A	0.08	A
	Overall	**0.475**	**A**	**0.53**	**A**	**0.48**	**A**	**0.53**	**A**
Greenbank Rd & Iris St & Highway 417 Ramp (signalized)	EBL	0.40	A	0.38	A	0.40	A	0.38	A
	EBT	0.84	D	0.78	C	0.84	D	0.78	C
	WBL	0.58	A	0.78	C	0.58	A	0.78	C
	NBT	0.70	B	0.46	A	0.71	C	0.46	A
	NBR	0.32	A	0.20	A	0.32	A	0.20	A
	SBL	1.01	F	0.97	E	1.01	F	0.97	E
	SBT	0.45	A	0.45	A	0.45	A	0.45	A
	Overall	**0.72**	**C**	**0.48**	**A**	**0.72**	**C**	**0.48**	**A**
Baseline Rd & McWatters Rd (unsignalized)	EBL	0.07	A	0.20	A	0.07	A	0.20	A
	SBR	0.09	A	0.16	A	0.09	A	0.16	A
	Overall		**A**		**A**		**A**		**A**

Note: saturation flow rate of 2000 veh/h/lane and PHF of 1.00

The 2025 intersection operations are expected to operate adequately and similar to existing conditions. Traffic operation results for the background and total traffic is similar due to the low number of development generated trips.

4.9.4 Future Intersection Operations- 2030

The results of the operational analysis at each intersection during AM and PM peak hours are shown in Table 14. The detailed results are provided in Appendix I.

Table 14 – 2030 Intersection Operations

Intersection	Movement	Background Traffic				Total Traffic			
		AM		PM		AM		PM	
		V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
Greenbank Rd & Baseline Rd (signalized)	EBL	0.84	D	0.80	C	0.84	D	0.80	C
	EBT	0.89	D	0.75	C	0.89	D	0.75	C
	EBR	0.89	D	0.76	C	0.89	D	0.76	C
	WBL	0.75	C	0.94	E	0.75	C	0.94	E
	WBT	0.48	A	0.83	D	0.48	A	0.83	D
	NBL	0.63	B	0.93	E	0.63	B	0.93	E
	NBT	0.76	C	0.54	A	0.76	C	0.54	A
	SBL	1.03	F	1.06	F	1.04	F	1.07	F
	SBT	0.33	A	0.85	D	0.33	A	0.86	E
	Overall	**0.85**	**D**	**0.85**	**D**	**0.85**	**D**	**0.85**	**D**
Greenbank Rd & Lisa Ave (signalized)	EBL/T/R	0.59	A	0.19	A	0.60	A	0.20	A
	WBL/T/R	0.52	A	0.27	A	0.58	A	0.30	A
	NBL	0.16	A	0.27	A	0.17	A	0.27	A
	NBT	0.50	A	0.48	A	0.50	A	0.48	A
	NBR	0.50	A	0.48	A	0.50	A	0.48	A
	SBL	0.22	A	0.41	A	0.25	A	0.45	A
	SBT	0.31	A	0.61	B	0.31	A	0.61	B
	SBR	0.05	A	0.08	A	0.05	A	0.08	A
	Overall	**0.55**	**A**	**0.55**	**A**	**0.49**	**A**	**0.55**	**A**
Greenbank Rd & Iris St & Highway 417 Ramp (signalized)	EBL	0.40	A	0.37	A	0.40	A	0.37	A
	EBT	0.85	D	0.78	C	0.85	D	0.78	C
	WBL	0.59	A	0.78	C	0.59	A	0.78	C
	NBT	0.74	C	0.47	A	0.74	C	0.48	A
	NBR	0.34	A	0.21	A	0.34	A	0.21	A
	SBL	1.04	F	0.99	E	1.04	F	0.95	E
	SBT	0.46	A	0.46	A	0.46	A	0.47	A
	Overall	**0.64**	**B**	**0.49**	**A**	**0.75**	**C**	**0.49**	**A**
Baseline Rd & McWatters Rd (unsignalized)	EBL	0.08	A	0.23	A	0.08	A	0.23	A
	SBR	0.10	A	0.17	A	0.10	A	0.17	A
	Overall		**A**		**A**		**A**		**A**

Note: saturation flow rate of 2000 veh/h/lane and PHF of 1.00

The 2030 intersection operations are similar to the 2025 conditions. Thus, traffic will operate adequately even with the impacts of the development. Traffic operation results for the background and total traffic is similar due to the low number of development generated trips. It is expected that the transit projects in the area, the LRT and BRT, will shift the travel mode to transit and hence the traffic operations will improve by 2030.

4.10 Summary of Improvements Indicated and Modification Options

The following summarizes the analysis and the results presented in this TIA report:

Proposed site and screening

- Located in the south-east corner of Greenbank Road / Lisa Avenue intersection
- Residential development with 235 units and 260 underground parking spaces
- Construction planned to start in 2022 and be completed by the end of 2024
- A connection is planned to the sidewalk on Greenbank Road
- Site well served by transit and at less than a kilometer from the future LRT Pinecrest Station

Forecasting

- Development will generate 96 new person trips during the AM and PM peak hours
- 36 new vehicle trips during AM peak hour and 37 during PM peak hour
- New vehicle trips will mostly be heading northbound on Greenbank Road
- Yearly background rates were calculated on each road using TRANS model outputs. Annual growth rates are below 1% for all arterial and collector roads

Strategy

- Managers of the development will unbundle parking costs from monthly rent
- Bike parking spaces are planned for the site and will be easily accessible
- The development generates less than 40 transit trips at peak hour which should not cause issues with the existing transit system (5 bus routes in the area) or planned transit system
- The intersection of Baseline Road / Greenbank Road is the most critical in the study area. However, the development is adding less than 5 trips at this intersection and does not create additional issues
- The operations of the intersections within the study area remain similar between the existing and projected conditions (2025 and 2030). No mitigation is required.

All of Which is Respectfully Submitted,

GHD

Vanessa Skelton, P.Eng.

Appendices

Appendix A

Screening Form

Certification Form for TIA Study PM

TIA Plan Reports

On 14 June 2017, the Council of the City of Ottawa adopted new Transportation Impact Assessment (TIA) Guidelines. In adopting the guidelines, Council established a requirement for those preparing and delivering transportation impact assessments and reports to sign a letter of certification.

Individuals submitting TIA reports will be responsible for all aspects of development-related transportation assessment and reporting, and undertaking such work, in accordance and compliance with the City of Ottawa's Official Plan, the Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines.

By submitting the attached TIA report (and any associated documents) and signing this document, the individual acknowledges that s/he meets the four criteria listed below.

CERTIFICATION

- ☑ I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines;
- ☑ I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;
- ☑ I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and
- ☑ I am either a licensed[1] or registered[2] professional in good standing, whose field of expertise
  - ☑ is either transportation engineering
  - ☐ or transportation planning .

[1,2] License of registration body that oversees the profession is required to have a code of conduct and ethics guidelines that will ensure appropriate conduct and representation for transportation planning and/or transportation engineering works.

City Of Ottawa
Infrastructure Services and Community Sustainability
Planning and Growth Management
110 Laurier Avenue West, 4th fl.
Ottawa, ON K1P 1J1
Tel. : 613-580-2424
Fax: 613-560-6006

Dated at Ottawa (City) this 22 day of October, 20 21.

Name : Vanessa Skelton

Professional title: Transportation Planning and Traffic Engineering Lead-Canada

Signature of individual certifier that s/he meets the above criteria

Office Contact Information (Please Print)	
Address:	179 Colonnade Road South Suite 400
City / Postal Code:	K2E 7J4
Telephone / Extension:	+1 613 288-1727
E-Mail Address:	Vanessa.Skelton@ghd.com

Stamp

LICENSED PROFESSIONAL ENGINEER
V.P. SKELTON
90505520
22 Oct/21
PROVINCE OF ONTARIO

City of Ottawa 2017 TIA Guidelines Screening Form

1. Description of Proposed Development

Municipal Address	1300 McWatters Road Ottawa, Ontario
Description of Location	Located on the corner of Lisa Avenue & Greenbank Road
Land Use Classification	Ground Floor Amenities and Apartments
Development Size (units)	235
Development Size (m^2)	Ground floor: 1484 square meters
Number of Accesses and Locations	Two accesses for underground parking through McWatters & Lisa Av
Phase of Development	Single
Buildout Year	2022

If available, please attach a sketch of the development or site plan to this form.

2. Trip Generation Trigger

Considering the Development's Land Use type and Size (as filled out in the previous section), please refer to the Trip Generation Trigger checks below.

Land Use Type	Minimum Development Size
Single-family homes	40 units
Townhomes or apartments	90 units
Office	3,500 m^2
Industrial	5,000 m^2
Fast-food restaurant or coffee shop	100 m^2
Destination retail	1,000 m^2
Gas station or convenience market	75 m^2

** If the development has a land use type other than what is presented in the table above, estimates of person-trip generation may be made based on average trip generation characteristics represented in the current edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual.*

If the proposed development size is greater than the sizes identified above, the Trip Generation Trigger is satisfied.

3. Location Triggers

	Yes	No
Does the development propose a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit or Spine Bicycle Networks?		X
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?*		X

**DPA and TOD are identified in the City of Ottawa Official Plan (DPA in Section 2.5.1 and Schedules A and B; TOD in Annex 6). See Chapter 4 for a list of City of Ottawa Planning and Engineering documents that support the completion of TIA).*

If any of the above questions were answered with 'Yes,' the Location Trigger is satisfied.

4. Safety Triggers

	Yes	No
Are posted speed limits on a boundary street are 80 km/hr or greater?		X
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?		X
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?	X	
Is the proposed driveway within auxiliary lanes of an intersection?		X
Does the proposed driveway make use of an existing median break that serves an existing site?		X
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?		X
Does the development include a drive-thru facility?		X

If any of the above questions were answered with 'Yes,' the Safety Trigger is satisfied.

5. Summary

	Yes	No
Does the development satisfy the Trip Generation Trigger?	X	
Does the development satisfy the Location Trigger?		X
Does the development satisfy the Safety Trigger?	X	

If none of the triggers are satisfied, the TIA Study is complete. If one or more of the triggers is satisfied, the TIA Study must continue into the next stage (Screening and Scoping).

Appendix B

Bus Schedules

Schedules & Maps

The next service change is on Saturday, September 04.

Schedule times are based on typical driving conditions and may vary. Please arrive at your stop a few minutes early to allow for any fluctuations in schedule.

Tue, Jun 29

58 Moodie

LINCOLN FIELDS 3A	IRIS / PINECREST MALL	MORRISON / DRAPER	BAYSHORE 4A	HYENA / CARLING CAMPUS	MOODIE C	FITZGERALD / AD. 16
			06:14	06:30	06:34	
06:37	06:43	06:47	06:54	07:10	07:14	
07:07	07:13	07:17	07:24	07:40	07:44	
07:37	07:43	07:48	07:56	08:11	08:16	
08:08	08:14	08:18	08:26	08:42	08:46	
08:38	08:44	08:48	08:56	09:12	09:16	
09:07	09:13	09:17	09:24	09:40	09:44	
09:37	09:43	09:47	09:54	10:10	10:14	
10:07	10:13	10:17	10:24	10:40	10:44	
10:33	10:39	10:43	10:50	11:06	11:10	11:16
10:59	11:05	11:09	11:16	11:32	11:36	11:42
11:29	11:35	11:39	11:46	12:02	12:06	12:12
11:58	12:04	12:08	12:15	12:31	12:35	
12:28	12:34	12:38	12:45	13:01	13:05	
12:58	13:04	13:08	13:15	13:31	13:35	
13:28	13:34	13:38	13:45	14:01	14:05	
13:58	14:04	14:08	14:15	14:31	14:35	
14:28	14:34	14:38	14:45	15:02	15:06	
14:58	15:04	15:08	15:16	15:33	15:37	
15:29	15:35	15:39	15:47	16:04	16:08	
15:43	15:49	15:54	16:02			
15:58	16:04	16:09	16:17	16:33	16:38	
16:27	16:33	16:38	16:46	17:02	17:07	
16:57	17:03	17:08	17:16	17:32	17:37	
17:29	17:35	17:39	17:47	18:04	18:08	
17:57	18:03	18:07	18:15	18:32	18:36	
18:31	18:37	18:41	18:48	19:03	19:07	
19:01	19:07	19:11	19:18	19:33	19:37	
19:31	19:37	19:41	19:47	20:02	20:06	
20:00	20:05	20:09	20:15	20:30	20:35	
20:31	20:36	20:40	20:46	21:01	21:06	
21:02	21:07	21:11	21:17	21:31	21:36	
21:32	21:37	21:41	21:47	22:01	22:06	
22:02	22:07	22:11	22:17	22:31	22:36	
22:32	22:37	22:41	22:47	23:01	23:06	

Schedules & Maps

The next service change is on Saturday, September 04.

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Tue, Jun 29

58 Lincoln Fields

MOODIE / FITZGERALD	FITZGERALD / AD. 16	MOODIE E	HYENA / CARLING CAMPUS	WOODRIDGE / BAYSHORE	BAYSHORE 3A	MORRISON / BASELINE	MORRISON / DRAPER	LINCOLN FIELDS 2A
		06:10	06:13	06:23	06:24	06:31	06:31	06:47
		06:40	06:43	06:53	06:54	07:01	07:01	07:19
		07:09	07:12	07:22	07:23	07:30	07:30	07:48
		07:25	07:28	07:38	07:39	07:46	07:46	08:04
					07:54	08:01	08:01	08:19
		07:55	07:58	08:08	08:09	08:16	08:16	08:34
		08:24	08:27	08:37	08:38	08:45	08:45	09:03
		08:53	08:56	09:06	09:07	09:14	09:14	09:32
		09:23	09:26	09:36	09:37	09:43	09:43	10:00
		09:55	09:58	10:08	10:09	10:15	10:15	10:32
		10:25	10:28	10:38	10:39	10:45	10:45	11:02
		10:55	10:58	11:08	11:09	11:15	11:15	11:32
		11:29	11:32	11:42	11:43	11:49	11:49	12:06
11:52	11:56	11:58	12:02	12:12	12:13	12:19	12:19	12:36
12:22	12:26	12:28	12:32	12:42	12:43	12:49	12:49	13:06
12:46	12:50	12:52	12:56	13:05	13:06	13:12	13:12	13:29
		13:16	13:19	13:28	13:29	13:36	13:36	13:53
		13:46	13:49	13:58	13:59	14:06	14:06	14:23
		14:16	14:19	14:28	14:29	14:36	14:36	14:53
		14:46	14:49	14:58	14:59	15:06	15:07	15:25
		15:16	15:19	15:28	15:29	15:36	15:37	15:55
		15:46	15:49	15:58	15:59	16:06	16:07	16:25
		16:17	16:20	16:29	16:30	16:37	16:38	16:56
		16:46	16:49	16:58	16:59	17:06	17:07	17:25
		17:18	17:21	17:30	17:31	17:38	17:39	17:57
		17:47	17:50	17:59	18:00	18:07	18:07	18:23
		18:17	18:20	18:29	18:30	18:37	18:37	18:53
		18:47	18:50	18:59	19:00	19:06	19:06	19:21
		19:17	19:20	19:29	19:30	19:36	19:36	19:51
		19:47	19:50	19:59	20:00	20:06	20:06	20:21
		20:16	20:19	20:28	20:29	20:35	20:35	20:50
		20:45	20:48	20:57	20:58	21:04	21:04	21:19
		21:16	21:19	21:28	21:29	21:35	21:35	21:50
		21:46	21:49	21:57	21:58	22:04	22:04	22:18
		22:16	22:19	22:27	22:28	22:34	22:34	22:48
		23:16	23:19	23:27	23:28	23:34	23:34	23:48

Schedules & Maps

The next service change is on Saturday, September 04.

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Tue, Jun 29

82 Lincoln Fields & Tunney's Pasture

[L] Continues to Tunney's Pasture

[S] Ends at Baseline

BAYSHORE 4A	DUMAURIER / PINECREST	PINECREST MALL	GREENBANK / BASELINE	CRAIG HENRY / GREENBANK	MAJESTIC / NEWHAVEN	WOODROFFE / MEDHURST	BASELINE 2B	LINCOLN FIELDS 2A	TUNNEY'S PASTURE C
				04:42[S]	04:48[S]	04:50[S]	04:54[S]		
				05:12[L]	05:18[L]	05:20[L]	05:24[L]	05:30	05:36
05:36[L]	05:40[L]		05:41[L]	05:50[L]	05:56[L]	05:58[L]	06:02[L]	06:08	06:14
06:06[L]	06:10[L]		06:11[L]	06:20[L]	06:26[L]	06:28[L]	06:32[L]	06:38	06:44
06:36[L]	06:40[L]		06:41[L]	06:50[L]	06:56[L]	06:58[L]	07:02[L]	07:08	07:14
07:06[L]	07:11[L]		07:12[L]	07:20[L]	07:27[L]	07:29[L]	07:33[L]	07:39	07:45
07:36[L]	07:41[L]		07:42[L]	07:50[L]	07:57[L]	07:59[L]	08:03[L]	08:10	08:16
08:06[L]	08:11[L]		08:13[L]	08:22[L]	08:29[L]	08:32[L]	08:36[L]	08:42	08:48
08:36[L]	08:41[L]		08:43[L]	08:52[L]	08:59[L]	09:02[L]	09:06[L]	09:12	09:18
09:05	09:10	09:12	09:15	09:24	09:30	09:33	09:37	09:44	
09:31	09:35	09:37	09:40	09:48	09:54	09:57	10:01	10:08	
10:01	10:05	10:07	10:10	10:18	10:24	10:27	10:31	10:38	
10:31	10:35	10:37	10:40	10:48	10:54	10:57	11:01	11:08	
11:01	11:05	11:07	11:10	11:18	11:25	11:28	11:32	11:38	
11:31	11:35	11:37	11:40	11:48	11:55	11:58	12:02	12:08	
12:01	12:05	12:07	12:10	12:18	12:25	12:28	12:32	12:38	
12:31	12:35	12:37	12:40	12:48	12:55	12:58	13:02	13:08	
13:01	13:05	13:07	13:10	13:18	13:25	13:28	13:32	13:38	
13:31	13:35	13:37	13:40	13:48	13:55	13:58	14:02	14:09	
14:03	14:07	14:09	14:12	14:20	14:27	14:30	14:34	14:41	
14:33	14:37	14:39	14:42	14:50	14:57	15:00	15:04	15:11	
15:05[L]	15:09[L]	15:11[L]	15:14[L]	15:22[L]	15:29[L]	15:32[L]	15:36[L]	15:43	15:50
15:28[L]	15:32[L]	15:34[L]	15:37[L]	15:45[L]	15:52[L]	15:55[L]	15:59[L]	16:06	16:13
15:56[L]	16:00[L]	16:02[L]	16:05[L]	16:13[L]	16:20[L]	16:23[L]	16:27[L]	16:34	16:41
16:26[L]	16:30[L]	16:32[L]	16:35[L]	16:43[L]	16:50[L]	16:53[L]	16:57[L]	17:04	17:11
16:56[L]	17:00[L]	17:02[L]	17:05[L]	17:13[L]	17:20[L]	17:23[L]	17:27[L]	17:34	17:41
17:26[L]	17:30[L]	17:32[L]	17:35[L]	17:43[L]	17:49[L]	17:51[L]	17:55[L]	18:03	18:10
17:56[L]	18:00[L]	18:02[L]	18:05[L]	18:13[L]	18:19[L]	18:21[L]	18:25[L]	18:33	18:40
18:24	18:28	18:30	18:33	18:41	18:47	18:49	18:53	18:59	
18:53	18:57	18:59	19:02	19:10	19:16	19:18	19:22	19:28	
19:23	19:27	19:29	19:32	19:40	19:46	19:48	19:52	19:58	
19:53	19:57	19:59	20:01	20:09	20:15	20:17	20:21	20:27	
20:23	20:27	20:29	20:31	20:39	20:45	20:47	20:51	20:57	

BAYSHORE 4A	DUMAURIER / PINECREST	PINECREST MALL	GREENBANK / BASELINE	CRAIG HENRY / GREENBANK	MAJESTIC / NEWHAVEN	WOODROFFE / MEDHURST	BASELINE 2B	LINCOLN FIELDS 2A	TUNNEY'S PASTURE C
20:53	20:57	20:59	21:01	21:09	21:15	21:17	21:21	21:27	
21:23	21:27	21:29	21:31	21:39	21:45	21:47	21:51	21:57	
21:53	21:57		21:59	22:07	22:13	22:15	22:18	22:25	
22:23	22:27		22:29	22:37	22:43	22:45	22:48	22:55	
22:53	22:57		22:59	23:07	23:13	23:15	23:18	23:25	
23:27	23:31		23:33	23:41	23:47	23:49	23:52	23:59	

TUNNEY'S PASTURE F	LINCOLN FIELDS 3A	BASELINE 1C	MAJESTIC / NEWHAVEN	CRAIG HENRY / ELVASTON	GREENBANK / BANNER	GREENBANK / BASELINE	GREENBANK / IRIS

Schedules & Maps

The next service change is on Saturday, September 04.

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Tue, Jun 29

82 Bayshore

[V] via Majestic

TUNNEY'S PASTURE F	LINCOLN FIELDS 3A	BASELINE 1C	MAJESTIC / NEWHAVEN	CRAIG HENRY / ELVASTON	GREENBANK / BANNER	GREENBANK / BASELINE	GREENBANK / IRIS	PINECREST MALL	DUMAURIER / PINECREST	BAYSHORE 3A
06:00	06:06	06:09	06:14	06:21	06:28	06:30	06:32		06:33	06:43
06:38	06:44	06:47	06:52	06:59	07:06	07:08	07:10		07:11	07:21
07:08	07:15	07:18	07:23	07:31	07:38	07:40	07:42		07:44	07:55
07:38	07:45	07:48	07:53	08:01	08:08	08:10	08:12		08:14	08:25
08:08	08:15	08:18	08:23	08:31	08:38	08:40	08:42		08:44	08:55
08:38	08:45	08:48	08:53	09:00	09:07	09:10	09:11		09:13	09:23
	09:15[V]	09:18[V]	09:23[V]	09:29[V]	09:36[V]	09:39[V]	09:40	09:41	09:43	09:53
	09:45[V]	09:48[V]	09:53[V]	09:59[V]	10:06[V]	10:09[V]	10:10	10:11	10:13	10:23
	10:15[V]	10:18[V]	10:23[V]	10:29[V]	10:36[V]	10:39[V]	10:40	10:41	10:43	10:53
	10:45[V]	10:48[V]	10:53[V]	10:59[V]	11:06[V]	11:09[V]	11:10	11:11	11:13	11:23
	11:15[V]	11:18[V]	11:23[V]	11:29[V]	11:36[V]	11:39[V]	11:40	11:41	11:43	11:53
	11:45[V]	11:48[V]	11:53[V]	11:59[V]	12:06[V]	12:09[V]	12:10	12:11	12:13	12:23
	12:15[V]	12:18[V]	12:23[V]	12:29[V]	12:36[V]	12:39[V]	12:40	12:41	12:43	12:53
	12:45[V]	12:48[V]	12:53[V]	12:59[V]	13:06[V]	13:09[V]	13:10	13:11	13:13	13:23
	13:15[V]	13:18[V]	13:23[V]	13:31[V]	13:38[V]	13:40[V]	13:42	13:43	13:45	13:55
	13:45[V]	13:48[V]	13:53[V]	14:01[V]	14:08[V]	14:10[V]	14:12	14:13	14:15	14:25
	14:15[V]	14:18[V]	14:23[V]	14:31[V]	14:38[V]	14:40[V]	14:42	14:43	14:45	14:56
	14:41[V]	14:44[V]	14:49[V]	14:57[V]	15:04[V]	15:06[V]	15:08	15:09	15:11	15:22
15:04[V]	15:11[V]	15:14[V]	15:19[V]	15:27[V]	15:34[V]	15:37[V]	15:39	15:40	15:43	15:54
15:27[V]	15:34[V]	15:37[V]	15:42[V]	15:50[V]	15:57[V]	15:59[V]	16:01	16:02	16:05	16:16
15:57[V]	16:04[V]	16:07[V]	16:12[V]	16:20[V]	16:27[V]	16:29[V]	16:31	16:32	16:35	16:46
16:27[V]	16:34[V]	16:37[V]	16:42[V]	16:50[V]	16:57[V]	16:59[V]	17:01	17:02	17:05	17:16
16:57[V]	17:04[V]	17:07[V]	17:12[V]	17:20[V]	17:27[V]	17:29[V]	17:31	17:32	17:34	17:45
17:27[V]	17:34[V]	17:37[V]	17:42[V]	17:50[V]	17:57[V]	17:59[V]	18:01	18:02	18:04	18:15
17:57[V]	18:04[V]	18:07[V]	18:12[V]	18:20[V]	18:27[V]	18:29[V]	18:31	18:32	18:34	18:45
	18:36[V]	18:39[V]	18:44[V]	18:51[V]	18:58[V]	19:00[V]	19:01	19:01	19:03	19:13
	19:06[V]	19:09[V]	19:14[V]	19:21[V]	19:28[V]	19:30[V]	19:31	19:31	19:33	19:43
	19:36[V]	19:39[V]	19:44[V]	19:51[V]	19:58[V]	20:00[V]	20:01	20:01	20:03	20:13
	20:06[V]	20:09[V]	20:14[V]	20:21[V]	20:28[V]	20:30[V]	20:31	20:31	20:33	20:43
	20:35[V]	20:38[V]	20:43[V]	20:50[V]	20:57[V]	20:59[V]	21:00	21:00	21:02	21:12
	21:05[V]	21:08[V]	21:13[V]	21:20[V]	21:27[V]	21:29[V]	21:30	21:30	21:32	21:42
	21:35[V]	21:38[V]	21:42[V]	21:49[V]	21:56[V]	21:59[V]	22:00		22:01	22:11
	22:05[V]	22:08[V]	22:13[V]	22:19[V]	22:25[V]	22:27[V]	22:28		22:29	22:39

TUNNEY'S PASTURE F	LINCOLN FIELDS 3A		BASELINE 1C	MAJESTIC / NEWHAVEN		CRAIG HENRY / ELVASTON	GREENBANK / BANNER		GREENBANK / BASELINE	GREENBANK / IRIS
				ELVASTON						
	22:35[V]	22:38[V]	22:43[V]	22:49[V]	22:55[V]	22:57[V]	22:58		22:59	23:09
	23:05[V]	23:08[V]	23:13[V]	23:19[V]	23:25[V]	23:27[V]	23:28		23:29	23:39
	23:35[V]	23:38[V]	23:43[V]	23:49[V]	23:55[V]	23:57[V]	23:58		23:59	00:09

Schedules & Maps

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Tue, Jun 29

88 Hurdman

[V] Via Navaho/Woodroffe

[a] From May 10 at 5:00 am until August 1 at 6:00 pm, Route 88 will be detoured due to the closure of Navaho north-side access road at Algonquin in front of the Residence building for construction. Read more

[x] Via Tyrell/Moodie

[y] Via Tyrell/Moodie & Navaho/Woodroffe

TERRY FOX 4A	HAZELDEAN MALL / WEST STOP	MOODIE / HADLEY	MOODIE / TYRELL	ROBERTSON / MOODIE	BASELINE 1A	NAVAHO / ALGONQUIN COLLEGE RESIDENCE	1305 BASELINE	BILLINGS BRIDGE 2A	HURDMAN B
					04:35[V]	04:37	04:42	04:52	04:57
04:34[y]	04:42[y]	04:47[y]	04:47[y]		05:00[y]	05:02	05:07	05:17	05:22
04:57[y]	05:05[y]	05:10[y]	05:10[y]		05:23[y]	05:25	05:30	05:40	05:45
05:27[V]	05:35[V]			05:41[V]	05:56[V]	05:58	06:03	06:15	06:21
		05:55[x]	05:56[x]		06:08[x]	06:10	06:15	06:28	06:33
05:51[V]	06:02[V]			06:08[V]	06:23[V]	06:25	06:30	06:43	06:48
		06:19[x]	06:20[x]		06:35[x]	06:37	06:43	06:58	07:03
06:15[V]	06:26[V]			06:32[V]	06:47[V]	06:49	06:55	07:09	07:14
		06:43	06:44		07:00	07:03	07:15	07:31	07:36
06:39	06:50			06:56	07:11	07:14	07:26	07:42	07:47
		07:07	07:08		07:30	07:33	07:42	07:58	08:06
07:03	07:15			07:22	07:45	07:48	07:57	08:13	08:21
		07:31	07:32		07:54	07:57	08:06	08:20	08:28
07:27	07:39			07:46	08:09	08:12	08:21	08:37	08:45
		07:55	07:56		08:18	08:21	08:30	08:44	08:52
07:51	08:03			08:10	08:35	08:38	08:47	09:01	09:09
		08:19	08:20		08:39	08:42	08:51	09:05	09:13
08:15	08:27			08:34	08:52	08:55	09:04	09:18	09:26
		08:43	08:44		09:03	09:06	09:17	09:30	09:38
08:39	08:50			08:56	09:11	09:14	09:25	09:38	09:46
08:49	09:00			09:06	09:21	09:24	09:35	09:48	09:56
09:04	09:15			09:21	09:36	09:39	09:50	10:01	10:07
09:19	09:30			09:36	09:51	09:54	10:05	10:16	10:22
09:34	09:45			09:51	10:06	10:09	10:20	10:31	10:37
09:49	10:00			10:06	10:21	10:24	10:35	10:46	10:52

TERRY FOX 4A	HAZELDEAN MALL / WEST STOP	MOODIE / HADLEY	MOODIE / TYRELL	ROBERTSON / MOODIE	BASELINE 1A	NAVAHO / ALGONQUIN COLLEGE RESIDENCE	1305 BASELINE	BILLINGS BRIDGE 2A	HURDMAN B
10:04	10:15			10:21	10:36	10:39	10:50	11:01	11:07
10:19	10:30			10:36	10:51	10:54	11:05	11:16	11:22
10:34	10:46			10:52	11:08	11:11	11:22	11:32	11:38
10:49	11:01			11:07	11:23	11:26	11:37	11:47	11:53
11:04	11:16			11:22	11:38	11:41	11:52	12:02	12:08
11:19	11:31			11:37	11:53	11:56	12:07	12:17	12:23
11:34	11:46			11:52	12:08	12:11	12:22	12:32	12:39
11:49	12:01			12:07	12:23	12:26	12:37	12:47	12:54
12:04	12:16			12:22	12:37	12:40	12:51	13:03	13:11
12:19	12:31			12:37	12:52	12:55	13:06	13:18	13:26
12:34	12:46			12:52	13:07	13:10	13:21	13:33	13:41
12:49	13:01			13:07	13:22	13:25	13:36	13:48	13:56
13:04	13:16			13:22	13:37	13:40	13:51	14:03	14:11
13:19	13:31			13:37	13:52	13:55	14:06	14:18	14:26
13:34	13:46			13:52	14:07	14:10	14:21	14:33	14:41
13:49	14:01			14:07	14:22	14:25	14:36	14:48	14:56
14:04	14:17			14:24	14:41	14:44	14:54	15:07	15:15
					14:54	14:57	15:07	15:23	15:33
14:27	14:40			14:47	15:04	15:07	15:17	15:30	15:38
					15:14	15:17	15:27	15:43	15:53
14:47	15:00			15:07	15:24	15:27	15:37	15:53	16:03
					15:34	15:36	15:47	16:02	16:12
15:07	15:20			15:27	15:44	15:47	15:57	16:13	16:23
					15:54	15:56	16:07	16:22	16:32
15:27	15:40			15:47	16:04	16:07	16:17	16:33	16:43
					16:16	16:18	16:29	16:43	16:54
15:47	16:00			16:08	16:26	16:28	16:39	16:54	17:04
					16:36	16:38	16:49	17:03	17:14
16:07	16:20			16:28	16:46	16:48	16:59	17:14	17:24
					16:56	16:58	17:09	17:23	17:34
16:27	16:40			16:48	17:06	17:08	17:19	17:33	17:44
					17:16	17:19	17:30	17:43	17:54
16:47	17:00			17:08	17:26	17:28	17:39	17:53	18:04
					17:36	17:39	17:49	18:00	18:10
17:07	17:20			17:28	17:46	17:48	17:59	18:13	18:24
					17:56	17:59	18:09	18:20	18:29
17:35	17:47			17:54	18:09	18:12	18:22	18:33	18:43
17:50	18:02			18:09	18:24	18:27	18:37	18:48	18:57
18:05	18:17			18:24	18:39	18:42	18:52	19:03	19:11
18:20	18:32			18:39	18:54	18:57	19:07	19:18	19:26
18:35	18:47			18:53	19:08	19:11	19:21	19:32	19:39
18:50	19:02			19:08	19:23	19:26	19:36	19:47	19:54
19:05	19:16			19:22	19:36	19:39	19:50	20:01	20:06
19:20	19:31			19:37	19:51	19:54	20:05	20:16	20:21
19:40	19:50			19:56	20:10	20:12	20:23	20:33	20:38
20:00	20:10			20:16	20:29	20:31	20:42	20:52	20:57
20:21	20:31			20:37	20:50	20:52	21:03	21:13	21:18
20:41	20:51			20:57	21:09	21:11	21:22	21:32	21:37
21:01	21:10			21:16	21:28	21:31	21:41	21:49	21:55
21:21	21:30			21:36	21:48	21:51	22:01	22:09	22:15
21:41	21:50			21:56	22:08	22:11	22:21	22:29	22:35
22:01	22:10			22:16	22:28	22:31	22:41	22:49	22:55
22:20[V]	22:29[V]			22:35[V]	22:47[V]	22:50	22:57	23:05	23:11
22:41[V]	22:50[V]			22:56[V]	23:08[V]	23:11	23:18	23:26	23:31

TERRY FOX 4A	HAZELDEAN MALL / WEST STOP	MOODIE / HADLEY	MOODIE / TYRELL	ROBERTSON / MOODIE	BASELINE 1A	NAVAHO / ALGONQUIN COLLEGE RESIDENCE	1305 BASELINE	BILLINGS BRIDGE 2A	HURDMAN B
23:01[V]	23:10[V]			23:16[V]	23:26[V]	23:29	23:35	23:43	23:48
23:31[V]	23:40[V]			23:45[V]	23:55[V]	23:58	00:04	00:10	00:15
00:03[V]	00:12[V]			00:17[V]	00:27[V]	00:30	00:36	00:42	00:47
00:33[V]	00:42[V]			00:47[V]	00:57[V]	01:00	01:06	01:12	01:17

Schedules & Maps

The next service change is on Saturday, September 04.

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Tue, Jun 29

88 Terry Fox

[V] Via Woodroffe/Navaho

[a] From May 10 at 5:00 am until August 1 at 6:00 pm, Route 88 will be detoured due to the closure of Navaho north-side access road at Algonquin in front of the Residence building for construction. Read more

[x] Via Tyrell/Moodie

[y] Via Tyrell/Moodie & Navaho/Woodroffe

HURDMAN D	BILLINGS BRIDGE 1A	BASELINE / MERIVALE	NAVAHO / ALGONQUIN COLLEGE RESIDENCE	BASELINE 2A	MOODIE / TYRELL	MOODIE / HADLEY	ROBERTSON / MOODIE	HAZELDEAN MALL / EAST STOP	TERRY FOX 3B
04:23[y]	04:28[y]	04:34[y]	04:39[y]	04:41[y]	04:53[y]	04:54		05:00	05:12
04:53[y]	04:58[y]	05:04[y]	05:09[y]	05:11[y]	05:23[y]	05:24		05:30	05:42
05:23[y]	05:28[y]	05:34[y]	05:40[y]	05:42[y]	05:54[y]	05:55		06:02	06:14
05:53[V]	05:58[V]	06:06[V]	06:13	06:15			06:30	06:40	06:51
06:08[V]	06:13[V]	06:21[V]	06:28	06:31			06:46	06:56	07:07
06:23[V]	06:28[V]	06:36[V]	06:43	06:46			07:01	07:10	07:21
06:37	06:42	06:51	07:02	07:05			07:19	07:28	07:40
06:47	06:52	07:01	07:12	07:15					
06:57	07:02	07:11	07:22	07:25			07:39	07:48	08:00
07:07	07:12	07:22	07:33	07:36					
07:17	07:22	07:32	07:43	07:46			08:03	08:12	08:25
07:27	07:32	07:42	07:53	07:56					
07:37	07:42	07:53	08:03	08:06			08:24	08:32	08:45
07:47	07:52	08:03	08:13	08:16					
07:57	08:02	08:13	08:23	08:26			08:44	08:52	09:05
08:07	08:12	08:23	08:33	08:36					
08:19	08:24	08:35	08:45	08:48			09:06	09:14	09:27
08:34	08:39	08:48	08:58	09:01			09:17	09:25	09:41
08:52	08:57	09:06	09:16	09:19			09:35	09:43	09:59
09:07	09:12	09:21	09:31	09:34			09:50	09:58	10:14
09:22	09:27	09:36	09:46	09:49			10:05	10:13	10:29
09:37	09:42	09:51	10:01	10:04			10:20	10:28	10:44
09:54	09:59	10:08	10:18	10:21			10:37	10:45	11:01
10:11	10:16	10:25	10:35	10:38			10:54	11:02	11:18
10:24	10:29	10:38	10:48	10:51			11:07	11:15	11:31

HURDMAN D	BILLINGS BRIDGE 1A	BASELINE / MERIVALE	NAVAHO / ALGONQUIN COLLEGE RESIDENCE	BASELINE 2A	MOODIE / TYRELL	MOODIE / HADLEY	ROBERTSON / MOODIE	HAZELDEAN MALL / EAST STOP	TERRY FOX 3B
10:37	10:42	10:51	11:01	11:04			11:20	11:28	11:44
10:52	10:57	11:06	11:16	11:19			11:35	11:43	11:59
11:07	11:12	11:21	11:31	11:34			11:50	11:58	12:14
11:22	11:27	11:36	11:46	11:49			12:06	12:14	12:30
11:36	11:41	11:50	12:00	12:03			12:20	12:28	12:44
11:53	11:58	12:07	12:17	12:20			12:37	12:45	13:01
12:08	12:13	12:22	12:32	12:35			12:52	13:00	13:16
12:23	12:28	12:37	12:47	12:50			13:07	13:15	13:31
12:38	12:43	12:52	13:02	13:05			13:22	13:30	13:46
12:54	12:59	13:08	13:18	13:21			13:38	13:46	14:02
13:09	13:14	13:23	13:35	13:38			13:57	14:05	14:20
13:26	13:31	13:40	13:52	13:55			14:14	14:22	14:37
13:41	13:46	13:55	14:07	14:10			14:29	14:37	14:52
13:56	14:01	14:10	14:22	14:25			14:44	14:52	15:07
14:11	14:16	14:26	14:38	14:41			15:00	15:10	15:25
14:26	14:31	14:41	14:53	14:56			15:15	15:25	15:40
14:41	14:46	14:56	15:08	15:11			15:30	15:40	15:55
14:56[x]	15:01[x]	15:11[x]	15:23[x]	15:26[x]	15:40[x]	15:42			
15:08	15:13	15:26	15:38	15:40			15:59	16:10	16:25
15:20[x]	15:25[x]	15:38[x]	15:50[x]	15:52[x]	16:14[x]	16:15			
15:32	15:37	15:53	16:05	16:08			16:25	16:36	16:51
15:44[x]	15:49[x]	16:05[x]	16:17[x]	16:20[x]	16:42[x]	16:43			
15:56	16:01	16:17	16:29	16:32			16:49	17:00	17:15
16:08[x]	16:13[x]	16:29[x]	16:41[x]	16:44[x]	17:06[x]	17:07			
16:20	16:25	16:41	16:53	16:56			17:13	17:24	17:39
16:32[x]	16:37[x]	16:53[x]	17:05[x]	17:08[x]	17:30[x]	17:31			
16:44	16:49	17:05	17:17	17:20			17:36	17:45	17:59
16:56[x]	17:01[x]	17:17[x]	17:29[x]	17:32[x]	17:51[x]	17:53			
17:08	17:13	17:25	17:38	17:40			17:57	18:06	18:17
17:20[x]	17:25[x]	17:37[x]	17:50[x]	17:52[x]	18:11[x]	18:13			
17:32	17:37	17:49	18:02	18:04			18:21	18:30	18:41
17:44	17:49	18:01	18:14	18:16			18:33	18:42	18:53
17:57	18:02	18:14	18:27	18:29			18:46	18:55	19:06
18:12	18:17	18:29	18:42	18:44			19:01	19:10	19:21
18:27	18:32	18:41	18:54	18:57			19:11	19:20	19:32
18:42	18:47	18:56	19:09	19:12			19:26	19:35	19:47
18:57	19:02	19:11	19:24	19:27			19:41	19:50	20:02
19:09	19:14	19:23	19:36	19:39			19:53	20:02	20:14
19:29	19:34	19:42	19:51	19:53			20:08	20:17	20:28
19:49	19:54	20:02	20:11	20:13			20:28	20:37	20:48
20:09	20:14	20:22	20:31	20:33			20:48	20:57	21:08
20:34	20:39	20:47	20:56	20:58			21:13	21:20	21:32
20:54	20:59	21:07	21:16	21:18			21:33	21:40	21:52
21:14	21:19	21:27	21:36	21:38			21:53	22:00	22:12
21:34	21:39	21:47	21:56	21:58			22:13	22:20	22:32
21:54	21:59	22:07	22:16	22:18			22:33	22:40	22:52
22:14	22:19	22:27	22:36	22:38			22:53	23:00	23:12
22:33[V]	22:38[V]	22:45[V]	22:52	22:55			23:06	23:13	23:25
23:00[V]	23:05[V]	23:12[V]	23:19	23:22			23:33	23:40	23:52
23:30[V]	23:35[V]	23:42[V]	23:49	23:52			00:03	00:10	00:19
00:01[V]	00:06[V]	00:13[V]	00:19	00:21			00:32	00:39	00:48
00:31[V]	00:36[V]	00:43[V]	00:49	00:51			01:02	01:09	01:18
01:01[V]	01:06[V]	01:13[V]	01:19	01:21			01:32	01:39	01:48

Schedules & Maps

The next service change is on Saturday, September 04.

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Tue, Jun 29

173 Barrhaven Centre

BAYSHORE 4A	DUMAURIER / PINECREST	PINECREST MALL	GREENBANK / BASELINE	GREENBANK / GIBBARD	WOODROFFE / KNOXDALE	FALLOWFIELD 1A	MALVERN / VENTNOR	STRANDHERD / JOCKVALE	MARKETPLACE 1A	BARRHAVEN CENTRE 1A
						05:53	05:58	06:08	06:11	06:12
						06:30	06:35	06:44	06:48	06:49
						07:00	07:05	07:14	07:18	07:19
						07:29	07:34	07:43	07:47	07:48
						08:00	08:05	08:14	08:18	08:19
						08:30	08:35	08:44	08:48	08:49
						09:01	09:06	09:15	09:18	09:19
						09:30	09:35	09:44	09:47	09:48
						10:00	10:05	10:14	10:17	10:18
10:03	10:09	10:12	10:15	10:18	10:23	10:30	10:35	10:44	10:47	10:48
						11:00	11:05	11:14	11:17	11:18
11:03	11:09	11:12	11:15	11:18	11:23	11:30	11:35	11:44	11:47	11:48
						12:00	12:05	12:14	12:17	12:18
12:03	12:09	12:12	12:15	12:18	12:23	12:30	12:35	12:44	12:47	12:48
						13:00	13:05	13:14	13:17	13:18
13:03	13:09	13:12	13:15	13:18	13:23	13:30	13:35	13:44	13:47	13:48
						14:00	14:05	14:14	14:17	14:18
14:03	14:09	14:12	14:15	14:18	14:23	14:30	14:35	14:44	14:47	14:48
						15:00	15:05	15:15	15:18	15:19
15:03	15:08	15:11	15:14	15:17	15:22	15:29	15:34	15:44	15:47	15:48
15:31	15:36	15:39	15:42	15:45	15:50	15:57	16:02	16:12	16:15	16:16
16:03	16:08	16:11	16:14	16:17	16:22	16:29	16:34	16:44	16:47	16:48
16:33	16:38	16:41	16:44	16:47	16:52	16:59	17:04	17:14	17:17	17:18
17:03	17:08	17:11	17:14	17:17	17:22	17:29	17:34	17:44	17:47	17:48
17:33	17:38	17:41	17:44	17:47	17:52	17:59	18:04	18:14	18:17	18:18
18:03	18:08	18:10	18:13	18:17	18:21	18:28	18:33	18:42	18:45	18:46

Schedules & Maps

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Tue, Jun 29

173 Bayshore

[S] Ends at Fallowfield

[V] Bypass Pinecrest Mall

BARRHAVEN CENTRE 2A	MARKETPLACE 2A	STRANDHERD / JOCKVALE	FOXFIELD / KADEER	FALLOWFIELD 2A	KNOXDALE / WOODROFFE	GIBBARD / GREENBANK	GREENBANK / BASELINE	GREENBANK / IRIS	PINECREST MALL	DUMAURIER / PINECREST	BAYSHORE 4A
06:17[S]	06:18[S]	06:22[S]	06:32[S]	06:39[S]							
06:54[V]	06:55[V]	06:59[V]	07:09[V]	07:16[V]	07:20[V]	07:26[V]	07:31[V]	07:33		07:35	07:43
07:24[V]	07:25[V]	07:29[V]	07:39[V]	07:46[V]	07:50[V]	07:56[V]	08:01[V]	08:03		08:05	08:13
07:54[V]	07:55[V]	07:59[V]	08:09[V]	08:16[V]	08:20[V]	08:26[V]	08:31[V]	08:33		08:35	08:43
08:26	08:27	08:31	08:41	08:48	08:52	08:58	09:03	09:05	09:06	09:08	09:16
08:57	08:58	09:02	09:12	09:19	09:23	09:29	09:34	09:36	09:37	09:39	09:47
09:30[S]	09:31[S]	09:35[S]	09:44[S]	09:50[S]							
10:00	10:01	10:05	10:14	10:20	10:24	10:31	10:35	10:37	10:38	10:41	10:49
10:30[S]	10:31[S]	10:35[S]	10:44[S]	10:50[S]							
11:00	11:01	11:05	11:14	11:20	11:24	11:31	11:35	11:37	11:38	11:41	11:49
11:30[S]	11:31[S]	11:35[S]	11:44[S]	11:50[S]							
12:00	12:01	12:05	12:14	12:20	12:24	12:31	12:35	12:37	12:38	12:41	12:49
12:30[S]	12:31[S]	12:35[S]	12:44[S]	12:50[S]							
13:00	13:01	13:05	13:14	13:20	13:24	13:31	13:35	13:37	13:38	13:41	13:49
13:30[S]	13:31[S]	13:35[S]	13:44[S]	13:50[S]							
14:00	14:01	14:05	14:14	14:20	14:24	14:31	14:35	14:37	14:38	14:41	14:49
14:30[S]	14:31[S]	14:35[S]	14:44[S]	14:50[S]							
15:00	15:01	15:05	15:14	15:20	15:24	15:31	15:35	15:37	15:38	15:41	15:49
15:28[S]	15:29[S]	15:33[S]	15:43[S]	15:50[S]							
16:00[S]	16:01[S]	16:05[S]	16:15[S]	16:22[S]							
16:28[S]	16:29[S]	16:33[S]	16:43[S]	16:50[S]							
16:59[S]	17:00[S]	17:04[S]	17:14[S]	17:21[S]							
17:30[S]	17:31[S]	17:35[S]	17:45[S]	17:52[S]							
18:00[S]	18:01[S]	18:05[S]	18:15[S]	18:22[S]							
18:30[S]	18:31[S]	18:35[S]	18:44[S]	18:51[S]							
19:00[S]	19:01[S]	19:05[S]	19:14[S]	19:21[S]							

Schedules & Maps

The next service change is on Saturday, September 04.

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Tue, Jun 29

282 Tunney's Pasture

KNOXDALE / RIVERBROOK	GREENBANK / MONTEREY	TUNNEY'S PASTURE C
06:08	06:17	06:32
06:38	06:48	07:05
07:08	07:18	07:35
07:35	07:46	08:05
08:04	08:14	08:32
08:35	08:45	09:03

Schedules & Maps

The next service change is on Saturday, September 04.

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Tue, Jun 29

282 Trend-Arlington

TUNNEY'S PASTURE F	GREENBANK / BASELINE	SISKIN / RIVERBROOK
15:37	15:51	16:02
16:07	16:21	16:32
16:34	16:48	16:59
16:59	17:13	17:24
17:24	17:37	17:47
17:53	18:06	18:16
18:24	18:37	18:47

691

Bayshore

OC Transpo

There have been recent changes to this line

For updated information, visit our website

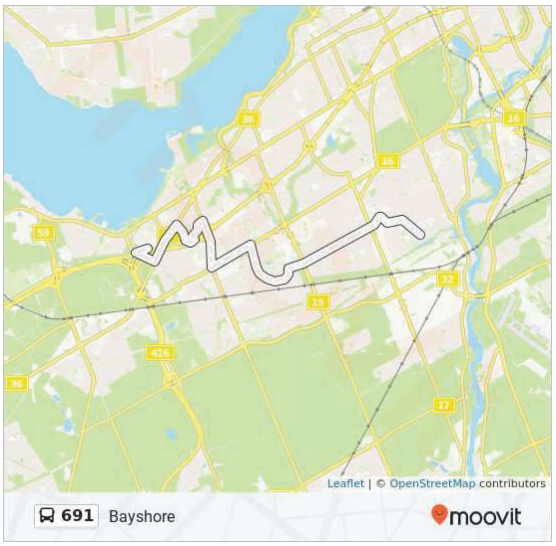
691 bus Route Schedule and Stops

The 691 bus (Bayshore) has 46 stops departing from Chesterton / Omer-Deslauriers and ending in Bayshore.
691 bus time schedule overview for the upcoming week: Starts operating at 3:19 PM and ends at 3:19 PM. Operating days this week: weekdays.

Choose any of the 691 bus stops below to find updated real-time schedules and to see their route map.

View on Map

691 bus Route Map



Direction: Bayshore (46 stops)

SHOW ON MAP CHANGE DIRECTION

- Chesterton / Omer-Deslauriers
  170 Chesterton Drive, Ottawa
  VIEW FULL SCHEDULE
- Chesterton / Juniper
  151 Chesterton Drive, Ottawa
  VIEW FULL SCHEDULE

691 bus Schedule

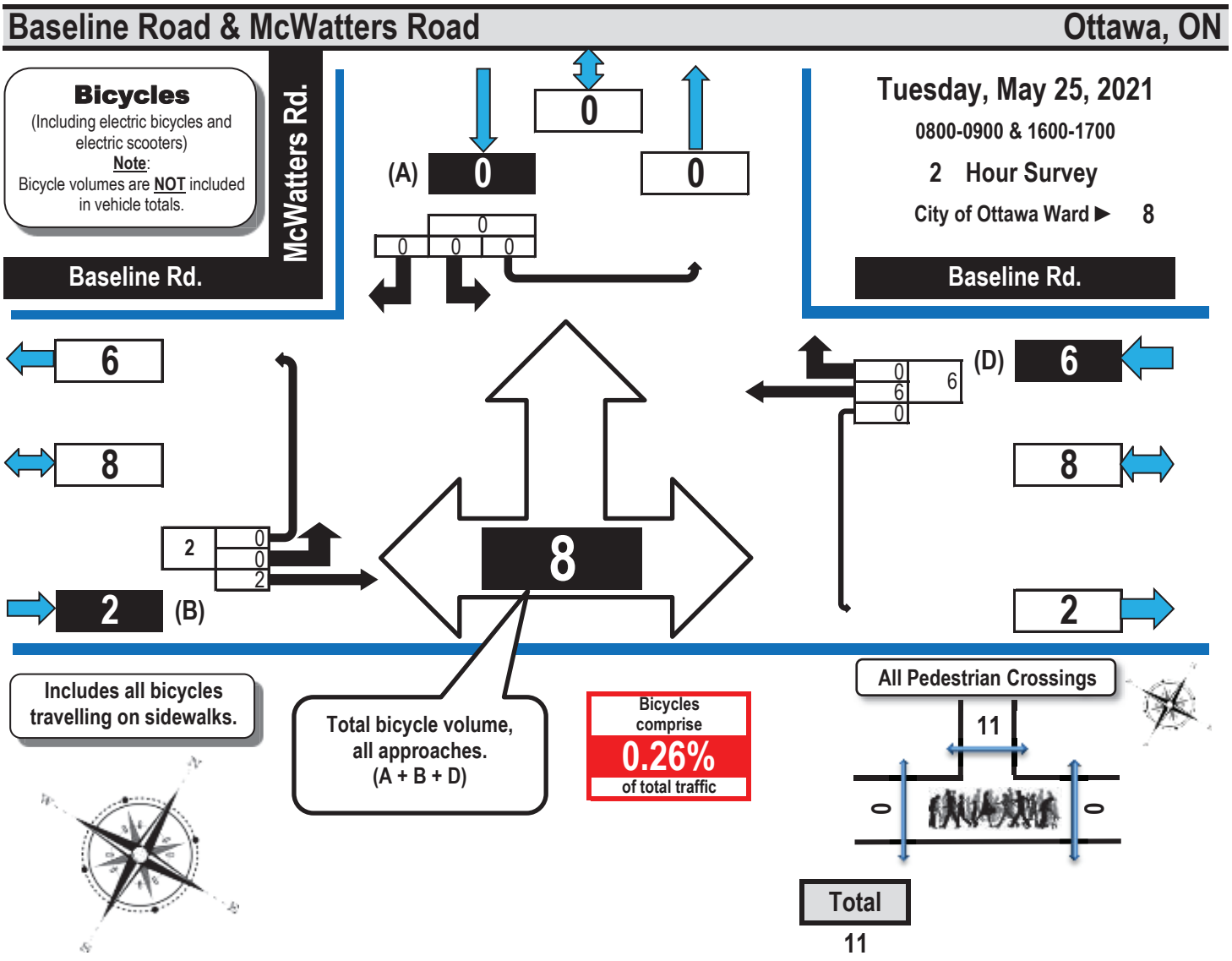
691 bus route operates on weekdays.
Regular schedule hours: 3:19 PM

Day	Operating Hours
Sunday	Not Operational
Monday	3:19 PM
Tuesday	3:19 PM

Appendix C

Traffic Data

Turning Movement Count
Bicycle Summary
Flow Diagram



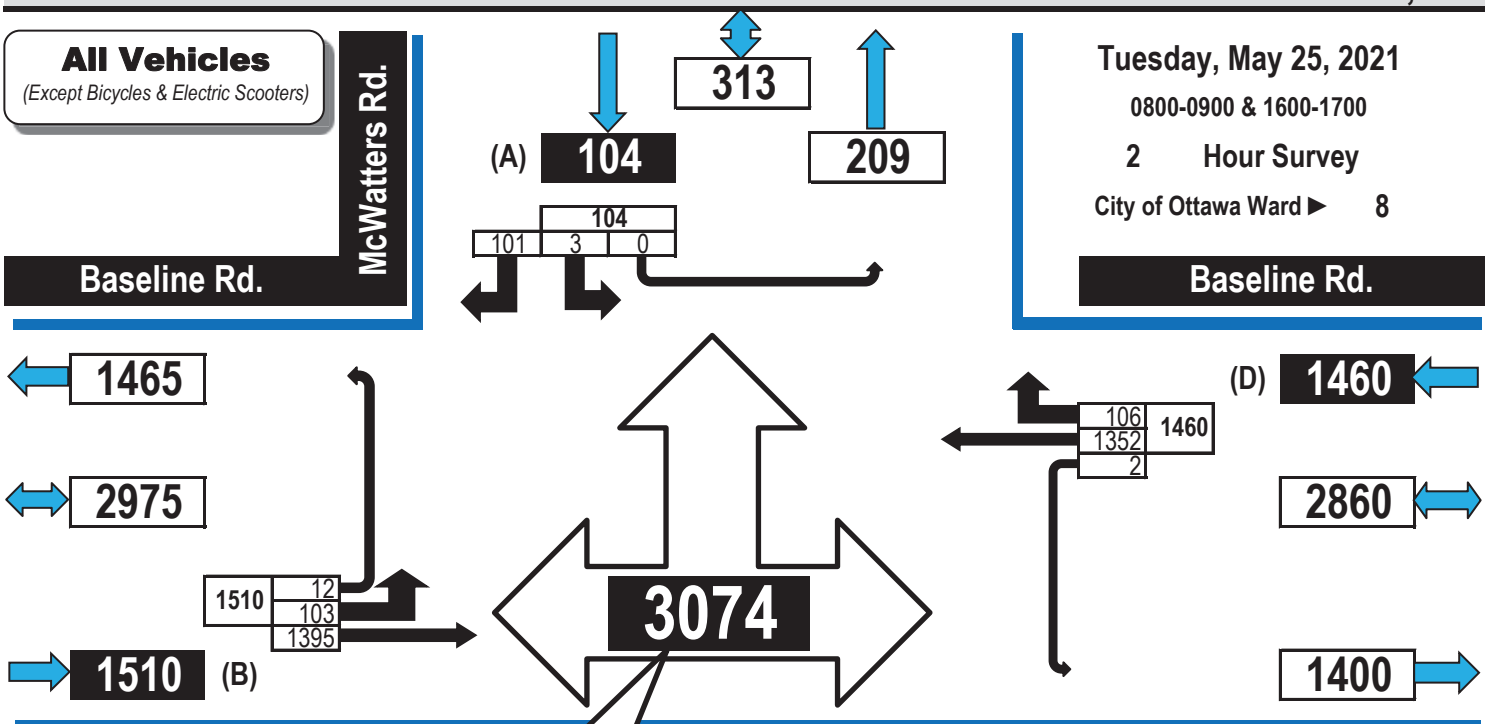
	Baseline Rd. Eastbound					Baseline Rd. Westbound					N/A Northbound					McWatters Rd. Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0700-0800	0	0		0	0		0	0	0	0						0		0	0	0	0
0800-0900	0	0		0	0		3	0	0	3						0		0	0	0	3
1600-1700	0	2		0	2		3	0	0	3						0		0	0	0	5
1700-1800	0	0		0	0		0	0	0	0						0		0	0	0	0
Totals	0	2		0	2		6	0	0	6						0		0	0	0	8

Turning Movement Count
Summary, AM and PM Peak Hour Flow Diagrams
All Vehicles Except Bicycles

Baseline Road & McWatters Road — Ottawa, ON

All Vehicles
(Except Bicycles & Electric Scooters)

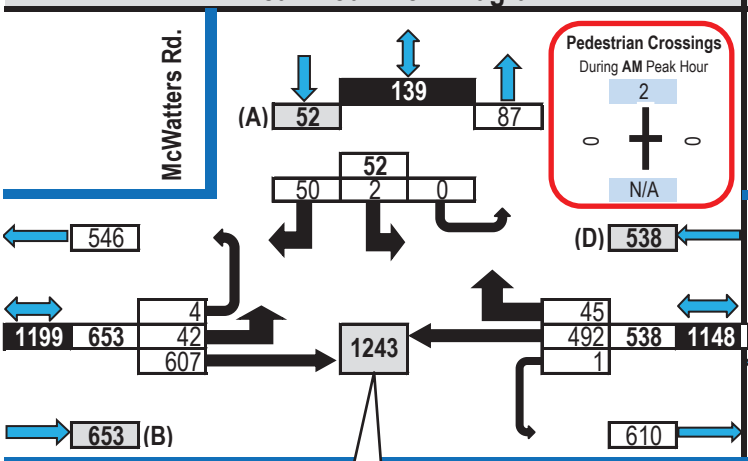
Tuesday, May 25, 2021
0800-0900 & 1600-1700
2 Hour Survey
City of Ottawa Ward ▶ 8



Total vehicle volume, all approaches. (A + B + D)

All Pedestrian Crossings
11
0 0
Total
11

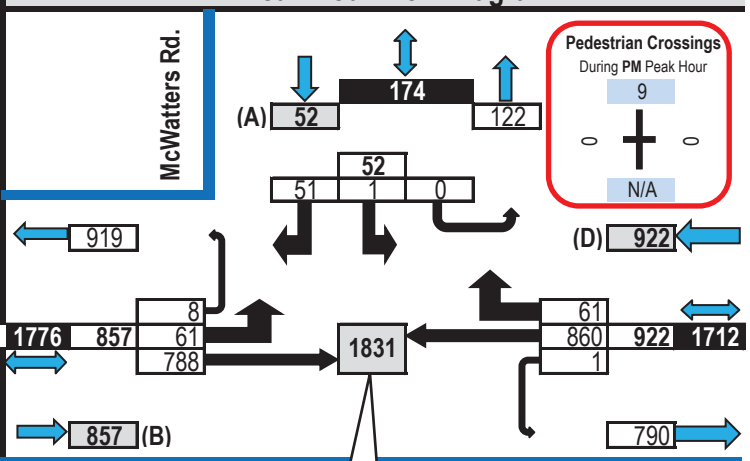
AM Peak Hour Flow Diagram



Total **AM Peak Hour** vehicle volume, all approaches. (A + B + D)

Summary - AM Peak Hr.	
Peak Hr.	0800-0900
Volume	1243
PHF	0.92

PM Peak Hour Flow Diagram



Total **PM Peak Hour** vehicle volume, all approaches. (A + B + D)

Summary - PM Peak Hr.	
Peak Hr.	1600-1700
Volume	1831
PHF	0.94

Turning Movement Count
Heavy Vehicle Summary
Flow Diagram

Baseline Road & McWatters Road — Ottawa, ON

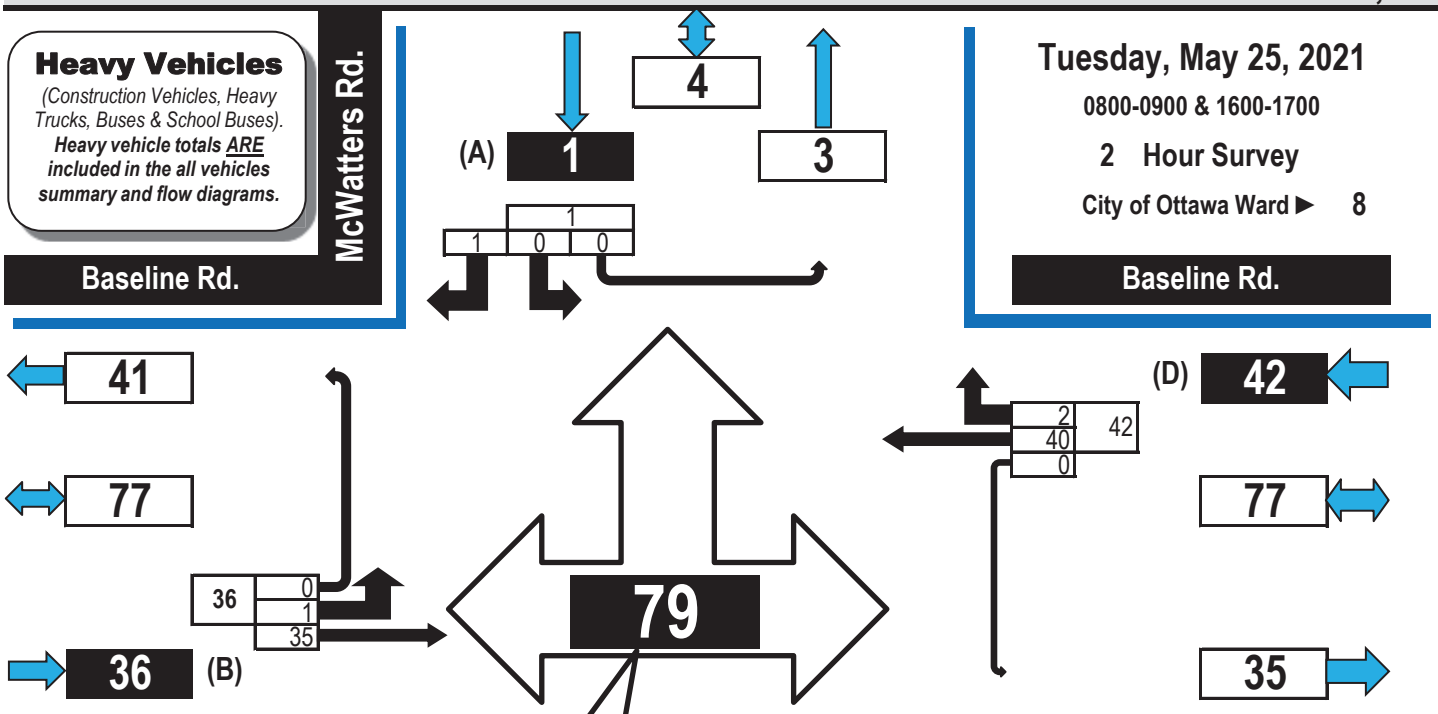
Heavy Vehicles
(Construction Vehicles, Heavy Trucks, Buses & School Buses).
Heavy vehicle totals ARE included in the all vehicles summary and flow diagrams.

McWatters Rd.

Baseline Rd.

Tuesday, May 25, 2021
0800-0900 & 1600-1700
2 Hour Survey
City of Ottawa Ward ► 8

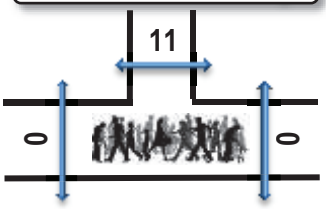
Baseline Rd.



Total heavy vehicle volume, all approaches. (A + B + D)

Heavy Vehicles Comprise **2.57%** of Total Traffic

All Pedestrian Crossings



Total
11

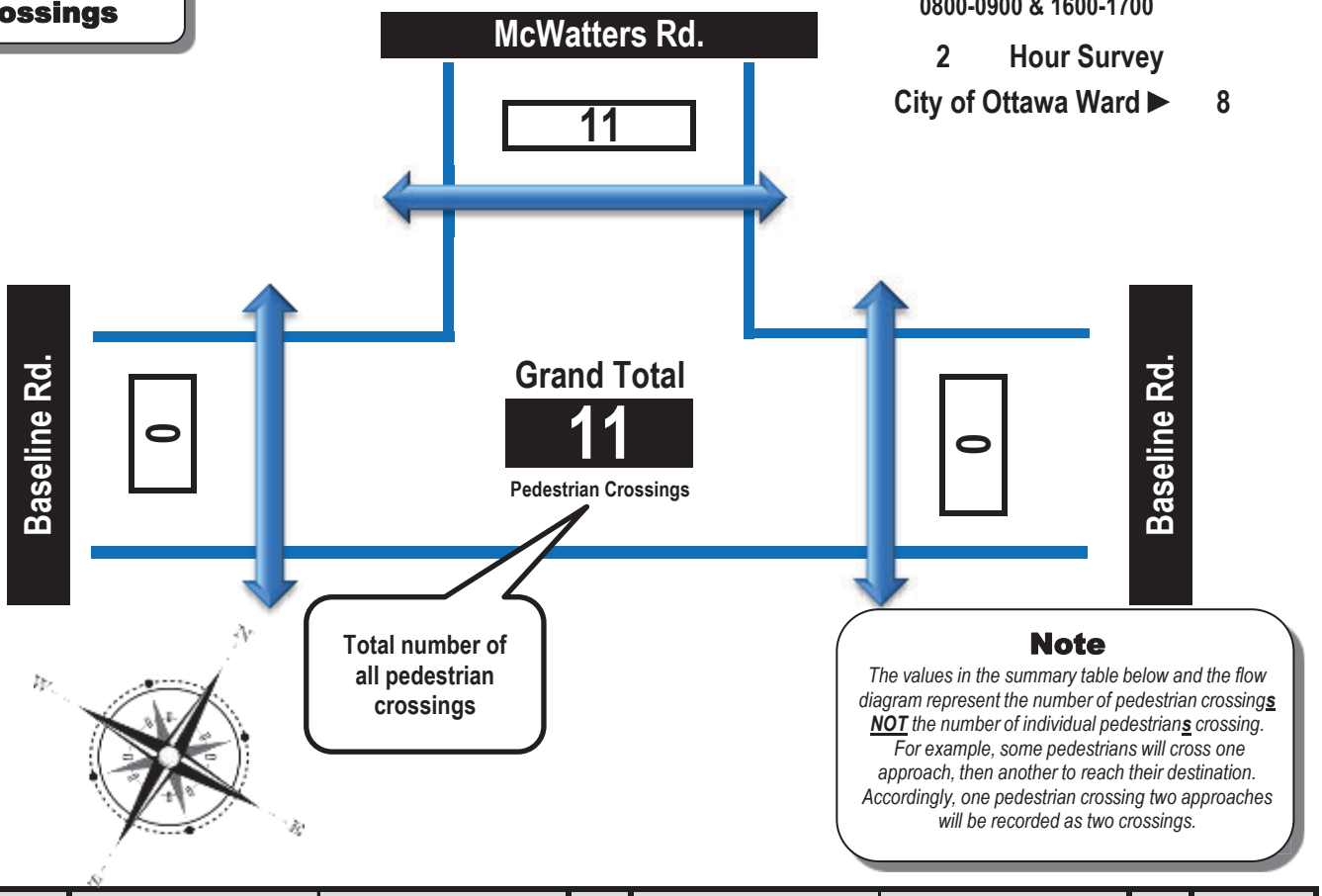
	Baseline Rd. Eastbound					Baseline Rd. Westbound					N/A Northbound					McWatters Rd. Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0700-0800	0	0		0	0		0	0	0	0						0		0	0	0	0
0800-0900	0	22		0	22		22	2	0	24						0		1	0	1	47
1600-1700	1	13		0	14		18	0	0	18						0		0	0	0	32
1700-1800	0	0		0	0		0	0	0	0						0		0	0	0	0
Totals	1	35		0	36		40	2	0	42						0		1	0	1	79

Turning Movement Count
Pedestrian Crossings Summary and Flow Diagram

Baseline Road & McWatters Road — Ottawa, ON

Pedestrian Crossings

Tuesday, May 25, 2021
0800-0900 & 1600-1700
2 Hour Survey
City of Ottawa Ward ► 8



Note
*The values in the summary table below and the flow diagram represent the number of pedestrian crossing**s** **NOT** the number of individual pedestrian**s** crossing. For example, some pedestrians will cross one approach, then another to reach their destination. Accordingly, one pedestrian crossing two approaches will be recorded as two crossings.*

Time Period	West Side Crossing Baseline Rd.	East Side Crossing Baseline Rd.	Street Total	South Side Crossing N/A	North Side Crossing McWatters Rd.	Street Total	Grand Total
0700-0800	0	0	0		0	0	0
0800-0900	0	0	0		2	2	2
1600-1700	0	0	0		9	9	9
1700-1800	0	0	0		0	0	0
Totals	0	0	0		11	11	11

Comments:
Traffic count conducted during the SARS-CoV-2 (Covid-19) pandemic. Pinecrest Public School closed. No left turn at any time southbound from McWatters Road and no right turn westbound from Baseline Road between 0700-0900, Monday to Friday. Northbound ramp on Pinecrest Road to Highway 417 westbound closed due to OTrain construction. Heavy vehicles comprise 2.52% of all traffic and buses comprise 42.25% of the heavy vehicle traffic. The bicycle total includes 1 E-bicycle and 1 E-scooter. During the AM time period between 0700 & 0900 almost every westbound right turn (illegal movement) travels to the Tim Horton's drive through.

ACCURATE TRUSTED TRAFFIC DATA

Turning Movement Count

Summary Report

Including AM and PM Peak Hours

All Vehicles Except Bicycles

Baseline Road & McWatters Road — Ottawa, ON

Survey Date: Tuesday, May 25, 2021 **Start Time:** 0800 **AADT Factor:** 0.9

Weather AM: Partly Cloudy 12º C **Survey Duration:** 2 Hrs. **Survey Hours:** 0800-0900 & 1600-1700

Weather PM: Cloudy 25º C **Surveyor(s):** T. Carmody

	Baseline Rd. Eastbound					Baseline Rd. Westbound						N/A Northbound					McWatters Rd. Southbound						
Time Period	LT	ST	RT	UT	E/B Tot	LT	ST	RT	UT	W/B Tot	Street Total	LT	ST	RT	UT	N/B Tot	LT	ST	RT	UT	S/B Tot	Street Total	Grand Total
0700-0800	0	0	0	0	**0**	0	0	0	0	**0**	**0**	0	0	0	0	**0**	0	0	0	0	**0**	**0**	**0**
0800-0900	42	607	0	4	**653**	0	492	45	1	**538**	**1191**	0	0	0	0	**0**	2	0	50	0	**52**	**52**	**1243**
1600-1700	61	788	0	8	**857**	0	860	61	1	**922**	**1779**	0	0	0	0	**0**	1	0	51	0	**52**	**52**	**1831**
1700-1800	0	0	0	0	**0**	0	0	0	0	**0**	**0**	0	0	0	0	**0**	0	0	0	0	**0**	**0**	**0**
Totals	103	1395	0	12	1510	0	1352	106	2	1460	2970	0	0	0	0	0	3	0	101	0	104	104	3074

Equivalent 12 & 24-hour Vehicle Volumes Including the Annual Average Daily Traffic (AADT) Factor Applicable to the Day and Month of the Turning Movement Count

Expansion factors are applied exclusively to standard weekday 8-hour turning movement counts conducted during the hours of 0700h - 1000h, 1130h - 1330h and 1500h - 1800h

Equivalent 12-hour vehicle volumes. These volumes are calculated by multiplying the 8-hour totals by the 8 ➡12 expansion factor of 1.39

Equ. 12 Hr	n/a	n/a	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a	**n/a**	**n/a**	n/a	n/a	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a	**n/a**	**n/a**	**n/a**

Average daily 12-hour vehicle volumes. These volumes are calculated by multiplying the equivalent 12-hour totals by the AADT factor of: 0.9

AADT 12-hr	n/a	n/a	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a	**n/a**	**n/a**	n/a	n/a	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a	**n/a**	**n/a**	**n/a**

24-Hour AADT. These volumes are calculated by multiplying the average daily 12-hour vehicle volumes by the 12 ➡24 expansion factor of 1.31

AADT 24 Hr	n/a	n/a	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a	**n/a**	**n/a**	n/a	n/a	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a	**n/a**	**n/a**	**n/a**

AADT and expansion factors provided by the City of Ottawa

AM Peak Hour Factor ➡ 0.92												Highest Hourly Vehicle Volume Between 0700h & 0900h										
AM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
0800-0900	42	607	0	4	**653**	0	492	45	1	**538**	**1191**	0	0	0	0	**0**	2	0	50	0	**52**	**52**	**1243**

PM Peak Hour Factor ➡ 0.94												Highest Hourly Vehicle Volume Between 1600h & 1800h										
PM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
1600-1700	61	788	0	8	**857**	0	860	61	1	**922**	**1779**	0	0	0	0	**0**	1	0	51	0	**52**	**52**	**1831**

Comments:

Traffic count conducted during the SARS-CoV-2 (Covid-19) pandemic. Pinecrest Public School closed. No left turn at any time southbound from McWatters Road and no right turn westbound from Baseline Road between 0700-0900, Monday to Friday. Northbound ramp on Pinecrest Road to Highway 417 westbound closed due to OTrain construction. Heavy vehicles comprise 2.57% of all traffic and buses comprise 37.97% of the heavy vehicle traffic. The bicycle total includes 1 E-Bicycle. During the AM time period between 0700 & 0900 almost every westbound right turn (illegal movement) travels to the Tim Horton's drive through.

Notes:

1. Includes all vehicle types except bicycles, electric bicycles, and electric scooters.
2. When expansion and AADT factors are applied, the results will differ slightly due to rounding.

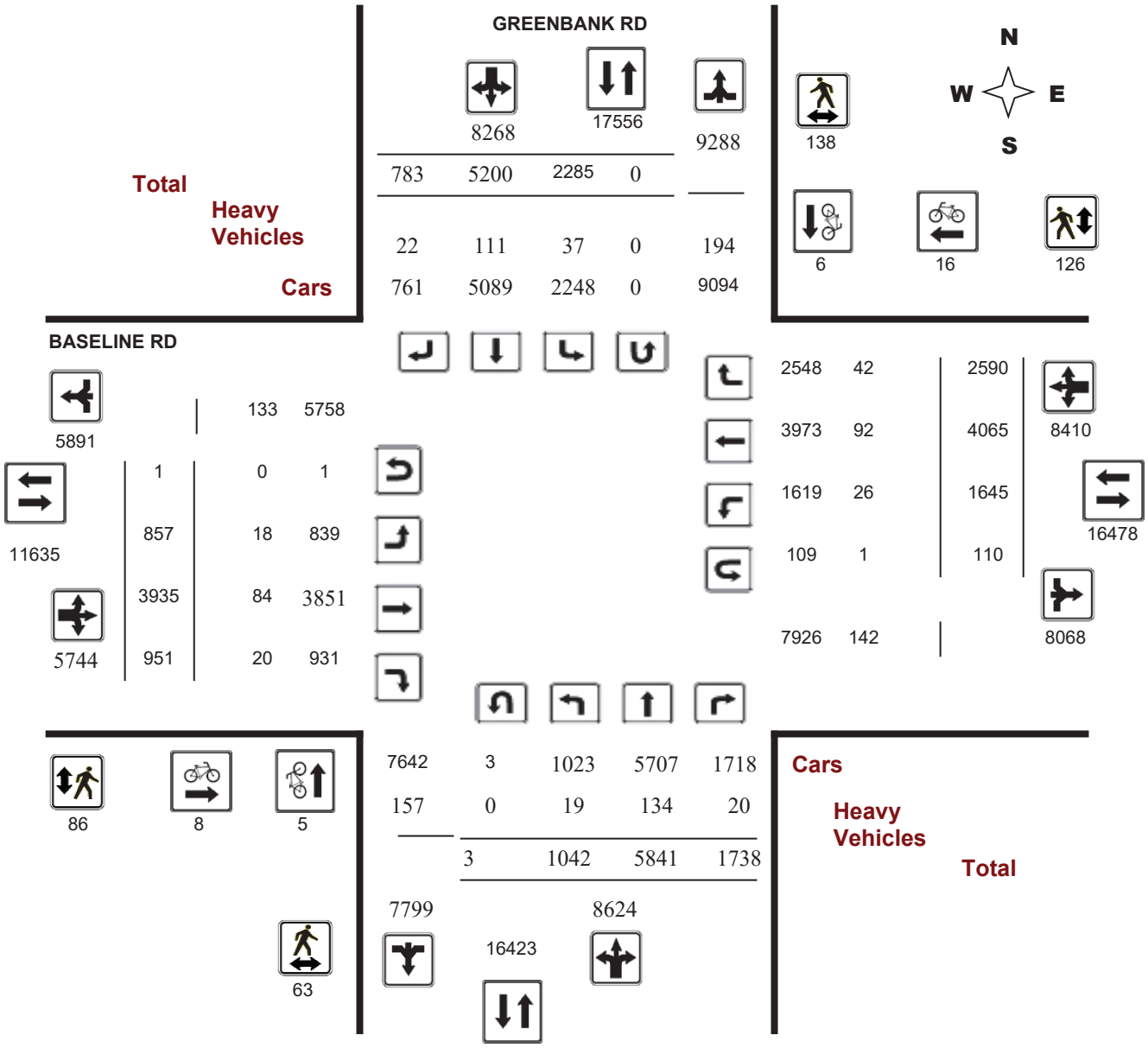
Transportation Services - Traffic Services

Turning Movement Count - Study Results

BASELINE RD @ GREENBANK RD

Survey Date: Thursday, August 11, 2016
Start Time: 07:00
WO No: 36185
Device: Miovision

Full Study Diagram



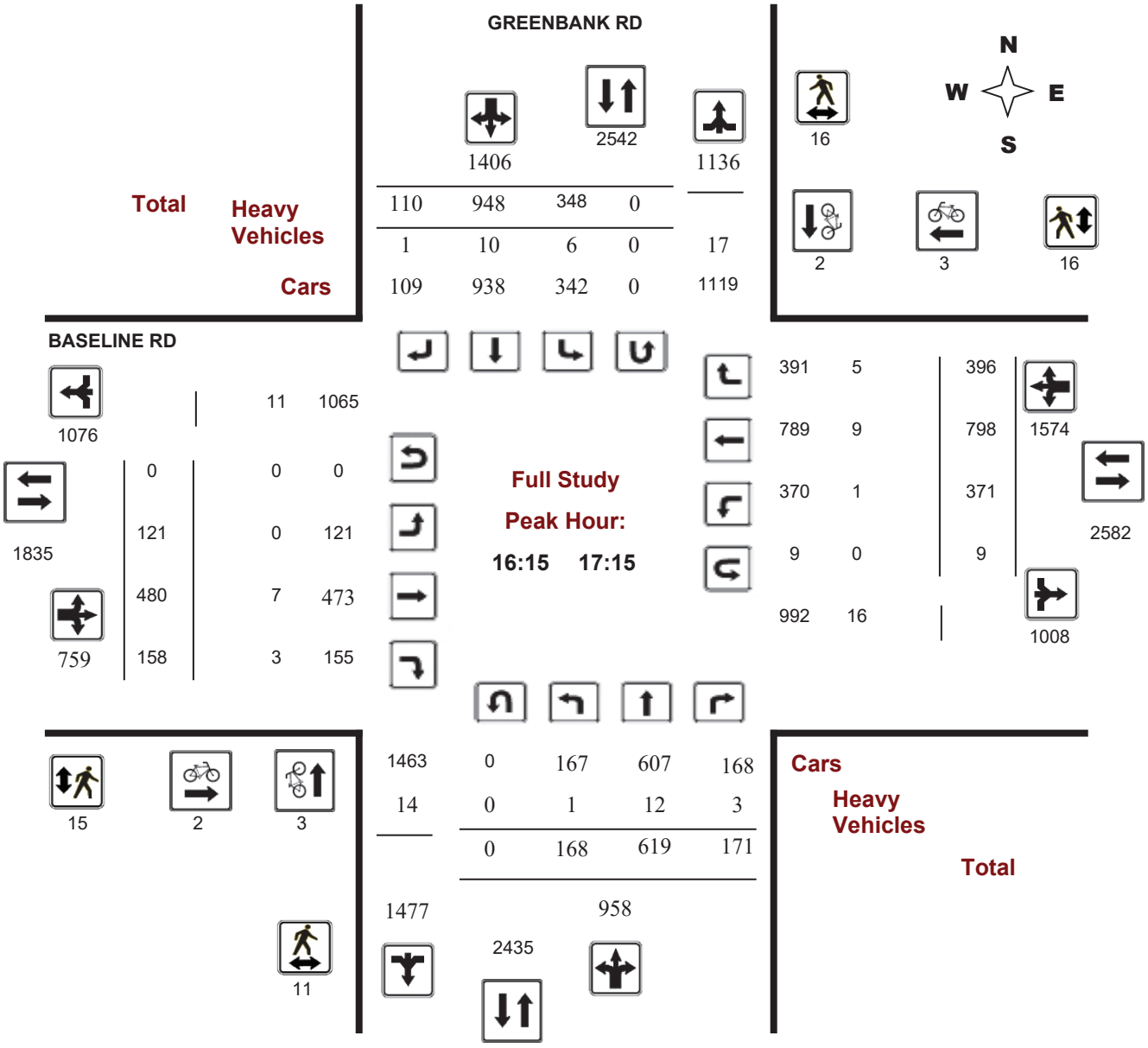
Transportation Services - Traffic Services

Turning Movement Count - Study Results

BASELINE RD @ GREENBANK RD

Survey Date: Thursday, August 11, 2016
Start Time: 07:00
WO No: 36185
Device: Miovision

Full Study Peak Hour Diagram



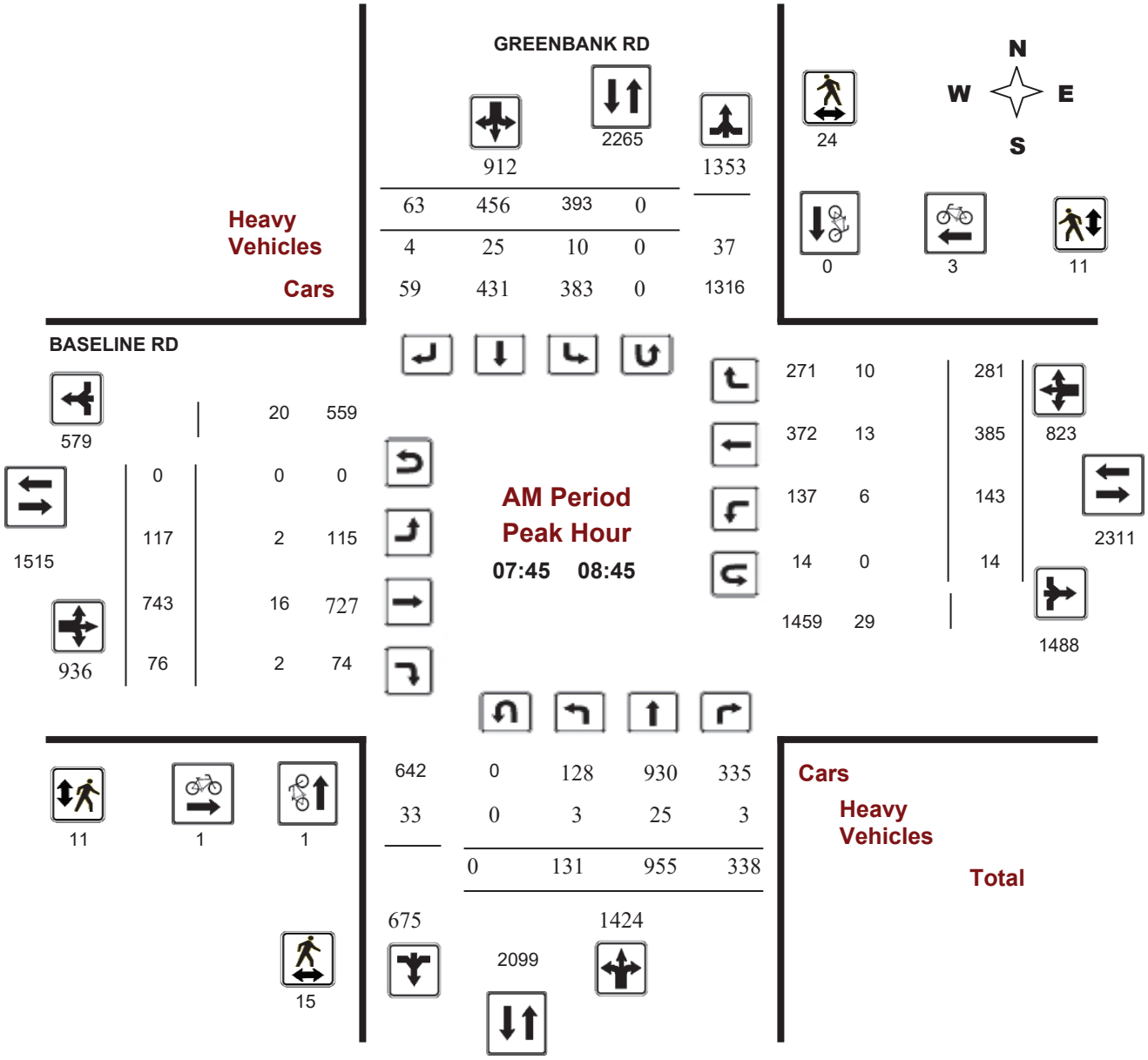
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BASELINE RD @ GREENBANK RD

Survey Date: Thursday, August 11, 2016 **WO No:** 36185

Start Time: 07:00 **Device:** Miovision



Comments

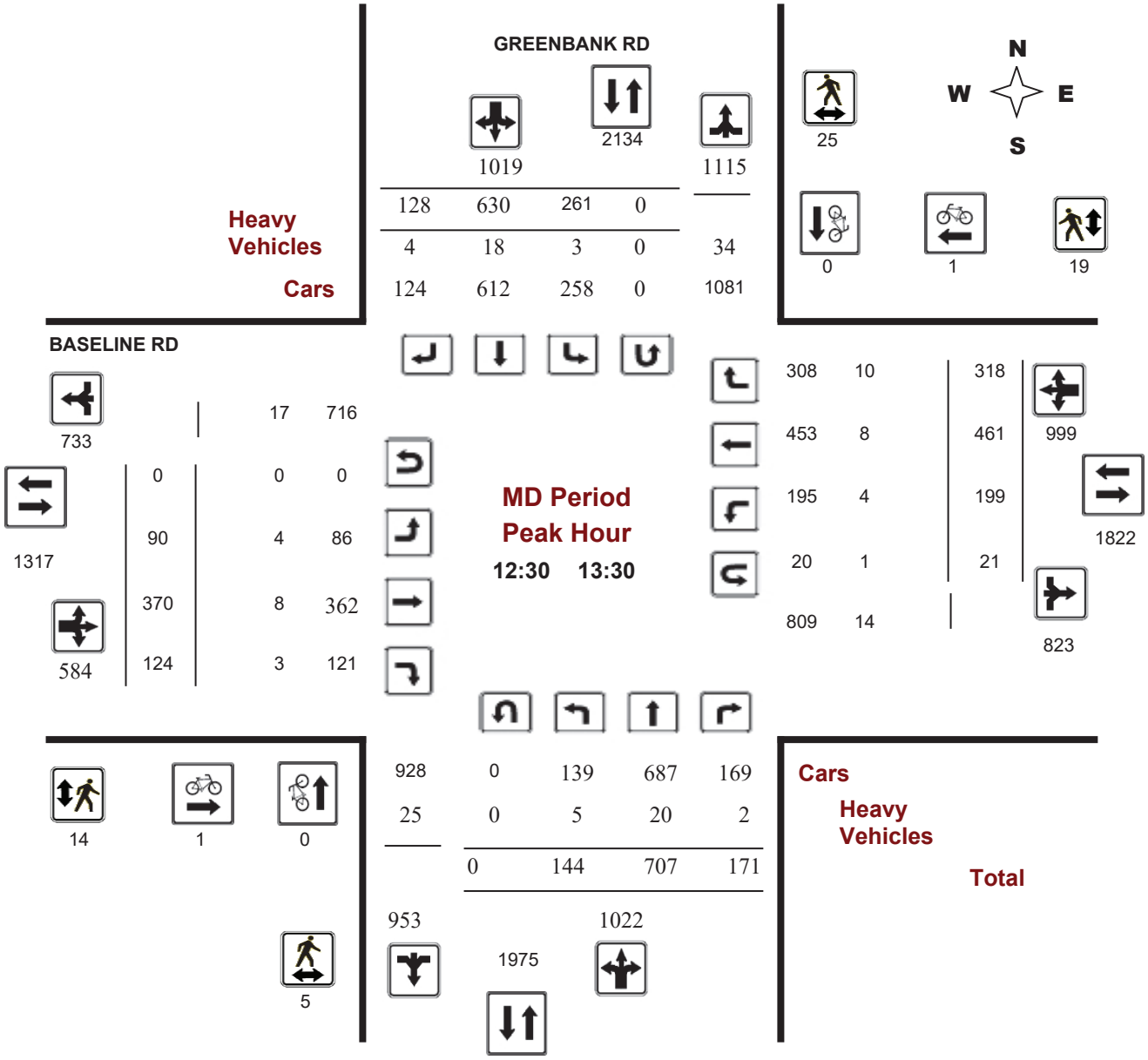
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BASELINE RD @ GREENBANK RD

Survey Date: Thursday, August 11, 2016 **WO No:** 36185

Start Time: 07:00 **Device:** Miovision



Comments

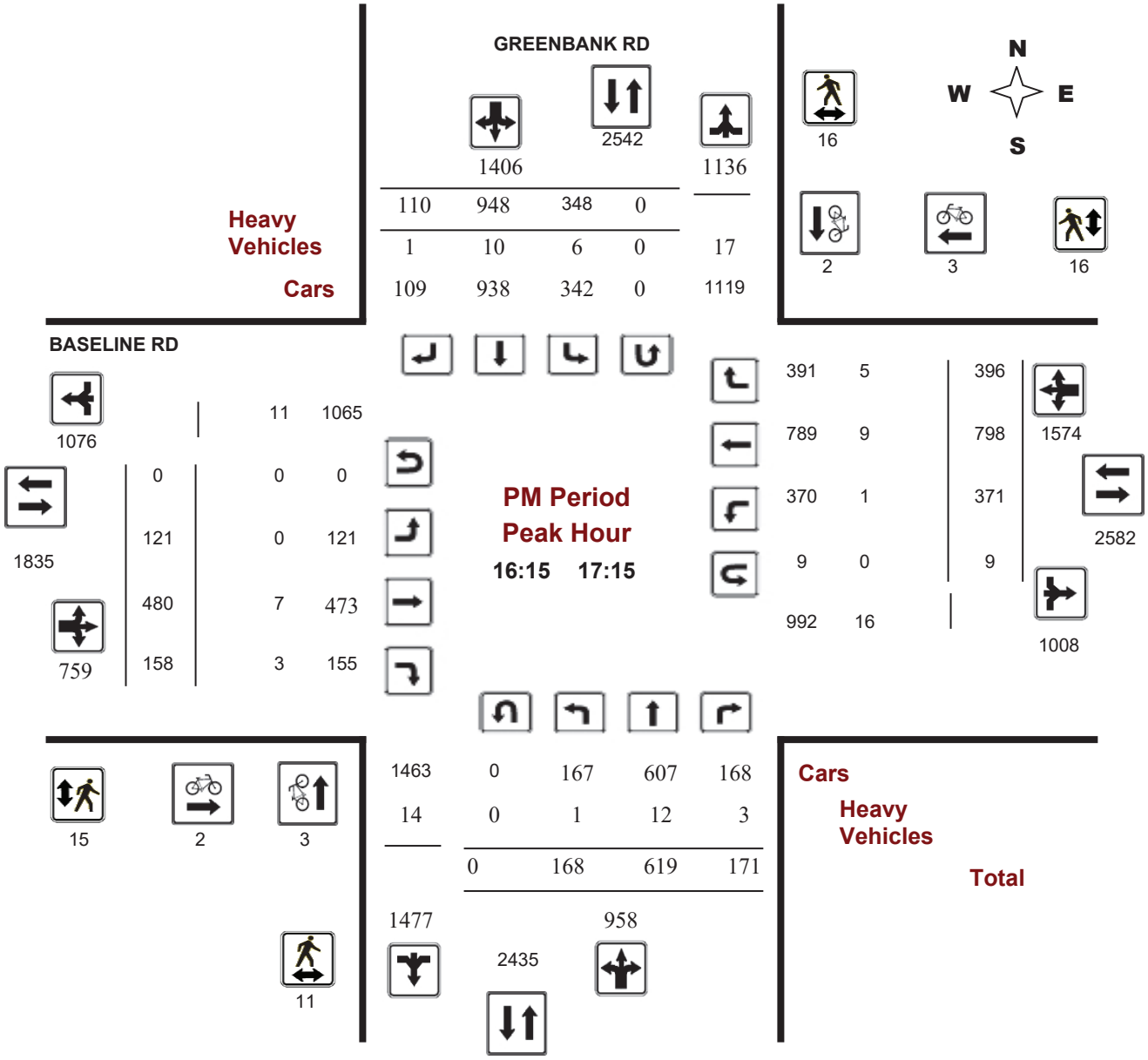
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BASELINE RD @ GREENBANK RD

Survey Date: Thursday, August 11, 2016 **WO No:** 36185

Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BASELINE RD @ GREENBANK RD

Survey Date: Thursday, August 11, 2016 **WO No:** 36185

Start Time: 07:00 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Thursday, August 11, 2016

Total Observed U-Turns

Northbound: 3 Southbound: 0

Eastbound: 1 Westbound: 110

AADT Factor

.90

	GREENBANK RD									BASELINE RD									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	91	864	289	**1244**	329	400	61	**790**	**2034**	86	750	65	**901**	93	254	173	**520**	**1421**	**3455**
08:00 09:00	139	964	323	**1426**	369	458	67	**894**	**2320**	121	692	73	**886**	147	401	308	**856**	**1742**	**4062**
09:00 10:00	106	732	200	**1038**	192	422	65	**679**	**1717**	108	427	92	**627**	129	371	300	**800**	**1427**	**3144**
11:30 12:30	120	672	221	**1013**	274	607	91	**972**	**1985**	108	386	132	**626**	171	423	326	**920**	**1546**	**3531**
12:30 13:30	144	707	171	**1022**	261	630	128	**1019**	**2041**	90	370	124	**584**	199	461	318	**978**	**1562**	**3603**
15:00 16:00	129	621	181	**931**	234	820	134	**1188**	**2119**	109	382	137	**628**	223	665	418	**1306**	**1934**	**4053**
16:00 17:00	165	606	161	**932**	344	951	126	**1421**	**2353**	127	476	166	**769**	355	812	398	**1565**	**2334**	**4687**
17:00 18:00	148	675	192	**1015**	282	912	111	**1305**	**2320**	108	452	162	**722**	328	678	349	**1355**	**2077**	**4397**
Sub Total	1042	5841	1738	**8621**	2285	5200	783	**8268**	**16889**	857	3935	951	**5743**	1645	4065	2590	**8300**	**14043**	**30932**
U Turns	3			**3**	0			**0**	**3**	**1**			**1**	110			**110**	**111**	**114**
Total	1045	5841	1738	**8624**	2285	5200	783	**8268**	**16892**	858	3935	951	**5744**	1755	4065	2590	**8410**	**14154**	**31046**
EQ 12Hr	1453	8119	2416	**11988**	3176	7228	1088	**11492**	**23480**	1193	5470	1322	**7985**	2439	5650	3600	**11689**	**19674**	**43154**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	1308	7307	2174	**10789**	2858	6505	979	**10342**	**21131**	1074	4923	1190	**7187**	2195	5085	3240	**10520**	**17707**	**38838**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**.90**					
AVG 24Hr	1713	9572	2848	**14133**	3744	8522	1282	**13548**	**27681**	1407	6449	1559	**9415**	2875	6661	4244	**13780**	**23195**	**50876**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BASELINE RD @ GREENBANK RD

Survey Date: Thursday, August 11, 2016 **WO No:** 36185

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute Increments

		GREENBANK RD									BASELINE RD									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	14	182	57	253	61	96	16	173	**426**	13	148	17	178	22	34	27	83	**261**	**687**
07:15	07:30	15	224	69	308	76	86	12	174	**482**	27	189	10	226	29	59	48	136	**362**	**844**
07:30	07:45	25	218	70	313	99	91	16	206	**519**	21	215	18	254	23	76	38	137	**391**	**910**
07:45	08:00	37	240	93	370	93	127	17	237	**607**	25	198	20	243	37	85	60	182	**425**	**1032**
08:00	08:15	25	221	102	348	98	96	7	201	**549**	38	207	14	259	39	98	53	190	**449**	**998**
08:15	08:30	39	245	71	355	117	113	18	248	**603**	28	160	16	204	36	91	73	200	**404**	**1007**
08:30	08:45	30	249	72	351	85	120	21	226	**577**	26	178	26	230	45	111	95	251	**481**	**1058**
08:45	09:00	45	249	78	372	69	129	21	219	**591**	29	147	17	193	40	101	87	228	**421**	**1012**
09:00	09:15	23	192	57	272	54	110	16	180	**452**	26	146	28	200	30	113	71	214	**414**	**866**
09:15	09:30	26	211	45	282	50	93	15	158	**440**	24	98	27	149	34	87	92	213	**362**	**802**
09:30	09:45	20	163	51	234	49	99	14	162	**396**	30	73	16	119	43	77	69	189	**308**	**704**
09:45	10:00	38	166	47	251	39	120	20	179	**430**	29	110	21	160	34	94	68	196	**356**	**786**
11:30	11:45	30	177	50	257	68	150	19	237	**494**	27	74	32	133	44	93	65	202	**335**	**829**
11:45	12:00	27	161	60	248	82	151	32	265	**513**	21	116	33	170	48	117	77	242	**412**	**925**
12:00	12:15	29	179	52	260	76	146	21	243	**503**	31	90	28	149	36	103	93	232	**381**	**884**
12:15	12:30	34	155	59	248	48	160	19	227	**475**	29	106	39	174	62	110	91	263	**437**	**912**
12:30	12:45	41	183	34	258	57	143	33	233	**491**	20	75	37	132	53	108	75	236	**368**	**859**
12:45	13:00	38	186	44	268	67	178	33	278	**546**	26	105	26	157	53	120	79	252	**409**	**955**
13:00	13:15	29	172	43	244	70	138	29	237	**481**	18	96	28	142	65	128	78	271	**413**	**894**
13:15	13:30	36	166	50	252	67	171	33	271	**523**	26	94	33	153	49	105	86	240	**393**	**916**
15:00	15:15	29	148	40	217	61	197	25	283	**500**	23	95	21	139	61	140	104	305	**444**	**944**
15:15	15:30	26	143	40	209	56	210	30	296	**505**	29	84	38	151	49	166	108	323	**474**	**979**
15:30	15:45	42	151	52	245	60	200	55	315	**560**	24	97	32	153	43	167	107	317	**470**	**1030**
15:45	16:00	33	179	49	261	57	213	24	294	**555**	33	106	46	185	77	192	99	368	**553**	**1108**
16:00	16:15	36	145	35	216	74	224	37	335	**551**	30	116	48	194	80	197	107	384	**578**	**1129**
16:15	16:30	36	149	30	215	89	243	35	367	**582**	40	127	44	211	93	217	89	399	**610**	**1192**
16:30	16:45	46	157	48	251	83	229	27	339	**590**	27	119	37	183	97	209	98	404	**587**	**1177**
16:45	17:00	47	155	48	250	98	255	27	380	**630**	30	114	37	181	89	189	104	382	**563**	**1193**
17:00	17:15	39	158	45	242	78	221	21	320	**562**	24	120	40	184	101	183	105	389	**573**	**1135**
17:15	17:30	35	190	41	266	71	230	27	328	**594**	26	117	50	193	85	179	81	345	**538**	**1132**
17:30	17:45	32	157	52	241	67	233	28	328	**569**	29	115	35	179	81	161	94	336	**515**	**1084**
17:45	18:00	43	170	54	267	66	228	35	329	**596**	29	100	37	166	77	155	69	301	**467**	**1063**
Total:		1045	5841	1738	8624	2285	5200	783	8268	**16892**	858	3935	951	5744	1755	4065	2590	8410	**16892**	**31,046**

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BASELINE RD @ GREENBANK RD

Survey Date: Thursday, August 11, 2016 **WO No:** 36185

Start Time: 07:00 **Device:** Miovision

Full Study Cyclist Volume

Time Period		GREENBANK RD			BASELINE RD			
		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	0	0	**0**	0	2	**2**	**2**
07:15	07:30	0	0	**0**	0	0	**0**	**0**
07:30	07:45	0	0	**0**	0	2	**2**	**2**
07:45	08:00	1	0	**1**	0	1	**1**	**2**
08:00	08:15	0	0	**0**	1	0	**1**	**1**
08:15	08:30	0	0	**0**	0	1	**1**	**1**
08:30	08:45	0	0	**0**	0	1	**1**	**1**
08:45	09:00	1	0	**1**	0	0	**0**	**1**
09:00	09:15	0	0	**0**	0	0	**0**	**0**
09:15	09:30	0	0	**0**	0	0	**0**	**0**
09:30	09:45	0	0	**0**	1	0	**1**	**1**
09:45	10:00	0	0	**0**	0	1	**1**	**1**
11:30	11:45	0	0	**0**	2	0	**2**	**2**
11:45	12:00	0	0	**0**	1	0	**1**	**1**
12:00	12:15	0	0	**0**	0	0	**0**	**0**
12:15	12:30	0	0	**0**	0	1	**1**	**1**
12:30	12:45	0	0	**0**	1	1	**2**	**2**
12:45	13:00	0	0	**0**	0	0	**0**	**0**
13:00	13:15	0	0	**0**	0	0	**0**	**0**
13:15	13:30	0	0	**0**	0	0	**0**	**0**
15:00	15:15	0	1	**1**	0	0	**0**	**1**
15:15	15:30	0	0	**0**	0	0	**0**	**0**
15:30	15:45	0	1	**1**	0	0	**0**	**1**
15:45	16:00	0	0	**0**	0	0	**0**	**0**
16:00	16:15	0	0	**0**	0	0	**0**	**0**
16:15	16:30	1	0	**1**	0	1	**1**	**2**
16:30	16:45	0	0	**0**	1	1	**2**	**2**
16:45	17:00	2	2	**4**	0	0	**0**	**4**
17:00	17:15	0	0	**0**	1	1	**2**	**2**
17:15	17:30	0	1	**1**	0	0	**0**	**1**
17:30	17:45	0	0	**0**	0	1	**1**	**1**
17:45	18:00	0	1	**1**	0	2	**2**	**3**
Total		5	6	**11**	8	16	**24**	**35**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BASELINE RD @ GREENBANK RD

Survey Date: Thursday, August 11, 2016 **WO No:** 36185

Start Time: 07:00 **Device:** Miovision

Full Study Pedestrian Volume

	GREENBANK RD			BASELINE RD			
Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	**Total**	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	**Total**	**Grand Total**
07:00 07:15	1	3	**4**	3	3	**6**	**10**
07:15 07:30	3	3	**6**	2	5	**7**	**13**
07:30 07:45	10	8	**18**	1	5	**6**	**24**
07:45 08:00	6	7	**13**	2	2	**4**	**17**
08:00 08:15	5	4	**9**	3	1	**4**	**13**
08:15 08:30	3	8	**11**	6	2	**8**	**19**
08:30 08:45	1	5	**6**	0	6	**6**	**12**
08:45 09:00	0	6	**6**	3	3	**6**	**12**
09:00 09:15	0	5	**5**	1	7	**8**	**13**
09:15 09:30	1	4	**5**	3	3	**6**	**11**
09:30 09:45	1	3	**4**	0	7	**7**	**11**
09:45 10:00	1	2	**3**	1	1	**2**	**5**
11:30 11:45	2	6	**8**	4	2	**6**	**14**
11:45 12:00	2	4	**6**	0	3	**3**	**9**
12:00 12:15	2	6	**8**	3	2	**5**	**13**
12:15 12:30	0	0	**0**	2	8	**10**	**10**
12:30 12:45	2	5	**7**	1	6	**7**	**14**
12:45 13:00	2	7	**9**	3	7	**10**	**19**
13:00 13:15	0	7	**7**	5	1	**6**	**13**
13:15 13:30	1	6	**7**	5	5	**10**	**17**
15:00 15:15	5	2	**7**	3	4	**7**	**14**
15:15 15:30	1	2	**3**	4	2	**6**	**9**
15:30 15:45	0	6	**6**	2	5	**7**	**13**
15:45 16:00	1	5	**6**	7	7	**14**	**20**
16:00 16:15	2	3	**5**	2	6	**8**	**13**
16:15 16:30	4	4	**8**	5	6	**11**	**19**
16:30 16:45	0	6	**6**	4	2	**6**	**12**
16:45 17:00	3	3	**6**	2	2	**4**	**10**
17:00 17:15	4	3	**7**	4	6	**10**	**17**
17:15 17:30	0	2	**2**	2	3	**5**	**7**
17:30 17:45	0	2	**2**	2	2	**4**	**6**
17:45 18:00	0	1	**1**	1	2	**3**	**4**
Total	63	138	**201**	86	126	**212**	**413**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BASELINE RD @ GREENBANK RD

Survey Date: Thursday, August 11, 2016 **WO No:** 36185

Start Time: 07:00 **Device:** Miovision

Full Study Heavy Vehicles

		GREENBANK RD									BASELINE RD									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	5	0	**5**	2	7	1	**10**	**15**	0	4	0	**4**	3	1	0	**4**	**8**	**23**
07:15	07:30	2	3	0	**5**	0	8	2	**10**	**15**	1	3	0	**4**	1	2	0	**3**	**7**	**22**
07:30	07:45	1	3	1	**5**	3	5	1	**9**	**14**	1	4	0	**5**	1	3	0	**4**	**9**	**23**
07:45	08:00	1	7	0	**8**	1	5	2	**8**	**16**	0	3	0	**3**	1	3	2	**6**	**9**	**25**
08:00	08:15	0	5	1	**6**	1	7	0	**8**	**14**	1	5	0	**6**	1	5	4	**10**	**16**	**30**
08:15	08:30	1	4	0	**5**	4	7	1	**12**	**17**	1	6	0	**7**	2	0	2	**4**	**11**	**28**
08:30	08:45	1	9	2	**12**	4	6	1	**11**	**23**	0	2	2	**4**	2	5	2	**9**	**13**	**36**
08:45	09:00	3	5	0	**8**	3	1	0	**4**	**12**	2	3	0	**5**	1	1	1	**3**	**8**	**20**
09:00	09:15	0	5	0	**5**	2	2	0	**4**	**9**	0	5	0	**5**	1	4	1	**6**	**11**	**20**
09:15	09:30	1	3	0	**4**	0	2	0	**2**	**6**	2	1	1	**4**	0	5	1	**6**	**10**	**16**
09:30	09:45	0	4	0	**4**	2	2	2	**6**	**10**	1	3	0	**4**	0	4	0	**4**	**8**	**18**
09:45	10:00	0	1	2	**3**	0	2	0	**2**	**5**	0	2	2	**4**	1	2	1	**4**	**8**	**13**
11:30	11:45	1	3	2	**6**	0	2	0	**2**	**8**	0	2	0	**2**	0	4	3	**7**	**9**	**17**
11:45	12:00	0	0	1	**1**	1	1	1	**3**	**4**	0	4	0	**4**	1	2	2	**5**	**9**	**13**
12:00	12:15	0	10	0	**10**	2	3	1	**6**	**16**	0	2	3	**5**	2	6	3	**11**	**16**	**32**
12:15	12:30	0	5	0	**5**	1	3	1	**5**	**10**	1	2	0	**3**	0	2	2	**4**	**7**	**17**
12:30	12:45	0	3	1	**4**	1	4	1	**6**	**10**	0	3	0	**3**	1	1	4	**6**	**9**	**19**
12:45	13:00	2	7	1	**10**	1	6	2	**9**	**19**	2	1	2	**5**	2	3	2	**7**	**12**	**31**
13:00	13:15	2	7	0	**9**	0	6	0	**6**	**15**	0	1	1	**2**	1	2	1	**4**	**6**	**22**
13:15	13:30	1	3	0	**4**	1	2	1	**4**	**8**	2	3	0	**5**	0	2	3	**5**	**10**	**18**
15:00	15:15	0	3	0	**3**	1	3	1	**5**	**8**	2	4	1	**7**	0	4	0	**4**	**11**	**19**
15:15	15:30	0	3	0	**3**	0	2	2	**4**	**7**	2	1	1	**4**	1	6	1	**8**	**12**	**19**
15:30	15:45	1	5	1	**7**	1	5	1	**7**	**14**	0	2	0	**2**	0	2	1	**3**	**5**	**19**
15:45	16:00	0	3	0	**3**	0	2	0	**2**	**5**	0	3	3	**6**	1	4	0	**5**	**11**	**16**
16:00	16:15	1	4	2	**7**	0	3	0	**3**	**10**	0	2	1	**3**	1	3	1	**5**	**8**	**18**
16:15	16:30	1	3	1	**5**	2	3	0	**5**	**10**	0	1	0	**1**	0	3	1	**4**	**5**	**15**
16:30	16:45	0	2	0	**2**	2	3	1	**6**	**8**	0	2	2	**4**	1	2	4	**7**	**11**	**19**
16:45	17:00	0	3	0	**3**	1	1	0	**2**	**5**	0	2	1	**3**	0	3	0	**3**	**6**	**11**
17:00	17:15	0	4	2	**6**	1	3	0	**4**	**10**	0	2	0	**2**	0	1	0	**1**	**3**	**13**
17:15	17:30	0	1	2	**3**	0	2	0	**2**	**5**	0	2	0	**2**	0	4	0	**4**	**6**	**11**
17:30	17:45	0	6	1	**7**	0	2	0	**2**	**9**	0	2	0	**2**	1	1	0	**2**	**4**	**13**
17:45	18:00	0	5	0	**5**	0	1	0	**1**	**6**	0	2	0	**2**	0	2	0	**2**	**4**	**10**
Total:	None	19	134	20	**173**	37	111	22	**170**	**343**	18	84	20	**122**	26	92	42	**160**	**282**	**626**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BASELINE RD @ GREENBANK RD

Survey Date: Thursday, August 11, 2016 **WO No:** 36185

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute U-Turn Total

Time Period		GREENBANK RD Northbound U-Turn Total	GREENBANK RD Southbound U-Turn Total	BASELINE RD Eastbound U-Turn Total	BASELINE RD Westbound U-Turn Total	Total
07:00	07:15	0	0	0	2	**2**
07:15	07:30	0	0	0	7	**7**
07:30	07:45	0	0	0	5	**5**
07:45	08:00	0	0	0	4	**4**
08:00	08:15	0	0	0	4	**4**
08:15	08:30	0	0	0	4	**4**
08:30	08:45	0	0	0	2	**2**
08:45	09:00	0	0	0	3	**3**
09:00	09:15	0	0	0	0	**0**
09:15	09:30	0	0	1	4	**5**
09:30	09:45	1	0	0	3	**4**
09:45	10:00	0	0	0	5	**5**
11:30	11:45	0	0	0	4	**4**
11:45	12:00	0	0	0	5	**5**
12:00	12:15	0	0	0	5	**5**
12:15	12:30	0	0	0	5	**5**
12:30	12:45	0	0	0	4	**4**
12:45	13:00	0	0	0	5	**5**
13:00	13:15	0	0	0	9	**9**
13:15	13:30	0	0	0	3	**3**
15:00	15:15	0	0	0	3	**3**
15:15	15:30	0	0	0	2	**2**
15:30	15:45	0	0	0	0	**0**
15:45	16:00	1	0	0	2	**3**
16:00	16:15	0	0	0	1	**1**
16:15	16:30	0	0	0	1	**1**
16:30	16:45	0	0	0	1	**1**
16:45	17:00	0	0	0	1	**1**
17:00	17:15	0	0	0	6	**6**
17:15	17:30	1	0	0	3	**4**
17:30	17:45	0	0	0	6	**6**
17:45	18:00	0	0	0	1	**1**
Total		3	0	1	110	**114**

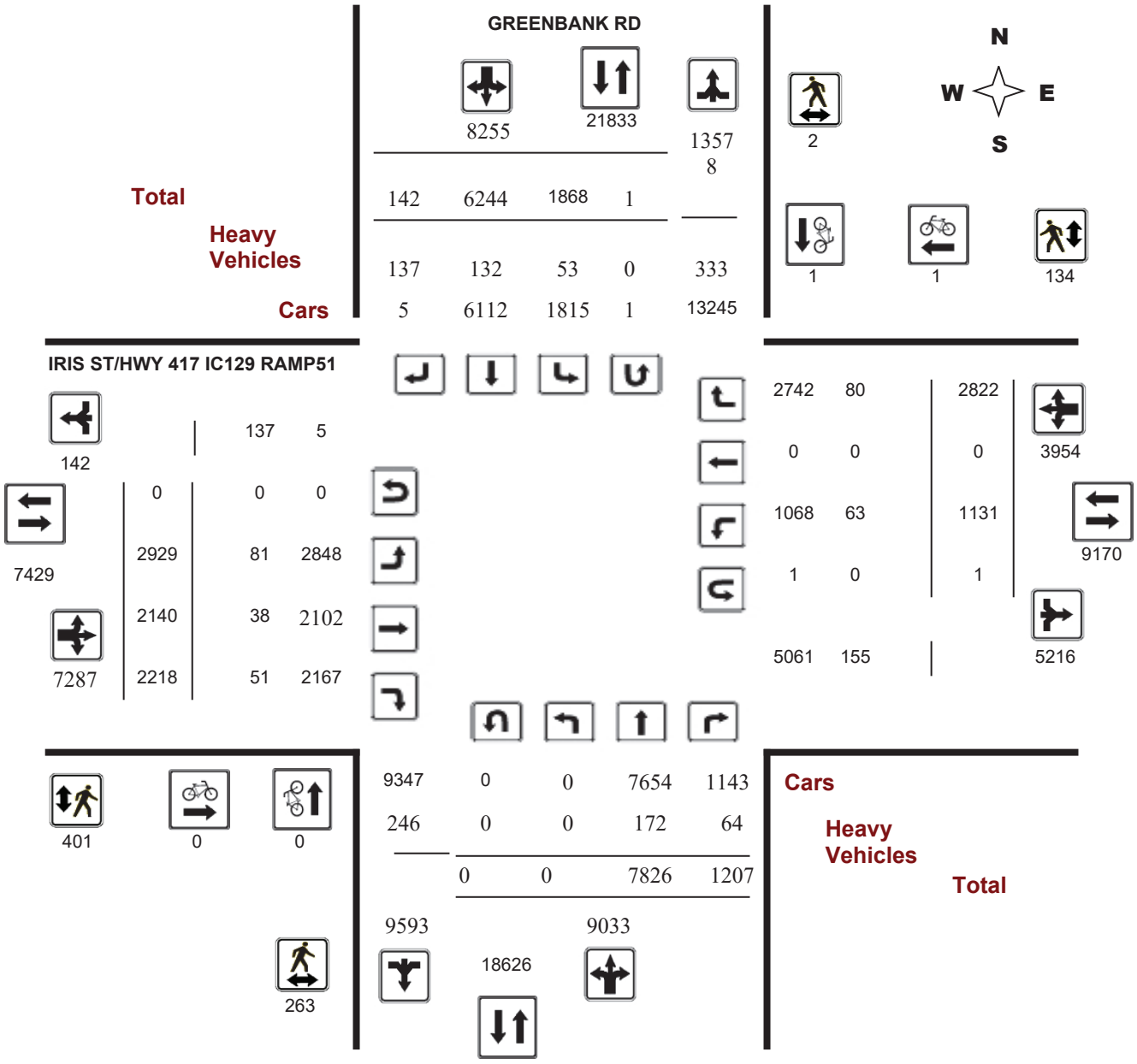
Transportation Services - Traffic Services

Turning Movement Count - Study Results

GREENBANK RD @ IRIS ST/HWY 417 IC129 RAMP51

Survey Date: Wednesday, January 16, 2019
Start Time: 07:00
WO No: 38263
Device: Miovision

Full Study Diagram



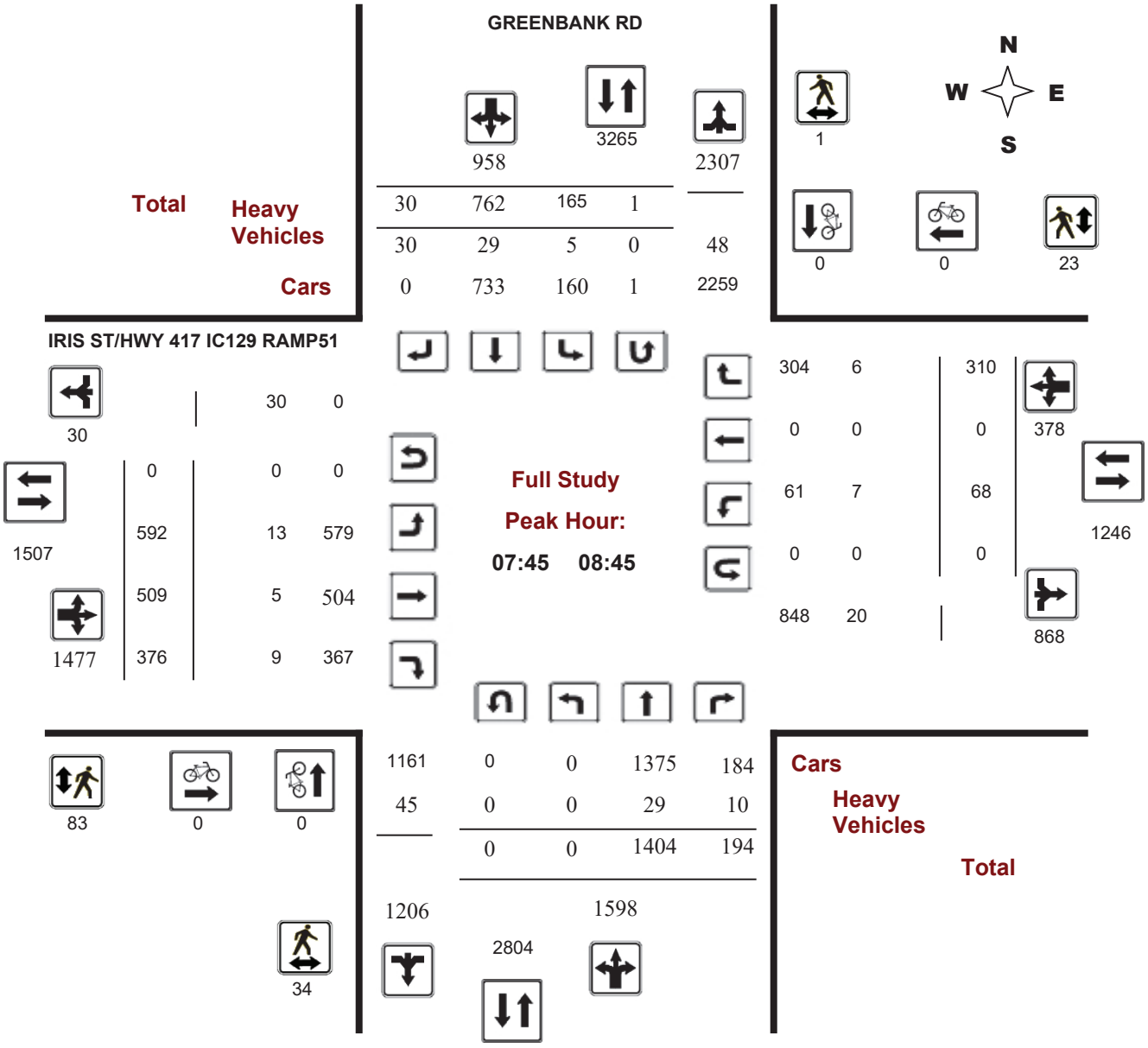
Transportation Services - Traffic Services

Turning Movement Count - Study Results

GREENBANK RD @ IRIS ST/HWY 417 IC129 RAMP51

Survey Date: Wednesday, January 16, 2019
Start Time: 07:00
WO No: 38263
Device: Miovision

Full Study Peak Hour Diagram



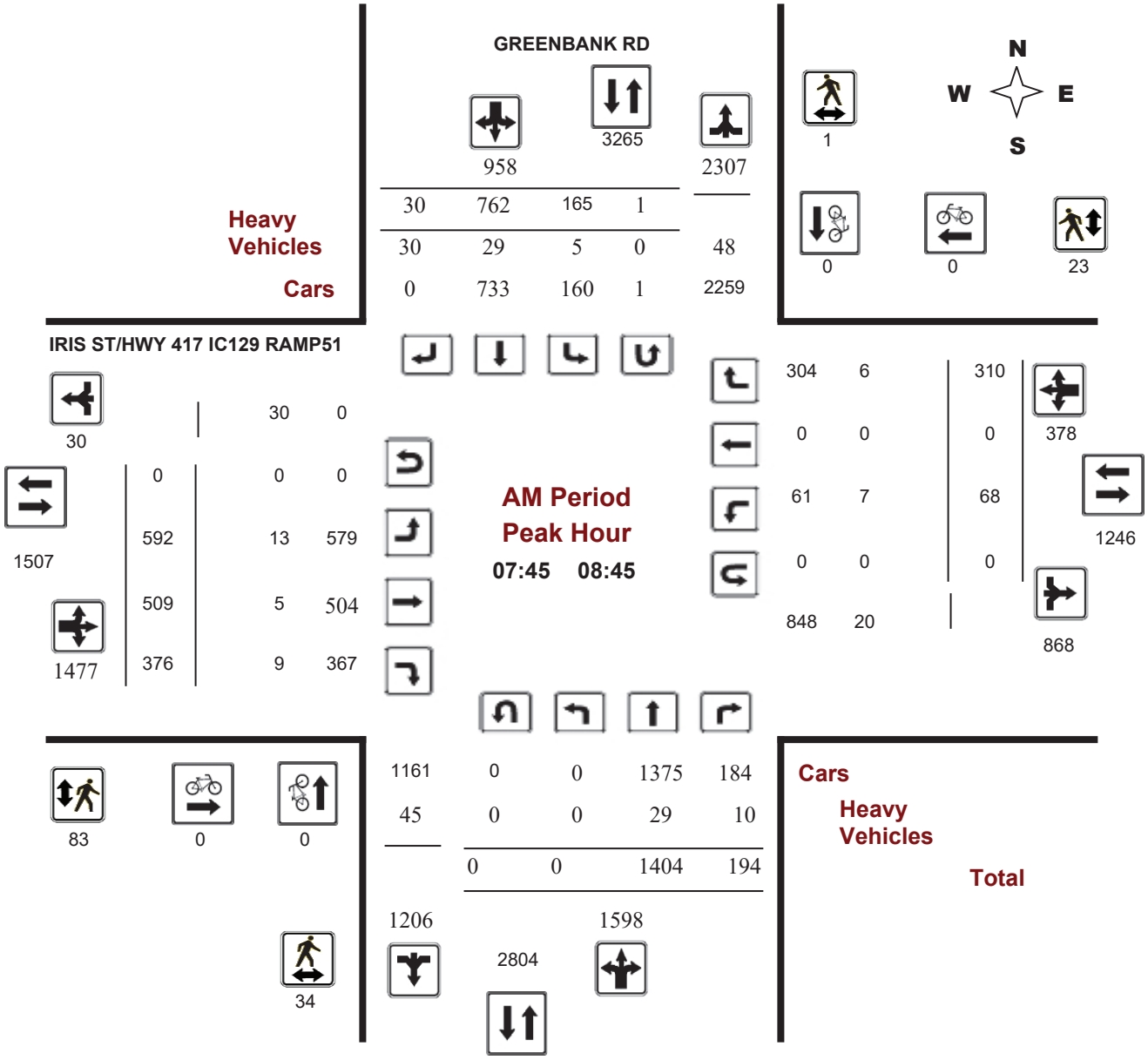
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

GREENBANK RD @ IRIS ST/HWY 417 IC129 RAMP51

Survey Date: Wednesday, January 16, 2019 **WO No:** 38263

Start Time: 07:00 **Device:** Miovision



Comments

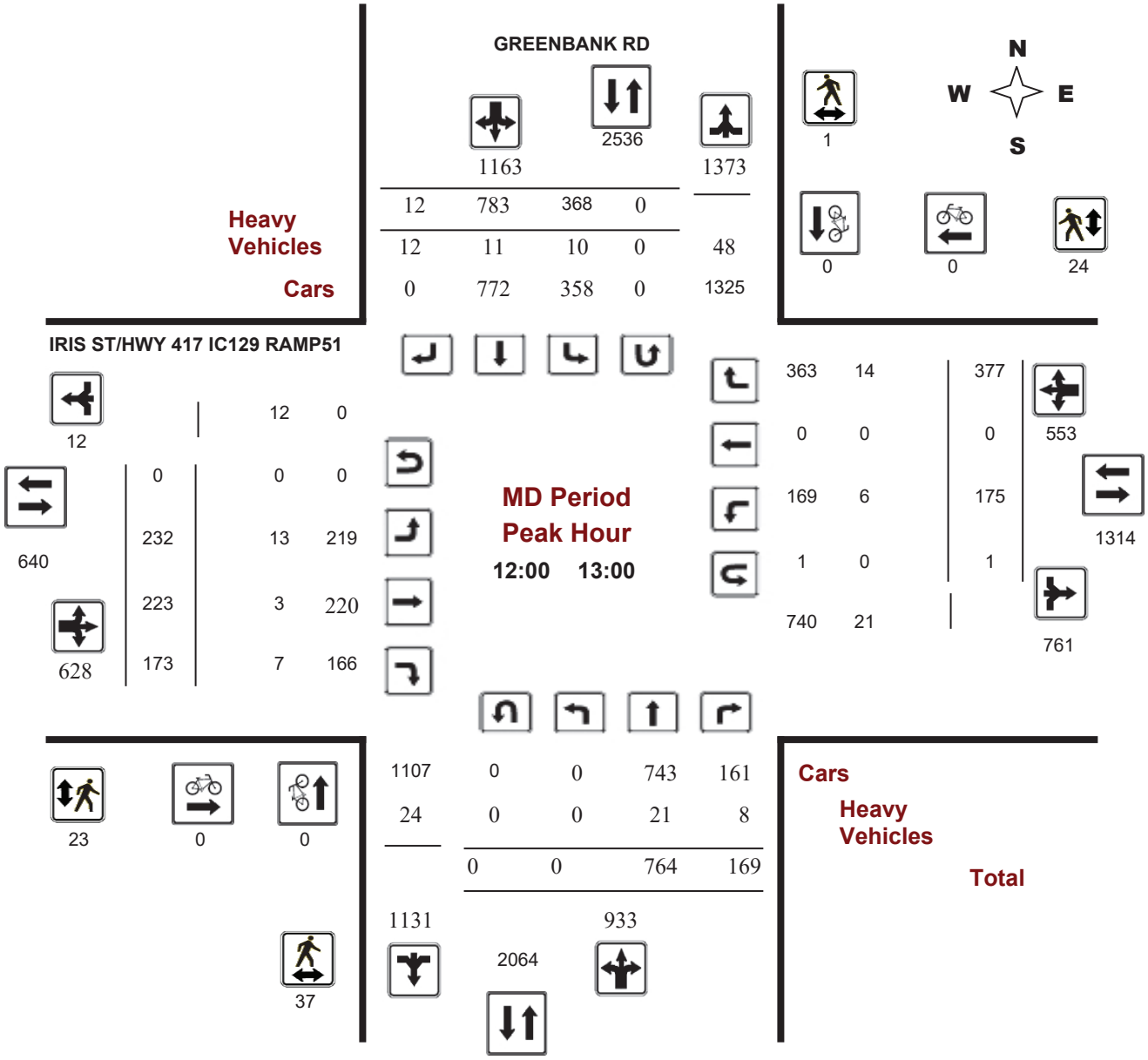
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

GREENBANK RD @ IRIS ST/HWY 417 IC129 RAMP51

Survey Date: Wednesday, January 16, 2019 **WO No:** 38263

Start Time: 07:00 **Device:** Miovision



Comments

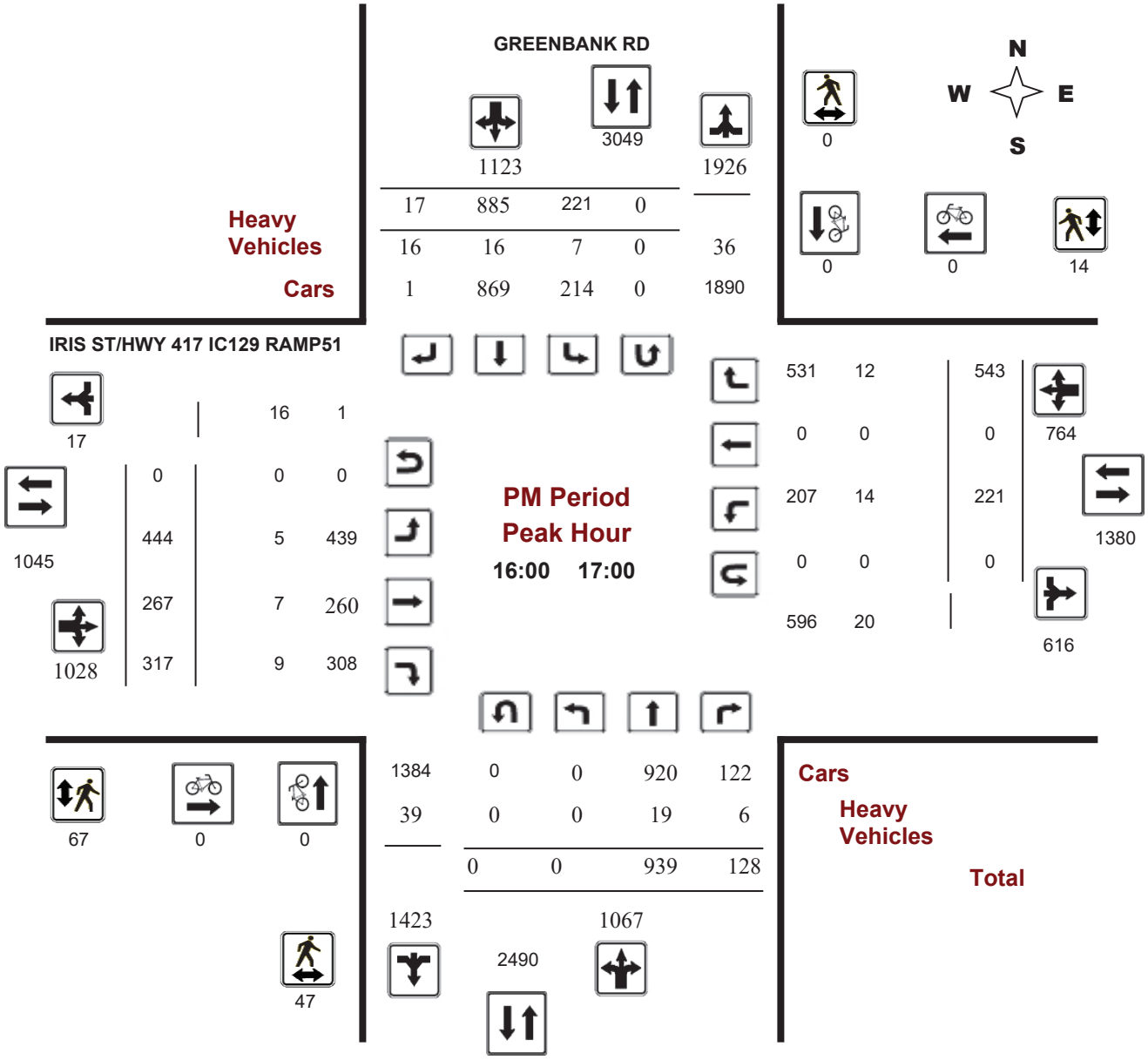
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

GREENBANK RD @ IRIS ST/HWY 417 IC129 RAMP51

Survey Date: Wednesday, January 16, 2019 **WO No:** 38263

Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

GREENBANK RD @ IRIS ST/HWY 417 IC129 RAMP51

Survey Date: Wednesday, January 16, 2019 **WO No:** 38263

Start Time: 07:00 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Wednesday, January 16, 201

Total Observed U-Turns

Northbound: 0 Southbound: 1

Eastbound: 0 Westbound: 1

AADT Factor

1.00

	GREENBANK RD								IRIS ST/HWY 417 IC129 RAMP51									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	0	1153	126	**1279**	163	652	28	**843**	**2122**	484	404	354	**1242**	48	0	152	**200**	**1442**	**3564**
08:00 09:00	0	1399	190	**1589**	168	757	28	**953**	**2542**	609	457	394	**1460**	71	0	297	**368**	**1828**	**4370**
09:00 10:00	0	1015	131	**1146**	210	637	16	**863**	**2009**	284	178	257	**719**	91	0	164	**255**	**974**	**2983**
11:30 12:30	0	805	184	**989**	341	739	10	**1090**	**2079**	257	220	183	**660**	141	0	369	**510**	**1170**	**3249**
12:30 13:30	0	732	122	**854**	329	746	12	**1087**	**1941**	245	189	176	**610**	190	0	408	**598**	**1208**	**3149**
15:00 16:00	0	947	174	**1121**	224	863	15	**1102**	**2223**	294	209	226	**729**	201	0	444	**645**	**1374**	**3597**
16:00 17:00	0	939	128	**1067**	221	885	17	**1123**	**2190**	444	267	317	**1028**	221	0	543	**764**	**1792**	**3982**
17:00 18:00	0	836	152	**988**	212	965	16	**1193**	**2181**	312	216	311	**839**	168	0	445	**613**	**1452**	**3633**
Sub Total	0	7826	1207	**9033**	1868	6244	142	**8254**	**17287**	2929	2140	2218	**7287**	1131	0	2822	**3953**	**11240**	**28527**
U Turns	0			**0**	1			**1**	**1**	**0**			**0**	1			**1**	**1**	**2**
Total	0	7826	1207	**9033**	1869	6244	142	**8255**	**17288**	2929	2140	2218	**7287**	1132	0	2822	**3954**	**11241**	**28529**
EQ 12Hr	0	10878	1678	**12556**	2598	8679	197	**11474**	**24030**	4071	2975	3083	**10129**	1573	0	3923	**5496**	**15625**	**39655**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	0	10878	1678	**12556**	2598	8679	197	**11474**	**24030**	4071	2975	3083	**10129**	1573	0	3923	**5496**	**15625**	**39655**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**1.00**					
AVG 24Hr	0	14250	2198	**16448**	3403	11369	258	**15030**	**31478**	5333	3897	4039	**13269**	2061	0	5139	**7200**	**20469**	**51947**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

GREENBANK RD @ IRIS ST/HWY 417 IC129 RAMP51

Survey Date: Wednesday, January 16, 2019 **WO No:** 38263

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute Increments

		GREENBANK RD									IRIS ST/HWY 417 IC129 RAMP51									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	254	17	271	33	129	6	168	**439**	105	45	80	230	4	0	31	35	**265**	**704**
07:15	07:30	0	268	29	297	41	156	5	202	**499**	116	91	96	303	12	0	34	46	**349**	**848**
07:30	07:45	0	318	31	349	42	179	10	231	**580**	128	129	85	342	15	0	32	47	**389**	**969**
07:45	08:00	0	313	49	362	47	188	7	242	**604**	135	139	93	367	17	0	55	72	**439**	**1043**
08:00	08:15	0	346	44	390	52	194	9	255	**645**	152	140	79	371	16	0	85	101	**472**	**1117**
08:15	08:30	0	352	56	408	33	202	8	243	**651**	152	132	104	388	15	0	83	98	**486**	**1137**
08:30	08:45	0	393	45	438	34	178	6	218	**656**	153	98	100	351	20	0	87	107	**458**	**1114**
08:45	09:00	0	308	45	353	50	183	5	238	**591**	152	87	111	350	20	0	42	62	**412**	**1003**
09:00	09:15	0	306	35	341	44	176	5	225	**566**	84	49	75	208	25	0	52	77	**285**	**851**
09:15	09:30	0	264	32	296	45	160	2	207	**503**	80	42	55	177	25	0	32	57	**234**	**737**
09:30	09:45	0	234	34	268	58	161	6	225	**493**	68	42	63	173	20	0	42	62	**235**	**728**
09:45	10:00	0	211	30	241	63	140	3	206	**447**	52	45	64	161	21	0	38	59	**220**	**667**
11:30	11:45	0	199	41	240	72	174	2	248	**488**	76	46	39	161	31	0	87	118	**279**	**767**
11:45	12:00	0	194	47	241	87	181	2	270	**511**	62	57	48	167	37	0	106	143	**310**	**821**
12:00	12:15	0	194	52	246	99	199	2	300	**546**	67	59	50	176	38	0	96	134	**310**	**856**
12:15	12:30	0	218	44	262	83	185	4	272	**534**	52	58	46	156	35	0	80	115	**271**	**805**
12:30	12:45	0	168	33	201	107	181	3	291	**492**	50	58	31	139	47	0	89	136	**275**	**767**
12:45	13:00	0	184	40	224	79	218	3	300	**524**	63	48	46	157	56	0	112	168	**325**	**849**
13:00	13:15	0	209	22	231	57	168	3	228	**459**	64	40	55	159	45	0	98	143	**302**	**761**
13:15	13:30	0	171	27	198	86	179	3	268	**466**	68	43	44	155	43	0	109	152	**307**	**773**
15:00	15:15	0	190	32	222	61	196	3	260	**482**	72	55	57	184	48	0	129	177	**361**	**843**
15:15	15:30	0	268	55	323	58	248	5	311	**634**	68	44	70	182	45	0	103	148	**330**	**964**
15:30	15:45	0	255	36	291	55	212	2	269	**560**	82	61	46	189	51	0	105	156	**345**	**905**
15:45	16:00	0	234	51	285	50	207	5	262	**547**	72	49	53	174	57	0	107	164	**338**	**885**
16:00	16:15	0	243	34	277	43	231	4	278	**555**	98	56	75	229	47	0	135	182	**411**	**966**
16:15	16:30	0	251	27	278	67	234	5	306	**584**	114	64	96	274	61	0	144	205	**479**	**1063**
16:30	16:45	0	221	31	252	47	197	1	245	**497**	108	57	76	241	59	0	117	176	**417**	**914**
16:45	17:00	0	224	36	260	64	223	7	294	**554**	124	90	70	284	54	0	147	201	**485**	**1039**
17:00	17:15	0	202	38	240	60	230	5	295	**535**	80	72	84	236	47	0	119	166	**402**	**937**
17:15	17:30	0	207	22	229	44	260	0	304	**533**	93	49	85	227	48	0	115	163	**390**	**923**
17:30	17:45	0	213	38	251	56	246	7	309	**560**	74	48	71	193	28	0	113	141	**334**	**894**
17:45	18:00	0	214	54	268	52	229	4	285	**553**	65	47	71	183	45	0	98	143	**326**	**879**
Total:		0	7826	1207	9033	1869	6244	142	8255	**17288**	2929	2140	2218	7287	1132	0	2822	3954	**17288**	**28,529**

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

GREENBANK RD @ IRIS ST/HWY 417 IC129 RAMP51

Survey Date: Wednesday, January 16, 2019 **WO No:** 38263

Start Time: 07:00 **Device:** Miovision

Full Study Cyclist Volume

Time Period		GREENBANK RD			IRIS ST/HWY 417 IC129 RAMP51			
		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	0	0	**0**	0	0	**0**	**0**
07:15	07:30	0	1	**1**	0	0	**0**	**1**
07:30	07:45	0	0	**0**	0	0	**0**	**0**
07:45	08:00	0	0	**0**	0	0	**0**	**0**
08:00	08:15	0	0	**0**	0	0	**0**	**0**
08:15	08:30	0	0	**0**	0	0	**0**	**0**
08:30	08:45	0	0	**0**	0	0	**0**	**0**
08:45	09:00	0	0	**0**	0	0	**0**	**0**
09:00	09:15	0	0	**0**	0	0	**0**	**0**
09:15	09:30	0	0	**0**	0	0	**0**	**0**
09:30	09:45	0	0	**0**	0	0	**0**	**0**
09:45	10:00	0	0	**0**	0	0	**0**	**0**
11:30	11:45	0	0	**0**	0	0	**0**	**0**
11:45	12:00	0	0	**0**	0	0	**0**	**0**
12:00	12:15	0	0	**0**	0	0	**0**	**0**
12:15	12:30	0	0	**0**	0	0	**0**	**0**
12:30	12:45	0	0	**0**	0	0	**0**	**0**
12:45	13:00	0	0	**0**	0	0	**0**	**0**
13:00	13:15	0	0	**0**	0	0	**0**	**0**
13:15	13:30	0	0	**0**	0	0	**0**	**0**
15:00	15:15	0	0	**0**	0	0	**0**	**0**
15:15	15:30	0	0	**0**	0	0	**0**	**0**
15:30	15:45	0	0	**0**	0	0	**0**	**0**
15:45	16:00	0	0	**0**	0	0	**0**	**0**
16:00	16:15	0	0	**0**	0	0	**0**	**0**
16:15	16:30	0	0	**0**	0	0	**0**	**0**
16:30	16:45	0	0	**0**	0	0	**0**	**0**
16:45	17:00	0	0	**0**	0	0	**0**	**0**
17:00	17:15	0	0	**0**	0	0	**0**	**0**
17:15	17:30	0	0	**0**	0	0	**0**	**0**
17:30	17:45	0	0	**0**	0	1	**1**	**1**
17:45	18:00	0	0	**0**	0	0	**0**	**0**
Total		0	1	**1**	0	1	**1**	**2**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

GREENBANK RD @ IRIS ST/HWY 417 IC129 RAMP51

Survey Date: Wednesday, January 16, 2019 **WO No:** 38263

Start Time: 07:00 **Device:** Miovision

Full Study Pedestrian Volume

	GREENBANK RD			IRIS ST/HWY 417 IC129 RAMP51			
Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	**Total**	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	**Total**	**Grand Total**
07:00 07:15	2	0	**2**	10	1	**11**	**13**
07:15 07:30	6	0	**6**	16	7	**23**	**29**
07:30 07:45	11	0	**11**	15	3	**18**	**29**
07:45 08:00	12	0	**12**	20	4	**24**	**36**
08:00 08:15	10	0	**10**	28	6	**34**	**44**
08:15 08:30	7	0	**7**	17	9	**26**	**33**
08:30 08:45	5	1	**6**	18	4	**22**	**28**
08:45 09:00	5	0	**5**	16	7	**23**	**28**
09:00 09:15	3	0	**3**	7	2	**9**	**12**
09:15 09:30	1	0	**1**	9	3	**12**	**13**
09:30 09:45	6	0	**6**	4	2	**6**	**12**
09:45 10:00	2	0	**2**	5	1	**6**	**8**
11:30 11:45	2	0	**2**	8	3	**11**	**13**
11:45 12:00	8	0	**8**	4	6	**10**	**18**
12:00 12:15	9	1	**10**	7	7	**14**	**24**
12:15 12:30	7	0	**7**	3	4	**7**	**14**
12:30 12:45	11	0	**11**	8	6	**14**	**25**
12:45 13:00	10	0	**10**	5	7	**12**	**22**
13:00 13:15	9	0	**9**	7	3	**10**	**19**
13:15 13:30	7	0	**7**	10	5	**15**	**22**
15:00 15:15	7	0	**7**	7	4	**11**	**18**
15:15 15:30	8	0	**8**	8	3	**11**	**19**
15:30 15:45	18	0	**18**	18	6	**24**	**42**
15:45 16:00	12	0	**12**	14	4	**18**	**30**
16:00 16:15	8	0	**8**	15	2	**17**	**25**
16:15 16:30	16	0	**16**	20	0	**20**	**36**
16:30 16:45	14	0	**14**	22	9	**31**	**45**
16:45 17:00	9	0	**9**	10	3	**13**	**22**
17:00 17:15	10	0	**10**	23	2	**25**	**35**
17:15 17:30	8	0	**8**	15	5	**20**	**28**
17:30 17:45	10	0	**10**	12	4	**16**	**26**
17:45 18:00	10	0	**10**	20	2	**22**	**32**
Total	263	2	**265**	401	134	**535**	**800**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

GREENBANK RD @ IRIS ST/HWY 417 IC129 RAMP51

Survey Date: Wednesday, January 16, 2019 **WO No:** 38263

Start Time: 07:00 **Device:** Miovision

Full Study Heavy Vehicles

		GREENBANK RD									IRIS ST/HWY 417 IC129 RAMP51									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	6	2	**8**	0	5	6	**11**	**19**	1	1	2	**4**	0	0	4	**4**	**8**	**27**
07:15	07:30	0	3	1	**4**	0	6	5	**11**	**15**	4	0	1	**5**	2	0	1	**3**	**8**	**23**
07:30	07:45	0	7	1	**8**	3	9	9	**21**	**29**	2	1	6	**9**	0	0	0	**0**	**9**	**38**
07:45	08:00	0	6	2	**8**	3	2	7	**12**	**20**	4	2	2	**8**	2	0	0	**2**	**10**	**30**
08:00	08:15	0	9	4	**13**	1	8	9	**18**	**31**	3	0	2	**5**	1	0	2	**3**	**8**	**39**
08:15	08:30	0	6	2	**8**	0	11	8	**19**	**27**	2	1	1	**4**	3	0	3	**6**	**10**	**37**
08:30	08:45	0	8	2	**10**	1	8	6	**15**	**25**	4	2	4	**10**	1	0	1	**2**	**12**	**37**
08:45	09:00	0	9	2	**11**	0	6	5	**11**	**22**	0	1	4	**5**	2	0	1	**3**	**8**	**30**
09:00	09:15	0	11	4	**15**	2	4	5	**11**	**26**	3	2	1	**6**	0	0	6	**6**	**12**	**38**
09:15	09:30	0	5	4	**9**	0	1	2	**3**	**12**	2	2	2	**6**	2	0	1	**3**	**9**	**21**
09:30	09:45	0	3	2	**5**	3	3	6	**12**	**17**	3	2	1	**6**	1	0	7	**8**	**14**	**31**
09:45	10:00	0	3	1	**4**	1	3	3	**7**	**11**	4	1	0	**5**	2	0	4	**6**	**11**	**22**
11:30	11:45	0	6	2	**8**	2	3	2	**7**	**15**	2	0	0	**2**	1	0	3	**4**	**6**	**21**
11:45	12:00	0	4	3	**7**	1	3	2	**6**	**13**	3	1	1	**5**	1	0	1	**2**	**7**	**20**
12:00	12:15	0	4	4	**8**	2	1	2	**5**	**13**	6	0	4	**10**	2	0	3	**5**	**15**	**28**
12:15	12:30	0	3	2	**5**	0	2	4	**6**	**11**	4	1	1	**6**	1	0	2	**3**	**9**	**20**
12:30	12:45	0	6	1	**7**	4	4	3	**11**	**18**	2	1	0	**3**	1	0	2	**3**	**6**	**24**
12:45	13:00	0	8	1	**9**	4	4	3	**11**	**20**	1	1	2	**4**	2	0	7	**9**	**13**	**33**
13:00	13:15	0	5	1	**6**	4	4	3	**11**	**17**	4	1	0	**5**	5	0	3	**8**	**13**	**30**
13:15	13:30	0	6	1	**7**	0	3	3	**6**	**13**	1	5	0	**6**	2	0	3	**5**	**11**	**24**
15:00	15:15	0	4	2	**6**	3	5	3	**11**	**17**	4	1	3	**8**	4	0	2	**6**	**14**	**31**
15:15	15:30	0	7	3	**10**	1	11	5	**17**	**27**	2	0	3	**5**	1	0	2	**3**	**8**	**35**
15:30	15:45	0	4	4	**8**	4	5	2	**11**	**19**	5	2	1	**8**	3	0	3	**6**	**14**	**33**
15:45	16:00	0	6	2	**8**	1	2	5	**8**	**16**	4	2	1	**7**	2	0	2	**4**	**11**	**27**
16:00	16:15	0	3	3	**6**	2	5	4	**11**	**17**	1	1	5	**7**	5	0	4	**9**	**16**	**33**
16:15	16:30	0	8	0	**8**	1	6	5	**12**	**20**	1	2	0	**3**	3	0	2	**5**	**8**	**28**
16:30	16:45	0	5	0	**5**	2	2	1	**5**	**10**	1	3	2	**6**	4	0	0	**4**	**10**	**20**
16:45	17:00	0	3	3	**6**	2	3	6	**11**	**17**	2	1	2	**5**	2	0	6	**8**	**13**	**30**
17:00	17:15	0	4	2	**6**	2	1	4	**7**	**13**	1	1	0	**2**	3	0	3	**6**	**8**	**21**
17:15	17:30	0	2	1	**3**	0	1	0	**1**	**4**	1	0	0	**1**	1	0	1	**2**	**3**	**7**
17:30	17:45	0	4	1	**5**	4	1	5	**10**	**15**	1	0	0	**1**	2	0	0	**2**	**3**	**18**
17:45	18:00	0	4	1	**5**	0	0	4	**4**	**9**	3	0	0	**3**	2	0	1	**3**	**6**	**15**
Total:	None	0	172	64	**236**	53	132	137	**322**	**558**	81	38	51	**170**	63	0	80	**143**	**313**	**871**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

GREENBANK RD @ IRIS ST/HWY 417 IC129 RAMP51

Survey Date: Wednesday, January 16, 2019 **WO No:** 38263

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute U-Turn Total

GREENBANK RD **IRIS ST/HWY 417 IC129 RAMP51**

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	**0**
07:15	07:30	0	0	0	0	**0**
07:30	07:45	0	0	0	0	**0**
07:45	08:00	0	0	0	0	**0**
08:00	08:15	0	0	0	0	**0**
08:15	08:30	0	0	0	0	**0**
08:30	08:45	0	1	0	0	**1**
08:45	09:00	0	0	0	0	**0**
09:00	09:15	0	0	0	0	**0**
09:15	09:30	0	0	0	0	**0**
09:30	09:45	0	0	0	0	**0**
09:45	10:00	0	0	0	0	**0**
11:30	11:45	0	0	0	0	**0**
11:45	12:00	0	0	0	0	**0**
12:00	12:15	0	0	0	0	**0**
12:15	12:30	0	0	0	0	**0**
12:30	12:45	0	0	0	0	**0**
12:45	13:00	0	0	0	1	**1**
13:00	13:15	0	0	0	0	**0**
13:15	13:30	0	0	0	0	**0**
15:00	15:15	0	0	0	0	**0**
15:15	15:30	0	0	0	0	**0**
15:30	15:45	0	0	0	0	**0**
15:45	16:00	0	0	0	0	**0**
16:00	16:15	0	0	0	0	**0**
16:15	16:30	0	0	0	0	**0**
16:30	16:45	0	0	0	0	**0**
16:45	17:00	0	0	0	0	**0**
17:00	17:15	0	0	0	0	**0**
17:15	17:30	0	0	0	0	**0**
17:30	17:45	0	0	0	0	**0**
17:45	18:00	0	0	0	0	**0**
Total		0	1	0	1	**2**

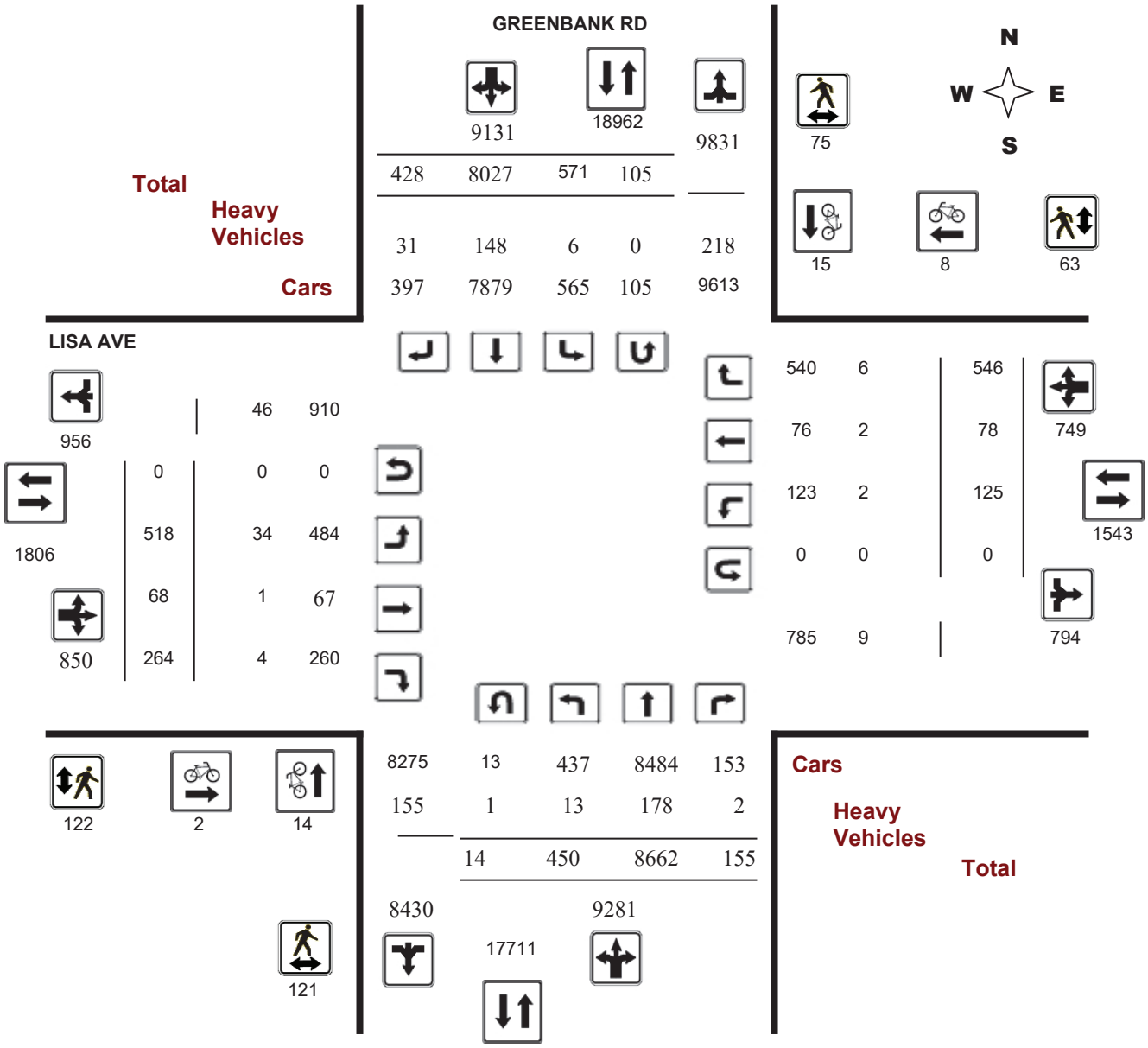
Transportation Services - Traffic Services

Turning Movement Count - Study Results

GREENBANK RD @ LISA AVE

Survey Date: Thursday, August 11, 2016
Start Time: 07:00
WO No: 36183
Device: Miovision

Full Study Diagram



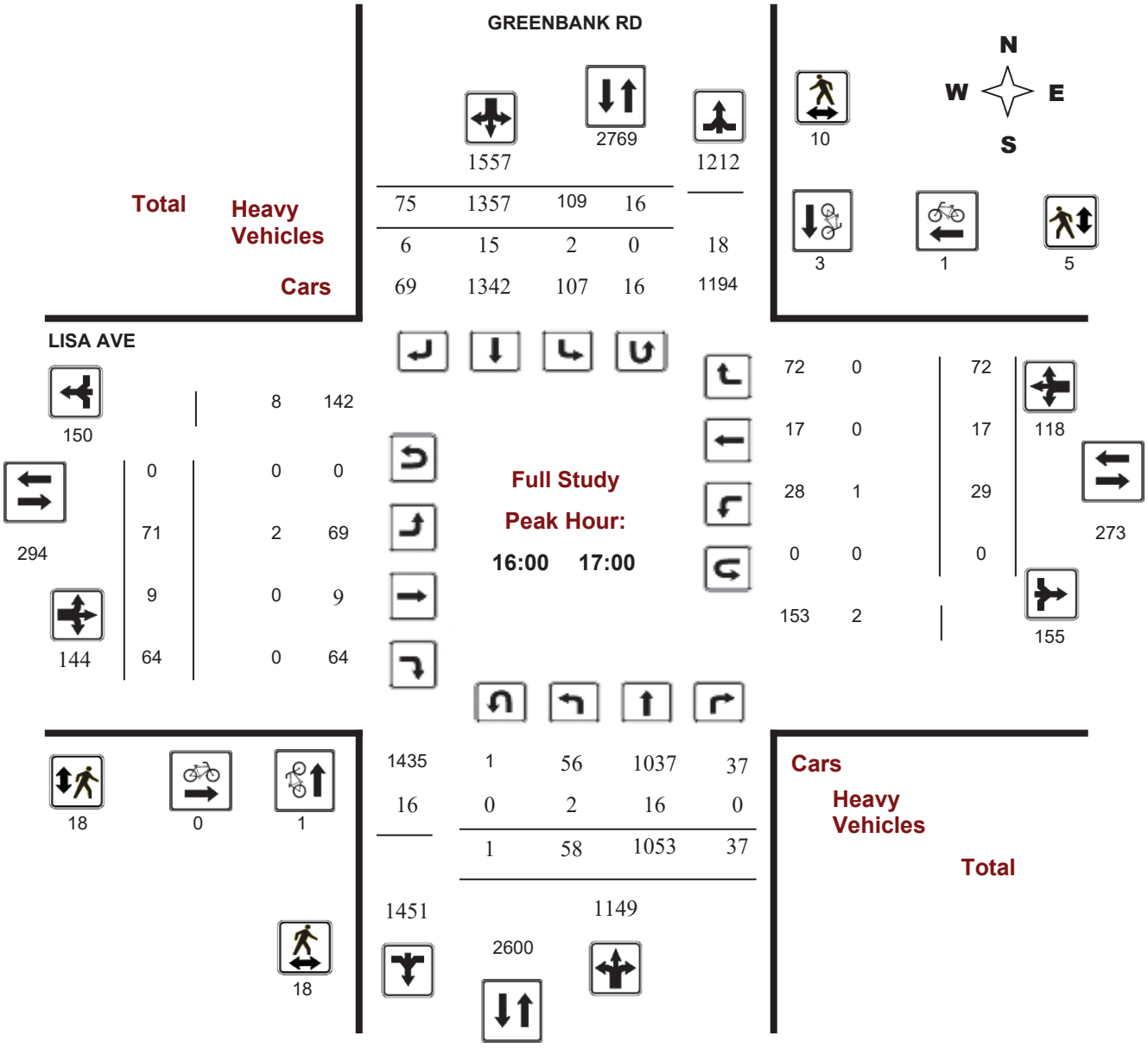
Transportation Services - Traffic Services

Turning Movement Count - Study Results

GREENBANK RD @ LISA AVE

Survey Date: Thursday, August 11, 2016
Start Time: 07:00
WO No: 36183
Device: Miovision

Full Study Peak Hour Diagram



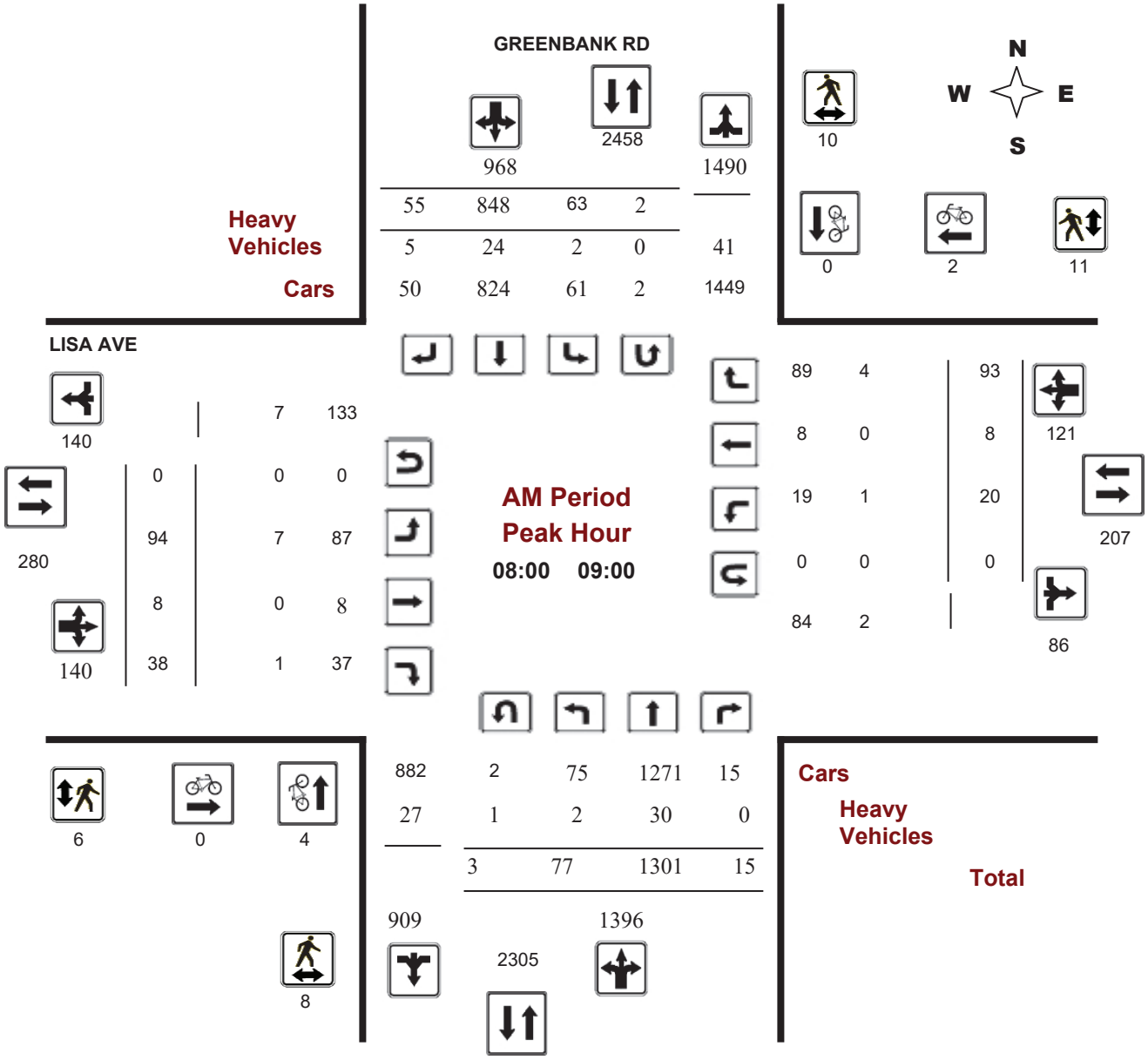
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

GREENBANK RD @ LISA AVE

Survey Date: Thursday, August 11, 2016 **WO No:** 36183

Start Time: 07:00 **Device:** Miovision



Comments

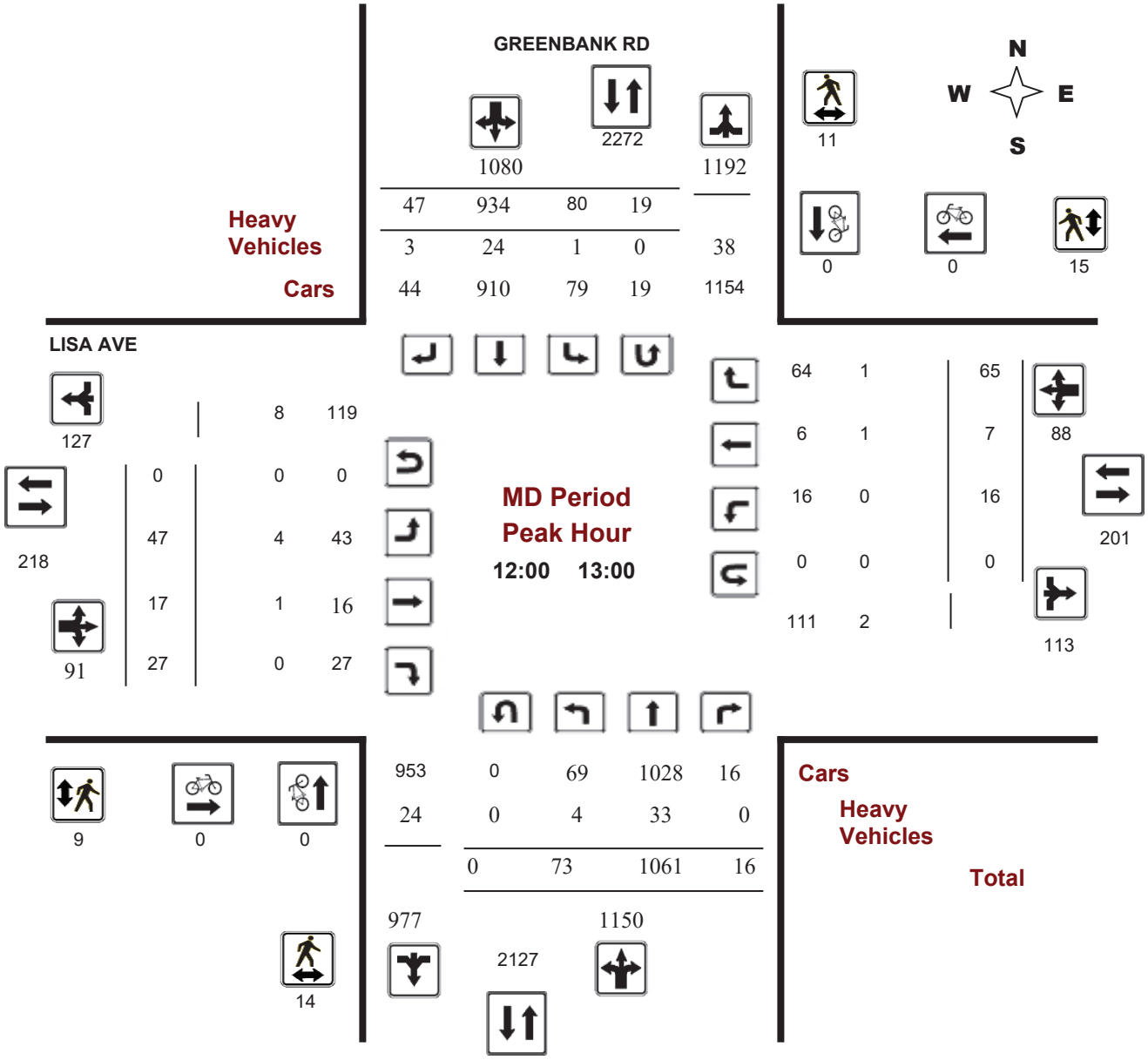
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

GREENBANK RD @ LISA AVE

Survey Date: Thursday, August 11, 2016 **WO No:** 36183

Start Time: 07:00 **Device:** Miovision



Comments

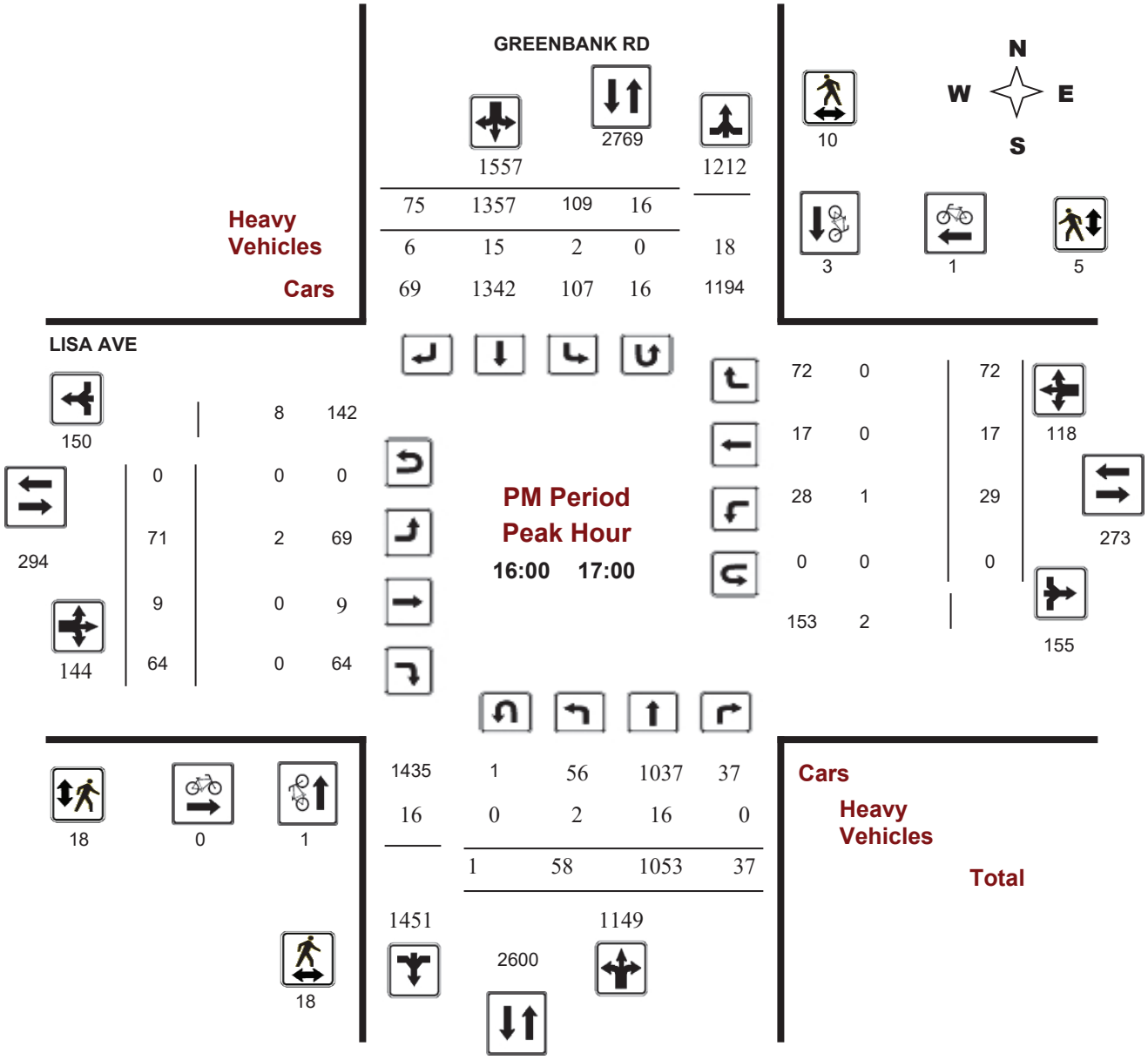
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

GREENBANK RD @ LISA AVE

Survey Date: Thursday, August 11, 2016 **WO No:** 36183

Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

GREENBANK RD @ LISA AVE

Survey Date: Thursday, August 11, 2016 **WO No:** 36183

Start Time: 07:00 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Thursday, August 11, 2016

Total Observed U-Turns

Northbound: 14 Southbound: 105

Eastbound: 0 Westbound: 0

AADT Factor

.90

	GREENBANK RD									LISA AVE									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	**NB TOT**	LT	ST	RT	**SB TOT**	**STR TOT**	LT	ST	RT	**EB TOT**	LT	ST	RT	**WB TOT**	**STR TOT**	**Grand Total**
07:00 08:00	46	1105	8	**1159**	63	772	20	**855**	**2014**	44	5	18	**67**	8	4	73	**85**	**152**	**2166**
08:00 09:00	77	1301	15	**1393**	63	848	55	**966**	**2359**	94	8	38	**140**	20	8	93	**121**	**261**	**2620**
09:00 10:00	44	1089	16	**1149**	47	645	40	**732**	**1881**	64	9	28	**101**	8	5	51	**64**	**165**	**2046**
11:30 12:30	62	1027	13	**1102**	80	943	47	**1070**	**2172**	50	12	30	**92**	19	8	73	**100**	**192**	**2364**
12:30 13:30	59	1064	16	**1139**	51	981	50	**1082**	**2221**	57	8	24	**89**	10	9	50	**69**	**158**	**2379**
15:00 16:00	55	1081	17	**1153**	73	1167	62	**1302**	**2455**	66	6	28	**100**	14	13	84	**111**	**211**	**2666**
16:00 17:00	58	1053	37	**1148**	109	1357	75	**1541**	**2689**	71	9	64	**144**	29	17	72	**118**	**262**	**2951**
17:00 18:00	49	942	33	**1024**	85	1314	79	**1478**	**2502**	72	11	34	**117**	17	14	50	**81**	**198**	**2700**
Sub Total	450	8662	155	**9267**	571	8027	428	**9026**	**18293**	518	68	264	**850**	125	78	546	**749**	**1599**	**19892**
U Turns	14			**14**	105			**105**	**119**	**0**			**0**	0			**0**	**0**	**119**
Total	464	8662	155	**9281**	676	8027	428	**9131**	**18412**	518	68	264	**850**	125	78	546	**749**	**1599**	**20011**
EQ 12Hr	645	12040	215	**12900**	940	11158	595	**12693**	**25593**	720	95	367	**1182**	174	108	759	**1041**	**2223**	**27816**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	580	10836	194	**11610**	846	10042	536	**11424**	**23034**	648	86	330	**1064**	157	97	683	**937**	**2001**	**25035**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**.90**					
AVG 24Hr	760	14195	254	**15209**	1108	13155	702	**14965**	**30174**	849	113	432	**1394**	206	127	895	**1228**	**2622**	**32796**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

GREENBANK RD @ LISA AVE

Survey Date: Thursday, August 11, 2016 **WO No:** 36183

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute Increments

		GREENBANK RD									LISA AVE									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	11	227	1	239	13	150	2	165	**404**	6	1	5	12	3	1	18	22	**34**	**438**
07:15	07:30	14	277	3	294	16	183	5	204	**498**	11	0	3	14	1	0	11	12	**26**	**524**
07:30	07:45	10	301	1	312	17	220	6	243	**555**	14	1	5	20	2	3	18	23	**43**	**598**
07:45	08:00	13	300	3	316	20	219	7	246	**562**	13	3	5	21	2	0	26	28	**49**	**611**
08:00	08:15	16	308	5	329	21	203	9	233	**562**	28	2	9	39	8	3	21	32	**71**	**633**
08:15	08:30	23	312	5	340	13	226	13	252	**592**	17	2	9	28	6	2	22	30	**58**	**650**
08:30	08:45	17	345	3	365	15	213	16	244	**609**	22	4	9	35	3	1	27	31	**66**	**675**
08:45	09:00	24	336	2	362	16	206	17	239	**601**	27	0	11	38	3	2	23	28	**66**	**667**
09:00	09:15	16	277	4	297	15	162	14	191	**488**	25	1	11	37	3	2	12	17	**54**	**542**
09:15	09:30	8	301	3	312	15	147	11	173	**485**	14	5	8	27	2	0	9	11	**38**	**523**
09:30	09:45	10	245	4	259	15	167	7	189	**448**	11	1	5	17	1	2	18	21	**38**	**486**
09:45	10:00	12	266	5	283	12	169	8	189	**472**	14	2	4	20	2	1	12	15	**35**	**507**
11:30	11:45	10	261	4	275	19	238	12	269	**544**	11	1	12	24	2	1	18	21	**45**	**589**
11:45	12:00	15	244	0	259	21	262	11	294	**553**	16	0	6	22	7	2	21	30	**52**	**605**
12:00	12:15	18	269	3	290	36	229	12	277	**567**	10	8	8	26	4	2	17	23	**49**	**616**
12:15	12:30	19	253	6	278	23	214	12	249	**527**	13	3	4	20	6	3	17	26	**46**	**573**
12:30	12:45	21	253	0	274	14	249	14	277	**551**	11	3	7	21	2	1	16	19	**40**	**591**
12:45	13:00	15	286	7	308	26	242	9	277	**585**	13	3	8	24	4	1	15	20	**44**	**629**
13:00	13:15	13	249	8	270	13	251	12	276	**546**	22	2	3	27	2	2	13	17	**44**	**590**
13:15	13:30	11	276	1	288	20	239	15	274	**562**	11	0	6	17	2	5	6	13	**30**	**592**
15:00	15:15	14	256	2	272	15	276	13	304	**576**	16	1	7	24	0	1	16	17	**41**	**617**
15:15	15:30	17	274	2	293	19	303	15	337	**630**	15	2	7	24	0	3	14	17	**41**	**671**
15:30	15:45	11	262	6	279	29	310	12	351	**630**	22	0	8	30	9	5	29	43	**73**	**703**
15:45	16:00	15	289	7	311	31	278	22	331	**642**	13	3	6	22	5	4	25	34	**56**	**698**
16:00	16:15	15	270	5	290	30	348	17	395	**685**	19	3	21	43	5	4	19	28	**71**	**756**
16:15	16:30	16	243	8	267	39	327	25	391	**658**	21	1	14	36	13	5	21	39	**75**	**733**
16:30	16:45	13	259	11	283	25	350	16	391	**674**	17	1	15	33	8	4	18	30	**63**	**737**
16:45	17:00	15	281	13	309	31	332	17	380	**689**	14	4	14	32	3	4	14	21	**53**	**742**
17:00	17:15	15	221	9	245	30	331	19	380	**625**	17	1	6	24	4	9	9	22	**46**	**671**
17:15	17:30	11	247	14	272	22	332	13	367	**639**	18	3	8	29	4	4	10	18	**47**	**686**
17:30	17:45	15	252	7	274	22	318	27	367	**641**	22	4	8	34	4	0	18	22	**56**	**697**
17:45	18:00	11	222	3	236	23	333	20	376	**612**	15	3	12	30	5	1	13	19	**49**	**661**
Total:		464	8662	155	9281	676	8027	428	9131	**18412**	518	68	264	850	125	78	546	749	**18412**	**20,011**

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

GREENBANK RD @ LISA AVE

Survey Date: Thursday, August 11, 2016 **WO No:** 36183

Start Time: 07:00 **Device:** Miovision

Full Study Cyclist Volume

Time Period		GREENBANK RD			LISA AVE			
		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	0	0	**0**	0	0	**0**	**0**
07:15	07:30	0	0	**0**	0	0	**0**	**0**
07:30	07:45	0	0	**0**	1	0	**1**	**1**
07:45	08:00	0	0	**0**	0	0	**0**	**0**
08:00	08:15	1	0	**1**	0	1	**1**	**2**
08:15	08:30	0	0	**0**	0	0	**0**	**0**
08:30	08:45	0	0	**0**	0	1	**1**	**1**
08:45	09:00	3	0	**3**	0	0	**0**	**3**
09:00	09:15	1	0	**1**	0	0	**0**	**1**
09:15	09:30	0	0	**0**	0	1	**1**	**1**
09:30	09:45	2	0	**2**	0	0	**0**	**2**
09:45	10:00	0	0	**0**	0	0	**0**	**0**
11:30	11:45	0	0	**0**	0	1	**1**	**1**
11:45	12:00	0	0	**0**	0	0	**0**	**0**
12:00	12:15	0	0	**0**	0	0	**0**	**0**
12:15	12:30	0	0	**0**	0	0	**0**	**0**
12:30	12:45	0	0	**0**	0	0	**0**	**0**
12:45	13:00	0	0	**0**	0	0	**0**	**0**
13:00	13:15	0	1	**1**	0	0	**0**	**1**
13:15	13:30	0	0	**0**	0	0	**0**	**0**
15:00	15:15	0	0	**0**	0	0	**0**	**0**
15:15	15:30	0	1	**1**	0	0	**0**	**1**
15:30	15:45	1	1	**2**	0	0	**0**	**2**
15:45	16:00	0	0	**0**	0	0	**0**	**0**
16:00	16:15	0	0	**0**	0	0	**0**	**0**
16:15	16:30	1	2	**3**	0	1	**1**	**4**
16:30	16:45	0	0	**0**	0	0	**0**	**0**
16:45	17:00	0	1	**1**	0	0	**0**	**1**
17:00	17:15	3	1	**4**	0	2	**2**	**6**
17:15	17:30	0	3	**3**	1	1	**2**	**5**
17:30	17:45	1	3	**4**	0	0	**0**	**4**
17:45	18:00	1	2	**3**	0	0	**0**	**3**
Total		14	15	**29**	2	8	**10**	**39**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

GREENBANK RD @ LISA AVE

Survey Date: Thursday, August 11, 2016 **WO No:** 36183

Start Time: 07:00 **Device:** Miovision

Full Study Pedestrian Volume

	GREENBANK RD			LISA AVE			
Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	**Total**	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	**Total**	**Grand Total**
07:00 07:15	2	1	**3**	2	3	**5**	**8**
07:15 07:30	1	3	**4**	4	0	**4**	**8**
07:30 07:45	1	3	**4**	3	3	**6**	**10**
07:45 08:00	2	6	**8**	4	1	**5**	**13**
08:00 08:15	3	2	**5**	3	3	**6**	**11**
08:15 08:30	3	2	**5**	2	6	**8**	**13**
08:30 08:45	0	2	**2**	0	0	**0**	**2**
08:45 09:00	2	4	**6**	1	2	**3**	**9**
09:00 09:15	1	1	**2**	1	3	**4**	**6**
09:15 09:30	1	2	**3**	1	3	**4**	**7**
09:30 09:45	0	1	**1**	3	2	**5**	**6**
09:45 10:00	5	8	**13**	2	1	**3**	**16**
11:30 11:45	4	0	**4**	0	0	**0**	**4**
11:45 12:00	1	2	**3**	2	2	**4**	**7**
12:00 12:15	3	3	**6**	3	3	**6**	**12**
12:15 12:30	4	2	**6**	3	5	**8**	**14**
12:30 12:45	4	3	**7**	2	6	**8**	**15**
12:45 13:00	3	3	**6**	1	1	**2**	**8**
13:00 13:15	4	0	**4**	3	0	**3**	**7**
13:15 13:30	3	0	**3**	0	1	**1**	**4**
15:00 15:15	4	0	**4**	3	0	**3**	**7**
15:15 15:30	4	2	**6**	3	1	**4**	**10**
15:30 15:45	3	6	**9**	4	1	**5**	**14**
15:45 16:00	15	0	**15**	15	1	**16**	**31**
16:00 16:15	3	0	**3**	2	0	**2**	**5**
16:15 16:30	9	2	**11**	7	1	**8**	**19**
16:30 16:45	5	6	**11**	3	3	**6**	**17**
16:45 17:00	1	2	**3**	6	1	**7**	**10**
17:00 17:15	6	3	**9**	14	3	**17**	**26**
17:15 17:30	8	1	**9**	10	0	**10**	**19**
17:30 17:45	8	3	**11**	7	5	**12**	**23**
17:45 18:00	8	2	**10**	8	2	**10**	**20**
Total	121	75	**196**	122	63	**185**	**381**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

GREENBANK RD @ LISA AVE

Survey Date: Thursday, August 11, 2016 **WO No:** 36183

Start Time: 07:00 **Device:** Miovision

Full Study Heavy Vehicles

		GREENBANK RD									LISA AVE									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	7	0	**7**	0	5	0	**5**	**12**	1	0	0	**1**	0	0	0	**0**	**1**	**13**
07:15	07:30	0	2	0	**2**	0	8	1	**9**	**11**	1	0	1	**2**	0	0	0	**0**	**2**	**13**
07:30	07:45	0	5	0	**5**	0	10	0	**10**	**15**	1	0	0	**1**	0	0	0	**0**	**1**	**16**
07:45	08:00	1	12	0	**13**	0	5	1	**6**	**19**	1	0	1	**2**	0	0	0	**0**	**2**	**21**
08:00	08:15	1	9	0	**10**	0	9	1	**10**	**20**	2	0	0	**2**	1	0	0	**1**	**3**	**23**
08:15	08:30	1	6	0	**7**	2	9	2	**13**	**20**	2	0	0	**2**	0	0	1	**1**	**3**	**24**
08:30	08:45	0	6	0	**6**	0	4	0	**4**	**10**	1	0	1	**2**	0	0	2	**2**	**4**	**14**
08:45	09:00	0	9	0	**9**	0	2	2	**4**	**13**	2	0	0	**2**	0	0	1	**1**	**3**	**16**
09:00	09:15	0	2	1	**3**	0	3	0	**3**	**6**	1	0	1	**2**	0	0	0	**0**	**2**	**8**
09:15	09:30	0	6	0	**6**	1	3	2	**6**	**12**	3	0	0	**3**	0	0	0	**0**	**3**	**15**
09:30	09:45	0	5	0	**5**	0	5	1	**6**	**11**	1	0	0	**1**	0	0	0	**0**	**1**	**12**
09:45	10:00	0	3	0	**3**	0	3	1	**4**	**7**	2	0	0	**2**	0	0	0	**0**	**2**	**9**
11:30	11:45	0	5	0	**5**	0	4	0	**4**	**9**	0	0	0	**0**	0	0	0	**0**	**0**	**9**
11:45	12:00	0	2	0	**2**	0	1	1	**2**	**4**	2	0	0	**2**	0	0	0	**0**	**2**	**6**
12:00	12:15	1	12	0	**13**	0	7	1	**8**	**21**	0	0	0	**0**	0	0	0	**0**	**0**	**21**
12:15	12:30	0	6	0	**6**	0	4	1	**5**	**11**	1	0	0	**1**	0	1	0	**1**	**2**	**13**
12:30	12:45	3	4	0	**7**	1	10	0	**11**	**18**	1	0	0	**1**	0	0	1	**1**	**2**	**20**
12:45	13:00	0	11	0	**11**	0	3	1	**4**	**15**	2	1	0	**3**	0	0	0	**0**	**3**	**18**
13:00	13:15	1	7	1	**9**	0	5	0	**5**	**14**	0	0	0	**0**	0	0	0	**0**	**0**	**14**
13:15	13:30	1	8	0	**9**	0	3	1	**4**	**13**	1	0	0	**1**	0	0	0	**0**	**1**	**14**
15:00	15:15	0	6	0	**6**	0	7	2	**9**	**15**	1	0	0	**1**	0	0	1	**1**	**2**	**17**
15:15	15:30	1	6	0	**7**	0	4	2	**6**	**13**	0	0	0	**0**	0	1	0	**1**	**1**	**14**
15:30	15:45	0	6	0	**6**	0	9	2	**11**	**17**	2	0	0	**2**	0	0	0	**0**	**2**	**19**
15:45	16:00	0	4	0	**4**	0	1	1	**2**	**6**	0	0	0	**0**	0	0	0	**0**	**0**	**6**
16:00	16:15	1	3	0	**4**	0	3	1	**4**	**8**	1	0	0	**1**	0	0	0	**0**	**1**	**9**
16:15	16:30	0	4	0	**4**	2	6	2	**10**	**14**	0	0	0	**0**	1	0	0	**1**	**1**	**15**
16:30	16:45	1	7	0	**8**	0	5	1	**6**	**14**	1	0	0	**1**	0	0	0	**0**	**1**	**15**
16:45	17:00	0	2	0	**2**	0	1	2	**3**	**5**	0	0	0	**0**	0	0	0	**0**	**0**	**5**
17:00	17:15	0	2	0	**2**	0	2	0	**2**	**4**	1	0	0	**1**	0	0	0	**0**	**1**	**5**
17:15	17:30	0	1	0	**1**	0	3	1	**4**	**5**	0	0	0	**0**	0	0	0	**0**	**0**	**5**
17:30	17:45	1	6	0	**7**	0	0	1	**1**	**8**	2	0	0	**2**	0	0	0	**0**	**2**	**10**
17:45	18:00	0	4	0	**4**	0	4	0	**4**	**8**	1	0	0	**1**	0	0	0	**0**	**1**	**9**
Total:	None	13	178	2	**193**	6	148	31	**185**	**378**	34	1	4	**39**	2	2	6	**10**	**49**	**428**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

GREENBANK RD @ LISA AVE

Survey Date: Thursday, August 11, 2016 **WO No:** 36183

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute U-Turn Total

Time Period		GREENBANK RD Northbound U-Turn Total	GREENBANK RD Southbound U-Turn Total	LISA AVE Eastbound U-Turn Total	LISA AVE Westbound U-Turn Total	Total
07:00	07:15	2	0	0	0	**2**
07:15	07:30	0	1	0	0	**1**
07:30	07:45	0	1	0	0	**1**
07:45	08:00	0	1	0	0	**1**
08:00	08:15	1	1	0	0	**2**
08:15	08:30	2	0	0	0	**2**
08:30	08:45	0	0	0	0	**0**
08:45	09:00	0	1	0	0	**1**
09:00	09:15	0	4	0	0	**4**
09:15	09:30	0	2	0	0	**2**
09:30	09:45	2	2	0	0	**4**
09:45	10:00	0	2	0	0	**2**
11:30	11:45	0	7	0	0	**7**
11:45	12:00	0	2	0	0	**2**
12:00	12:15	0	6	0	0	**6**
12:15	12:30	0	4	0	0	**4**
12:30	12:45	0	3	0	0	**3**
12:45	13:00	0	6	0	0	**6**
13:00	13:15	1	7	0	0	**8**
13:15	13:30	0	6	0	0	**6**
15:00	15:15	0	5	0	0	**5**
15:15	15:30	0	3	0	0	**3**
15:30	15:45	1	4	0	0	**5**
15:45	16:00	1	9	0	0	**10**
16:00	16:15	1	3	0	0	**4**
16:15	16:30	0	9	0	0	**9**
16:30	16:45	0	3	0	0	**3**
16:45	17:00	0	1	0	0	**1**
17:00	17:15	2	4	0	0	**6**
17:15	17:30	0	3	0	0	**3**
17:30	17:45	0	1	0	0	**1**
17:45	18:00	1	4	0	0	**5**
Total		14	105	0	0	**119**

Appendix D

Collision Data

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: BASELINE RD @ GREENBANK RD

Traffic Control: Traffic signal **Total Collisions:** 110

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Jan-07, Wed,06:45	Clear	Rear end	Non-fatal injury	Slush	East	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Feb-08, Sun,11:30	Snow	Angle	P.D. only	Loose snow	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Feb-09, Mon,07:28	Snow	Rear end	P.D. only	Slush	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Feb-12, Thu,08:50	Clear	Rear end	P.D. only	Slush	West	Turning right	Pick-up truck	Other motor vehicle	0
					West	Turning right	Automobile, station wagon	Other motor vehicle	
2015-Mar-13, Fri,17:36	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	
2015-Mar-26, Thu,17:28	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2015-Apr-10, Fri,20:36	Clear	Rear end	Non-fatal injury	Wet	South	Going ahead	Pick-up truck	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2015-May-01, Fri,16:20	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2015-May-26, Tue,14:29	Clear	Rear end	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Jun-04, Thu,15:50	Clear	Rear end	P.D. only	Dry	West	Going ahead	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Jun-15, Mon,18:08	Clear	Rear end	P.D. only	Dry	North	Turning right	Unknown	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: BASELINE RD @ GREENBANK RD

Traffic Control: Traffic signal **Total Collisions:** 110

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Jun-18, Thu,21:45	Rain	Turning movement	P.D. only	Wet	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Pick-up truck	Other motor vehicle	
2015-Jun-25, Thu,05:58	Clear	SMV other	Non-fatal injury	Dry	North	Going ahead	Automobile, station wagon	Pedestrian	1
2015-Jun-26, Fri,17:03	Clear	Angle	Non-fatal injury	Dry	North	Turning right	Automobile, station wagon	Cyclist	0
					West	Going ahead	Bicycle	Other motor vehicle	
2015-Jun-30, Tue,12:45	Clear	Rear end	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle	0
					West	Turning right	Pick-up truck	Other motor vehicle	
2015-Jul-14, Tue,07:17	Clear	Rear end	P.D. only	Dry	South	Going ahead	Pick-up truck	Other motor vehicle	0
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					South	Slowing or stopping	Pick-up truck	Other motor vehicle	
2015-Jul-29, Wed,21:01	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					South	Stopped	Pick-up truck	Other motor vehicle	
2015-Aug-07, Fri,16:19	Clear	Rear end	P.D. only	Dry	West	Going ahead	Pick-up truck	Other motor vehicle	0
					West	Stopped	Pick-up truck	Other motor vehicle	
2015-Sep-01, Tue,20:39	Clear	Rear end	Non-fatal injury	Dry	North	Going ahead	Pick-up truck	Other motor vehicle	0
					North	Going ahead	Pick-up truck	Other motor vehicle	
2015-Sep-12, Sat,11:49	Clear	Rear end	P.D. only	Dry	North	Going ahead	Passenger van	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	
2015-Oct-07, Wed,16:53	Clear	Sideswipe	P.D. only	Dry	West	Overtaking	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Oct-19, Mon,15:57	Rain	Sideswipe	P.D. only	Wet	South	Changing lanes	Pick-up truck	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Oct-29, Thu,08:10	Clear	Rear end	P.D. only	Wet	North	Turning right	Passenger van	Other motor vehicle	0
					North	Turning right	Pick-up truck	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: BASELINE RD @ GREENBANK RD

Traffic Control: Traffic signal

Total Collisions: 110

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Nov-07, Sat,13:52	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Passenger van	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	
2016-Feb-10, Wed,17:05	Clear	Rear end	P.D. only	Wet	West	Slowing or stopping	Passenger van	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2016-Feb-12, Fri,15:38	Clear	Rear end	Non-fatal injury	Ice	West	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2016-Feb-17, Wed,07:45	Clear	Rear end	P.D. only	Slush	South	Slowing or stopping	Delivery van	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2016-Feb-25, Thu,18:34	Snow	Sideswipe	P.D. only	Ice	North	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					North	Turning left	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Pick-up truck	Other motor vehicle	
2016-Mar-04, Fri,10:09	Clear	Angle	P.D. only	Dry	South	Reversing	Snow plow	Other motor vehicle	0
					West	Going ahead	Municipal transit bus	Other motor vehicle	
2016-Mar-08, Tue,18:06	Rain	Angle	P.D. only	Wet	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Turning left	Pick-up truck	Other motor vehicle	
2016-Mar-30, Wed,18:42	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2016-Apr-09, Sat,09:14	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Apr-17, Sun,18:20	Clear	Rear end	P.D. only	Dry	North	Going ahead	Passenger van	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2016-May-20, Fri,14:00	Clear	Rear end	P.D. only	Dry	North	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Pick-up truck	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: BASELINE RD @ GREENBANK RD

Traffic Control: Traffic signal **Total Collisions:** 110

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Jun-05, Sun,15:23	Rain	Rear end	P.D. only	Wet	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Turning left	Pick-up truck	Other motor vehicle	
					East	Changing lanes	Automobile, station wagon	Other	
2016-Jun-21, Tue,09:33	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Jul-03, Sun,16:47	Clear	Angle	Non-fatal injury	Dry	West	Turning right	Automobile, station wagon	Cyclist	0
					South	Going ahead	Bicycle	Other motor vehicle	
2016-Jul-21, Thu,18:20	Clear	Sideswipe	Non-fatal injury	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Passenger van	Other motor vehicle	
2016-Aug-31, Wed,14:06	Clear	Rear end	Non-fatal injury	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Slowing or stopping	Pick-up truck	Other motor vehicle	
2016-Oct-05, Wed,14:32	Clear	Rear end	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2016-Oct-11, Tue,07:48	Clear	Rear end	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2016-Oct-19, Wed,04:07	Clear	Angle	Non-fatal injury	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Oct-23, Sun,17:17	Clear	Other	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Municipal transit bus	Other motor vehicle	
2016-Nov-03, Thu,16:55	Clear	Rear end	P.D. only	Dry	South	Going ahead	Passenger van	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2016-Nov-22, Tue,22:46	Clear	Angle	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	

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Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: BASELINE RD @ GREENBANK RD

Traffic Control: Traffic signal **Total Collisions:** 110

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Dec-18, Sun,14:20	Clear	Sideswipe	P.D. only	Slush	West	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Jan-30, Mon,08:15	Clear	Rear end	P.D. only	Ice	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Jan-30, Mon,09:41	Clear	Rear end	P.D. only	Dry	East	Unknown	Unknown	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Feb-13, Mon,16:00	Clear	Other	P.D. only	Wet	West	Reversing	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Feb-15, Wed,10:51	Snow	Rear end	P.D. only	Loose snow	East	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					East	Stopped	Snow plow	Other motor vehicle	
2017-Mar-17, Fri,18:08	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Slowing or stopping	Passenger van	Other motor vehicle	
					West	Stopped	Pick-up truck	Other motor vehicle	
2017-Mar-20, Mon,09:58	Clear	Rear end	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2017-Apr-21, Fri,12:39	Rain	Rear end	P.D. only	Wet	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Apr-23, Sun,12:05	Clear	Rear end	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2017-Apr-28, Fri,18:04	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					North	Turning left	Automobile, station wagon	Other motor vehicle	
2017-May-28, Sun,17:58	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	

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Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: BASELINE RD @ GREENBANK RD

Traffic Control: Traffic signal **Total Collisions:** 110

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2017-Jun-25, Sun,12:58	Rain	Rear end	Non-fatal injury	Wet	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Passenger van	Other motor vehicle	
2017-Jul-04, Tue,17:43	Clear	Sideswipe	P.D. only	Dry	South	Stopped	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Aug-21, Mon,09:58	Clear	Rear end	Non-fatal injury	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle	0
					East	Turning right	Automobile, station wagon	Other motor vehicle	
2017-Aug-26, Sat,13:30	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Sep-25, Mon,08:49	Clear	Rear end	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Sep-26, Tue,16:59	Clear	Rear end	P.D. only	Dry	East	Unknown	Unknown	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Oct-03, Tue,07:41	Clear	Rear end	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2017-Oct-05, Thu,11:29	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Oct-26, Thu,18:00	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Nov-02, Thu,17:34	Rain	Rear end	P.D. only	Wet	South	Turning right	Automobile, station wagon	Other motor vehicle	0
					South	Turning right	Automobile, station wagon	Other motor vehicle	
2018-Jan-01, Mon,03:30	Clear	Rear end	P.D. only	Dry	North	Going ahead	Passenger van	Other motor vehicle	0
					North	Stopped	Passenger van	Other motor vehicle	

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Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: BASELINE RD @ GREENBANK RD

Traffic Control: Traffic signal **Total Collisions:** 110

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-Jan-09, Tue,18:45	Snow	Rear end	P.D. only	Slush	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jan-15, Mon,14:36	Clear	Sideswipe	P.D. only	Loose snow	East	Changing lanes	Municipal transit bus	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Jan-31, Wed,19:52	Snow	Sideswipe	P.D. only	Loose snow	West	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Feb-10, Sat,17:54	Snow	Rear end	P.D. only	Slush	North	Slowing or stopping	Passenger van	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Feb-13, Tue,13:52	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Feb-17, Sat,12:50	Clear	Rear end	P.D. only	Dry	West	Merging	Passenger van	Other motor vehicle	0
					West	Stopped	Pick-up truck	Other motor vehicle	
2018-Mar-08, Thu,20:15	Snow	Sideswipe	P.D. only	Slush	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Mar-11, Sun,15:21	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Turning right	Automobile, station wagon	Other motor vehicle	
2018-Apr-16, Mon,16:29	Rain	Rear end	P.D. only	Wet	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Municipal transit bus	Other motor vehicle	
2018-Jul-05, Thu,08:30	Clear	Rear end	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Turning right	Passenger van	Other motor vehicle	
2018-Sep-13, Thu,17:33	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	

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Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: BASELINE RD @ GREENBANK RD

Traffic Control: Traffic signal **Total Collisions:** 110

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-Sep-15, Sat,10:30	Clear	Rear end	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2018-Sep-21, Fri,22:18	Clear	Angle	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Oct-04, Thu,15:20	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Nov-07, Wed,17:11	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Nov-16, Fri,15:48	Snow	Sideswipe	P.D. only	Loose snow	West	Changing lanes	Delivery van	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2018-Nov-24, Sat,16:30	Clear	Rear end	P.D. only	Wet	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Nov-26, Mon,15:45	Rain	Sideswipe	P.D. only	Wet	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Dec-05, Wed,15:55	Snow	Rear end	P.D. only	Loose snow	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Passenger van	Other motor vehicle	
2018-Dec-18, Tue,12:40	Clear	Rear end	Non-fatal injury	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle	0
					North	Turning left	Automobile, station wagon	Other motor vehicle	
2018-Dec-18, Tue,16:50	Clear	Sideswipe	P.D. only	Dry	North	Unknown	Passenger van	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Dec-29, Sat,02:20	Rain	Sideswipe	P.D. only	Wet	South	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	

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Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: BASELINE RD @ GREENBANK RD

Traffic Control: Traffic signal **Total Collisions:** 110

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2019-Jan-17, Thu,09:57	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Delivery van	Other motor vehicle	
2019-Jan-22, Tue,12:54	Clear	Rear end	P.D. only	Ice	North	Going ahead	Pick-up truck	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Jan-25, Fri,13:57	Clear	Rear end	Non-fatal injury	Wet	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Slowing or stopping	Passenger van	Other motor vehicle	
2019-Feb-14, Thu,17:00	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Unknown	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Feb-17, Sun,13:47	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Feb-26, Tue,20:29	Clear	Rear end	Non-fatal injury	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2019-Mar-12, Tue,14:30	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Mar-19, Tue,08:00	Clear	Rear end	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Apr-13, Sat,14:15	Clear	Rear end	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2019-Apr-20, Sat,13:48	Clear	Rear end	Non-fatal injury	Dry	North	Unknown	Unknown	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Jun-13, Thu,21:15	Rain	Angle	P.D. only	Wet	East	Turning right	Unknown	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	

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Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: BASELINE RD @ GREENBANK RD

Traffic Control: Traffic signal **Total Collisions:** 110

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2019-Jun-14, Fri,15:20	Clear	Rear end	P.D. only	Wet	South	Going ahead	Truck - dump	Other motor vehicle	0
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2019-Jul-29, Mon,17:13	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Aug-06, Tue,11:45	Clear	Rear end	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2019-Aug-12, Mon,11:16	Clear	Rear end	P.D. only	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle	0
					East	Turning right	Automobile, station wagon	Other motor vehicle	
2019-Aug-15, Thu,17:55	Clear	Rear end	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Aug-20, Tue,10:00	Clear	Sideswipe	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Sep-30, Mon,16:09	Clear	Rear end	P.D. only	Dry	West	Unknown	Unknown	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Oct-10, Thu,16:00	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Nov-22, Fri,07:53	Clear	Rear end	P.D. only	Wet	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Dec-11, Wed,11:43	Clear	Rear end	Non-fatal injury	Dry	West	Turning right	Pick-up truck	Other motor vehicle	0
					West	Turning right	Automobile, station wagon	Other motor vehicle	
					West	Turning right	Fire vehicle	Other motor vehicle	

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Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: GREENBANK RD @ LISA AVE

Traffic Control: Traffic signal **Total Collisions:** 47

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Jan-12, Mon,03:43	Clear	SMV other	P.D. only	Wet	East	Going ahead	Snow plow	Pole (utility, power)	0
2015-May-28, Thu,18:46	Clear	Angle	P.D. only	Dry	West	Making "U" turn	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Jun-26, Fri,16:10	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Aug-20, Thu,10:22	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Aug-27, Thu,14:28	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Sep-29, Tue,07:16	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Pick-up truck	Other motor vehicle	
					West	Stopped	Truck - closed	Other motor vehicle	
2015-Oct-14, Wed,12:24	Clear	Rear end	P.D. only	Dry	South	Going ahead	Pick-up truck	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Dec-16, Wed,15:42	Clear	Turning movement	P.D. only	Dry	North	Making "U" turn	Pick-up truck	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Jan-30, Sat,17:54	Clear	Rear end	Non-fatal injury	Wet	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2016-Feb-17, Wed,12:23	Clear	Turning movement	P.D. only	Loose snow	North	Turning left	Unknown	Other motor vehicle	0
					South	Going ahead	Pick-up truck	Other motor vehicle	
2016-May-20, Fri,15:57	Clear	Rear end	Non-fatal injury	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: GREENBANK RD @ LISA AVE

Traffic Control: Traffic signal **Total Collisions:** 47

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Jul-09, Sat,17:05	Rain	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2016-Oct-19, Wed,10:58	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2016-Nov-03, Thu,07:18	Rain	SMV other	Non-fatal injury	Wet	West	Turning left	Automobile, station wagon	Pedestrian	1
2016-Dec-11, Sun,09:08	Clear	Angle	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					North	Turning left	Automobile, station wagon	Other motor vehicle	
2016-Dec-14, Wed,20:46	Snow	Turning movement	P.D. only	Packed snow	North	Turning left	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Pick-up truck	Other motor vehicle	
2016-Dec-24, Sat,12:39	Clear	Turning movement	Non-fatal injury	Wet	South	Making "U" turn	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Pick-up truck	Other motor vehicle	
2017-Feb-10, Fri,11:17	Clear	Rear end	Non-fatal injury	Dry	South	Going ahead	Passenger van	Other motor vehicle	0
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Feb-16, Thu,07:31	Snow	Rear end	P.D. only	Loose snow	South	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					South	Stopped	Pick-up truck	Other motor vehicle	
2017-Apr-07, Fri,12:36	Clear	Rear end	P.D. only	Wet	West	Going ahead	Pick-up truck	Other motor vehicle	0
					West	Stopped	Pick-up truck	Other motor vehicle	
2017-Apr-21, Fri,00:11	Rain	Angle	P.D. only	Wet	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-May-18, Thu,17:45	Clear	Turning movement	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Turning left	Pick-up truck	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: GREENBANK RD @ LISA AVE

Traffic Control: Traffic signal **Total Collisions:** 47

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2017-Aug-04, Fri,22:55	Rain	Turning movement	P.D. only	Wet	East	Turning left	Unknown	Other motor vehicle	0
					West	Turning right	Automobile, station wagon	Other motor vehicle	
2017-Aug-05, Sat,17:27	Clear	Angle	Non-fatal injury	Dry	South	Turning right	Unknown	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Sep-01, Fri,16:37	Clear	Angle	Non-fatal injury	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2017-Sep-06, Wed,14:50	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Nov-11, Sat,12:43	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Delivery van	Other motor vehicle	0
					North	Slowing or stopping	Delivery van	Other motor vehicle	
2017-Nov-23, Thu,09:00	Clear	Rear end	P.D. only	Wet	South	Going ahead	Passenger van	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jan-15, Mon,12:43	Clear	Other	P.D. only	Dry	North	Reversing	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Police vehicle	Other motor vehicle	
2018-Jan-28, Sun,19:41	Clear	SMV other	Non-fatal injury	Dry	West	Turning left	Automobile, station wagon	Pedestrian	1
2018-Mar-02, Fri,12:24	Clear	Rear end	Non-fatal injury	Dry	North	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Mar-07, Wed,16:23	Snow	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Jul-05, Thu,11:21	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: GREENBANK RD @ LISA AVE

Traffic Control: Traffic signal **Total Collisions:** 47

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-Oct-10, Wed,17:10	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2018-Nov-22, Thu,07:50	Clear	Rear end	P.D. only	Ice	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Dec-14, Fri,12:37	Freezing Rain	Rear end	Non-fatal injury	Ice	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Dec-14, Fri,19:48	Freezing Rain	Angle	P.D. only	Ice	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Jan-26, Sat,13:47	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Feb-27, Wed,07:34	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Mar-04, Mon,23:31	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Jun-05, Wed,08:31	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Jun-18, Tue,17:10	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Pick-up truck	Other motor vehicle	
2019-Jul-25, Thu,18:03	Clear	Rear end	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2019-Aug-26, Mon,15:40	Clear	Rear end	P.D. only	Dry	South	Going ahead	Pick-up truck	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: GREENBANK RD @ LISA AVE

Traffic Control: Traffic signal **Total Collisions:** 47

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2019-Aug-30, Fri,15:00	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Pick-up truck	Other motor vehicle	
2019-Oct-03, Thu,10:58	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Truck - closed	Other motor vehicle	
2019-Nov-06, Wed,08:30	Clear	Angle	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Delivery van	Other motor vehicle	

Location: PINECREST RD @ BASELINE RD

Traffic Control: Stop sign **Total Collisions:** 9

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Jan-18, Sun,01:03	Clear	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Jan-24, Sat,15:28	Clear	Turning movement	P.D. only	Wet	East	Turning left	Passenger van	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Jul-07, Tue,16:14	Clear	Turning movement	Non-fatal injury	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Motorcycle	Other motor vehicle	
					South	Turning right	Automobile, station wagon	Other motor vehicle	
2016-Nov-17, Thu,15:56	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2018-Dec-16, Sun,16:40	Clear	Angle	Non-fatal injury	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Dec-19, Wed,08:54	Clear	SMV unattended vehicle	P.D. only	Wet	West	Turning right	Passenger van	Unattended vehicle	0
2019-Mar-18, Mon,16:32	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: PINECREST RD @ BASELINE RD

Traffic Control: Stop sign **Total Collisions:** 9

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2019-Aug-22, Thu,15:40	Clear	Turning movement	Non-fatal injury	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Nov-25, Mon,14:28	Clear	SMV other	Non-fatal injury	Dry	South	Turning right	Automobile, station wagon	Pedestrian	1

Appendix E

TDM Measures Checklist

TDM Measures Checklist:
Residential Developments (multi-family, condominium or subdivision)

Legend

BASIC — The measure is generally feasible and effective, and in most cases would benefit the development and its users

BETTER — The measure could maximize support for users of sustainable modes, and optimize development performance

★ — The measure is one of the most dependably effective tools to encourage the use of sustainable modes

		TDM measures: *Residential developments*	Check if proposed & add descriptions
	1.	**TDM PROGRAM MANAGEMENT**	
	1.1	**Program coordinator**	
BASIC ★	1.1.1	Designate an internal coordinator, or contract with an external coordinator	☐
	1.2	**Travel surveys**	
BETTER	1.2.1	Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	☐
	2.	**WALKING AND CYCLING**	
	2.1	**Information on walking/cycling routes & destinations**	
BASIC	2.1.1	Display local area maps with walking/cycling access routes and key destinations at major entrances *(multi-family, condominium)*	☒
	2.2	**Bicycle skills training**	
BETTER	2.2.1	Offer on-site cycling courses for residents, or subsidize off-site courses	☐

			TDM measures: *Residential developments*	Check if proposed & add descriptions
		3.	**TRANSIT**	
		3.1	**Transit information**	
BASIC		3.1.1	Display relevant transit schedules and route maps at entrances *(multi-family, condominium)*	☒
BETTER		3.1.2	Provide real-time arrival information display at entrances *(multi-family, condominium)*	☐
		3.2	**Transit fare incentives**	
BASIC	★	3.2.1	Offer PRESTO cards preloaded with one monthly transit pass on residence purchase/move-in, to encourage residents to use transit	☐
BETTER		3.2.2	Offer at least one year of free monthly transit passes on residence purchase/move-in	☐
		3.3	**Enhanced public transit service**	
BETTER	★	3.3.1	Contract with OC Transpo to provide early transit services until regular services are warranted by occupancy levels *(subdivision)*	☐
		3.4	**Private transit service**	
BETTER		3.4.1	Provide shuttle service for seniors homes or lifestyle communities (e.g. scheduled mall or supermarket runs)	☐
		4.	**CARSHARING & BIKESHARING**	
		4.1	**Bikeshare stations & memberships**	
BETTER		4.1.1	Contract with provider to install on-site bikeshare station (*multi-family)*	☐
BETTER		4.1.2	Provide residents with bikeshare memberships, either free or subsidized *(multi-family)*	☐
		4.2	**Carshare vehicles & memberships**	
BETTER		4.2.1	Contract with provider to install on-site carshare vehicles and promote their use by residents	☐
BETTER		4.2.2	Provide residents with carshare memberships, either free or subsidized	☐
		5.	**PARKING**	
		5.1	**Priced parking**	
BASIC	★	5.1.1	Unbundle parking cost from purchase price *(condominium)*	☐
BASIC	★	5.1.2	Unbundle parking cost from monthly rent *(multi-family)*	☒

			TDM measures: *Residential developments*	Check if proposed & add descriptions
		6.	**TDM MARKETING & COMMUNICATIONS**	
		6.1	**Multimodal travel information**	
BASIC	★	6.1.1	Provide a multimodal travel option information package to new residents	☐
		6.2	**Personalized trip planning**	
BETTER	★	6.2.1	Offer personalized trip planning to new residents	☐

Appendix F

Existing Intersection Operations

HCM 6th Signalized Intersection Summary
1: Greenbank Rd & Baseline Rd

06-04-2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	743	76	157	385	324	131	1055	338	390	453	63
Future Volume (veh/h)	117	743	76	157	385	324	131	1055	338	390	453	63
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1758	1744	1758	1744	1772	1758	1786	1758	1730	1716
Adj Flow Rate, veh/h	130	826	84	174	428	0	146	1172	0	433	503	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	3	4	3	4	2	3	1	3	5	6
Cap, veh/h	135	892	91	220	927		187	1154		360	1135	
Arrive On Green	0.08	0.29	0.29	0.07	0.28	0.00	0.11	0.35	0.00	0.11	0.35	0.00
Sat Flow, veh/h	1688	3085	314	3222	3340	1478	1688	3340	1514	3248	3287	1454
Grp Volume(v), veh/h	130	451	459	174	428	0	146	1172	0	433	503	0
Grp Sat Flow(s),veh/h/ln	1688	1683	1715	1611	1670	1478	1688	1670	1514	1624	1643	1454
Q Serve(g_s), s	10.8	36.4	36.4	7.4	14.9	0.0	11.8	48.4	0.0	15.5	16.6	0.0
Cycle Q Clear(g_c), s	10.8	36.4	36.4	7.4	14.9	0.0	11.8	48.4	0.0	15.5	16.6	0.0
Prop In Lane	1.00		0.18	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	135	486	496	220	927		187	1154		360	1135	
V/C Ratio(X)	0.96	0.93	0.93	0.79	0.46		0.78	1.02		1.20	0.44	
Avail Cap(c_a), veh/h	135	525	535	258	1043		187	1154		360	1135	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	64.2	48.3	48.3	64.2	41.9	0.0	60.6	45.8	0.0	62.3	35.4	0.0
Incr Delay (d2), s/veh	65.9	21.8	21.5	13.2	0.4	0.0	27.0	30.5	0.0	115.4	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	19.0	19.3	3.6	6.6	0.0	6.7	26.0	0.0	12.4	7.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	130.1	70.1	69.9	77.4	42.3	0.0	87.6	76.3	0.0	177.6	36.7	0.0
LnGrp LOS	F	E	E	E	D		F	F		F	D	
Approach Vol, veh/h		1040			602	A		1318	A		936	A
Approach Delay, s/veh		77.5			52.4			77.6			101.9	
Approach LOS		E			D			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.0	54.9	16.4	46.8	22.0	54.9	18.0	45.1
Change Period (Y+Rc), s	6.5	6.5	* 6.8	* 6.3	6.5	6.5	* 6.8	* 6.3
Max Green Setting (Gmax), s	15.5	43.5	* 11	* 44	15.5	43.5	* 11	* 44
Max Q Clear Time (g_c+I1), s	17.5	50.4	9.4	38.4	13.8	18.6	12.8	16.9
Green Ext Time (p_c), s	0.0	0.0	0.1	2.1	0.1	2.5	0.0	2.1

Intersection Summary	
HCM 6th Ctrl Delay	79.5
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	8	38	20	8	98	80	1401	15	63	848	55
Future Volume (veh/h)	99	8	38	20	8	98	80	1401	15	63	848	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1702	1800	1758	1730	1800	1744	1758	1772	1800	1758	1758	1674
Adj Flow Rate, veh/h	110	9	0	22	9	109	89	1557	17	70	942	61
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	7	0	3	5	0	4	3	2	0	3	3	9
Cap, veh/h	180	13		55	28	186	426	2609	28	235	2554	1085
Arrive On Green	0.14	0.14	0.00	0.14	0.14	0.14	0.76	0.76	0.76	0.76	0.76	0.76
Sat Flow, veh/h	913	89	0	173	196	1300	557	3411	37	323	3340	1418
Grp Volume(v), veh/h	119	0	0	140	0	0	89	768	806	70	942	61
Grp Sat Flow(s),veh/h/ln	1002	0	0	1670	0	0	557	1683	1765	323	1670	1418
Q Serve(g_s), s	6.1	0.0	0.0	0.0	0.0	0.0	8.7	27.6	27.7	16.8	12.9	1.5
Cycle Q Clear(g_c), s	17.2	0.0	0.0	11.1	0.0	0.0	21.7	27.6	27.7	44.4	12.9	1.5
Prop In Lane	0.92		0.00	0.16		0.78	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	193	0		269	0	0	426	1287	1350	235	2554	1085
V/C Ratio(X)	0.62	0.00		0.52	0.00	0.00	0.21	0.60	0.60	0.30	0.37	0.06
Avail Cap(c_a), veh/h	269	0		357	0	0	426	1287	1350	235	2554	1085
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.9	0.0	0.0	56.3	0.0	0.0	8.9	7.1	7.1	16.7	5.4	4.0
Incr Delay (d2), s/veh	3.2	0.0	0.0	1.6	0.0	0.0	1.1	2.0	2.0	3.2	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	0.0	0.0	5.0	0.0	0.0	1.3	11.5	12.0	1.6	5.1	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.1	0.0	0.0	57.9	0.0	0.0	10.1	9.2	9.1	20.0	5.8	4.1
LnGrp LOS	E	A		E	A	A	B	A	A	B	A	A
Approach Vol, veh/h		119	A		140			1663			1073	
Approach Delay, s/veh		63.1			57.9			9.2			6.6	
Approach LOS		E			E			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		113.1		26.9		113.1		26.9				
Change Period (Y+Rc), s		6.0		* 6.9		6.0		* 6.9				
Max Green Setting (Gmax), s		99.0		* 28		99.0		* 28				
Max Q Clear Time (g_c+I1), s		29.7		19.2		46.4		13.1				
Green Ext Time (p_c), s		56.2		0.8		28.6		1.5				

Intersection Summary	
HCM 6th Ctrl Delay	12.7
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	592	509	376	68	0	310	0	1404	194	166	762	0
Future Volume (veh/h)	592	509	376	68	0	310	0	1404	194	166	762	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1786	1772	1660	0	1772	0	1772	1730	1758	1744	0
Adj Flow Rate, veh/h	658	566	0	76	0	344	0	1560	216	184	847	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	1	2	10	0	2	0	2	5	3	4	0
Cap, veh/h	1450	627		117	0	0	0	1667	505	135	1473	0
Arrive On Green	0.44	0.35	0.00	0.04	0.00	0.00	0.00	0.34	0.34	0.04	0.44	0.00
Sat Flow, veh/h	3274	1786	1502	3066	76		0	4997	1466	3248	3400	0
Grp Volume(v), veh/h	658	566	0	76	67.6		0	1560	216	184	847	0
Grp Sat Flow(s),veh/h/ln	1637	1786	1502	1533	E		0	1612	1466	1624	1657	0
Q Serve(g_s), s	18.2	39.1	0.0	3.2			0.0	40.6	14.7	5.4	24.8	0.0
Cycle Q Clear(g_c), s	18.2	39.1	0.0	3.2			0.0	40.6	14.7	5.4	24.8	0.0
Prop In Lane	1.00		1.00	1.00			0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1450	627		117			0	1667	505	135	1473	0
V/C Ratio(X)	0.45	0.90		0.65			0.00	0.94	0.43	1.36	0.57	0.00
Avail Cap(c_a), veh/h	1450	673		257			0	1667	505	135	1473	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00			0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	25.2	40.1	0.0	61.7			0.0	41.2	32.7	62.3	26.9	0.0
Incr Delay (d2), s/veh	0.2	14.9	0.0	5.9			0.0	11.3	2.6	203.9	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.8	21.1	0.0	1.4			0.0	18.7	6.1	6.1	10.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.5	55.0	0.0	67.6			0.0	52.5	35.4	266.2	28.6	0.0
LnGrp LOS	C	E		E			A	D	D	F	C	A
Approach Vol, veh/h		1224	A					1776			1031	
Approach Delay, s/veh		39.1						50.4			71.0	
Approach LOS		D						D			E	

Timer - Assigned Phs	1	2	3	4	6	7
Phs Duration (G+Y+Rc), s	13.0	52.3	12.1	52.6	65.3	64.7
Change Period (Y+Rc), s	* 7.6	* 7.5	7.1	7.0	* 7.5	7.1
Max Green Setting (Gmax), s	* 5.4	* 36	10.9	49.0	* 49	19.9
Max Q Clear Time (g_c+I1), s	7.4	42.6	5.2	41.1	26.8	20.2
Green Ext Time (p_c), s	0.0	0.0	0.1	4.5	13.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	52.5
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	46	1425	816	45	0	50
Future Vol, veh/h	46	1425	816	45	0	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	450	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	51	1583	907	50	0	56

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	957	0	-	0	-	479
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	714	-	-	-	0	533
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	714	-	-	-	-	533
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	12.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	714	-	-	-	533
HCM Lane V/C Ratio	0.072	-	-	-	0.104
HCM Control Delay (s)	10.4	-	-	-	12.5
HCM Lane LOS	B	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.3

HCM 6th Signalized Intersection Summary
1: Greenbank Rd & Baseline Rd

06-04-2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	121	480	158	380	798	396	168	619	171	348	992	110
Future Volume (veh/h)	121	480	158	380	798	396	168	619	171	348	992	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1786	1772	1800	1786	1786	1786	1772	1772	1772	1786	1786
Adj Flow Rate, veh/h	134	533	176	422	887	0	187	688	0	387	1102	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	1	2	0	1	1	1	2	2	2	1	1
Cap, veh/h	161	636	209	369	916		162	1020		313	1028	
Arrive On Green	0.09	0.25	0.25	0.11	0.27	0.00	0.10	0.30	0.00	0.10	0.30	0.00
Sat Flow, veh/h	1714	2509	825	3326	3393	1514	1701	3367	1502	3274	3393	1514
Grp Volume(v), veh/h	134	360	349	422	887	0	187	688	0	387	1102	0
Grp Sat Flow(s),veh/h/ln	1714	1697	1637	1663	1697	1514	1701	1683	1502	1637	1697	1514
Q Serve(g_s), s	8.4	22.1	22.3	12.2	28.4	0.0	10.5	19.7	0.0	10.5	33.3	0.0
Cycle Q Clear(g_c), s	8.4	22.1	22.3	12.2	28.4	0.0	10.5	19.7	0.0	10.5	33.3	0.0
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	161	430	415	369	916		162	1020		313	1028	
V/C Ratio(X)	0.83	0.84	0.84	1.14	0.97		1.15	0.67		1.24	1.07	
Avail Cap(c_a), veh/h	190	458	442	369	916		162	1020		313	1028	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	49.0	38.9	39.0	48.9	39.7	0.0	49.8	33.6	0.0	49.8	38.3	0.0
Incr Delay (d2), s/veh	22.6	12.2	13.1	92.1	22.2	0.0	117.3	3.6	0.0	131.7	49.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	7.9	7.8	8.6	11.0	0.0	8.7	6.0	0.0	9.0	16.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.5	51.1	52.1	141.0	61.9	0.0	167.0	37.1	0.0	181.4	87.7	0.0
LnGrp LOS	E	D	D	F	E		F	D		F	F	
Approach Vol, veh/h		843			1309	A		875	A		1489	A
Approach Delay, s/veh		54.8			87.4			64.9			112.0	
Approach LOS		D			F			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	39.8	19.0	34.2	17.0	39.8	17.2	36.0
Change Period (Y+Rc), s	6.5	6.5	* 6.8	* 6.3	6.5	6.5	* 6.8	* 6.3
Max Green Setting (Gmax), s	10.5	31.5	* 12	* 30	10.5	31.5	* 12	* 30
Max Q Clear Time (g_c+I1), s	12.5	21.7	14.2	24.3	12.5	35.3	10.4	30.4
Green Ext Time (p_c), s	0.0	6.0	0.0	3.6	0.0	0.0	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	85.1
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	9	64	29	17	72	56	1046	34	125	1357	75
Future Volume (veh/h)	71	9	64	29	17	72	56	1046	34	125	1357	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1758	1800	1800	1758	1800	1800	1758	1772	1800	1772	1786	1688
Adj Flow Rate, veh/h	79	10	0	32	19	80	62	1162	38	139	1508	83
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	0	0	3	0	0	3	2	0	2	1	8
Cap, veh/h	352	41		116	79	242	171	2091	68	265	2133	899
Arrive On Green	0.25	0.25	0.00	0.25	0.25	0.25	0.63	0.63	0.63	0.63	0.63	0.63
Sat Flow, veh/h	1141	161	0	295	312	953	318	3327	109	466	3393	1430
Grp Volume(v), veh/h	89	0	0	131	0	0	62	588	612	139	1508	83
Grp Sat Flow(s),veh/h/ln	1302	0	0	1560	0	0	318	1683	1752	466	1697	1430
Q Serve(g_s), s	0.0	0.0	0.0	0.2	0.0	0.0	17.8	21.9	21.9	26.7	32.7	2.5
Cycle Q Clear(g_c), s	7.0	0.0	0.0	7.1	0.0	0.0	50.5	21.9	21.9	48.6	32.7	2.5
Prop In Lane	0.89		0.00	0.24		0.61	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	393	0		437	0	0	171	1058	1101	265	2133	899
V/C Ratio(X)	0.23	0.00		0.30	0.00	0.00	0.36	0.56	0.56	0.52	0.71	0.09
Avail Cap(c_a), veh/h	394	0		439	0	0	171	1058	1101	265	2133	899
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.1	0.0	0.0	33.3	0.0	0.0	30.5	11.7	11.7	25.6	13.7	8.1
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.4	0.0	0.0	5.9	2.1	2.0	7.2	2.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.0	2.2	0.0	0.0	1.2	3.1	3.2	2.3	4.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.4	0.0	0.0	33.7	0.0	0.0	36.4	13.8	13.7	32.8	15.7	8.3
LnGrp LOS	C	A		C	A	A	D	B	B	C	B	A
Approach Vol, veh/h		89	A		131			1262			1730	
Approach Delay, s/veh		33.4			33.7			14.8			16.7	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	75.1	34.9	75.1	34.9
Change Period (Y+Rc), s	6.0	* 6.9	6.0	* 6.9
Max Green Setting (Gmax), s	69.0	* 28	69.0	* 28
Max Q Clear Time (g_c+I1), s	52.5	9.0	50.6	9.1
Green Ext Time (p_c), s	13.9	1.0	17.1	1.6

Intersection Summary	
HCM 6th Ctrl Delay	17.1
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	444	267	327	231	0	543	0	1049	140	221	925	17
Future Volume (veh/h)	444	267	327	231	0	543	0	1049	140	221	925	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1786	1758	1758	1716	0	1772	0	1772	1730	1758	1772	396
Adj Flow Rate, veh/h	493	297	0	257	0	603	0	1166	156	246	1028	19
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	3	3	6	0	2	0	2	5	3	2	100
Cap, veh/h	1189	364		315	0	0	0	1955	592	210	1783	33
Arrive On Green	0.36	0.21	0.00	0.10	0.00	0.00	0.00	0.40	0.40	0.06	0.53	0.53
Sat Flow, veh/h	3300	1758	1490	3170	257		0	4997	1466	3248	3381	62
Grp Volume(v), veh/h	493	297	0	257	66.7		0	1166	156	246	512	535
Grp Sat Flow(s),veh/h/ln	1650	1758	1490	1585	E		0	1612	1466	1624	1683	1761
Q Serve(g_s), s	14.6	21.0	0.0	10.3			0.0	24.6	9.2	8.4	26.8	26.8
Cycle Q Clear(g_c), s	14.6	21.0	0.0	10.3			0.0	24.6	9.2	8.4	26.8	26.8
Prop In Lane	1.00		1.00	1.00			0.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	1189	364		315			0	1955	592	210	888	928
V/C Ratio(X)	0.41	0.82		0.82			0.00	0.60	0.26	1.17	0.58	0.58
Avail Cap(c_a), veh/h	1189	541		412			0	1955	592	210	888	928
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00			0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.3	49.2	0.0	57.4			0.0	30.4	25.8	60.8	20.9	20.9
Incr Delay (d2), s/veh	0.2	6.0	0.0	9.3			0.0	1.4	1.1	116.4	2.7	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	8.0	0.0	3.8			0.0	6.9	2.5	6.2	6.9	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.5	55.1	0.0	66.7			0.0	31.8	26.9	177.2	23.6	23.5
LnGrp LOS	C	E		E			A	C	C	F	C	C
Approach Vol, veh/h		790	A					1322			1293	
Approach Delay, s/veh		40.4						31.2			52.8	
Approach LOS		D						C			D	

Timer - Assigned Phs	1	2	3	4	6	7
Phs Duration (G+Y+Rc), s	16.0	60.0	20.0	33.9	76.0	54.0
Change Period (Y+Rc), s	* 7.6	* 7.5	7.1	7.0	* 7.5	7.1
Max Green Setting (Gmax), s	* 8.4	* 36	16.9	40.0	* 52	16.9
Max Q Clear Time (g_c+I1), s	10.4	26.6	12.3	23.0	28.8	16.6
Green Ext Time (p_c), s	0.0	7.7	0.6	4.0	15.7	0.1

Intersection Summary	
HCM 6th Ctrl Delay	43.3
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	69	930	1523	61	0	51
Future Vol, veh/h	69	930	1523	61	0	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	450	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	77	1033	1692	68	0	57

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1760	0	-	0	-	880
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	351	-	-	-	0	290
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	351	-	-	-	-	290
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	20.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	351	-	-	-	290
HCM Lane V/C Ratio	0.218	-	-	-	0.195
HCM Control Delay (s)	18.1	-	-	-	20.4
HCM Lane LOS	C	-	-	-	C
HCM 95th %tile Q(veh)	0.8	-	-	-	0.7

Appendix G

MMLOS Analysis

	INTERSECTIONS	Greenbank Road / Baseline Road			
		NORTHBOUND	WESTBOUND	SOUTHBOUND	EASTBOUND
PEDESTRIAN	Lanes	6	6	6	8
	Median	No median	No median	No median	No median
	Island Refuge	No	No	No	No
	Conflicting Left Turns	Protected	Protected	Protected	Protected
	Conflicting Right Turns	Permissive	Permissive	Permissive	Permissive
	RTOR?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed
	Ped Leading Interval ?	Yes	Yes	Yes	Yes
	Corner Radius (largest)	0	3	0	0
	Crosswalk Type	Standard transverse markings	Standard transverse markings	Standard transverse markings	Standard transverse markings
	Level of service	**E (33)**	**E (33)**	**E (33)**	**F (-2)**
		F			
CYCLIST	Type of Bikeway	Mixed Traffic	Mixed Traffic	Mixed Traffic	Bike Lanes
	Turning Speed (25km/h to 80 km/h)	25	25	25	25
	Right Turn Storage Length	Over 50 m	0 to 25 m	Over 50 m	0 to 25 m
	Dual Right Turn ?	No	No	No	No
	Shared Through-Right ?	No	No	No	Yes
	Bike Box ?	No	No	No	No
	Number of Lanes Crossed for Left Turns	2+	2+	2+	2+
	Operating Speed on Approach	60-69 km/h	60-69 km/h	60-69 km/h	60-69 km/h
	Dual Left Turn Lanes ?	No	Yes	Yes	No
	Level of service	**F**	**A**	**F**	**A**
		F			
TRANSIT	Average Signal Delay	no transit priority	≤10	no transit priority	≤10
	Level of service		B		B
		B			
TRUCK	Turning Radius (smallest)	15+ m	10-15 m	15+ m	10-15 m
	Number of Receiving Lanes	2	3	3	2
	Level of service	**A**	**B**	**A**	**B**
		B			
AUTO	**Level of service**	**E**			

	INTERSECTIONS	Greenbank Road / Lisa Ave			
		NORTHBOUND	WESTBOUND	SOUTHBOUND	EASTBOUND
PEDESTRIAN	Lanes	5	2	6	2
	Median	No median	No median	No median	No median
	Island Refuge	No	No	No	No
	Conflicting Left Turns	Permissive	Permissive	Permissive	Permissive
	Conflicting Right Turns	Permissive	Permissive	Permissive	Permissive
	RTOR?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed
	Ped Leading Interval ?	No	No	No	No
	Corner Radius (largest)	0	2	0	0
	Crosswalk Type	Standard transverse markings	Standard transverse markings	Standard transverse markings	Standard transverse markings
	Level of service	**E (38)**	**B (86)**	**F (20)**	**B (85)**
		F			
CYCLIST	Type of Bikeway	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
	Turning Speed (25km/h to 80 km/h)	25	25	25	25
	Right Turn Storage Length	0 to 25 m	0 to 25 m	25 to 50 m	0 to 25 m
	Dual Right Turn ?	No	No	No	No
	Shared Through-Right ?	No	No	No	No
	Bike Box ?	No	No	No	No
	Number of Lanes Crossed for Left Turns	2+	1	2+	1
	Operating Speed on Approach	60-69 km/h	50-59 km/h	60-69 km/h	50-59 km/h
	Dual Left Turn Lanes ?	No	No	No	No
	Level of service	**F**	**A**	**D**	**A**
		F			
TRANSIT	Average Signal Delay	no transit priority	no transit	no transit priority	no transit priority
	Level of service				
TRUCK	Turning Radius (smallest)	10-15 m	0-10 m	10-15 m	10-15 m
	Number of Receiving Lanes	1	2	1	2
	Level of service	**E**	**D**	**E**	**B**
		E			
AUTO	**Level of service**	**A**			

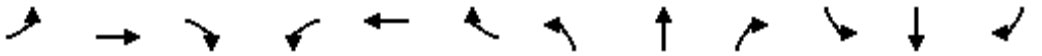
	INTERSECTIONS	Greenbank Road / Iris Street / Highway 417 Ramp			
		NORTHBOUND	WESTBOUND	SOUTHBOUND	EASTBOUND
PEDESTRIAN	Lanes	9	9	NO PEDESTRIAN CROSSING	4
	Median	Median >2.4 m	No median		Median >2.4 m
	Island Refuge	Yes	No		Yes
	Conflicting Left Turns	Protected	Protected		Protected
	Conflicting Right Turns	Permissive	Permissive		No right turn / Prohibited
	RTOR?	RTOR allowed	RTOR allowed		0
	Ped Leading Interval ?	No	No		No
	Corner Radius (largest)	0	3		0
	Crosswalk Type	Standard transverse markings	Standard transverse markings		Standard transverse markings
	Level of service	**F (-8)**	**F (-21)**		**B (78)**
		F			
CYCLIST	Type of Bikeway	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
	Turning Speed (25km/h to 80 km/h)	25	25	25	25
	Right Turn Storage Length	0 to 25 m	0 to 25 m	25 to 50 m	0 to 25 m
	Dual Right Turn ?	No	No	No	No
	Shared Through-Right ?	No	No	No	No
	Bike Box ?	No	No	No	No
	Number of Lanes Crossed for Left Turns	2+	1	2+	1
	Operating Speed on Approach	60-69 km/h	50-59 km/h	60-69 km/h	50-59 km/h
	Dual Left Turn Lanes ?	No	No	No	No
	Level of service	**F**	**A**	**A**	**F**
		F			
TRANSIT	Average Signal Delay	no transit priority	no transit priority	no transit priority	no transit
	Level of service				
TRUCK	Turning Radius (smallest)	10-15 m	15+ m	NO RIGHT TURN	15+ m
	Number of Receiving Lanes	2	3		2
	Level of service	**B**	**A**		**A**
		B			
AUTO	**Level of service**	**C**			

Appendix H

2025 Intersection Operations

HCM 6th Signalized Intersection Summary
1: Greenbank Rd & Baseline Rd

10/21/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	121	747	76	158	397	334	131	1087	340	402	467	65
Future Volume (veh/h)	121	747	76	158	397	334	131	1087	340	402	467	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1969	1969	1953	1938	1953	1938	1969	1953	1984	1953	1922	1906
Adj Flow Rate, veh/h	121	747	76	158	397	0	131	1087	0	402	467	0
Peak Hour 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
Percent Heavy Veh, %	2	2	3	4	3	4	2	3	1	3	5	6
Cap, veh/h	145	844	86	212	846		208	1475		400	1452	
Arrive On Green	0.08	0.25	0.25	0.06	0.23	0.00	0.11	0.40	0.00	0.11	0.40	0.00
Sat Flow, veh/h	1875	3428	349	3580	3711	1642	1875	3711	1682	3609	3652	1616
Grp Volume(v), veh/h	121	407	416	158	397	0	131	1087	0	402	467	0
Grp Sat Flow(s),veh/h/ln	1875	1870	1906	1790	1856	1642	1875	1856	1682	1804	1826	1616
Q Serve(g_s), s	8.9	29.4	29.4	6.1	12.9	0.0	9.4	34.9	0.0	15.5	12.4	0.0
Cycle Q Clear(g_c), s	8.9	29.4	29.4	6.1	12.9	0.0	9.4	34.9	0.0	15.5	12.4	0.0
Prop In Lane	1.00		0.18	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	145	461	469	212	846		208	1475		400	1452	
V/C Ratio(X)	0.83	0.88	0.89	0.75	0.47		0.63	0.74		1.01	0.32	
Avail Cap(c_a), veh/h	150	584	595	286	1158		208	1475		400	1452	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	63.7	50.8	50.9	64.8	46.7	0.0	59.5	35.9	0.0	62.3	29.1	0.0
Incr Delay (d2), s/veh	30.9	12.7	12.6	7.0	0.4	0.0	13.7	3.3	0.0	46.6	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	16.1	16.4	3.1	6.4	0.0	5.4	17.5	0.0	10.0	6.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	94.6	63.5	63.4	71.8	47.1	0.0	73.2	39.3	0.0	108.8	29.7	0.0
LnGrp LOS	F	E	E	E	D		E	D		F	C	
Approach Vol, veh/h		944			555	A		1218	A		869	A
Approach Delay, s/veh		67.5			54.2			42.9			66.3	
Approach LOS		E			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.0	62.1	15.1	40.8	22.0	62.1	17.6	38.2
Change Period (Y+Rc), s	6.5	6.5	* 6.8	* 6.3	6.5	6.5	* 6.8	* 6.3
Max Green Setting (Gmax), s	15.5	43.5	* 11	* 44	15.5	43.5	* 11	* 44
Max Q Clear Time (g_c+I1), s	17.5	36.9	8.1	31.4	11.4	14.4	10.9	14.9
Green Ext Time (p_c), s	0.0	3.1	0.2	3.1	0.2	2.3	0.0	1.9

Intersection Summary	
HCM 6th Ctrl Delay	56.8
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	102	8	39	21	9	101	82	1444	15	65	874	57
Future Volume (veh/h)	102	8	39	21	9	101	82	1444	15	65	874	57
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1891	2000	1953	1922	2000	1938	1953	1969	2000	1953	1953	1860
Adj Flow Rate, veh/h	102	8	0	21	9	101	82	1444	15	65	874	57
Peak Hour 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
Percent Heavy Veh, %	7	0	3	5	0	4	3	2	0	3	3	9
Cap, veh/h	173	12		54	27	173	481	2982	31	288	2918	1239
Arrive On Green	0.12	0.12	0.00	0.12	0.12	0.12	0.79	0.79	0.79	0.79	0.79	0.79
Sat Flow, veh/h	1018	98	0	197	226	1422	596	3793	39	361	3711	1576
Grp Volume(v), veh/h	110	0	0	131	0	0	82	712	747	65	874	57
Grp Sat Flow(s),veh/h/ln	1117	0	0	1845	0	0	596	1870	1962	361	1856	1576
Q Serve(g_s), s	4.6	0.0	0.0	0.0	0.0	0.0	6.2	18.4	18.4	10.6	9.2	1.1
Cycle Q Clear(g_c), s	14.1	0.0	0.0	9.4	0.0	0.0	15.5	18.4	18.4	29.0	9.2	1.1
Prop In Lane	0.93		0.00	0.16		0.77	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	185	0		254	0	0	481	1470	1542	288	2918	1239
V/C Ratio(X)	0.59	0.00		0.52	0.00	0.00	0.17	0.48	0.48	0.23	0.30	0.05
Avail Cap(c_a), veh/h	291	0		386	0	0	481	1470	1542	288	2918	1239
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.7	0.0	0.0	58.3	0.0	0.0	6.3	5.2	5.2	10.2	4.2	3.3
Incr Delay (d2), s/veh	3.0	0.0	0.0	1.6	0.0	0.0	0.8	1.1	1.1	1.8	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	0.0	0.0	4.8	0.0	0.0	1.0	8.2	8.6	1.1	4.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.7	0.0	0.0	59.9	0.0	0.0	7.1	6.3	6.3	12.0	4.5	3.4
LnGrp LOS	E	A		E	A	A	A	A	A	B	A	A
Approach Vol, veh/h		110	A		131			1541			996	
Approach Delay, s/veh		63.7			59.9			6.3			4.9	
Approach LOS		E			E			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	116.1	23.9	116.1	23.9
Change Period (Y+Rc), s	6.0	* 6.9	6.0	* 6.9
Max Green Setting (Gmax), s	99.0	* 28	99.0	* 28
Max Q Clear Time (g_c+I1), s	20.4	16.1	31.0	11.4
Green Ext Time (p_c), s	56.8	1.0	28.8	1.5

Intersection Summary	
HCM 6th Ctrl Delay	10.6
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	596	528	387	70	0	321	0	1446	200	171	785	31
Future Volume (veh/h)	596	528	387	70	0	321	0	1446	200	171	785	31
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1969	1984	1969	1844	0	1969	0	1969	1922	2197	1938	440
Adj Flow Rate, veh/h	596	528	0	70	0	321	0	1446	200	171	785	31
Peak Hour 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
Percent Heavy Veh, %	2	1	2	10	0	2	0	2	5	3	4	100
Cap, veh/h	1474	627		121	0	0	0	2055	623	169	1741	69
Arrive On Green	0.41	0.32	0.00	0.04	0.00	0.00	0.00	0.38	0.38	0.04	0.48	0.48
Sat Flow, veh/h	3638	1984	1668	3407	70		0	5552	1629	4060	3610	143
Grp Volume(v), veh/h	596	528	0	70	66.1		0	1446	200	171	400	416
Grp Sat Flow(s),veh/h/ln	1819	1984	1668	1704	E		0	1792	1629	2030	1841	1912
Q Serve(g_s), s	15.1	32.2	0.0	2.6			0.0	29.6	11.2	5.4	18.7	18.7
Cycle Q Clear(g_c), s	15.1	32.2	0.0	2.6			0.0	29.6	11.2	5.4	18.7	18.7
Prop In Lane	1.00		1.00	1.00			0.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	1474	627		121			0	2055	623	169	888	922
V/C Ratio(X)	0.40	0.84		0.58			0.00	0.70	0.32	1.01	0.45	0.45
Avail Cap(c_a), veh/h	1474	748		286			0	2055	623	169	888	922
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00			0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.5	41.4	0.0	61.7			0.0	33.9	28.3	62.3	22.3	22.3
Incr Delay (d2), s/veh	0.2	7.5	0.0	4.4			0.0	2.0	1.4	73.0	1.7	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	18.2	0.0	1.3			0.0	14.1	5.1	4.6	9.2	9.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.7	48.9	0.0	66.1			0.0	36.0	29.6	135.3	23.9	23.8
LnGrp LOS	C	D		E			A	D	C	F	C	C
Approach Vol, veh/h		1124	A					1646			987	
Approach Delay, s/veh		37.6						35.2			43.2	
Approach LOS		D						D			D	

Timer - Assigned Phs	1	2	3	4		6	7					
Phs Duration (G+Y+Rc), s	13.0	57.2	11.7	48.1		70.2	59.8					
Change Period (Y+Rc), s	* 7.6	* 7.5	7.1	7.0		* 7.5	7.1					
Max Green Setting (Gmax), s	* 5.4	* 36	10.9	49.0		* 49	19.9					
Max Q Clear Time (g_c+I1), s	17.1	31.6	4.6	34.2		20.7	17.1					
Green Ext Time (p_c), s	0.0	3.8	0.1	6.9		14.2	1.0					

Intersection Summary	
HCM 6th Ctrl Delay	38.5
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	53	1436	837	52	0	52
Future Vol, veh/h	53	1436	837	52	0	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	450	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	53	1436	837	52	0	52

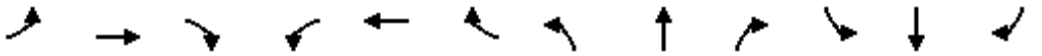
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	889	0	-	0	-	445
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	758	-	-	-	0	561
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	758	-	-	-	-	561
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	12.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	758	-	-	-	561
HCM Lane V/C Ratio	0.07	-	-	-	0.093
HCM Control Delay (s)	10.1	-	-	-	12.1
HCM Lane LOS	B	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.3

HCM 6th Signalized Intersection Summary
1: Greenbank Rd & Baseline Rd

10/21/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	483	158	382	803	408	168	638	172	359	1022	113
Future Volume (veh/h)	125	483	158	382	803	408	168	638	172	359	1022	113
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	2000	1984	1969	2000	1984	1984	1984	1969	1969	1969	1984	1984
Adj Flow Rate, veh/h	125	483	158	382	803	0	168	638	0	359	1022	0
Peak Hour 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
Percent Heavy Veh, %	0	1	2	0	1	1	1	2	2	2	1	1
Cap, veh/h	156	644	209	410	977		180	1220		347	1229	
Arrive On Green	0.08	0.23	0.23	0.11	0.26	0.00	0.10	0.33	0.00	0.10	0.33	0.00
Sat Flow, veh/h	1905	2797	909	3695	3770	1682	1890	3741	1668	3638	3770	1682
Grp Volume(v), veh/h	125	325	316	382	803	0	168	638	0	359	1022	0
Grp Sat Flow(s),veh/h/ln	1905	1885	1821	1848	1885	1682	1890	1870	1668	1819	1885	1682
Q Serve(g_s), s	7.1	17.6	17.8	11.3	22.1	0.0	9.7	15.2	0.0	10.5	27.6	0.0
Cycle Q Clear(g_c), s	7.1	17.6	17.8	11.3	22.1	0.0	9.7	15.2	0.0	10.5	27.6	0.0
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	156	434	419	410	977		180	1220		347	1229	
V/C Ratio(X)	0.80	0.75	0.75	0.93	0.82		0.93	0.52		1.03	0.83	
Avail Cap(c_a), veh/h	211	509	492	410	1018		180	1220		347	1229	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	49.6	39.4	39.4	48.5	38.4	0.0	49.4	30.1	0.0	49.8	34.3	0.0
Incr Delay (d2), s/veh	14.3	5.1	5.6	28.1	5.3	0.0	47.5	1.6	0.0	57.3	6.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	9.2	9.1	7.1	11.5	0.0	7.2	7.6	0.0	7.8	14.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.9	44.4	45.0	76.6	43.7	0.0	96.9	31.7	0.0	107.1	40.9	0.0
LnGrp LOS	E	D	D	E	D		F	C		F	D	
Approach Vol, veh/h		766			1185	A		806	A		1381	A
Approach Delay, s/veh		47.8			54.3			45.3			58.1	
Approach LOS		D			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	42.4	19.0	31.6	17.0	42.4	15.8	34.8
Change Period (Y+Rc), s	6.5	6.5	* 6.8	* 6.3	6.5	6.5	* 6.8	* 6.3
Max Green Setting (Gmax), s	10.5	31.5	* 12	* 30	10.5	31.5	* 12	* 30
Max Q Clear Time (g_c+I1), s	12.5	17.2	13.3	19.8	11.7	29.6	9.1	24.1
Green Ext Time (p_c), s	0.0	7.5	0.0	5.5	0.0	1.7	0.1	4.1

Intersection Summary	
HCM 6th Ctrl Delay	52.6
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	73	9	66	30	20	74	58	1078	35	129	1398	77
Future Volume (veh/h)	73	9	66	30	20	74	58	1078	35	129	1398	77
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1953	2000	2000	1953	2000	2000	1953	1969	2000	1969	1984	1875
Adj Flow Rate, veh/h	73	9	0	30	20	74	58	1078	35	129	1398	77
Peak Hour 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
Percent Heavy Veh, %	3	0	0	3	0	0	3	2	0	2	1	8
Cap, veh/h	371	43		120	94	257	211	2324	75	306	2370	999
Arrive On Green	0.25	0.25	0.00	0.25	0.25	0.25	0.63	0.63	0.63	0.63	0.63	0.63
Sat Flow, veh/h	1216	168	0	314	369	1010	356	3698	120	506	3770	1589
Grp Volume(v), veh/h	82	0	0	124	0	0	58	545	568	129	1398	77
Grp Sat Flow(s),veh/h/ln	1383	0	0	1693	0	0	356	1870	1947	506	1885	1589
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	12.7	16.8	16.8	19.7	24.1	2.1
Cycle Q Clear(g_c), s	5.0	0.0	0.0	6.0	0.0	0.0	36.7	16.8	16.8	36.5	24.1	2.1
Prop In Lane	0.89		0.00	0.24		0.60	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	413	0		471	0	0	211	1176	1224	306	2370	999
V/C Ratio(X)	0.20	0.00		0.26	0.00	0.00	0.27	0.46	0.46	0.42	0.59	0.08
Avail Cap(c_a), veh/h	415	0		473	0	0	211	1176	1224	306	2370	999
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.4	0.0	0.0	32.9	0.0	0.0	22.9	10.7	10.7	20.3	12.1	8.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.3	0.0	0.0	3.2	1.3	1.3	4.2	1.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	0.0	2.9	0.0	0.0	1.3	8.0	8.3	2.9	11.3	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.7	0.0	0.0	33.2	0.0	0.0	26.1	12.0	12.0	24.5	13.1	8.1
LnGrp LOS	C	A		C	A	A	C	B	B	C	B	A
Approach Vol, veh/h		82	A		124			1171			1604	
Approach Delay, s/veh		32.7			33.2			12.7			13.8	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	75.2	34.8	75.2	34.8
Change Period (Y+Rc), s	6.0	* 6.9	6.0	* 6.9
Max Green Setting (Gmax), s	69.0	* 28	69.0	* 28
Max Q Clear Time (g_c+I1), s	38.7	7.0	38.5	8.0
Green Ext Time (p_c), s	21.8	0.9	26.5	1.6

Intersection Summary	
HCM 6th Ctrl Delay	14.7
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	447	277	337	238	0	563	0	1081	144	227	952	0
Future Volume (veh/h)	447	277	337	238	0	563	0	1081	144	227	952	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1984	1953	1953	1906	0	1969	0	1969	1922	1953	1969	0
Adj Flow Rate, veh/h	447	277	0	238	0	563	0	1081	144	227	952	0
Peak Hour 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
Percent Heavy Veh, %	1	3	3	6	0	2	0	2	5	3	2	0
Cap, veh/h	1183	355		306	0	0	0	2376	720	233	2114	0
Arrive On Green	0.32	0.18	0.00	0.09	0.00	0.00	0.00	0.44	0.44	0.06	0.57	0.00
Sat Flow, veh/h	3666	1953	1655	3522	238		0	5552	1629	3609	3839	0
Grp Volume(v), veh/h	447	277	0	238	63.0		0	1081	144	227	952	0
Grp Sat Flow(s),veh/h/ln	1833	1953	1655	1761	E		0	1792	1629	1804	1870	0
Q Serve(g_s), s	12.2	17.6	0.0	8.6			0.0	18.3	7.0	8.2	19.3	0.0
Cycle Q Clear(g_c), s	12.2	17.6	0.0	8.6			0.0	18.3	7.0	8.2	19.3	0.0
Prop In Lane	1.00		1.00	1.00			0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1183	355		306			0	2376	720	233	2114	0
V/C Ratio(X)	0.38	0.78		0.78			0.00	0.46	0.20	0.97	0.45	0.00
Avail Cap(c_a), veh/h	1183	601		458			0	2376	720	233	2114	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00			0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.0	50.7	0.0	58.1			0.0	25.3	22.2	60.7	16.5	0.0
Incr Delay (d2), s/veh	0.2	3.7	0.0	4.8			0.0	0.6	0.6	51.3	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	9.5	0.0	4.3			0.0	8.5	3.1	5.6	9.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.2	54.4	0.0	63.0			0.0	26.0	22.8	112.0	17.2	0.0
LnGrp LOS	C	D		E			A	C	C	F	B	A
Approach Vol, veh/h		724	A					1225			1179	
Approach Delay, s/veh		41.9						25.6			35.4	
Approach LOS		D						C			D	

Timer - Assigned Phs	1	2	3	4		6	7					
Phs Duration (G+Y+Rc), s	16.0	65.0	18.4	30.6		81.0	49.0					
Change Period (Y+Rc), s	* 7.6	* 7.5	7.1	7.0		* 7.5	7.1					
Max Green Setting (Gmax), s	* 8.4	* 36	16.9	40.0		* 52	16.9					
Max Q Clear Time (g_c+I1), s	10.2	20.3	10.6	19.6		21.3	14.2					
Green Ext Time (p_c), s	0.0	12.0	0.7	4.1		18.1	0.7					

Intersection Summary	
HCM 6th Ctrl Delay	35.2
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	80	934	1540	71	0	53
Future Vol, veh/h	80	934	1540	71	0	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	450	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	80	934	1540	71	0	53

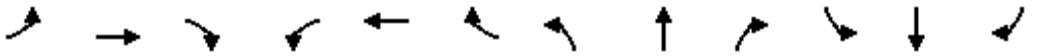
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1611	0	-	0	-	806
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	401	-	-	-	0	325
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	401	-	-	-	-	325
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	18.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	401	-	-	-	325
HCM Lane V/C Ratio	0.2	-	-	-	0.163
HCM Control Delay (s)	16.2	-	-	-	18.2
HCM Lane LOS	C	-	-	-	C
HCM 95th %tile Q(veh)	0.7	-	-	-	0.6

HCM 6th Signalized Intersection Summary
1: Greenbank Rd & Baseline Rd

10/21/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	747	76	158	397	336	131	1089	340	407	471	67
Future Volume (veh/h)	122	747	76	158	397	336	131	1089	340	407	471	67
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1969	1969	1953	1938	1953	1938	1969	1953	1984	1953	1922	1906
Adj Flow Rate, veh/h	122	747	76	158	397	0	131	1089	0	407	471	0
Peak Hour 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
Percent Heavy Veh, %	2	2	3	4	3	4	2	3	1	3	5	6
Cap, veh/h	146	844	86	212	844		208	1475		400	1451	
Arrive On Green	0.08	0.25	0.25	0.06	0.23	0.00	0.11	0.40	0.00	0.11	0.40	0.00
Sat Flow, veh/h	1875	3428	349	3580	3711	1642	1875	3711	1682	3609	3652	1616
Grp Volume(v), veh/h	122	407	416	158	397	0	131	1089	0	407	471	0
Grp Sat Flow(s),veh/h/ln	1875	1870	1906	1790	1856	1642	1875	1856	1682	1804	1826	1616
Q Serve(g_s), s	9.0	29.4	29.4	6.1	13.0	0.0	9.4	35.0	0.0	15.5	12.5	0.0
Cycle Q Clear(g_c), s	9.0	29.4	29.4	6.1	13.0	0.0	9.4	35.0	0.0	15.5	12.5	0.0
Prop In Lane	1.00		0.18	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	146	461	469	212	844		208	1475		400	1451	
V/C Ratio(X)	0.84	0.88	0.89	0.75	0.47		0.63	0.74		1.02	0.32	
Avail Cap(c_a), veh/h	150	584	595	286	1158		208	1475		400	1451	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	63.7	50.8	50.9	64.8	46.8	0.0	59.5	36.0	0.0	62.3	29.2	0.0
Incr Delay (d2), s/veh	31.2	12.7	12.6	7.0	0.4	0.0	13.7	3.3	0.0	49.8	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	16.1	16.4	3.1	6.4	0.0	5.4	17.6	0.0	10.2	6.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	94.9	63.5	63.4	71.8	47.2	0.0	73.2	39.3	0.0	112.1	29.8	0.0
LnGrp LOS	F	E	E	E	D		E	D		F	C	
Approach Vol, veh/h		945			555	A		1220	A		878	A
Approach Delay, s/veh		67.5			54.2			43.0			67.9	
Approach LOS		E			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.0	62.1	15.1	40.8	22.0	62.1	17.7	38.2
Change Period (Y+Rc), s	6.5	6.5	* 6.8	* 6.3	6.5	6.5	* 6.8	* 6.3
Max Green Setting (Gmax), s	15.5	43.5	* 11	* 44	15.5	43.5	* 11	* 44
Max Q Clear Time (g_c+I1), s	17.5	37.0	8.1	31.4	11.4	14.5	11.0	15.0
Green Ext Time (p_c), s	0.0	3.1	0.2	3.1	0.2	2.4	0.0	1.9

Intersection Summary	
HCM 6th Ctrl Delay	57.2
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	102	8	39	32	9	115	82	1444	20	71	874	57
Future Volume (veh/h)	102	8	39	32	9	115	82	1444	20	71	874	57
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1891	2000	1953	1922	2000	1938	1953	1969	2000	1953	1953	1860
Adj Flow Rate, veh/h	102	8	0	32	9	115	82	1444	20	71	874	57
Peak Hour 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
Percent Heavy Veh, %	7	0	3	5	0	4	3	2	0	3	3	9
Cap, veh/h	176	12		68	26	174	525	2952	41	309	2900	1232
Arrive On Green	0.13	0.13	0.00	0.13	0.13	0.13	0.78	0.78	0.78	0.78	0.78	0.78
Sat Flow, veh/h	997	96	0	289	202	1378	663	3777	52	399	3711	1576
Grp Volume(v), veh/h	110	0	0	156	0	0	82	715	749	71	874	57
Grp Sat Flow(s),veh/h/ln	1093	0	0	1869	0	0	663	1870	1959	399	1856	1576
Q Serve(g_s), s	3.7	0.0	0.0	0.0	0.0	0.0	5.6	18.9	18.9	10.7	9.4	1.1
Cycle Q Clear(g_c), s	14.8	0.0	0.0	11.0	0.0	0.0	15.1	18.9	18.9	29.7	9.4	1.1
Prop In Lane	0.93		0.00	0.21		0.74	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	188	0		267	0	0	525	1462	1531	309	2900	1232
V/C Ratio(X)	0.59	0.00		0.58	0.00	0.00	0.16	0.49	0.49	0.23	0.30	0.05
Avail Cap(c_a), veh/h	296	0		393	0	0	525	1462	1531	309	2900	1232
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.6	0.0	0.0	58.4	0.0	0.0	6.5	5.4	5.4	10.7	4.4	3.5
Incr Delay (d2), s/veh	2.9	0.0	0.0	2.0	0.0	0.0	0.6	1.2	1.1	1.7	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	0.0	0.0	5.7	0.0	0.0	1.0	8.5	8.9	1.2	4.1	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.5	0.0	0.0	60.4	0.0	0.0	7.2	6.6	6.5	12.4	4.6	3.5
LnGrp LOS	E	A		E	A	A	A	A	A	B	A	A
Approach Vol, veh/h		110	A		156			1546			1002	
Approach Delay, s/veh		63.5			60.4			6.6			5.1	
Approach LOS		E			E			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	115.4	24.6	115.4	24.6
Change Period (Y+Rc), s	6.0	* 6.9	6.0	* 6.9
Max Green Setting (Gmax), s	99.0	* 28	99.0	* 28
Max Q Clear Time (g_c+I1), s	20.9	16.8	31.7	13.0
Green Ext Time (p_c), s	56.5	0.9	28.6	1.8

Intersection Summary	
HCM 6th Ctrl Delay	11.3
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	596	528	389	70	0	321	0	1458	202	171	789	30
Future Volume (veh/h)	596	528	389	70	0	321	0	1458	202	171	789	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1969	1984	1969	1844	0	1969	0	1969	1922	2197	1938	440
Adj Flow Rate, veh/h	596	528	0	70	0	321	0	1458	202	171	789	30
Peak Hour 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
Percent Heavy Veh, %	2	1	2	10	0	2	0	2	5	3	4	100
Cap, veh/h	1474	627		121	0	0	0	2055	623	169	1744	66
Arrive On Green	0.41	0.32	0.00	0.04	0.00	0.00	0.00	0.38	0.38	0.04	0.48	0.48
Sat Flow, veh/h	3638	1984	1668	3407	70		0	5552	1629	4060	3616	137
Grp Volume(v), veh/h	596	528	0	70	66.1		0	1458	202	171	402	417
Grp Sat Flow(s),veh/h/ln	1819	1984	1668	1704	E		0	1792	1629	2030	1841	1913
Q Serve(g_s), s	15.1	32.2	0.0	2.6			0.0	29.9	11.4	5.4	18.8	18.8
Cycle Q Clear(g_c), s	15.1	32.2	0.0	2.6			0.0	29.9	11.4	5.4	18.8	18.8
Prop In Lane	1.00		1.00	1.00			0.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	1474	627		121			0	2055	623	169	888	923
V/C Ratio(X)	0.40	0.84		0.58			0.00	0.71	0.32	1.01	0.45	0.45
Avail Cap(c_a), veh/h	1474	748		286			0	2055	623	169	888	923
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00			0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.5	41.4	0.0	61.7			0.0	34.0	28.3	62.3	22.3	22.3
Incr Delay (d2), s/veh	0.2	7.5	0.0	4.4			0.0	2.1	1.4	73.0	1.7	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	18.2	0.0	1.3			0.0	14.2	5.1	4.6	9.2	9.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.7	48.9	0.0	66.1			0.0	36.1	29.7	135.3	23.9	23.9
LnGrp LOS	C	D		E			A	D	C	F	C	C
Approach Vol, veh/h		1124	A					1660			990	
Approach Delay, s/veh		37.6						35.3			43.1	
Approach LOS		D						D			D	

Timer - Assigned Phs	1	2	3	4		6	7
Phs Duration (G+Y+Rc), s	13.0	57.2	11.7	48.1		70.2	59.8
Change Period (Y+Rc), s	* 7.6	* 7.5	7.1	7.0		* 7.5	7.1
Max Green Setting (Gmax), s	* 5.4	* 36	10.9	49.0		* 49	19.9
Max Q Clear Time (g_c+I1), s	17.4	31.9	4.6	34.2		20.8	17.1
Green Ext Time (p_c), s	0.0	3.5	0.1	6.9		14.3	1.0

Intersection Summary	
HCM 6th Ctrl Delay	38.6
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	53	1441	839	52	0	52
Future Vol, veh/h	53	1441	839	52	0	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	450	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	53	1441	839	52	0	52

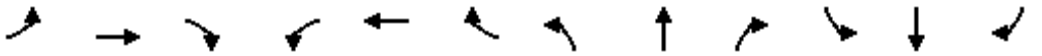
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	891	0	-	0	-	446
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	757	-	-	-	0	560
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	757	-	-	-	-	560
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	12.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	757	-	-	-	560
HCM Lane V/C Ratio	0.07	-	-	-	0.093
HCM Control Delay (s)	10.1	-	-	-	12.1
HCM Lane LOS	B	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.3

HCM 6th Signalized Intersection Summary
1: Greenbank Rd & Baseline Rd

10/21/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	127	483	158	382	803	408	168	641	172	363	1024	114
Future Volume (veh/h)	127	483	158	382	803	408	168	641	172	363	1024	114
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	2000	1984	1969	2000	1984	1984	1984	1969	1969	1969	1984	1984
Adj Flow Rate, veh/h	127	483	158	382	803	0	168	641	0	363	1024	0
Peak Hour 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
Percent Heavy Veh, %	0	1	2	0	1	1	1	2	2	2	1	1
Cap, veh/h	158	644	209	410	973		180	1220		347	1229	
Arrive On Green	0.08	0.23	0.23	0.11	0.26	0.00	0.10	0.33	0.00	0.10	0.33	0.00
Sat Flow, veh/h	1905	2797	909	3695	3770	1682	1890	3741	1668	3638	3770	1682
Grp Volume(v), veh/h	127	325	316	382	803	0	168	641	0	363	1024	0
Grp Sat Flow(s),veh/h/ln	1905	1885	1821	1848	1885	1682	1890	1870	1668	1819	1885	1682
Q Serve(g_s), s	7.2	17.6	17.8	11.3	22.1	0.0	9.7	15.3	0.0	10.5	27.6	0.0
Cycle Q Clear(g_c), s	7.2	17.6	17.8	11.3	22.1	0.0	9.7	15.3	0.0	10.5	27.6	0.0
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	158	434	419	410	973		180	1220		347	1229	
V/C Ratio(X)	0.80	0.75	0.75	0.93	0.83		0.93	0.53		1.05	0.83	
Avail Cap(c_a), veh/h	211	509	492	410	1018		180	1220		347	1229	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	49.5	39.4	39.4	48.5	38.5	0.0	49.4	30.2	0.0	49.8	34.3	0.0
Incr Delay (d2), s/veh	14.8	5.1	5.5	28.1	5.5	0.0	47.5	1.6	0.0	60.7	6.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	7.9	7.7	6.3	9.7	0.0	6.5	6.3	0.0	7.3	12.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.3	44.4	45.0	76.6	43.9	0.0	96.9	31.8	0.0	110.4	41.0	0.0
LnGrp LOS	E	D	D	E	D		F	C		F	D	
Approach Vol, veh/h		768			1185	A		809	A		1387	A
Approach Delay, s/veh		47.9			54.4			45.3			59.2	
Approach LOS		D			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	42.4	19.0	31.6	17.0	42.4	15.9	34.7
Change Period (Y+Rc), s	6.5	6.5	* 6.8	* 6.3	6.5	6.5	* 6.8	* 6.3
Max Green Setting (Gmax), s	10.5	31.5	* 12	* 30	10.5	31.5	* 12	* 30
Max Q Clear Time (g_c+I1), s	12.5	17.3	13.3	19.8	11.7	29.6	9.2	24.1
Green Ext Time (p_c), s	0.0	7.5	0.0	5.5	0.0	1.6	0.1	4.1

Intersection Summary	
HCM 6th Ctrl Delay	53.0
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	73	9	66	37	20	83	58	1078	40	141	1398	77
Future Volume (veh/h)	73	9	66	37	20	83	58	1078	40	141	1398	77
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1953	2000	2000	1953	2000	2000	1953	1969	2000	1969	1984	1875
Adj Flow Rate, veh/h	73	9	0	37	20	83	58	1078	40	141	1398	77
Peak Hour 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
Percent Heavy Veh, %	3	0	0	3	0	0	3	2	0	2	1	8
Cap, veh/h	386	44		133	86	260	227	2312	86	331	2370	999
Arrive On Green	0.25	0.25	0.00	0.25	0.25	0.25	0.63	0.63	0.63	0.63	0.63	0.63
Sat Flow, veh/h	1275	175	0	361	340	1021	395	3678	136	560	3770	1589
Grp Volume(v), veh/h	82	0	0	140	0	0	58	548	570	141	1398	77
Grp Sat Flow(s),veh/h/ln	1450	0	0	1723	0	0	395	1870	1944	560	1885	1589
Q Serve(g_s), s	0.0	0.0	0.0	1.4	0.0	0.0	11.2	16.9	16.9	19.5	24.1	2.1
Cycle Q Clear(g_c), s	5.5	0.0	0.0	7.0	0.0	0.0	35.3	16.9	16.9	36.4	24.1	2.1
Prop In Lane	0.89		0.00	0.26		0.59	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	430	0		479	0	0	227	1175	1222	331	2370	999
V/C Ratio(X)	0.19	0.00		0.29	0.00	0.00	0.26	0.47	0.47	0.43	0.59	0.08
Avail Cap(c_a), veh/h	432	0		481	0	0	227	1175	1222	331	2370	999
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.6	0.0	0.0	33.2	0.0	0.0	22.5	10.7	10.7	20.3	12.1	8.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.3	0.0	0.0	2.7	1.3	1.3	4.0	1.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	0.0	2.8	0.0	0.0	1.1	5.3	5.5	2.4	7.3	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.8	0.0	0.0	33.5	0.0	0.0	25.2	12.1	12.0	24.3	13.2	8.1
LnGrp LOS	C	A		C	A	A	C	B	B	C	B	A
Approach Vol, veh/h		82	A		140			1176			1616	
Approach Delay, s/veh		32.8			33.5			12.7			13.9	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	75.1	34.9	75.1	34.9
Change Period (Y+Rc), s	6.0	* 6.9	6.0	* 6.9
Max Green Setting (Gmax), s	69.0	* 28	69.0	* 28
Max Q Clear Time (g_c+I1), s	37.3	7.5	38.4	9.0
Green Ext Time (p_c), s	22.5	0.9	26.5	1.8

Intersection Summary	
HCM 6th Ctrl Delay	14.8
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	447	277	340	240	0	563	0	1089	145	227	959	0
Future Volume (veh/h)	447	277	340	240	0	563	0	1089	145	227	959	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1984	1953	1953	1906	0	1969	0	1969	1922	1953	1969	0
Adj Flow Rate, veh/h	447	277	0	240	0	563	0	1089	145	227	959	0
Peak Hour 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
Percent Heavy Veh, %	1	3	3	6	0	2	0	2	5	3	2	0
Cap, veh/h	1185	355		308	0	0	0	2373	719	233	2112	0
Arrive On Green	0.32	0.18	0.00	0.09	0.00	0.00	0.00	0.44	0.44	0.06	0.56	0.00
Sat Flow, veh/h	3666	1953	1655	3522	240		0	5552	1629	3609	3839	0
Grp Volume(v), veh/h	447	277	0	240	63.1		0	1089	145	227	959	0
Grp Sat Flow(s),veh/h/ln	1833	1953	1655	1761	E		0	1792	1629	1804	1870	0
Q Serve(g_s), s	12.2	17.6	0.0	8.7			0.0	18.5	7.1	8.2	19.5	0.0
Cycle Q Clear(g_c), s	12.2	17.6	0.0	8.7			0.0	18.5	7.1	8.2	19.5	0.0
Prop In Lane	1.00		1.00	1.00			0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1185	355		308			0	2373	719	233	2112	0
V/C Ratio(X)	0.38	0.78		0.78			0.00	0.46	0.20	0.97	0.45	0.00
Avail Cap(c_a), veh/h	1185	601		458			0	2373	719	233	2112	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00			0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.9	50.7	0.0	58.1			0.0	25.4	22.3	60.7	16.6	0.0
Incr Delay (d2), s/veh	0.2	3.7	0.0	5.0			0.0	0.6	0.6	51.3	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	8.5	0.0	3.9			0.0	7.0	2.6	5.1	7.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.1	54.4	0.0	63.1			0.0	26.1	22.9	112.0	17.3	0.0
LnGrp LOS	C	D		E			A	C	C	F	B	A
Approach Vol, veh/h		724	A					1234			1186	
Approach Delay, s/veh		41.9						25.7			35.4	
Approach LOS		D						C			D	

Timer - Assigned Phs	1	2	3	4		6	7
Phs Duration (G+Y+Rc), s	16.0	64.9	18.5	30.6		80.9	49.1
Change Period (Y+Rc), s	* 7.6	* 7.5	7.1	7.0		* 7.5	7.1
Max Green Setting (Gmax), s	* 8.4	* 36	16.9	40.0		* 52	16.9
Max Q Clear Time (g_c+I1), s	10.2	20.5	10.7	19.6		21.5	14.2
Green Ext Time (p_c), s	0.0	11.9	0.7	4.1		18.1	0.7

Intersection Summary	
HCM 6th Ctrl Delay	35.2
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	80	938	1540	75	0	53
Future Vol, veh/h	80	938	1540	75	0	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	450	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	80	938	1540	75	0	53

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1615	0	-	0	-	808
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	400	-	-	-	0	324
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	400	-	-	-	-	324
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	18.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	400	-	-	-	324
HCM Lane V/C Ratio	0.2	-	-	-	0.164
HCM Control Delay (s)	16.2	-	-	-	18.3
HCM Lane LOS	C	-	-	-	C
HCM 95th %tile Q(veh)	0.7	-	-	-	0.6

Appendix I

2030 Intersection Operations

HCM 6th Signalized Intersection Summary
1: Greenbank Rd & Baseline Rd

10/21/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	124	751	76	159	407	342	131	1114	342	412	479	67
Future Volume (veh/h)	124	751	76	159	407	342	131	1114	342	412	479	67
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1969	1969	1953	1938	1953	1938	1969	1953	1984	1953	1922	1906
Adj Flow Rate, veh/h	124	751	76	159	407	0	131	1114	0	412	479	0
Peak Hour 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
Percent Heavy Veh, %	2	2	3	4	3	4	2	3	1	3	5	6
Cap, veh/h	148	848	86	213	845		208	1470		400	1447	
Arrive On Green	0.08	0.25	0.25	0.06	0.23	0.00	0.11	0.40	0.00	0.11	0.40	0.00
Sat Flow, veh/h	1875	3430	347	3580	3711	1642	1875	3711	1682	3609	3652	1616
Grp Volume(v), veh/h	124	409	418	159	407	0	131	1114	0	412	479	0
Grp Sat Flow(s),veh/h/ln	1875	1870	1906	1790	1856	1642	1875	1856	1682	1804	1826	1616
Q Serve(g_s), s	9.1	29.5	29.6	6.1	13.3	0.0	9.4	36.3	0.0	15.5	12.8	0.0
Cycle Q Clear(g_c), s	9.1	29.5	29.6	6.1	13.3	0.0	9.4	36.3	0.0	15.5	12.8	0.0
Prop In Lane	1.00		0.18	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	148	462	471	213	845		208	1470		400	1447	
V/C Ratio(X)	0.84	0.89	0.89	0.75	0.48		0.63	0.76		1.03	0.33	
Avail Cap(c_a), veh/h	150	584	595	286	1158		208	1470		400	1447	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	63.6	50.8	50.8	64.8	46.9	0.0	59.5	36.5	0.0	62.3	29.4	0.0
Incr Delay (d2), s/veh	31.9	12.8	12.7	7.1	0.4	0.0	13.7	3.7	0.0	53.3	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	16.2	16.5	3.1	6.6	0.0	5.4	18.2	0.0	10.4	6.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	95.5	63.6	63.4	71.9	47.3	0.0	73.2	40.2	0.0	115.5	30.0	0.0
LnGrp LOS	F	E	E	E	D		E	D		F	C	
Approach Vol, veh/h		951			566	A		1245	A		891	A
Approach Delay, s/veh		67.7			54.2			43.6			69.5	
Approach LOS		E			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.0	62.0	15.1	40.9	22.0	62.0	17.8	38.2
Change Period (Y+Rc), s	6.5	6.5	* 6.8	* 6.3	6.5	6.5	* 6.8	* 6.3
Max Green Setting (Gmax), s	15.5	43.5	* 11	* 44	15.5	43.5	* 11	* 44
Max Q Clear Time (g_c+I1), s	17.5	38.3	8.1	31.6	11.4	14.8	11.1	15.3
Green Ext Time (p_c), s	0.0	2.7	0.2	3.1	0.2	2.4	0.0	2.0

Intersection Summary	
HCM 6th Ctrl Delay	57.9
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	9	40	21	10	104	85	1480	16	67	896	58
Future Volume (veh/h)	105	9	40	21	10	104	85	1480	16	67	896	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1891	2000	1953	1922	2000	1938	1953	1969	2000	1953	1953	1860
Adj Flow Rate, veh/h	105	9	0	21	10	104	85	1480	16	67	896	58
Peak Hour 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
Percent Heavy Veh, %	7	0	3	5	0	4	3	2	0	3	3	9
Cap, veh/h	179	13		53	29	176	516	2974	32	302	2912	1236
Arrive On Green	0.12	0.12	0.00	0.12	0.12	0.12	0.78	0.78	0.78	0.78	0.78	0.78
Sat Flow, veh/h	1053	107	0	191	233	1425	648	3791	41	387	3711	1576
Grp Volume(v), veh/h	114	0	0	135	0	0	85	730	766	67	896	58
Grp Sat Flow(s),veh/h/ln	1160	0	0	1849	0	0	648	1870	1961	387	1856	1576
Q Serve(g_s), s	4.5	0.0	0.0	0.0	0.0	0.0	6.0	19.3	19.3	10.4	9.6	1.2
Cycle Q Clear(g_c), s	14.3	0.0	0.0	9.7	0.0	0.0	15.6	19.3	19.3	29.7	9.6	1.2
Prop In Lane	0.92		0.00	0.16		0.77	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	192	0		258	0	0	516	1467	1539	302	2912	1236
V/C Ratio(X)	0.59	0.00		0.52	0.00	0.00	0.16	0.50	0.50	0.22	0.31	0.05
Avail Cap(c_a), veh/h	307	0		389	0	0	516	1467	1539	302	2912	1236
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.8	0.0	0.0	58.2	0.0	0.0	6.5	5.3	5.3	10.6	4.3	3.4
Incr Delay (d2), s/veh	2.9	0.0	0.0	1.6	0.0	0.0	0.7	1.2	1.2	1.7	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	0.0	0.0	4.9	0.0	0.0	1.0	8.7	9.1	1.1	4.1	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.7	0.0	0.0	59.8	0.0	0.0	7.2	6.5	6.5	12.3	4.6	3.4
LnGrp LOS	E	A		E	A	A	A	A	A	B	A	A
Approach Vol, veh/h		114	A		135			1581			1021	
Approach Delay, s/veh		63.7			59.8			6.5			5.0	
Approach LOS		E			E			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	115.8	24.2	115.8	24.2
Change Period (Y+Rc), s	6.0	* 6.9	6.0	* 6.9
Max Green Setting (Gmax), s	99.0	* 28	99.0	* 28
Max Q Clear Time (g_c+I1), s	21.3	16.3	31.7	11.7
Green Ext Time (p_c), s	57.8	1.0	29.5	1.6

Intersection Summary	
HCM 6th Ctrl Delay	10.8
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	599	544	397	72	0	331	0	1484	205	175	805	0
Future Volume (veh/h)	599	544	397	72	0	331	0	1484	205	175	805	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1969	1984	1969	1844	0	1969	0	1969	1922	2197	1938	0
Adj Flow Rate, veh/h	599	544	0	72	0	331	0	1484	205	175	805	0
Peak Hour 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
Percent Heavy Veh, %	2	1	2	10	0	2	0	2	5	3	4	0
Cap, veh/h	1500	641		121	0	0	0	2018	611	169	1750	0
Arrive On Green	0.41	0.32	0.00	0.04	0.00	0.00	0.00	0.38	0.38	0.04	0.48	0.00
Sat Flow, veh/h	3638	1984	1668	3407	72		0	5552	1629	4060	3778	0
Grp Volume(v), veh/h	599	544	0	72	66.3		0	1484	205	175	805	0
Grp Sat Flow(s),veh/h/ln	1819	1984	1668	1704	E		0	1792	1629	2030	1841	0
Q Serve(g_s), s	15.1	33.2	0.0	2.7			0.0	31.0	11.7	5.4	19.1	0.0
Cycle Q Clear(g_c), s	15.1	33.2	0.0	2.7			0.0	31.0	11.7	5.4	19.1	0.0
Prop In Lane	1.00		1.00	1.00			0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1500	641		121			0	2018	611	169	1750	0
V/C Ratio(X)	0.40	0.85		0.59			0.00	0.74	0.34	1.04	0.46	0.00
Avail Cap(c_a), veh/h	1500	748		286			0	2018	611	169	1750	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00			0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.9	41.1	0.0	61.8			0.0	35.0	29.0	62.3	22.9	0.0
Incr Delay (d2), s/veh	0.2	8.1	0.0	4.6			0.0	2.4	1.5	79.6	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	18.9	0.0	1.3			0.0	14.8	5.3	4.8	9.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.1	49.2	0.0	66.3			0.0	37.5	30.5	141.9	23.8	0.0
LnGrp LOS	C	D		E			A	D	C	F	C	A
Approach Vol, veh/h		1143	A					1689			980	
Approach Delay, s/veh		37.6						36.6			44.9	
Approach LOS		D						D			D	

Timer - Assigned Phs	1	2	3	4		6	7
Phs Duration (G+Y+Rc), s	13.0	56.3	11.7	49.0		69.3	60.7
Change Period (Y+Rc), s	* 7.6	* 7.5	7.1	7.0		* 7.5	7.1
Max Green Setting (Gmax), s	* 5.4	* 36	10.9	49.0		* 49	19.9
Max Q Clear Time (g_c+I1), s	17.1	33.0	4.7	35.2		21.1	17.1
Green Ext Time (p_c), s	0.0	2.4	0.1	6.7		14.4	1.1

Intersection Summary	
HCM 6th Ctrl Delay	39.5
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	60	1445	854	59	0	54
Future Vol, veh/h	60	1445	854	59	0	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	450	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	60	1445	854	59	0	54

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	913	0	-	0	-	457
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	742	-	-	-	0	551
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	742	-	-	-	-	551
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	12.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	742	-	-	-	551
HCM Lane V/C Ratio	0.081	-	-	-	0.098
HCM Control Delay (s)	10.3	-	-	-	12.2
HCM Lane LOS	B	-	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.3

HCM 6th Signalized Intersection Summary
1: Greenbank Rd & Baseline Rd

10/21/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	128	485	158	384	807	418	168	654	173	368	1048	116
Future Volume (veh/h)	128	485	158	384	807	418	168	654	173	368	1048	116
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	2000	1984	1969	2000	1984	1984	1984	1969	1969	1969	1984	1984
Adj Flow Rate, veh/h	128	485	158	384	807	0	168	654	0	368	1048	0
Peak Hour 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
Percent Heavy Veh, %	0	1	2	0	1	1	1	2	2	2	1	1
Cap, veh/h	159	646	209	410	973		180	1218		347	1228	
Arrive On Green	0.08	0.23	0.23	0.11	0.26	0.00	0.10	0.33	0.00	0.10	0.33	0.00
Sat Flow, veh/h	1905	2800	906	3695	3770	1682	1890	3741	1668	3638	3770	1682
Grp Volume(v), veh/h	128	326	317	384	807	0	168	654	0	368	1048	0
Grp Sat Flow(s),veh/h/ln	1905	1885	1821	1848	1885	1682	1890	1870	1668	1819	1885	1682
Q Serve(g_s), s	7.3	17.7	17.9	11.3	22.2	0.0	9.7	15.7	0.0	10.5	28.6	0.0
Cycle Q Clear(g_c), s	7.3	17.7	17.9	11.3	22.2	0.0	9.7	15.7	0.0	10.5	28.6	0.0
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	159	435	420	410	973		180	1218		347	1228	
V/C Ratio(X)	0.80	0.75	0.76	0.94	0.83		0.93	0.54		1.06	0.85	
Avail Cap(c_a), veh/h	211	509	492	410	1018		180	1218		347	1228	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	49.5	39.3	39.4	48.5	38.5	0.0	49.4	30.3	0.0	49.8	34.6	0.0
Incr Delay (d2), s/veh	15.0	5.1	5.6	29.1	5.7	0.0	47.5	1.7	0.0	65.0	7.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	7.9	7.8	6.4	9.8	0.0	6.5	6.4	0.0	7.5	12.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.5	44.5	45.0	77.6	44.2	0.0	96.9	32.0	0.0	114.7	42.3	0.0
LnGrp LOS	E	D	D	E	D		F	C		F	D	
Approach Vol, veh/h		771			1191	A		822	A		1416	A
Approach Delay, s/veh		48.0			55.0			45.3			61.1	
Approach LOS		D			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	42.3	19.0	31.7	17.0	42.3	16.0	34.7
Change Period (Y+Rc), s	6.5	6.5	* 6.8	* 6.3	6.5	6.5	* 6.8	* 6.3
Max Green Setting (Gmax), s	10.5	31.5	* 12	* 30	10.5	31.5	* 12	* 30
Max Q Clear Time (g_c+I1), s	12.5	17.7	13.3	19.9	11.7	30.6	9.3	24.2
Green Ext Time (p_c), s	0.0	7.4	0.0	5.5	0.0	0.8	0.1	4.0

Intersection Summary	
HCM 6th Ctrl Delay	53.9
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	10	68	31	22	76	59	1105	36	132	1434	79
Future Volume (veh/h)	75	10	68	31	22	76	59	1105	36	132	1434	79
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1953	2000	2000	1953	2000	2000	1953	1969	2000	1969	1984	1875
Adj Flow Rate, veh/h	75	10	0	31	22	76	59	1105	36	132	1434	79
Peak Hour 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
Percent Heavy Veh, %	3	0	0	3	0	0	3	2	0	2	1	8
Cap, veh/h	390	49		122	100	259	218	2324	76	323	2370	999
Arrive On Green	0.25	0.25	0.00	0.25	0.25	0.25	0.63	0.63	0.63	0.63	0.63	0.63
Sat Flow, veh/h	1292	191	0	320	392	1021	381	3697	120	548	3770	1589
Grp Volume(v), veh/h	85	0	0	129	0	0	59	559	582	132	1434	79
Grp Sat Flow(s),veh/h/ln	1483	0	0	1733	0	0	381	1870	1947	548	1885	1589
Q Serve(g_s), s	0.0	0.0	0.0	0.1	0.0	0.0	12.1	17.4	17.4	18.5	25.1	2.1
Cycle Q Clear(g_c), s	5.4	0.0	0.0	6.3	0.0	0.0	37.2	17.4	17.4	35.9	25.1	2.1
Prop In Lane	0.88		0.00	0.24		0.59	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	439	0		481	0	0	218	1176	1224	323	2370	999
V/C Ratio(X)	0.19	0.00		0.27	0.00	0.00	0.27	0.48	0.48	0.41	0.61	0.08
Avail Cap(c_a), veh/h	440	0		483	0	0	218	1176	1224	323	2370	999
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.5	0.0	0.0	32.9	0.0	0.0	23.4	10.8	10.8	20.3	12.2	8.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.3	0.0	0.0	3.0	1.4	1.3	3.8	1.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	0.0	2.6	0.0	0.0	1.1	5.5	5.7	2.3	7.7	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.8	0.0	0.0	33.2	0.0	0.0	26.4	12.2	12.2	24.1	13.4	8.1
LnGrp LOS	C	A		C	A	A	C	B	B	C	B	A
Approach Vol, veh/h		85	A		129			1200			1645	
Approach Delay, s/veh		32.8			33.2			12.9			14.0	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	75.1	34.9	75.1	34.9
Change Period (Y+Rc), s	6.0	* 6.9	6.0	* 6.9
Max Green Setting (Gmax), s	69.0	* 28	69.0	* 28
Max Q Clear Time (g_c+I1), s	39.2	7.4	37.9	8.3
Green Ext Time (p_c), s	21.9	1.0	27.2	1.6

Intersection Summary	
HCM 6th Ctrl Delay	14.9
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	449	285	345	244	0	580	0	1108	148	232	976	17
Future Volume (veh/h)	449	285	345	244	0	580	0	1108	148	232	976	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1984	1953	1953	1906	0	1969	0	1969	1922	1953	1969	440
Adj Flow Rate, veh/h	449	285	0	244	0	580	0	1108	148	232	976	17
Peak Hour 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
Percent Heavy Veh, %	1	3	3	6	0	2	0	2	5	3	2	100
Cap, veh/h	1205	364		312	0	0	0	2343	710	233	2103	37
Arrive On Green	0.33	0.19	0.00	0.09	0.00	0.00	0.00	0.44	0.44	0.06	0.56	0.56
Sat Flow, veh/h	3666	1953	1655	3522	244		0	5552	1629	3609	3762	66
Grp Volume(v), veh/h	449	285	0	244	63.3		0	1108	148	232	485	508
Grp Sat Flow(s),veh/h/ln	1833	1953	1655	1761	E		0	1792	1629	1804	1870	1957
Q Serve(g_s), s	12.2	18.1	0.0	8.8			0.0	19.0	7.3	8.4	20.1	20.1
Cycle Q Clear(g_c), s	12.2	18.1	0.0	8.8			0.0	19.0	7.3	8.4	20.1	20.1
Prop In Lane	1.00		1.00	1.00			0.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	1205	364		312			0	2343	710	233	1045	1094
V/C Ratio(X)	0.37	0.78		0.78			0.00	0.47	0.21	0.99	0.46	0.46
Avail Cap(c_a), veh/h	1205	601		458			0	2343	710	233	1045	1094
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00			0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.4	50.4	0.0	58.0			0.0	26.1	22.8	60.8	17.1	17.1
Incr Delay (d2), s/veh	0.2	3.7	0.0	5.3			0.0	0.7	0.7	57.4	1.5	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	8.7	0.0	4.0			0.0	7.3	2.7	5.4	7.6	7.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.6	54.1	0.0	63.3			0.0	26.7	23.4	118.2	18.6	18.5
LnGrp LOS	C	D		E			A	C	C	F	B	B
Approach Vol, veh/h		734	A					1256			1225	
Approach Delay, s/veh		41.5						26.4			37.4	
Approach LOS		D						C			D	

Timer - Assigned Phs	1	2	3	4		6	7					
Phs Duration (G+Y+Rc), s	16.0	64.2	18.6	31.2		80.2	49.8					
Change Period (Y+Rc), s	* 7.6	* 7.5	7.1	7.0		* 7.5	7.1					
Max Green Setting (Gmax), s	* 8.4	* 36	16.9	40.0		* 52	16.9					
Max Q Clear Time (g_c+I1), s	10.4	21.0	10.8	20.1		22.1	14.2					
Green Ext Time (p_c), s	0.0	11.6	0.7	4.1		18.0	0.8					

Intersection Summary	
HCM 6th Ctrl Delay	36.1
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	91	935	1554	80	0	55
Future Vol, veh/h	91	935	1554	80	0	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	450	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	91	935	1554	80	0	55

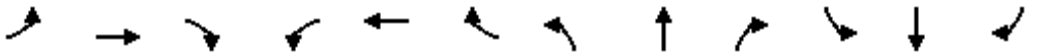
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1634	0	-	0	-	817
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	393	-	-	-	0	320
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	393	-	-	-	-	320
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	1.5	0	18.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	393	-	-	-	320
HCM Lane V/C Ratio	0.232	-	-	-	0.172
HCM Control Delay (s)	16.9	-	-	-	18.6
HCM Lane LOS	C	-	-	-	C
HCM 95th %tile Q(veh)	0.9	-	-	-	0.6

HCM 6th Signalized Intersection Summary
1: Greenbank Rd & Baseline Rd

10/21/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	751	76	159	407	344	131	1116	342	417	483	69
Future Volume (veh/h)	125	751	76	159	407	344	131	1116	342	417	483	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1969	1969	1953	1938	1953	1938	1969	1953	1984	1953	1922	1906
Adj Flow Rate, veh/h	125	751	76	159	407	0	131	1116	0	417	483	0
Peak Hour 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
Percent Heavy Veh, %	2	2	3	4	3	4	2	3	1	3	5	6
Cap, veh/h	149	848	86	213	843		208	1470		400	1447	
Arrive On Green	0.08	0.25	0.25	0.06	0.23	0.00	0.11	0.40	0.00	0.11	0.40	0.00
Sat Flow, veh/h	1875	3430	347	3580	3711	1642	1875	3711	1682	3609	3652	1616
Grp Volume(v), veh/h	125	409	418	159	407	0	131	1116	0	417	483	0
Grp Sat Flow(s),veh/h/ln	1875	1870	1906	1790	1856	1642	1875	1856	1682	1804	1826	1616
Q Serve(g_s), s	9.2	29.5	29.6	6.1	13.3	0.0	9.4	36.4	0.0	15.5	12.9	0.0
Cycle Q Clear(g_c), s	9.2	29.5	29.6	6.1	13.3	0.0	9.4	36.4	0.0	15.5	12.9	0.0
Prop In Lane	1.00		0.18	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	149	462	471	213	843		208	1470		400	1447	
V/C Ratio(X)	0.84	0.89	0.89	0.75	0.48		0.63	0.76		1.04	0.33	
Avail Cap(c_a), veh/h	150	584	595	286	1158		208	1470		400	1447	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	63.6	50.8	50.8	64.8	46.9	0.0	59.5	36.5	0.0	62.3	29.4	0.0
Incr Delay (d2), s/veh	32.3	12.8	12.7	7.1	0.4	0.0	13.7	3.7	0.0	56.9	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	16.2	16.5	3.1	6.6	0.0	5.4	18.3	0.0	10.6	6.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	95.8	63.6	63.4	71.9	47.4	0.0	73.2	40.2	0.0	119.1	30.0	0.0
LnGrp LOS	F	E	E	E	D		E	D		F	C	
Approach Vol, veh/h		952			566	A		1247	A		900	A
Approach Delay, s/veh		67.8			54.3			43.7			71.3	
Approach LOS		E			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.0	62.0	15.1	40.9	22.0	62.0	17.9	38.1
Change Period (Y+Rc), s	6.5	6.5	* 6.8	* 6.3	6.5	6.5	* 6.8	* 6.3
Max Green Setting (Gmax), s	15.5	43.5	* 11	* 44	15.5	43.5	* 11	* 44
Max Q Clear Time (g_c+I1), s	17.5	38.4	8.1	31.6	11.4	14.9	11.2	15.3
Green Ext Time (p_c), s	0.0	2.7	0.2	3.1	0.2	2.4	0.0	2.0

Intersection Summary	
HCM 6th Ctrl Delay	58.4
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	9	40	32	10	118	85	1480	21	73	896	58
Future Volume (veh/h)	105	9	40	32	10	118	85	1480	21	73	896	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1891	2000	1953	1922	2000	1938	1953	1969	2000	1953	1953	1860
Adj Flow Rate, veh/h	105	9	0	32	10	118	85	1480	21	73	896	58
Peak Hour 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
Percent Heavy Veh, %	7	0	3	5	0	4	3	2	0	3	3	9
Cap, veh/h	178	13		68	27	180	509	2935	42	296	2884	1225
Arrive On Green	0.13	0.13	0.00	0.13	0.13	0.13	0.78	0.78	0.78	0.78	0.78	0.78
Sat Flow, veh/h	984	103	0	281	210	1378	648	3776	54	385	3711	1576
Grp Volume(v), veh/h	114	0	0	160	0	0	85	733	768	73	896	58
Grp Sat Flow(s),veh/h/ln	1088	0	0	1869	0	0	648	1870	1959	385	1856	1576
Q Serve(g_s), s	4.0	0.0	0.0	0.0	0.0	0.0	6.2	20.1	20.1	12.0	9.9	1.2
Cycle Q Clear(g_c), s	15.4	0.0	0.0	11.3	0.0	0.0	16.1	20.1	20.1	32.1	9.9	1.2
Prop In Lane	0.92		0.00	0.20		0.74	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	191	0		275	0	0	509	1454	1523	296	2884	1225
V/C Ratio(X)	0.60	0.00		0.58	0.00	0.00	0.17	0.50	0.50	0.25	0.31	0.05
Avail Cap(c_a), veh/h	294	0		393	0	0	509	1454	1523	296	2884	1225
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.4	0.0	0.0	58.0	0.0	0.0	6.9	5.7	5.7	11.6	4.6	3.6
Incr Delay (d2), s/veh	2.9	0.0	0.0	1.9	0.0	0.0	0.7	1.3	1.2	2.0	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	0.0	0.0	5.9	0.0	0.0	1.1	9.1	9.5	1.3	4.3	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.3	0.0	0.0	59.9	0.0	0.0	7.7	7.0	6.9	13.6	4.9	3.7
LnGrp LOS	E	A		E	A	A	A	A	A	B	A	A
Approach Vol, veh/h		114	A		160			1586			1027	
Approach Delay, s/veh		63.3			59.9			7.0			5.4	
Approach LOS		E			E			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	114.8	25.2	114.8	25.2
Change Period (Y+Rc), s	6.0	* 6.9	6.0	* 6.9
Max Green Setting (Gmax), s	99.0	* 28	99.0	* 28
Max Q Clear Time (g_c+I1), s	22.1	17.4	34.1	13.3
Green Ext Time (p_c), s	57.6	0.9	29.4	1.8

Intersection Summary	
HCM 6th Ctrl Delay	11.6
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	599	544	399	72	0	331	0	1496	207	175	809	0
Future Volume (veh/h)	599	544	399	72	0	331	0	1496	207	175	809	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1969	1984	1969	1844	0	1969	0	1969	1922	2197	1938	0
Adj Flow Rate, veh/h	599	544	0	72	0	331	0	1496	207	175	809	0
Peak Hour 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
Percent Heavy Veh, %	2	1	2	10	0	2	0	2	5	3	4	0
Cap, veh/h	1500	641		121	0	0	0	2018	611	169	1750	0
Arrive On Green	0.41	0.32	0.00	0.04	0.00	0.00	0.00	0.38	0.38	0.04	0.48	0.00
Sat Flow, veh/h	3638	1984	1668	3407	72		0	5552	1629	4060	3778	0
Grp Volume(v), veh/h	599	544	0	72	66.3		0	1496	207	175	809	0
Grp Sat Flow(s),veh/h/ln	1819	1984	1668	1704	E		0	1792	1629	2030	1841	0
Q Serve(g_s), s	15.1	33.2	0.0	2.7			0.0	31.3	11.8	5.4	19.2	0.0
Cycle Q Clear(g_c), s	15.1	33.2	0.0	2.7			0.0	31.3	11.8	5.4	19.2	0.0
Prop In Lane	1.00		1.00	1.00			0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1500	641		121			0	2018	611	169	1750	0
V/C Ratio(X)	0.40	0.85		0.59			0.00	0.74	0.34	1.04	0.46	0.00
Avail Cap(c_a), veh/h	1500	748		286			0	2018	611	169	1750	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00			0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.9	41.1	0.0	61.8			0.0	35.1	29.0	62.3	22.9	0.0
Incr Delay (d2), s/veh	0.2	8.1	0.0	4.6			0.0	2.5	1.5	79.6	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	18.9	0.0	1.3			0.0	15.0	5.3	4.8	9.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.1	49.2	0.0	66.3			0.0	37.6	30.5	141.9	23.8	0.0
LnGrp LOS	C	D		E			A	D	C	F	C	A
Approach Vol, veh/h		1143	A					1703			984	
Approach Delay, s/veh		37.6						36.8			44.8	
Approach LOS		D						D			D	

Timer - Assigned Phs	1	2	3	4		6	7
Phs Duration (G+Y+Rc), s	13.0	56.3	11.7	49.0		69.3	60.7
Change Period (Y+Rc), s	* 7.6	* 7.5	7.1	7.0		* 7.5	7.1
Max Green Setting (Gmax), s	* 5.4	* 36	10.9	49.0		* 49	19.9
Max Q Clear Time (g_c+I1), s	17.4	33.3	4.7	35.2		21.2	17.1
Green Ext Time (p_c), s	0.0	2.1	0.1	6.7		14.5	1.1

Intersection Summary	
HCM 6th Ctrl Delay	39.6
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	60	1450	856	59	0	54
Future Vol, veh/h	60	1450	856	59	0	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	450	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	60	1450	856	59	0	54

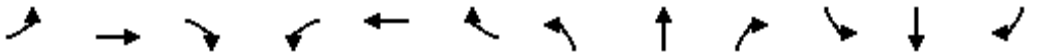
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	915	0	-	0	-	458
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	741	-	-	-	0	550
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	741	-	-	-	-	550
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	12.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	741	-	-	-	550
HCM Lane V/C Ratio	0.081	-	-	-	0.098
HCM Control Delay (s)	10.3	-	-	-	12.3
HCM Lane LOS	B	-	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.3

HCM 6th Signalized Intersection Summary
1: Greenbank Rd & Baseline Rd

10/21/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	485	158	384	807	418	168	657	173	372	1050	117
Future Volume (veh/h)	130	485	158	384	807	418	168	657	173	372	1050	117
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	2000	1984	1969	2000	1984	1984	1984	1969	1969	1969	1984	1984
Adj Flow Rate, veh/h	130	485	158	384	807	0	168	657	0	372	1050	0
Peak Hour 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
Percent Heavy Veh, %	0	1	2	0	1	1	1	2	2	2	1	1
Cap, veh/h	162	646	209	410	968		180	1218		347	1228	
Arrive On Green	0.08	0.23	0.23	0.11	0.26	0.00	0.10	0.33	0.00	0.10	0.33	0.00
Sat Flow, veh/h	1905	2800	906	3695	3770	1682	1890	3741	1668	3638	3770	1682
Grp Volume(v), veh/h	130	326	317	384	807	0	168	657	0	372	1050	0
Grp Sat Flow(s),veh/h/ln	1905	1885	1821	1848	1885	1682	1890	1870	1668	1819	1885	1682
Q Serve(g_s), s	7.4	17.7	17.9	11.3	22.3	0.0	9.7	15.8	0.0	10.5	28.6	0.0
Cycle Q Clear(g_c), s	7.4	17.7	17.9	11.3	22.3	0.0	9.7	15.8	0.0	10.5	28.6	0.0
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	162	435	420	410	968		180	1218		347	1228	
V/C Ratio(X)	0.80	0.75	0.76	0.94	0.83		0.93	0.54		1.07	0.86	
Avail Cap(c_a), veh/h	211	509	492	410	1018		180	1218		347	1228	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	49.4	39.3	39.4	48.5	38.6	0.0	49.4	30.3	0.0	49.8	34.7	0.0
Incr Delay (d2), s/veh	15.5	5.1	5.6	29.1	5.8	0.0	47.5	1.7	0.0	68.6	7.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	7.9	7.8	6.4	9.9	0.0	6.5	6.5	0.0	7.6	12.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.0	44.5	45.0	77.6	44.5	0.0	96.9	32.1	0.0	118.3	42.4	0.0
LnGrp LOS	E	D	D	E	D		F	C		F	D	
Approach Vol, veh/h		773			1191	A		825	A		1422	A
Approach Delay, s/veh		48.1			55.1			45.3			62.3	
Approach LOS		D			E			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	42.3	19.0	31.7	17.0	42.3	16.1	34.6
Change Period (Y+Rc), s	6.5	6.5	* 6.8	* 6.3	6.5	6.5	* 6.8	* 6.3
Max Green Setting (Gmax), s	10.5	31.5	* 12	* 30	10.5	31.5	* 12	* 30
Max Q Clear Time (g_c+I1), s	12.5	17.8	13.3	19.9	11.7	30.6	9.4	24.3
Green Ext Time (p_c), s	0.0	7.4	0.0	5.5	0.0	0.8	0.1	4.0

Intersection Summary	
HCM 6th Ctrl Delay	54.3
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	10	68	38	22	85	59	1105	41	144	1434	79
Future Volume (veh/h)	75	10	68	38	22	85	59	1105	41	144	1434	79
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1953	2000	2000	1953	2000	2000	1953	1969	2000	1969	1984	1875
Adj Flow Rate, veh/h	75	10	0	38	22	85	59	1105	41	144	1434	79
Peak Hour 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
Percent Heavy Veh, %	3	0	0	3	0	0	3	2	0	2	1	8
Cap, veh/h	381	47		133	91	258	218	2311	86	321	2369	999
Arrive On Green	0.25	0.25	0.00	0.25	0.25	0.25	0.63	0.63	0.63	0.63	0.63	0.63
Sat Flow, veh/h	1255	186	0	359	356	1013	381	3678	136	545	3770	1589
Grp Volume(v), veh/h	85	0	0	145	0	0	59	562	584	144	1434	79
Grp Sat Flow(s),veh/h/ln	1441	0	0	1727	0	0	381	1870	1944	545	1885	1589
Q Serve(g_s), s	0.0	0.0	0.0	1.4	0.0	0.0	12.1	17.5	17.6	21.0	25.1	2.1
Cycle Q Clear(g_c), s	5.8	0.0	0.0	7.2	0.0	0.0	37.2	17.5	17.6	38.5	25.1	2.1
Prop In Lane	0.88		0.00	0.26		0.59	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	428	0		481	0	0	218	1175	1222	321	2369	999
V/C Ratio(X)	0.20	0.00		0.30	0.00	0.00	0.27	0.48	0.48	0.45	0.61	0.08
Avail Cap(c_a), veh/h	430	0		483	0	0	218	1175	1222	321	2369	999
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.7	0.0	0.0	33.2	0.0	0.0	23.4	10.9	10.9	21.1	12.3	8.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.3	0.0	0.0	3.0	1.4	1.3	4.5	1.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	0.0	2.9	0.0	0.0	1.1	5.5	5.7	2.6	7.7	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.9	0.0	0.0	33.6	0.0	0.0	26.4	12.2	12.2	25.6	13.4	8.1
LnGrp LOS	C	A		C	A	A	C	B	B	C	B	A
Approach Vol, veh/h		85	A		145			1205			1657	
Approach Delay, s/veh		32.9			33.6			12.9			14.2	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	75.1	34.9	75.1	34.9
Change Period (Y+Rc), s	6.0	* 6.9	6.0	* 6.9
Max Green Setting (Gmax), s	69.0	* 28	69.0	* 28
Max Q Clear Time (g_c+I1), s	39.2	7.8	40.5	9.2
Green Ext Time (p_c), s	22.0	1.0	25.2	1.8

Intersection Summary	
HCM 6th Ctrl Delay	15.1
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	449	285	348	246	0	580	0	1116	149	221	983	17
Future Volume (veh/h)	449	285	348	246	0	580	0	1116	149	221	983	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1984	1953	1953	1906	0	1969	0	1969	1922	1953	1969	440
Adj Flow Rate, veh/h	449	285	0	246	0	580	0	1116	149	221	983	17
Peak Hour 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
Percent Heavy Veh, %	1	3	3	6	0	2	0	2	5	3	2	100
Cap, veh/h	1207	364		314	0	0	0	2340	709	233	2101	36
Arrive On Green	0.33	0.19	0.00	0.09	0.00	0.00	0.00	0.44	0.44	0.06	0.56	0.56
Sat Flow, veh/h	3666	1953	1655	3522	246		0	5552	1629	3609	3762	65
Grp Volume(v), veh/h	449	285	0	246	63.4		0	1116	149	221	489	511
Grp Sat Flow(s),veh/h/ln	1833	1953	1655	1761	E		0	1792	1629	1804	1870	1957
Q Serve(g_s), s	12.2	18.1	0.0	8.9			0.0	19.2	7.4	7.9	20.3	20.3
Cycle Q Clear(g_c), s	12.2	18.1	0.0	8.9			0.0	19.2	7.4	7.9	20.3	20.3
Prop In Lane	1.00		1.00	1.00			0.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	1207	364		314			0	2340	709	233	1044	1093
V/C Ratio(X)	0.37	0.78		0.78			0.00	0.48	0.21	0.95	0.47	0.47
Avail Cap(c_a), veh/h	1207	601		458			0	2340	709	233	1044	1093
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00			0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.3	50.4	0.0	58.0			0.0	26.2	22.8	60.6	17.2	17.2
Incr Delay (d2), s/veh	0.2	3.7	0.0	5.4			0.0	0.7	0.7	44.5	1.5	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	8.7	0.0	4.0			0.0	7.4	2.7	4.8	7.6	8.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.5	54.1	0.0	63.4			0.0	26.9	23.5	105.0	18.7	18.6
LnGrp LOS	C	D		E			A	C	C	F	B	B
Approach Vol, veh/h		734	A					1265			1221	
Approach Delay, s/veh		41.5						26.5			34.3	
Approach LOS		D						C			C	

Timer - Assigned Phs	1	2	3	4		6	7
Phs Duration (G+Y+Rc), s	16.0	64.1	18.7	31.2		80.1	49.9
Change Period (Y+Rc), s	* 7.6	* 7.5	7.1	7.0		* 7.5	7.1
Max Green Setting (Gmax), s	* 8.4	* 36	16.9	40.0		* 52	16.9
Max Q Clear Time (g_c+I1), s	19.9	21.2	10.9	20.1		22.3	14.2
Green Ext Time (p_c), s	0.0	11.5	0.7	4.1		18.1	0.8

Intersection Summary	
HCM 6th Ctrl Delay	35.0
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	91	939	1554	84	0	55
Future Vol, veh/h	91	939	1554	84	0	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	450	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	91	939	1554	84	0	55

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1638	0	-	0	-	819
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	392	-	-	-	0	319
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	392	-	-	-	-	319
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	1.5	0	18.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	392	-	-	-	319
HCM Lane V/C Ratio	0.232	-	-	-	0.172
HCM Control Delay (s)	16.9	-	-	-	18.6
HCM Lane LOS	C	-	-	-	C
HCM 95th %tile Q(veh)	0.9	-	-	-	0.6

Appendix J

Comments and Responses

Comments from Scoping Report Review

- ***Element 2.1.2 - Existing Conditions:***
  - Include description of McWatters Rd;
    - Done
  - Include description of McWatters Rd/Greenbank Rd intersection;
    - Done
  - Existing intersections should be described in text or table format within the existing conditions section of the report;
    - Done
  - Include existing driveways to adjacent developments (both sides of all roads bordering the site) within 200 m of proposed site driveway, indicating the land use associated with the driveway;
    - Done
  - Figure 3 should also include the location of bus stops within the study area;
    - Done
  - Include existing area traffic management measures, if there are none this should be noted.
    - Done
  - Include existing peak hour travel demands for all modes (i.e. pedestrian volumes and cyclist volumes are missing from Figure 4); and
    - Done
  - The collision data should be separated by location and include all intersections (i.e. Greenbank/Lisa, Greenbank/Baseline, Lisa/McWatters, McWatters/Baseline) and segments (i.e. Greenbank, Lisa, McWatters and Baseline) of the boundary streets of the site. You can reach out to nancy.blair@ottawa.ca for collision data.
    - Done

- ***Element 2.1.3 - Planned Conditions***
  - Include planned cycling infrastructure as per the City's Cycling Plan. (https://documents.ottawa.ca/sites/documents/files/documents/ocp2013_report_en.pdf)
    - Done
  - The BRT is on the TMP's Network Concept, therefore will not be in place until post-2031, this should be identified in the TIA.
    - Done
  - The TMP also includes Baseline Road as being a Transit Priority Corridor with Isolated Measures as part of the Affordable Network, this should be identified in the TIA.
    - Done
  - TIA should note that there were no other developments within the study area at the time the study was prepared. (https://ottawa.ca/en/planning-development-and-construction/whats-happening-your-neighbourhood/development-application-search-tool)
    - Done

- ***Element 2.2.1 - Study Area***
  - The site generated traffic volumes and distribution assumptions were not reviewed as part of this Scoping Report, these are to be included in the Forecasting report.
  - If a reduction in study area is being sought based upon travel patterns, additional details are needed to confirm how vehicles access/egress the site and parking garage. Are parking garages connected underground?

- Additional details provided about parking garage locations and connections

- A reduced study area is supported, however, the study area should include: Baseline/Greenbank and Baseline/McWatters.
- Noted

- Keep the reasoning provided for excluding the additional intersections within the report. Note that upon circulation of the Forecasting Report, this section will be reviewed by additional City staff.

- ***Module 2.3 - Exemptions Review***
  - Module 4.5 is required, because the proposed site is residential.
  - Module 4.7 is required.
  - Modules 4.1.3, 4.2.2, 4.6 and 4.8 are exempt.

Comments from Forecasting Report Review

Transportation Engineering Services

The TIA report submissions are to be submitted as cumulative reports. The Forecasting Report should include the screening and scoping portions of the TIA study. Following the standardized format provides a simpler way to review the report and ensures that steps are not missed.

- Completed

TIA Screening and Scoping Report:

- Existing Conditions: Provide existing pedestrian and cycling facilities within the study area.
- The existing pedestrian and cycling facilities are listed in section 3.1

- Area Multi-Modal Network: Include truck route information.
- Added to section 3.1

- Driveways: Discuss any concerns on major driveways/accesses, i.e. Pinecrest Public School access.
- Added

- Transit: Include the latest OC Transpo network map and route schedules.
- Added

Peak Hour Travel Demand:

- The captured data shown in Figure 6 and 7 for Baseline Rd and McWatters Rd is not listed in Table 2 - Intersection Count Data, instead, the Pinecrest RD and Greenbank Rd / E-NS Off-Ramp Hwy 417 intersection in Table 2 is not within the study area. Update the list in Table 2.
- Corrected

- The obtained existing traffic counts on studied intersections should be attached to this report as supporting documents.
- Added

- Collision Analysis: Request detailed collision data from Nancy Blair (Nancy.blair@ottawa.ca) for studied intersections to determine if there are any directional patterns. Provide details on the pedestrian and cycling collisions. The collision data should be attached as supporting documents.
- Added

- Appendix A, Trip Generation Trigger: Based on the provided general information of the proposed development, indicate which land use type is a trigger to be satisfied.
- Completed

TIA Forecasting Report:

- Trip Generation and Mode Shares: Justify any trip reduction factor applied to the development site.
- No trip reduction factor was applied
- Trip Assignment: Show estimated trips entering and leaving the 2 proposed accesses in Figure 1.
- Added

General Background Growth Rates:

- In Figure 2, the projected volumes for 2025 are the same as the existing volumes shown in Figure 6 in TIA Screening and Scoping report. The growth rates were not factored in to calculate the background volumes for 2025.
- In Figure 3, the projected volumes calculated based on the inaccurate numbers shown in Figure 2. Update background volumes for both 2025 and 2030 horizons.
- Provide total volumes including future background volumes and new trips for both 2025 and 2030 horizons.
- Review updated report.
- Demand Rationalization: The intersection capacity analysis needs to be conducted for both existing and background traffic conditions to determine V/C ratio or delays and Level of Service for each movement. Only the studies intersections need to be included in this analysis. Synchro Analysis Reports need to be attached as supporting documents.
- Intersection capacity analysis is part of the Strategy Report

Traffic Signal Operations

- A pedestrian connection between this site and retail south of the site on Greenbank Road would be of benefit.
- The development proposed in this project is at the corner of Lisa Avenue and Greenbank Road, which is 200m north of the retail. A pedestrian connection is provided from the new development to Greenbank Road. While pedestrian connections can be built to public property, a pedestrian connection to an adjacent private property requires agreement from the adjacent landowners, which has not been provided.

Development Review – Transportation

- We encourage you to provide the comments and responses from all previous circulations within the TIA appendix document.
- Added

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Reference No.: 11224343

October 26, 2021

David Trousdale
HOMESTEAD LAND HOLDINGS LIMITED
80 Johnson Street
Kingston, Ontario K7L 1X7

Traffic Impact Assessment Comments

Dear Mr. Trousdale:

Following the City of Ottawa's review of the Traffic Impact Assessment report, we are providing the following responses.

Section 2.1 mentions that "the existing accesses on Lisa Avenue and McWatters Road will be used for the development". Yet in Figures 11, 14, and 15, no site-generated traffic is shown for the McWatters Road access. Please justify.
Response: Although there are accesses to the development on both Lisa Avenue and McWatters Road, no traffic has been assigned to the McWatters Road access, because it does not provide a logical path for drivers. The underground parking access to the proposed building is located near the Lisa Avenue access and drivers using the McWatters Road access would have to drive through the parking area in a convoluted pattern at slow speed and complete a 180º turn to enter the parking garage. In addition, at McWatters Road/Baseline Road, a southbound right-turn only movement is permitted and therefore all exiting traffic must travel through the intersection of Greenbank Road/ Baseline Road, which has long delays. Drivers using the Lisa Avenue access travel through the intersection of Lisa Avenue/ Greenbank Road where the intersection operates with minimal delay.

Section 3.3 for demand rationalization seems to only assess and demonstrate the proposed development's minimal impact on the adjacent intersections. However, seeing that future peak hour serviced demand on the transportation network, by definition, cannot exceed future capacity, the purpose of this module is, where necessary, to adjust projected background and/or development-generated travel demands to create a more realistic picture of future conditions. Especially considering Section 4.9 of the report which demonstrates certain movements exceeding capacity, it is important to demonstrate how the additional volumes in the future (site-generated or not) will be accommodated in the overall road network.
Response: For existing conditions a v/c ratio over 1.0 is not possible since the traffic volumes that travel through an intersection during the peak hour indicate that the volume capacity is at or above the number of vehicles counted. Therefore, the suggested saturation flow rate and PHF do not match the actual conditions. Using a saturation flow rate of 2000 veh/h/lane and a PHF of 1.0 provides a more realistic situation at the intersections. For the future conditions analysis, it is expected that the transit projects in the area, the LRT and BRT, will shift the travel mode to transit and hence the traffic operations are within the range of LOS 'A' and 'F'. Thus, traffic will operate adequately even with the impacts of the development.will improve by 2030. Traffic operation results for the background and total traffic is similar due to the low number of development generated trips.

The TDM Measures checklist from Appendix E only provides a single item: the unbundling of parking costs from monthly rent. More TDM measures should be provided. For instance, to encourage transit

usage, providing a prepaid Presto pass is a proven tool. Displaying relevant transit schedules and route maps at entrances is also an easily implemented item.
Response: In Appendix E additional TDM tools were added: Display local area maps with walking/cycling access routes and key destinations at major entrances and Display relevant transit schedules and route maps at entrances (multi-family, condominium).

Section 4.6 should not be exempted from the TIA as the proposed development relies on two local roads for access. Even if the total volumes are not expected to exceed ATM capacity thresholds, this must be demonstrated, and analysis presented in Section 4.6.
Response: As per the email received on May 5th from the City, the Module 4.6 is exempt

In Section 4.7, existing and future transit demand/capacities must be clearly identified to demonstrate that the transit system will not be negatively impacted. This section in the report only mentions a theoretical conclusion with no supporting data.
Response: According to OC Transpo website, the O-Train Confederation Line is planned to have a capacity of 10,700 passengers per hour in each direction, during peak hours with a potential growth to 18,000 passenger per hour in each direction by 2031 and eventually reaching a maximum capacity of 24,000 passengers per hour in each direction. There are 0 passengers on the LRT currently, therefore the 40 transit trips anticipated from this development should not negatively impact the 10,700 available capacity on the LRT. Given that there are currently 5 bus routes in the area surrounding the development and that new transit infrastructure will be put in place to improve transit in the area, the addition of 40 new trips in the transit system at peak hours should not be an issue. The current average load on the buses in the vicinity of the development during the AM and PM peak hour are between 6 passengers and 33 passengers. The standard OC Transpo bus has a capacity of 68 passengers according the OC Transpo website. Therefore, even if 88% of all expected transit passengers boarded a single bus in the peak hour, the transit passengers from this development would be accommodated.

MMLOS calculations need to be reviewed more thoroughly in future applications as several errors were found. For instance:

The Baseline Road/McWatters Road intersection is not a signalized one - so it should not be assessed for intersection MMLOS.
Response: The Baseline Road/McWatters Road intersection is not in Table 12 of section 4.9.2 Network Intersection MMLOS. Table 12 and Appendix G have been updated.

The Greenbank Road / Baseline Road intersection has a PLOS of F as shown in Table 12 (due to the 'equivalent' amount of 3.5m lanes crossed - refer to clause 2.8 of the Addendum to the MMLOS guidelines). This is not reflected in Appendix G, however. This same intersection's Auto LOS is also shown to have different scores in Table 12 vs Appendix G.
Response: The Auto LOS is E in both Table 12 and Appendix G. The PLOS for Greenbank Road / Baseline Road is F in Appendix G. Table 12 and Appendix G have been updated.

For the Greenbank Road /Lisa Avenue intersection, Appendix G shows high speeds and "2+ lanes crossed for left turns" in the NB direction. And yet for some reason it still shows a BLOS of A instead of F (which will apply for the whole intersection). Please justify.
Response: The overall BLOS for Greenbank Road & Lisa Avenue is F in Table 12 and Appendix G. Table 12 and Appendix G have been updated.

The Greenbank Road / Iris Street / Hwy 417 Ramp intersection also has a PLOS of F due to the same reason mentioned above pertaining to the equivalent amount of 3.5m lanes crossed.
Response: Table 12 and Appendix G have been updated.

Please justify why TLOS was not assessed for any of the intersections, and instead marked as "N/A".
Response: TLOS was not assessed because the guidelines indicate that the TLOS is intended to be applied along rapid transit corridors or corridors with transit priority measures, which is not the case for our study area.

All intersections are within "Policy Areas" as per Exhibit 22 of the MMLOS Guidelines due to being in close proximity of schools and/or within a TOD area. As such, PLOS targets should be A not C and Auto LOS targets E not D for all intersections.
Response: The PLOS target is C and Auto LOS target is E for all intersections as presented in Table 12. Table 12 and Appendix G have been updated.

For BLOS purposes, the Greenbank Rd / Baseline Rd intersection actually has a target of C, while the remaining two signalized intersections from Table 12 actually have targets of B.
Response: The target is C for Greenbank Rd / Baseline Rd and B for the other two intersections as shown in Table 12. Table 12 and Appendix G have been updated.

Should you have any questions on the above, please do not hesitate to contact us.

Sincerely,

GHD

Vanessa Skelton
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Reference No.: 11224343

December 15, 2021

David Trousdale
HOMESTEAD LAND HOLDINGS LIMITED
80 Johnson Street
Kingston, Ontario K7L 1X7

Traffic Impact Assessment Comments

Dear Mr. Trousdale:

Following the City of Ottawa's second submission comments dated December 8, 2021, we are providing the following responses.

Please justify why TLOS was not assessed for any of the intersections, Baseline Rd is identified as a Transit Priority Corridor within the TMP's Affordable Network.
Response:
From the Baseline Road Rapid Transit Corridor Planning and EA Study, completed in 2017,

"Transit Priority Measures being considered are:
• The removal of bus bays to reduce merging requirements for buses
• Signal timing improvements
• Queue jump lanes at Greenbank
• Intermittent bus only lanes in select portions (Where existing roadway can be reallocated)
These measures will help improve transit operations in the western half of the study area prior to ultimate implementation of the project."

For the segment between McWatters Road and Greenbank Road, there will continue to be buses in mixed traffic with limited driveway friction and therefore will have a LOS 'D', which meets the target.

At the intersection of Greenbank Road and Baseline Road, the Baseline Road Rapid Transit Corridor Planning and EA Study indicates that transit signal priority (TSP) measures, including queue jump lanes, will be implemented as part of the project. The queue jump lanes are considered a high-level TSP and hence the intersection will have a LOS 'B', which meets the target.

Should you have any questions on the above, please do not hesitate to contact us.

Sincerely,

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